Measuring the transformative utopian impulse for planetary health in the age of the Anthropocene: a multi-study scale development and validation

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Summary

Background Transformative utopian impulse for planetary health is people's propensity to have thoughts and engage in actions of which the purpose is to transform the current society into a better one in the future by addressing existing global issues. We aimed to develop a well-validated scale that can measure the transformative utopian impulse for planetary health and uncover its role in societal transformation.

Methods We developed a scale to measure the transformative utopian impulse for planetary health across 11 studies with 6248 participants from the USA (from the MTurk database) and the UK (from the Prolifico.co database). Participants were eligible take part in the studies if they completed the consent form. Participants who did not pass the seriousness check or did not accurately answer all instructed response items were excluded from statistical analyses. We used exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) to determine the factor structure of the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS). Then we analysed the TUIPHS' nomological network (ie, the relationships between TUIPHS and various constructs ranging from personality traits and values to economic, social, and political attitudes and beliefs). We then examined the scale's incremental predictive validity by testing whether it predicts various attitudes and behaviours relevant to social change beyond scales that measure competing constructs (this part of the study is registered at OSF Registries [https://osf.io/ztj2f]). Finally, we examined the TUIPHS' longitudinal predictive validity by probing whether it predicts people's future support for social change.

Findings Data were collected between Oct 8, 2018, and July 6, 2020. We established that TUIPHS has a four-factor structure and can also be scored as a single general factor, indicating that it captures an overarching theoretical construct (ie, the transformative utopian impulse for planetary health). We then showed that the scale is related to various specific individual difference measures that capture diverse aspects of people's propensity to actively engage in thoughts and actions oriented toward the betterment of society. Moreover, TUIPHS predicted, above and beyond 20 competing scales highly correlated ($r \geq 0 \cdot 50$) with it, a series of 19 self-reported behavioural and attitudinal constructs pertaining to social change. Finally, participants' past TUIPHS scores predicted their support, a few months later, for social movements that aim to build a more just and resilient society than in the current day.

Interpretation This research lays the groundwork for future theoretical and empirical research into the psychological and behavioural processes attached to the transformative utopian impulse for planetary health as a source of transformative social change toward a better way of being and living.

Funding The London School of Economics and Political Science.

Lancet Planet Health 2022; 6: e230–42

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Introduction

A reflection on the necessity of hope in today's global order calls for those seeking a just, equal, and healthy existence for humanity and nature to exercise the transformative utopian impulse.[1] The Sustainable Development Goals (SDGs), set by the UN 2030 Agenda, put the concept of transformation at the forefront of the sustainability discourse.[2] A transformation of our current society, defined as implementing substantial and fundamental changes regarding how the society operates, is considered urgent and essential if we want to live in a more sustainable world in the future.[3] Although further scientific and technological advances will be necessary to achieve this goal, it has been pointed out that transformation is a social process that requires structural, social, and cultural changes across societies and should be considered from a pluridisciplinary angle.[4] From this perspective, the role of the utopian impulse, a concept traditionally studied in social sciences and humanities, has been identified as one of the key themes to be explored in relation to societal transformation.[4] In this study, we aim to develop a scale measuring the transformative utopian impulse for planetary health, defined as people's propensity to have thoughts and

Research in context

Evidence before this study

Scholars from many disciplines have emphasised the importance of utopian thinking for social change, although little research has been undertaken to combine the utopian theory with scale development in psychology. We ran a query in Scopus database using the following query string: "utopia" OR "utopian thinking" OR "utopian impulse" OR "utopianism" AND "measure" AND "scale", in the fields related to "title", "abstract", and "keywords". We took into account works published between Jan 1, 1973, and Dec 31, 2018, in English, in scientific journals, and confined the search to the subject areas "Psychology" and "Social Sciences", yielding 608 articles. After examining the title, abstract, and keywords of the selected documents, it appears that only one article attempted to measure the construct of utopianism. A similar search including the same descriptors on works published between Jan 1, 2019, and Feb 21, 2022, yielded 365 scientific articles. After examining the title, abstract, and keywords of the selected documents, it appeared that none of them attempted to measure the construct of utopianism. In the sole article found, utopianism was conceptualised as general utopian thinking, which refers to people's tendency to imagine an ideal society and what it might look like. It was found that the measure of general utopian thinking was correlated with the activation of three utopian functions: compensation, criticism, and change. Moreover, it was shown that engaging in this thinking enhanced intentions to criticise and change society. However, the measure of utopian thinking created in this research did not go beyond the classic definition of utopia as ideal society to encompass its transformative aspect and did not characterise the content of a specific type of utopia. Also, to the best of our knowledge, neither this study nor previous research has produced a well-validated scale following the standard steps of scale development (ie, exploratory and confirmatory factor analyses; convergent, discriminant, and predictive validity) that measures individual differences in utopian thinking.

Added value of this study

In this study, we suggest an alternative and more specific approach that conceptualises utopian thinking for planetary health and articulates the criticism and the change functions of this utopian vision in our current society. In this regard, we operationalised the construct of transformative utopian impulse for planetary health, defined as the propensity to have thoughts and engage in actions whose purpose is to transform the current society into a better one in the future by addressing existing global issues. More specifically, we developed the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) that measures individual differences in this construct and can be used to understand the role that people's personality plays in transformative social change on economic, social, and political levels. We developed a scale using exploratory and confirmatory factor analyses and showed that TUIPHS is correlated with various conceptually linked measures (eg, hope, utopianism, activist identity, egalitarianism), thus establishing its convergent validity. We also showed that TUIPHS is not correlated with constructs that do not have theoretical links with the transformative utopian impulse (eg, self-esteem and material values), thus establishing its discriminant validity. Moreover, by testing the incremental predictive validity of TUIPHS, we showed that it predicts, above and beyond competing scales, including the measure of general utopian thinking (ie, utopianism), a wide range of self-reported attitudes and behaviours that contribute to sustainable development via transformative change at economic, social, and political levels, including participation in protests, and a reduction of production and consumption (ie, degrowth). Further, we established longitudinal predictive validity of TUIPHS by showing that people's present scores on the scale predict their future attitudes and intentions toward social movements such as Black Lives Matter and Build Back Better UK that aim to build a more inclusive and resilient society in the future.

Implications of all the available evidence

Our study documents the first well-validated scale on a timely construct such as utopian thinking that is considered essential for planetary health but remains under-researched. We show that, whereas the transformative utopian impulse for planetary health is linked to many specific individual difference measures that were developed to assess people's propensity to contribute to social change (eg, activism, ethical consumption, and helping others), it predicts a range of attitudes, intentions, and behaviours that comprise social change beyond these specific personality characteristics. Our research therefore indicates that people might have a general overarching tendency (ie, the transformative utopian impulse for planetary health) to contribute to societal transformation that is channelled via diverse attitudes and behaviours. The scale we have developed allows researchers, policy makers, and other change makers to measure this tendency and further examine to what extent it plays a role in both individual transformative actions and large-scale movements that aim to transform society.

engage in actions of which the purpose is to transform the current society into a better one in the future by addressing existing global issues. In doing so, this research lays the foundation for uncovering the role that psychological processes behind utopian thought and practices play in social change toward a better way of being and living.

Coined by Thomas More in 1516 in his famous book depicting an imaginary country,[5] the word utopia is a pun in Greek: utopia being a eutopia (the good place) and outopia (no place). Since then, the word utopia has been described as a non-existent good place[6] and the best society in full operation.[7] However, literary utopias such as More's should be distinguished from utopian thought,

which is fragmentary because it does not present a society in full operation.[8] This fragmentary quality is illustrated in sustainable development politics, in which utopian thought is common but does not translate into an authoritarian blueprint that depicts in detail a hypothetical ideal society.[9] Rather, utopian thought takes the form of visionary expressions ranging from general principles (eg, sectoral goals) to concrete implementations (eg, ecological housing)[10] that transcend our present society and signal a future that is more desirable than current day in which global issues (eg, poverty and climate change) are resolved.[11]

A distinct but complementary approach understands the definition of utopia broadly, as an expression of the desire for a better way of being and living,[12] and identifies three main functions of utopian thought in the literature: criticism, compensation, and change.[12] Concerning the criticism function, because utopias are traditionally associated with alternative and better ways of being and living, utopian thought can be considered a constructive criticism of the current society in light of a hypothetical world[12–14] that points out places in which something is missing[15] and what is wrong with the way we now live.[6] The compensation function indicates that utopian thought can be used to escape everyday problems (eg, via daydreaming), and thus associated with status quo and inaction, whereas the change function indicates that utopian thought can involve envisioning potential ways to transform society.[12,16] The change function is essential for understanding the difference between abstract and concrete utopia,[17] without which the transformative utopian impulse cannot be accurately portrayed.

Abstract utopia is the realm of wishful thinking and is confined to fantasies or inner dreams or daydreams of ideal alternative worlds.[17] In contrast, concrete utopia is the realm of will-full thinking to create a new future world "which is more adequate for us, without degrading, suffering, anxiety, self-alienation, nothingness".[17] In this sense, given its contrast to abstract utopia, which does not have to be possible or plausible, concrete utopia is linked to the perceived possibility that the current world could be improved in the future and thus fulfils the change function.[12,18,19] When concrete, utopia is associated with an impulse (ie, inclination or a tendency to think or to act in a specific way) to transform the current society into a better one with solutions in everyday life.[18,20]

In contrast to dystopias, utopias usually "have universal scope and offer benefits to all within this frame of reference".[21] In the context of sustainable development, as illustrated by SDGs, and planetary health, the transformative utopian impulse fosters visions of a better way of living shaped by humanistic and egalitarian values oriented toward the democratic ideals of economic equality, social justice, universal rights, and concern for others' wellbeing,[9,10,22–27] of which the purpose is achieving happiness and dignity and avoiding suffering and degradation.[17]

Against this background, the transformative utopian impulse for planetary health articulates reflection and action: namely, a critical point of view about the current society, which is unsatisfactory and unfinished and can possibly be improved, and a transformative approach, which aims to implement solutions in the real world that could lead to economic, social, and environmental improvements in the future. Such solutions might have not yet[17] been adopted or scaled up, but they express the possibility to come. For instance, some solutions that exist at present but are not implemented, well known, or widely used could be adopted or further developed to progress toward the SDGs and contribute to addressing the climate crisis and economic and social issues.[26,28,29] These solutions include universal basic income,[30] fair trade,[25,31] or Transition Towns (ie, grassroot community projects oriented toward self-sufficiency).[32,33] More radical solutions than these are also possible. For example, degrowth comprises a sustainable downscaling of production and consumption,[34] and entails a critique of the economic growth model usually endorsed in sustainable development (eg, the UN 2030 Agenda).

Conceptualising the transformative utopian impulse for planetary health does not represent the first attempt to measure utopian thinking in psychology. Indeed, utopianism, which captures general utopian thinking, defined as the extent to which people usually engage in imagining ideal societies, has been previously examined from a psychological perspective.[16] This research has engendered preliminary insights regarding the relevance of utopian thinking for understanding social change. Namely, it was found that when people had an increased engagement in imagining ideal societies, they had a decreased satisfaction with the current society (ie, the criticism function), and an increased intention to take action to change their society (ie, the change function). However, this measure of utopianism has several key limitations in relation to studying the transformative aspects of utopian thinking. Most importantly, it relies on the definition of utopia as ideal society and captures people's general thoughts about such a society (eg, "I often think about what an ideal society might look like").[16] Accordingly, this approach does not consider the content of a specific type of utopia,[16] and omits the concrete endeavours that have the potential to change the current society into a better one via resolution of its biggest issues, and that characterise the transformative process of utopia.[35] Moreover, to the best of our knowledge, no previous research has followed the standard steps of scale development (ie, exploratory and confirmatory factor analyses, and convergent, discriminant, and predictive validity)[36] to produce a well-validated scale that measures individual differences in utopian thinking and can be used by researchers, practitioners, activists, and other changemakers to understand the role that personality plays in transformative social change on economic, social, and political levels.

To overcome these limitations, in the present research, we develop the transformative utopian impulse for planetary health as a construct that enriches the theoretical and practical understanding of social change from the perspective of utopian theory. In this regard, we do not intend to conceptualise general utopian thinking, and do not focus on ideal societies. Rather, we follow utopian theory that reclaims utopian as an action word,[35] and suggests the aforementioned broader definition of utopia to express the propensity to reach for a better way of living that manifests in everyday life in which something is missing.[17,18,37] We conceptualise the transformative aspects of the utopian impulse in relation to the global issues that pertain to our present society (eg, climate change and economic and social inequalities), and that require actual and possible change for a better world (eg, increased sustainability and egality). The transformative utopian impulse for planetary health is therefore a propensity to engage in thinking and action directed at addressing the most pressing global issues to transform society into a better one that is devoid of these issues. In the present research, we carried out 11 empirical studies in which we developed and validated a scale that measures individual differences in the transformative utopian impulse for planetary health, to show that it predicts various attitudes, intentions, and behaviours linked to transformative social change.

Methods

In this study we developed a scale to measure individual differences in the transformative utopian impulse for planetary health in participants in the USA and the UK. First, we developed the scale via exploratory and confirmatory factor analyses (study 1). Then, we tested the scale's nomological network (ie, its links to various personality traits, values, attitudes, and beliefs; study 2 [including studies 2a, 2b, 2c, 2d, and 2e]). We then probed the scale's incremental predictive validity (study 3 [including studies 3a, 3b, 3c, and 3d]) by examining whether it predicts various behavioural and attitudinal variables relevant to social change beyond competitor scales, and its longitudinal predictive validity (study 4) by testing whether it predicts people's future support for social change. In all studies, sample size was determined before any data analysis, and we report all measures, manipulations, and exclusions in the appendix (pp 1–59). Overall, across study 1 (samples 1 and 2) and studies 2 and 3, 4387 US participants recruited via Amazon Mechanical Turk (MTurk) were included in the analyses. In study 1 (samples 3 and 4), 1861 UK participants were included, and in study 4, 799 UK participants were included; all UK participants were recruited via Prolific.co. MTurk and Prolific.co are crowdsourcing websites where researchers can hire and compensate participants for taking part in computerised tasks (eg, online surveys). Participants were eligible if they completed the consent form. Participants who did not pass the seriousness check (ie, did not answer positively to the survey question asking whether they have taken part in the study seriously) or did not accurately answer all instructed response items were excluded from statistical analyses (for exclusion criteria details, see appendix pp 7, 18, 31, and 56). Because study 4 was a longitudinal study, its participants were recruited from the same pool of participants comprising sample 4 in study 1 and so there were a total of 6248 individual participants across all studies. Studies 1 (sample 4) and 4 used a nationally representative UK sample concerning age, sex, and ethnicity. Additional studies that were conducted regarding the transformative utopian impulse for planetary health but did not fit into the Article due to space constraints are available in appendix (pp 60–75). All procedures in these studies received approval from our institutional ethics committee.

See Online for appendix

Scale development

In study 1 (appendix pp 6–15), we first created a set of representative items on the basis of previous theorising and in consultation with experts (panel 1). We then carried out exploratory (EFA) and confirmatory factor analyses (CFA) to select items for the scale and determine its factor structure.[49] Finally, we used bifactor statistical indices to show that the scale can be scored as a single general factor,[50,51] which supports the ability of the scale to capture a general overarching construct (ie, the transformative utopian impulse for planetary health), in line with our theorising.

Nomological network

We did five studies (2a, 2b, 2c, 2d, and 2e) to map the nomological network[52] of the transformative utopian impulse for planetary health and integrate it with psychological theory by investigating its links to various constructs ranging from personality traits and values to economic, social, and political attitudes and beliefs measured by 79 scales and subscales (appendix pp 16–24). In doing so, we wanted to establish the convergent validity of the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) by showing that it correlates with, but is also distinct from, various theoretically relevant constructs (eg, utopianism, hope, activist identity, and egalitarianism). We also tested the scale's discriminant validity by showing that it does not correlate or has low correlations with the constructs that are not of theoretical relevance (eg, self-esteem and material values).[36,53]

Incremental predictive validity

We then examined the incremental predictive validity of TUIPHS to show that it predicts, above and beyond the 20 competing scales highly correlated ($r \geq 0 \cdot 50$) with it (table 1; appendix pp 24–28), a series of 19 self-reported behavioural (studies 3a and 3b) and attitudinal constructs (studies 3c and 3d). These constructs were created on the basis of the literature to capture different aspects of societal transformation that can be thematically organised into

Panel 1: Item development

The scale items were developed to capture the key elements of the transformative utopian impulse for planetary health identified in the literature discussed in the Introduction.[10,12,14,16–18,35] First, the items had to fulfil the criticism function of utopia by indicating that the world has pressing issues that need to be resolved.[12,14,16] In some items, we used general phrases such as "the biggest issues of our age" for respondents to decide what these issues are (eg, item 13; appendix p 9). In other items, we referred to the most pressing global problems (eg, climate change and economic and social inequality) aligned with SDGs,[2] which are typically specified in the literature on utopia[9,14,22,25,38–40] or other scholarly publications.[26,27,41,42] Importantly, the items had to fulfil the change rather than the compensation function of utopia.[12,16–18,35] Indeed, linked to daydreaming and escapism, the compensation function might manifest itself as being disengaged from society and practicing inaction rather than transformative action,[12,16] which leaves the compensation function out of the scope of our analysis. Our items reflected people's propensity to engage in thoughts or pursue actions aimed at transforming the world by tackling its current issues. In relation to thoughts, the items assessed the extent to which people themselves are inclined to think about ideas to transform the world (eg, item 14; appendix p 10) or are motivated to search for such ideas developed by others or react positively when they encounter them (eg, item 9; appendix p 11). In relation to actions, some items referred more generally to actions to change the world (eg, item 12; appendix p 9) and some others to specific actions (eg, item 26; appendix p 12). Regarding specific actions, we focused on the choice of socially conscious products and services that could create a change by tackling issues the world is currently facing (eg, exploitation, economic inequality, and environmental issues), and are thus considered utopian.[22,25,31,43] Promoting sustainable and equitable patterns of consumption by supporting sustainable business models that address social, environmental, and commercial goals has consistently been identified among the essential steps needed to transform our societies.[26] It is worthwhile to note that our items did not employ market-related verbs such as pay, buy, or purchase, so that the choice or selection of such products or services can also include non-monetary exchanges (eg, the SDGs in Action mobile application). As another aspect of the change function of utopia, we went beyond assessing people's own actions that contribute to transforming the world. We probed whether people search for or positively respond to currently existing solutions developed by others that could potentially transform the world (eg, item 40; appendix p 12), or how likely people are to believe that such solutions exist even if they are not widely adopted or easily identified (eg, item 53; appendix p 11). Indeed, various publications concerning utopia emphasise that the solutions that could transform the society might already exist at present (ie, they are concrete), and could lead to change if they were widely adopted or scaled up.[17,18,20,25,28,32,40,44–46] Finally, all our items had to satisfy the three distinct levels of the utopian impulse: body, time, and the collective dimension.[14] Regarding body, all the items involved words linked to motivation, affect, and action (eg, drive, impulse, urge, feeling, excitement, and choices).[12,14,17,35] Concerning time, we created items that used past, present, or future tenses, given that the transformative utopian impulse is also about taking insights and inspiration from the progress achieved in the past, and the solutions or ideas available at present to ultimately transform the future.[12,14] In this regard, our items did not include the past tense in relation to returning to an idealised past, but in relation to being inspired or motivated by ideas that successfully transformed the world. The final important aspect of our items is that they had to involve the collective dimension,[14] and thus emphasise or imply that transforming the world benefits people collectively (eg, item 2 appendix p 11) rather than a single individual, in contrast to personal utopias.[47] We first created an initial pool of 59 items based on these principles, and these items were then shared with expert utopian scholars for feedback. Given that the concept of the utopian impulse was originally proposed and discussed by Ernst Bloch,[17] and that our goal in developing this scale was to engage with the scholarly literature on the humanities, we identified and corresponded with scholars who have expertise in his work to attain feedback regarding the initial scale items. These experts included Lyman T Sargent, Darren Webb, Rainer Zimmermann, Peter Thompson, and Athanasios Marvakis. Although our main criterion when contacting these scholars was expertise in Bloch's conceptualisation of the utopian impulse, many of the scholars are generally considered leaders in the field of utopian studies who have made seminal contributions regarding utopian scholarship. For example, Lyman T Sargent is one of the world's foremost scholars on utopian studies. He is the founding editor of Utopian Studies and served as the editor during the journal's first 15 years. He is also the recipient of the Distinguished Scholar Award from the Society for Utopian Studies and has written *Utopianism: a Very Short Introduction*,[6] in which he covers the current state of knowledge regarding utopian scholarship. Therefore, even if we cannot claim to have contacted a representative sample of utopian scholars, which in practice would be very difficult,[48] we did receive feedback from individuals who have a comprehensive and representative knowledge of utopian literature. Overall, the final list of 60 items (appendix pp 9–12) that was included in exploratory factor analysis incorporated the expert feedback that can be summarised as follows.

First, the experts pointed out that we should remove any expressions referring to a perfect or ideal world, because even if utopias can be radically different than the current world, they are never perfect or ideal. For that reason, our items

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(Panel 1 continued from previous page)

typically refer to a better or improved world that strives toward resolving the biggest issues the current world is facing, but never to a perfect or ideal world. Second, they indicated that utopias are transformative (ie, they constitute radical changes of society), and this should be emphasised across items if possible. For this reason, expressions that emphasise the transformative aspect of the utopian impulse are present in many items (ie, transforming society, creating or achieving a radically different world, attempting to resolve the world's biggest issues, etc). Third, the scholars emphasised that people who have a high utopian impulse should believe that a radical social change is possible. For this reason, our items generally imply this belief (eg, item 40; appendix p 12). Fourth, the experts indicated that we need to have some extreme items that can distinguish between participants who have exceptionally strong utopian impulse and those who do not. For this reason, our final item pool includes several extreme items (eg, item 17; appendix p 9). Fifth, because in the initial version we had eight items referring to equality, we were told to reduce this number as we were overemphasising one specific value that might not be equally strong in all individuals who have high utopian impulse. For this reason, we both reduced the number of items in which we refer to the concept of equality and replaced the term equality with inequality, given that the transformative utopian impulse concerns the propensity to resolve existing global issues, and inequality is typically evoked as one of the most pressing issues (eg, UN SDG 10 aims to reduce inequality within and among countries).

SDG=Sustainable Development Goal.

	Factor 1	Factor 2	Factor 3	Factor 4	General factor
Study 2b (n=266)					
Utopianism[16]	0·699 (<0·0001)	0·529 (<0·0001	0·579 (<0·0001)	0·588 (<0·0001)	0·688 (<0·0001)
IRI, empathic concern[54]	0·372 (<0·0001)	0·454 (<0·0001)	0·589 (<0·0001)	0·486 (<0·0001)	0·543 (<0·0001)
Study 2c (n=268)					
PVQ5X, self-direction thought[55]	0·358 (<0·0001)	0·444 (<0·0001)	0·556 (<0·0001)	0·454 (<0·0001)	0·507 (<0·0001)
PVQ5X, universalism-concern[55]	0·451 (<0·0001)	0·621 (<0·0001)	0·653 (<0·0001)	0·541 (<0·0001)	0·633 (<0·0001)
PVQ5X, universalism-nature[55]	0·567 (<0·0001)	0·575 (<0·0001)	0·662 (<0·0001)	0·686 (<0·0001)	0·702 (<0·0001)
PVQ5X, universalism-tolerance[55]	0·523 (<0·0001)	0·578 (<0·0001)	0·617 (<0·0001)	0·562 (<0·0001)	0·640 (<0·0001)
Study 2d (n=263)					
Green scale[56]	0·523 (<0·0001)	0·604 (<0·0001)	0·675 (<0·0001)	0·796 (<0·0001)	0·724 (<0·0001)
EMCB, eco-buy[57]	0·473 (<0·0001)	0·553 (<0·0001)	0·602 (<0·0001)	0·772 (<0·0001)	0·669 (<0·0001)
EMCB, eco-boycott[57]	0·428 (<0·0001)	0·538 (<0·0001)	0·595 (<0·0001)	0·725 (<0·0001)	0·636 (<0·0001)
EMCB, recycle[57]	0·447 (<0·0001)	0·542 (<0·0001)	0·578 (<0·0001)	0·675 (<0·0001)	0·625 (<0·0001)
EMCB, CSR-boycott[57]	0·397 (<0·0001)	0·506 (<0·0001)	0·556 (<0·0001)	0·701 (<0·0001)	0·601 (<0·0001)
EMCB, pay more[57]	0·456 (<0·0001)	0·527 (<0·0001)	0·578 (<0·0001)	0·696 (<0·0001)	0·630 (<0·0001)
Egalitarianism scale[58]	0·449 (<0·0001)	0·574 (<0·0001)	0·553 (<0·0001)	0·560 (<0·0001)	0·595 (<0·0001)
AHO[59]	0·517 (<0·0001)	0·607 (<0·0001)	0·636 (<0·0001)	0·593 (<0·0001)	0·656 (<0·0001)
AICS, activist identity[60]	0·676 (<0·0001)	0·496 (<0·0001)	0·486 (<0·0001)	0·599 (<0·0001)	0·636 (<0·0001)
AICS, activist commitment[60]	0·658 (<0·0001)	0·473 (<0·0001)	0·476 (<0·0001)	0·611 (<0·0001)	0·625 (<0·0001)
Study 2e (n=255)					
SDO-E, pro-trait[61]	−0·370 (<0·0001)	−0·542 (<0·0001)	−0·500 (<0·0001)	−0·424 (<0·0001)	−0·513 (<0·0001)
SDO-E, con-trait[61]	0·393 (<0·0001)	0·565 (<0·0001)	0·526 (<0·0001)	0·422 (<0·0001)	0·532 (<0·0001)
Humanitarianism-egalitarianism[62]	0·508 (<0·0001)	0·619 (<0·0001)	0·624 (<0·0001)	0·545 (<0·0001)	0·645 (<0·0001)
Economic system justification[63]	−0·326 (<0·0001)	−0·556 (<0·0001)	−0·435 (<0·0001)	−0·416 (<0·0001)	−0·483 (<0·0001)

Data are presented as Pearson correlation coefficient *r* (p value). Raw significance values are reported: no significance levels stopped being significant after the false discovery rate (FDR) correction was applied across factors 1 to 4. The general transformative utopian impulse factor is reported for informative purposes (it was not involved in sample size planning based on the FDR correction and we therefore did not use the correction in relation to this factor). TUIPHS=Transformative Utopian Impulse for Planetary Health Scale. IRI=Interpersonal Reactivity Index. FSM=fundamental social motives. REI=Rational Experiential Inventory. PVQ5X=Portrait Value Questionnaire. MVS=Material Values Scale. EMCB=Ethically Minded Consumer Behavior Scale. CSR=corporate social responsibility. AHO=attitudes toward helping others. ACO=attitudes toward charitable organisations. AICS=Activist Identity and Commitment Scale. BJW=belief in a just world. SDO-E=Social dominance orientation anti-egalitarianism.

Table 1: **Measures tested in studies 2b, 2c, 2d, and 2e that were highly correlated (r≥0·50) with one or more of the TUIPHS factors**

three broad domains: economic, social, and political. The first set of constructs, linked to the economic domain, involved behaviours such as collecting information about ethical products and services (research), supporting local products and brands (localism), and engaging in personally costly actions for public good (sacrifice). Economically

related attitudes were illustrated by constructs expressing thoughts in favour of social justice (life improvement), and a reduction of production and consumption (degrowth). Another set of constructs, linked to the social domain, exemplified behaviours such as getting informed about concrete initiatives and solutions to tackle global issues (knowledge), engaging in actions that support individual or collective change (individual change and collective change), and collective imagination (collective imagination). Regarding the social domain, we also developed constructs that measure attitudes in favour of immediate action (urgency) and bottom-up implementations and solutions (empowerment), or attitudes inspired by empathy toward others in need (perspective taking and refugees). A third set of constructs illustrated politically related behaviours such as arguing in favour of democratic tolerance (tolerance) or publicly advocating for a cause (public). Politically related attitudes expressed feelings (immersion), emotions (contempt), or opinions (commitment and personal autonomy) that have been associated with utopian thinking and social change. These constructs and their relevance to the transformative utopian impulse for planetary health are further detailed in the appendix (pp 33–38).

We expected that, using a hierarchical regression analysis, adding the four TUIPHS factors (established in study 1) to a model that contains the covariates (gender and age) as well as a competing scale (or a set of subscales comprising the competing scale) will significantly increase R^2 for each of the aforementioned behavioural and attitudinal dependent variables (hypothesis 1). We also expected that, in each computed hierarchical regression, one (or more) of the TUIPHS factors would individually predict an increase in these dependent variables (hypothesis 2). For both hypotheses, we used the false discovery rate (FDR) correction to prevent false-positive findings.[64] All the hypotheses and analyses for studies 3a, 3b, 3c, and 3d were preregistered (appendix pp 31–32).

Longitudinal predictive validity

In a subsequent study, we tested whether people's scores on TUIPHS (measured between Feb 3 and Feb 7, 2020) predicted support for two social movements associated to events that took place and were discussed in the news in May and June, 2020, namely Build Back Better UK (BBB) and Black Lives Matter (BLM). We selected these two activist social movements because their purpose is to

For more on the **Build Back Better statement** see https://www.buildbackbetter.org.uk/

***Panel 2*: The Transformative Utopian Impulse for Planetary Health Scale**

EFA and CFA established four factors comprising the TUIPHS. The responses are anchored on 7-point scales from 1 (strongly disagree) to 7 (strongly agree). Bifactor analyses showed that even if EFA and CFA determined that TUIPHS can be scored factor per factor by averaging scores for the three items comprising each factor listed below, it can also be scored as a general factor by averaging scores across all items comprising this scale. The item numbers correspond to the numbers reported in the figure and appendix (pp 9–12).

Factor 1 (TUIPHS-TTA): propensity for transformative utopian thinking and action

Item 17: One of the most important driving forces in my life is to develop ideas that could contribute to a better world in which nothing is missing for all human beings.

Item 13: I frequently have the impulse to help transform the current society into a new world where the biggest issues of our age are extinct.

Item 8: I often participate in conversations whose purpose is to come up with potential solutions to the biggest social ills of our time.

Factor 2 (TUIPHS-BTS): belief in transformative utopian solutions

Item 53: I feel that there are many alternative social and economic activities that could resolve current social issues if they were widely adopted.

Item 2: I often feel that there are new ways of living that would create social and economic justice for everyone.

Item 39: I often get the impression that the future of our society could be better if some existing solutions to transform economic and social reality were scaled up.

Factor 3 (TUIPHS-RTS): responsiveness to transformative utopian solutions

Item 50: I feel excited when I come across propositions that could overcome our past and present economic, social, and environmental failures.

Item 40: I am thrilled when I come across already existing solutions that could improve the circumstances of people who are underprivileged if they were more widely adopted.

Item 9: I get excited when I encounter ideas that changed the world for the better by enabling social and economic progress.

Factor 4 (TUIPHS-CPS): choice of transformative utopian products and services

Item 26: Current examples of social and economic inequality motivate me to choose ethical products that counter exploitation and injustice.

Item 36: Whenever I have the choice, I choose products and services that can help fix the social and environmental problems resulting from our malfunctioning economic system.

Item 43: My everyday choices of products and services can help transform the economic and social life of the workers in these industries.

EFA=exploratory factor analyses. CFA=confirmatory factor analyses. TUIPHS=Transformative Utopian Impulse for Planetary Health Scale.

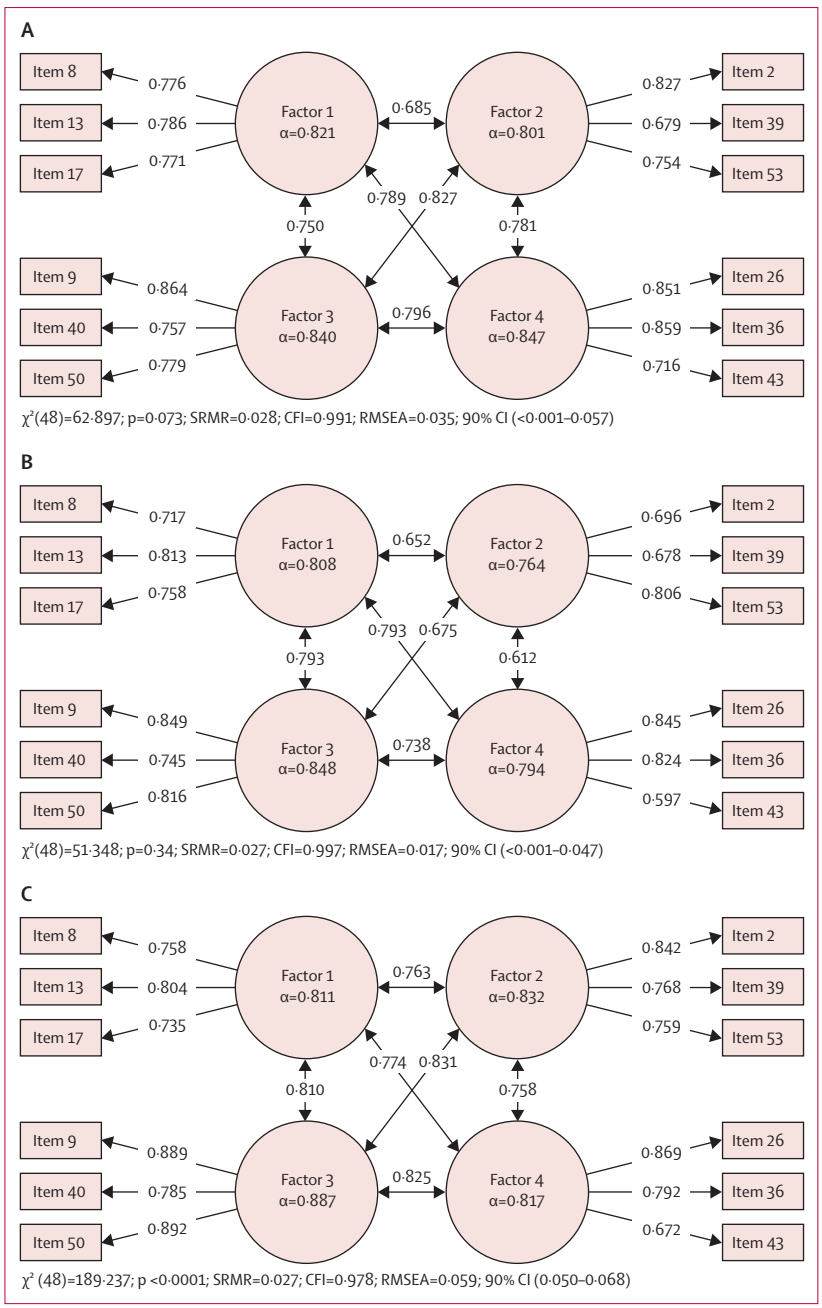

Figure: **Factor structure of the TUIPHS**
Factor structure of TUIPHS established using confirmatory factor analyses on sample 2 (US participants; A), sample 3 (UK participants; B), and sample 4 (nationally representative UK participants; C) with standardised item and latent variable loadings. Model fit was estimated using the MLMV maximum likelihood estimator with robust standard errors,[67] and conservative cut-off values of SRMR, RMSEA, and CFI were used to indicate a good model fit: SRMR <0·05; CFI >0·95; and RMSEA <0·06.[68,69] CFI and RMSEA were calculated using recommendations by Savalei.[70] α below the name of each factor refers to Cronbach's α for that factor. TUIPHS=Transformative Utopian Impulse for Planetary Health Scale. MLMV=maximum likelihood mean and variance adjusted estimator. SRMR=standardised root mean square residual. RMSEA=root mean square error of approximation. CFI=comparative fit index.

tackle deep-seated racial, social, and economic inequalities, and because they express and nurture utopian aspirations. The BBB campaign, launched by Green New Deal UK on May 8, 2020, aims to build a better society in the post-COVID-19 pandemic world. The BLM movement, through the network Movement for Black Lives, aims to transform an unjust society into a just one,[65] and thus contributes to realising the utopia of human rights.[23] Created in 2013, the BLM social movement gained further international attention during the global George Floyd protests in 2020.[66] Therefore, the purpose of this longitudinal study was to capture the power of TUIPHS to predict people's attitudes and behavioural intentions in reaction to naturally occurring events and in reaction to initiatives that are critical of our current society and that aim to transform it into a better one (appendix p 57).

We expected that, when using a hierarchical regression analysis to predict support for BBB and BLM, adding the four TUIPHS factors to a model that contains a set of covariates (age, gender, income, and political ideology) as well as ethnicity and COVID-19-related measures would significantly increase R^2 (hypothesis 3). We also expected that, in each computed hierarchical regression, one (or more) of the TUIPHS factors would individually predict an increase in support for BBB or BLM (hypothesis 4). For both hypotheses, we used the FDR correction to prevent false positive findings (appendix pp 56–57).[67]

Role of the funding source
The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results
In study 1, the data for sample 1 were collected between Oct 8 and Oct 9, 2018, data for sample 2 were collected on Oct 15, 2018, data for sample 3 were collected on Oct 16, 2018, and the data for sample 4 were collected between Feb 3 and Feb 7, 2020. The data for study 2a were collected between Nov 5 and Nov 6 2018, data for study 2b were collected between Nov 6 and Nov 7, 2018, data for study 2c were collected on Nov 7, 2018, data for study 2d were collected on Nov 9, 2018, and data for study 2e were collected on Nov 14, 2018. The data for study 3a were collected between June 10 and June 11, 2019, data for study 3b were collected between June 11 and June 12, 2019, data for study 3c were collected between June 12 and June 15, 2019, and data for study 3d were collected between June 13 and June 15, 2019. The data for study 4 were collected between July 3 and July 6, 2020. In study 1 (n=2926), we developed TUIPHS (panel 2). A four-factor structure was first extracted using EFA on sample 1, and further supported via CFA on samples 2, 3, and 4 (figure). We also established configural, metric, scalar, and residual measurement invariance of our scale concerning country (US *vs* UK) and gender (men *vs* women).[71] That is, we confirmed that TUIPHS measures the same construct in the USA and the UK, and in men and women, and can therefore be used to compare individual differences in the transformative utopian

	Change in R^2 covariates	Change in R^2 competing scale	Change in R^2 TUIPHS	Significant factors
Utopianism[16]	0·016 (0·016)	0·241 (<0·0001)	0·232 (<0·0001)	F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
IRI, empathic concern[54]	0·016 (0·016)	0·070 (<0·0001)	0·396 (<0·0001)	F1 (0·0024), F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green scale[56]	0·016 (0·016)	0·298 (<0·0001)	0·178 (<0·0001)	F1 (0·0027), F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)[57]	0·016 (0·016)	0·306 (<0·0001)	0·186 (<0·0001)	F1 (0·00095), F2 (<0·0001), GF(<0·0001)
Egalitarianism scale[58]	0·016 (0·016)	0·303 (<0·0001)	0·189 (<0·0001)	F1 (0·0025), F2 (<0·0001), F4 (0·0011), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, and UNT)[55]	0·016 (0·016)	0·360 (<0·0001)	0·128 (<0·0001)	F1 (0·013), F2 (<0·0001), GF (<0·0001)
AHO[59]	0·066 (<0·0001)	0·116 (<0·0001)	0·245 (<0·0001)	F1 (0·042),* F2 (<0·0001), F3 (0·0072), F4 (0·0021), GF (<0·0001)
AICS (all subscales)[60]	0·066 (<0·0001)	0·144 (<0·0001)	0·216 (<0·0001)	F2 (<0·0001), F3 (0·0035), F4 (0·0051), GF (<0·0001)
Humanitarianism-egalitarianism[62]	0·066 (<0·0001)	0·138 (<0·0001)	0·223 (<0·0001)	F1 (0·038),* F2 (0·00012), F3 (0·00083), F4 (0·0026), GF (<0·0001)
SDO-E (pro-trait and con-trait)[61]	0·066 (<0·0001)	0·104 (<0·0001)	0·256 (<0·0001)	F1 (0·035),* F2 (<0·0001), F3 (0·0036), F4 (0·0026), GF (<0·0001)
Economic system justification[63]	0·066 (<0·0001)	0·234 (<0·0001)	0·153 (<0·0001)	F1 (0·019), F2 (0·019), F3 (0·013), F4 (0·0063), GF (<0·0001)

The numbers in parentheses in all columns correspond to the p values (raw significance values are reported). This table illustrates incremental predictive validity on the degrowth variable only (this variable was measured on a scale from 1 (never) to 5 (very often).[72] The full results of the incremental predictive validity on the remaining 18 dependent variables are reported in appendix (pp 40–55). The significant factors column shows individual factors that were significant as predictors and GF in this column indicates the TUIPHS scored as a general factor. GF is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because GF was not involved in sample size planning based on the FDR correction, we did not use the correction in relation to this factor. *indicates results that stopped being significant after the FDR correction was applied across change in R^2 for the TUIPHS and factors 1 to 4. TUIPHS=Transformative Utopian Impulse for Planetary Health Scale. F=factor. GF=general factor. IRI=Interpersonal Reactivity Index. EMCB=ethically minded consumer behaviour. PVQ5X=Portrait Value Questionnaire. SDT=self-direction thought. UNC=universalism-concern. UNN=universalism-nature. UNT=universalism-tolerance. AHO=attitudes toward helping others. AICS=Activist Identity and Commitment Scale. SDO-E=Social dominance orientation anti-egalitarianism. FDR=false discovery rate.

Table 2: **Incremental predictive validity of the TUIPHS regarding the degrowth variable in studies 3c and 3d**

	Change in R^2 covariates	Change in R^2 ethnicity	Change in R^2 COVID*	Change in R^2 TUIPHS	Significant factors
Future needs statement	0·076 (<0·0001)	0·009 (0·097)	0·003 (0·80)	0·052 (<0·0001)	F2 (0·0074), F3 (0·043),† GF (<0·0001)
Fulfilling life statement	0·150 (<0·0001)	0·008 (0·13)	0·002 (0·89)	0·102 (<0·0001)	F2 (0·0023), F3 (0·0054), F4 (0·0024), GF (<0·0001)
Rewarding jobs for all	0·091 (<0·0001)	0·008 (0·13)	0·001 (0·97)	0·069 (<0·0001)	F2 (0·0024), GF (<0·0001)
Resilience and climate emergency	0·099 (<0·0001)	0·006 (0·28)	0·003 (0·77)	0·126 (<0·0001)	F2 (0·040),† F4 (<0·0001), GF (<0·0001)
New economic structure	0·206 (<0·0001)	0·008 (0·095)	0·015 (0·0091)	0·062 (<0·0001)	F1 (0·046),† F2 (0·0031), GF (<0·0001)
Support for BLM	0·328 (<0·0001)	0·013 (0·0038)	0·005 (0·36)	0·051 (<0·0001)	F2 (0·00088), GF (<0·0001)
Intention to participate in BLM protests	0·241 (<0·0001)	0·018 (0·00092)	0·004 (0·49)	0·040 (<0·0001)	F1 (0·0018), GF (<0·0001)

The numbers in parentheses in all columns correspond to the p values (raw significance values are reported). The significant factors column shows which individual factors were significant as predictors and GF in this column indicates the TUIPHS scored as a general factor. GF is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because these analyses are exploratory, we did not use the FDR correction. *COVID-19 effect on daily life. †indicates results that stopped being significant after the FDR correction was applied across change in R^2 for the TUIPHS and factors 1 to 4. TUIPHS=Transformative Utopian Impulse for Planetary Health Scale. BLM=Black Lives Matter. F=factor. GF=general factor. FDR=false discovery rate.

Table 3: **Longitudinal predictive validity of the TUIPHS on BLM related variables in study 4**

impulse for planetary health between the two countries, and between the two genders. Moreover, by using bifactor statistical indices,[50,51] we showed that the scale can be scored as a single general factor, and its items therefore capture an overarching theoretical construct (ie, the transformative utopian impulse for planetary health).

Studies 2a, 2b, 2c, 2d, and 2e (n=1306) show convergent and discriminant validity of TUIPHS by showing that its factors were correlated with the theoretically linked constructs (eg, table 1), but uncorrelated with the constructs that were not theoretically relevant, such as self-esteem and material values (appendix pp 24–28). A series of CFAs indicated that the four factors are distinct from any other constructs to which they were highly correlated, including utopianism (appendix pp 28–29).

In studies 3a, 3b, 3c, and 3d (n=2016), hypothesis 1 was supported for all dependent variables, given that including the four TUIPHS factors in the hierarchical regression model significantly increased R^2 (appendix pp 40–55; table 2 for illustrative results on the degrowth variable). All the results remained significant after applying the FDR correction. Furthermore, hypothesis 2 was supported in all cases, except for the dependent variables refugees and perspective taking when TUIPHS was combined with the portrait values questionnaire,[55] in which cases the significant relationship between factor 3 and these two dependent variables did not pass the FDR correction.

In study 4 (n=799), we found that participants' past TUIPHS scores predicted support for both the BLM and BBB social movements 23 weeks later. Indeed, our hypotheses were supported for all dependent variables (table 3); including the four TUIPHS factors in the hierarchical regression model significantly increased R^2

(hypothesis 3). Moreover, at least one of the scale factors individually predicted an increase in support for BLM or BBB (hypothesis 4). All the results remained significant after applying the FDR correction.

Discussion

This study established the transformative utopian impulse for planetary health as a psychological construct of relevance to attitudes, intentions, and behaviour pertaining to social change in the age of the Anthropocene, in which the environment is seen as increasingly central to social and economic progress.[73] After developing a theoretically-driven scale to measure individual differences in the transformative utopian impulse for planetary health, we mapped the nomological network of the scale to embed it within personality psychology. We showed that the scale reflects people's propensity to actively engage in thoughts and actions oriented toward the betterment of society by tackling some of its biggest issues such as sustainability and economic and social inequality (appendix pp 29–30). More specifically, TUIPHS was related to scales that capture thoughts and actions linked to openness to change and exploration of new ideas (eg, openness to experience, stimulation, and self-directed thought),[55] a critical perspective on the current society (eg, economic system non-justification),[63] concern for others (eg, empathic concern and attitudes toward helping others),[54,59] a strong commitment to democratic values and equal rights (eg, universalism, humanitarianism, and egalitarianism),[55,58,61,62] and inclinations to actively participate in tackling societal problems (eg, activist identity and commitment and ethically minded consumer behaviour).[57,60]

We then showed the incremental predictive validity of TUIPHS by using it to predict 19 behavioural and attitudinal dependent variables above and beyond various competing measures (eg, utopianism, ethically minded consumer behaviour, economic system justification, and activist identity and commitment).[16,54–63] These dependent variables showed an engagement in thoughts and actions that articulated an openness and readiness to change (eg, collective imagination; immersion in solutions to economic, social, and environmental issues; individual change; knowledge about past or current concrete utopian initiatives; public expression of desire to transform society; and urgency to radically transform society), a critical perspective on the current society and its economic and social organisation (eg, collective change, commitment to initiatives or protests in favour of sustainable social change, anger at those who show contempt for others or the society, degrowth, life improvement, localism, and research information about socially conscious consumption), a concern for others and the planet (eg, perspective taking, empathy toward refugees, and the sacrifice of self-interest for the good of the collective), and a strong support for democratic values (eg, empowerment, personal autonomy, and tolerance).

Subsequently, we showed the longitudinal predictive validity of TUIPHS. More specifically, people's scores on this scale, assessed before the implementation of lockdowns in Europe, predicted the expression of a desire a few months later for a different economic structure after COVID-19, and for a better and more resilient society than the current one, that can tackle climate change, meet our future needs, and in which everyone can have rewarding jobs and live a fulfilling life. Similarly, participants' TUIPHS scores, measured months before the global George Floyd protests, predicted support for, and intentions to participate in, BLM protests.

Overall, our findings therefore make several important theoretical contributions. First, they validate theorising regarding the transformative utopian impulse for planetary health spanning across disciplines such as philosophy, sociology, and utopian studies. Indeed, although thinkers within these disciplines theorised about various elements that construe the utopian impulse (eg, criticism of the current state of society and motivation to develop solutions that can transform society and to search for such solutions), it has never been empirically examined whether these elements fall within a coherent theoretical construct. By using bifactor analyses[50,51] to show that the TUIPHS items that were constructed by implementing these elements capture a general latent variable, we showed that the diverse theoretical aspects of the utopian impulse operate as an integrated individual characteristic, thus providing empirical support for the construct's coherence. Moreover, our results also support the theoretical link between the utopian impulse and transformative social change because we showed that TUIPHS predicted a range of self-reported attitudes and behaviours that comprise this change.

Second, we generate additional novel insights regarding the structure of the transformative utopian impulse for planetary health as an individual characteristic. Specifically, we show that this trait is multilayered because it comprises people's propensity for transformative utopian thinking and action (factor 1), their belief in (factor 2) and responsiveness to (factor 3) transformative utopian solutions, and their choice of transformative utopian products and services (factor 4). In doing so, our scale also addresses a conceptual need identified in the sustainable development literature in which the utopian impulse has been recognised as one of the key themes to improve the understanding of the social aspects of societal transformation with a plurality of perspectives inherited from social sciences and the humanities.[4] Moreover, by mapping the nomological network of the transformative utopian impulse for planetary health, this research adds to the literature on the personal sphere of transformation that encompasses ideas, beliefs, and values about what a just, desirable, and sustainable world would be.[74] Additionally, the incremental and longitudinal predictive validity studies, by encompassing both self-reported attitudes and behaviours, also informed how the transformative utopian impulse for planetary health is

expressed in the systems and structures of the political sphere (eg, through support of BLM and BBB) and realised in the practical sphere with specific actions (eg, commitment to initiatives or protests in favour of social change).

Third, we show that the transformative utopian impulse is a relatively broad individual difference that is related to a wide range of more specific traits that capture people's propensity to contribute to social change (green consumption, activism, ethical consumption, helping others, etc), and yet it predicts many attitudes, intentions, and behaviours that constitute social change beyond these specific personality characteristics. Our research therefore indicates that people have a general propensity to contribute to societal transformation (ie, the transformative utopian impulse for planetary health) that can be channelled via diverse specific behaviours.

In sum, we have developed the first well-validated psychological scale to measure individual differences in the propensity for diverse forms of transformative utopian thinking and action for planetary health. We hope that this measure will be utilised by researchers, but also activists and non-governmental organisations, to shed new light on how social change happens and how to create it. For example, our scale can be used to measure the transformative utopian impulse for planetary health in a population of interest (eg, a city, region, country, etc) to uncover if, for a transformative change to happen, there is a specific level of the utopian impulse that people need to have on average, or if it is more important that a specific proportion of the population have a high utopian impulse so they can drive the change. Likewise, one could investigate whether inciting societal transformation on a global level requires first mobilising people with a strong utopian impulse who might then engage in activities to propel the remaining members of the society to act. Indeed, the literature on societal transformation highlights the importance of the deliberate transformations that are aimed to enable a desirable future and are generally led by a minority of committed individuals.[75]

Finally, to understand the value of our research it is also necessary to examine its main limitations. The transformative utopian impulse for planetary health as a construct was developed using participants from the UK and the USA who were all recruited via online panels (Prolific.co and MTurk), and only the UK sample for studies 1 (sample 4) and 4 was nationally representative. Although the representativeness of participants suggests that our results, apart from the representative samples, might not generalise across the UK and USA populations, it is important to point out that various studies found that the types of samples we collected (ie, large online samples) are generally representative of the corresponding populations, even more so than the census-representative panels.[76,77] It is therefore highly unlikely that our research is limited in terms of generalisability to the two countries we studied; however, one disadvantage is that we focused on Western cultures (USA and UK), but we did not examine whether the transformative utopian impulse for planetary health manifests in the same way in Eastern cultures, or more largely in the Global South. For example, Eastern and Western cultures differ in their norms, values, and communication styles,[78] and it is possible that the transformative utopian impulse for planetary health is experienced and expressed differently in the East than in the West.[79] Moreover, TUIPHS was tested in two democratic countries (USA and UK), and it is probable that people living in authoritarian political regimes would be less likely to openly communicate their transformative utopian impulse for planetary health than those living in democratic countries, or that they might experience it in a different way. Furthermore, it is worth noting that the transformative utopian impulse for planetary health is associated with thoughts and actions in support of a future society that, despite being aligned with UN SDGs, might not be considered better or more desirable by everyone, so much so that one person's utopia can be another's nightmare.[4] This scenario also raises the questions pertaining to divergences between people's judgements regarding what constitutes a transformation,[4] and what should be transformed and why.[75] In other words, an object or a result of transformation desired by some might not be viewed in the same way by others. Differences can also be observed at the cross-cultural level, and further research is needed to understand how the means and the ends of transformation can vary between people but also between cultures.[11] Although TUIPHS can help in this process (at least in English-speaking countries across the world), respondents can make sense of the concept of transformation differently when answering scale items. Qualitative techniques, such as interviews and lay focus groups, are thus also needed to further understand convergences and divergences in sense-making pertaining to sustainability transformation.[11] We therefore hope that the present research will inspire researchers to investigate this construct within various political systems and cultures, with a wide range of different but complementary research methods.

Contributors

FB and DK both contributed equally to the project and were responsible for the study's conceptualisation, methodology, investigation, formal analysis, data curation, validation, writing (of the original draft and the review and editing process), and funding acquisition. Both authors had full access to all the data in the study and accept responsibility for publication.

Declaration of interests

FB and DK were awarded £4996 from the Department of Psychological and Behavioural Science, The London School of Economics and Political Science (LSE), to contribute toward paying research participants for the studies reported in the article. LSE Research Online covered all article processing charges. All other authors declare no competing interests.

Data sharing

The data collected for the study, including deidentified participant data and a data dictionary defining each field in the set, as well as the original surveys that were used to collect the data, can be accessed via the Open Science Framework (OSF; https://osf.io/59y26/). All the data and the

surveys are available to everyone without any restrictions (ie, without investigator support and without needing to sign specific approvals or access agreements).

Acknowledgments
We are grateful to Athanasios Marvakis, Lyman T Sargent, Peter Thompson, Darren Webb, and Rainer Zimmermann for providing constructive and thoughtful feedback during scale development. We would also like to thank Gemma Gordon, Sandra Jovchelovitch, Alex Gillespie, and Martin W Bauer for their very helpful comments during the preparation of this manuscript.

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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Basso F, Krpan D. Measuring the transformative utopian impulse for planetary health in the age of the Anthropocene: a multi-study scale development and validation. *Lancet Planet Health* 2022; **6:** e230–42.

Contents

Demographics

Table A1. Participants' demographics for Studies 1-7 before exclusion

Study	Sample N°	Sample Size	M age	SD age	Gender			Country
					Male	Female	Other	
1	1	751	35·89	10·87	441	310	-	US
1	2	499	37·77	11·97	282	217	-	US
1	3	496	37·97	12·97	147	349	-	UK
1	4	1500	45·01	15·45	729	770	1	UK
2a	-	293	35·44	10·97	164	129	-	US
2b	-	326	37·78	11·37	156	170	-	US
2c	-	316	38·50	12·51	165	151	-	US
2d	-	313	37·19	11·68	155	158	-	US
2e	-	311	37·93	11·36	150	161	-	US
3a	-	604	36·79	11·76	265	339	-	US
3b	-	606	36·94	11·67	260	346	-	US
3c	-	610	37·03	11·61	232	378	-	US
3d	-	609	38·26	12·50	223	386	-	US
4	-	802	48·28	14·55	395	407	0	UK
5	-	960	39·40	12·73	429	527	0	US
6	-	351	35·27	11·72	178	173	0	US
7	-	345	37·69	12·16	167	174	4	US

US participants were recruited via Amazon Mechanical Turk (MTurk). UK participants were recruited via Prolific Academic. Studies 6 and 7 are reported in Appendix. Participants from Study 4 are the same ones who were initially tested for Sample 4 (Study 1), and then contacted again to examine longitudinal predictive validity of their initial scores on the Transformative Utopian Impulse for Planetary Health Scale. For that reason, they are not counted toward the total number of participants we tested in the present article.

Total: 8,890 (without Sample 4) participants before exclusion

Table A2. Participants' demographics for Studies 1-7 after exclusion

Study	Sample N°	Sample Size	M age	SD age	Gender			Country
					Male	Female	Other	
1	1	629	36·01	10·96	360	269	-	US
1	2	436	38·08	12·13	239	197	-	US
1	3	466	38·01	12·98	137	329	-	UK
1	4	1395	45·01	15·44	682	712	1	UK
2a	-	254	35·76	10·92	137	117	-	US
2b	-	266	37·65	10·54	126	140	-	US
2c	-	268	38·66	12·71	140	128	-	US
2d	-	263	37·71	12·03	126	137	-	US
2e	-	255	37·91	11·31	115	140	-	US
3a	-	520	37·07	11·99	217	303	-	US
3b	-	489	36·71	11·61	215	274	-	US
3c	-	521	37·09	11·51	201	320	-	US
3d	-	486	38·49	12·60	177	309	-	US
4	-	799	48·28	14·54	392	407	0	UK
5	-	847	39·57	12·72	365	480	0	US
6	-	324	35·46	11·77	160	164	0	US
7	-	266	38·82	12·69	119	144	3	US

US participants were recruited via Amazon Mechanical Turk (MTurk). UK participants were recruited via Prolific Academic. Studies 6 and 7 are reported in Appendix. Participants from Study 4 are the same ones who were initially tested for Sample 4 (Study 1), and then contacted again to examine longitudinal predictive validity of their initial scores on the Transformative Utopian Impulse for Planetary Health Scale. For that reason, they are not counted toward the total number of participants we tested in the present article.

Total: 7,685 (without Study 4) participants after exclusion

Study 1: Scale development

Item development

Initially, we created 59 items based on the criteria listed in Panel 1 and shared them with expert utopian scholars for feedback. Given that the concept of the utopian impulse was originally proposed and discussed by Ernst Bloch,[1] and that our goal in developing this scale was to engage with the scholarly literature on the humanities, we identified and corresponded with scholars who have expertise in his work to attain feedback regarding the initial scale items. These experts included Lyman T. Sargent, Darren Webb, Rainer Zimmermann, Peter Thompson, and Athanasios Marvakis. Although our main criterion when contacting these scholars was expertise in Bloch's conceptualization of the utopian impulse, many of them are generally considered as leaders in the field of utopian studies who have made seminal contributions regarding utopian scholarship. For example, Lyman T. Sargent is one of the world's foremost scholars on utopian studies. He is the founding editor of Utopian Studies and served as the editor during the journal's first fifteen years. He is also the recipient of the Distinguished Scholar Award from the Society for Utopian Studies and has written *Utopianism: A Very Short Introduction*,[2] where he covers the current state of knowledge regarding utopian scholarship. Therefore, even if we cannot claim to have contacted a representative sample of utopian scholars, which in practice would be very difficult to achieve,[3] we did receive feedback from individuals who have a comprehensive and representative knowledge of utopian literature.

In addition to Lyman T. Sargent, we also received feedback from Athanasios Marvakis who wrote a dense chapter linking Bloch's philosophy and psychology among other contributions to the utopian literature,[4] Peter Thompson who was the director of the Centre for Ernst Bloch Studies at the University of Sheffield and coedited the book *The privatization of hope. Ernst Bloch and the future of utopia*,[5] Darren Webb who authored various articles on utopia, including *Modes of hoping* which explores the commonalities and differences between hope in utopian studies and hope in psychology,[6] and Rainer Zimmermann who edited a German volume which examines *The Principle of Hope*[1] based on the most up to date discourse in utopian studies.[7] Note that the other utopian scholars we contacted have not replied to our emails. We also directly consulted with academic colleagues who wrote on utopia, imagination and social change.

Overall, the final list of 60 items (see Table A3) that was included in exploratory factor analysis incorporated the expert feedback that can be summarized as follows. First, experts pointed out that we should remove any expressions referring to a "perfect" or "ideal" world, because even if utopias can be radically different than the current world, they are never perfect or ideal. For that reason, our items typically refer to a better or improved world that strives toward resolving the biggest issues the current world is facing, but never to a perfect or ideal world. Second, they indicated that utopias are transformative (i.e., they constitute radical changes of society), and this should be emphasized across items where possible. For this reason, expressions that emphasize the transformative aspect of the utopian impulse are present in many items (i.e., transforming society, creating or achieving a radically different world, attempting to resolve the world's biggest issues, etc.). Third, they emphasized that people who have a high utopian impulse should believe that a radical social change is possible. For this reason, our items generally imply this belief (e.g., Item 40, Table A3). Fourth, the experts indicated that we need to have some extreme items that can distinguish between participants who have exceptionally strong utopian impulse and those who do not. For this reason, our final item pool includes several extreme items (e.g., Item 17, Table A3). Fifth, because in the initial version we had eight items referring to equality,

we were told to reduce this number as we were overemphasizing one specific value that may not be equally strong in all individuals who have high utopian impulse. For this reason, we both reduced the number of items in which we refer to the concept of equality and replaced the term *equality* with *inequality*, given that the transformative utopian impulse for planetary health concerns the propensity to resolve existing global issues, and inequality is typically evoked as one of the most pressing issues (e.g., UN SDG 10 aims to "Reduce inequality within and among countries").

All items were answered on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*) because this response type is typically used in other scales and yields good psychometric properties.[8] Although many psychological scales answered using a Likert format use reverse-worded items to minimize acquiescence bias, such items may result in various methodological issues, including contamination of the factor structure, lack of measurement invariance, lower internal consistency, etc.[9,10] It has also been demonstrated that such items in fact do not prevent response biases such as acquiescence from occurring, and that a more effective way to do this is having a short scale with roughly 10 items posed in the same direction.[11] For this reason, we did not use reverse items and we constructed a scale that is relatively short while having good psychometric properties.

Participants and procedure

Four samples were collected. Participants' demographics before and after exclusion are reported in Tables A1 and A2. The exclusion criteria and the rationale behind the sample sizes are detailed below (see *Exclusion Criteria* section). For each sample, participants first completed the consent form, after which they received the transformative utopian impulse for planetary health items. In Sample 1, they received all 60 items (Table A3), and in Samples 2, 3 and 4 only the 12 items selected for the Transformative Utopian Impulse for Planetary Health Scale (Table 1). For Samples 1, 2 and 3, items were presented in a randomized order, and participants subsequently completed a short version (form C) of the Marlowe-Crowne Social Desirability Scale to ensure that our items are not susceptible to socially desirable responding.[12] Note that in Sample 4, the scale was collected on a UK representative sample from another research (not reported here),[13] where scale items were not presented in a randomized order, and which did not include a short version (form C) of the Marlowe-Crowne Social Desirability Scale.[12] The data for Sample 1 were collected between 8-9 October 2018, for Sample 2 on 15 October 2018, for Sample 3 on 16 October 2018, and for Sample 4 on 3-7 February 2020.

Exclusion criteria

In each of the four samples, participants completed a seriousness check.[14] In addition, in Samples 1, 2, and 3, three instructed-response items (e.g., "Please respond with 'Strongly agree' for this item") were used per each sample.[15] Only participants who passed the seriousness check and accurately answered all instructed-response items were included in statistical analyses. As part of another research collected on a UK representative sample (not reported here), Sample 4 included similar and additional exclusion criteria.[13]

Rationale behind sample size for exploratory and confirmatory factor analyses

In the absence of general consensus regarding required sample size for exploratory factor analysis, we considered a range of different approaches when determining the number of participants to recruit in Sample 1.[16,17] Comrey and Lee suggested that testing a minimum of 300

participants is necessary, and they urged researchers to obtain a sample of 500 or more participants whenever possible.[18] Other researchers indicated that the ratio of the number of participants tested to the number of items should be at least 5:1 or ideally 10:1.[17,19,20] Moreover, MacCallum and colleagues estimated that, with a ratio of items to factors of 10:3 or higher a sample size of 400 should yield a high power, even under low communalities.[16] Based on these assumptions, we decided that we would need a sample of roughly 600 participants—the final sample size after exclusions were applied exceeded this number ($N_{Sample1} = 629$). This sample size meets the criterion of Comrey and Lee as well as the criterion regarding the sample to item ratio,[17,19,20] considering that we created a total of 60 items.[18] It also meets the criterion by MacCallum and colleagues, given that, based on our theoretical assumptions, we did not have a reason to expect that the ratio of items to factors would be larger than 10:3 (which would mean that more than 18 factors would be extracted).[16]

To determine the number of participants for Samples 2, 3 and 4 used in confirmatory factor analyses, we computed the necessary sample size to replicate the parameters obtained via confirmatory factor analysis conducted on Sample 1 using a Monte Carlo simulation,[21] implemented via the R package *simsem.*[22] The factor loadings used for the simulation were acquired from the confirmatory factor analysis performed on Sample 1, with the std.lv argument being set to TRUE and std.ov to FALSE. We used a conservative significance level of 0·01 and the high power of 0·999999. This power analysis indicated that testing 362 participants is enough to replicate the factor structure established using the original confirmatory factor analysis on Sample 1. The three samples—Sample 2 ($N = 436$), Sample 3 ($N = 466$) and Sample 4 ($N = 1,395$)—exceeded the sample size after the exclusion criteria were applied.

Exploratory factor analysis (EFA)

The Kaiser-Meyer-Olkin measure of sampling adequacy, which was 0·99, and Bartlett's test of sphericity, which was significant, χ^2 (1770) = 37839·86, $p < 0·0001$, provided a strong evidence for the suitability of the data for EFA.[23] To determine how many factors to retain, we first performed a parallel analysis,[24–26] which showed that five factors should be retained. We therefore performed a maximum likelihood (ML) EFA (Table A3) with five factors and used an oblique rotation—*promax*—given that we expected the factors to be correlated because they belong to the same theoretical construct and because this rotation typically produces a clean factor structure.[27,28] Kaiser normalization was implemented with promax.[29]

As can be seen in Table A3, the analysis showed that, in addition to explaining a relatively small proportion of variance, the fifth factor had highest standardized loadings on only two items (0·73 and 0·68), whereas all of its other loadings were relatively small (≤ 0·33). We therefore discarded the fifth factor for several reasons—because factors that have fewer than three variables are generally discouraged,[30] and because our results suggest that the fifth factor may be a result of overfactoring,[24] and may have occurred due to the linguistic similarity between the two items (i.e. these were the only two items referring to technology). It is common that a final scale factor is not retained due to statistical and/or conceptual limitations.[24,31]

We labelled Factor 1 *Propensity for Transformative Utopian Thinking and Action* because it contains items that broadly tackled people's drive to engage in thoughts and actions aimed at transforming society (e.g., Items 12-13). We labelled Factor 2 *Belief in Transformative Utopian Solutions* as it contains items that captured whether people believe that solutions that can transform society already exist even if they are not widely known or adopted (e.g., Items 35 & 53). We labelled Factor 3 *Responsiveness to Transformative Utopian Solutions* because it

contains items related to people's affective and motivational reactions when they encounter solutions that have the potential to transform society (e.g., Items 40 & 45). Finally, we labelled Factor 4 *Choice of Transformative Utopian Products and Services* as it contains items that assessed how frequently people choose products and services that could transform society because they are based on ethical and sustainable practices (e.g., Items 26 & 31). For each of the four retained factors, representative items that were further tested in CFA were selected based on several statistical and conceptual criteria.

Table A3. Final pool of items and standardized factor loadings from the exploratory factor analysis

Item	F 1	F 2	F 3	F 4	F 5
17.* One of the most important driving forces in my life is to develop ideas that could contribute to a better world in which nothing is missing for all human beings.	0·915				
8.* I often participate in conversations whose purpose is to come up with potential solutions to the biggest social ills of our time.	0·907				
13.* I frequently have the impulse to help transform the current society into a new world where the biggest issues of our age are extinct.	0·879				
6. I am driven to think about big ideas that could provide solutions to some of the challenges humanity is facing today.	0·773				
16. I am the type of person who is inclined to brainstorm about solutions to existing global challenges.	0·747				
46. I have the urge to look for concrete propositions that could improve our malfunctioning economic system.	0·718				
18. I often think about transformative ideas that could radically change the world by making it a more just place where everyone will have equal opportunities.	0·716				
3. I tend to look for new types of society that could overcome life adversities such as poverty, crime, and discrimination.	0·711				
12. My actions are motivated by the prospect of achieving a radically different world in which the social, economic, and environmental issues of today will be resolved.	0·662				
37. I make every effort to encourage activities, products, and services that could contribute to resolving the most challenging economic, social, or environmental issues that we are facing nowadays.	0·652			0·352	
21. Whenever I hear about a social, economic, or environmental issue, I spontaneously think about how efforts can be made to radically change the world to resolve it.	0·647				
44. I seek existing solutions that will change the living conditions of everyone in our society for the better.	0·645				
47. I push solutions that can make our future society more sustainable.	0·634				
23. When I hear about a social issue that affects people, I usually feel the urge to find solutions that could transform our current society to fix it.	0·629				

10. My actions are motivated by the desire to transform the world into a place where all human beings would flourish.	0·628		
5. I often have an urge to do things that could contribute to a radically better society where all human rights are guaranteed and enjoyed by everyone.	0·607		
11. I can't help thinking about ideas that would transform the current world into a place where all people would have full rights to food, lodging, medicine, education, and work.	0·603		
52. The world in which we live is faced with many socioeconomic and environmental problems, but I am taking concrete steps to contribute to a new world where at least some of them would stop existing.	0·603		
14. I am strongly attracted to developing big ideas that could resolve the most challenging social, economic, or environmental issues that we currently face.	0·587		0·382
25. When I hear about a strike action, I can't help thinking about how to create a new world in which everybody would have fair working conditions.	0·577		
1. I am driven by the prospect of creating a society in which the ills of today's world will not exist.	0·560		
27. Incidents involving discrimination against people motivate me to think about how I could transform the current world into a place where such suffering would be eliminated.	0·543		
55. I often tend to think about how political institutions could be remodelled to overcome the global challenges of today.	0·530		
22. Whenever I see people who are socially or economically disadvantaged, I start thinking about how it would be possible to achieve a new society devoid of these problems.	0·500	0·473	
48. I am eager to find propositions for alternative ways of economic and social life that can eventually become reality.	0·493		0·328
41. I am motivated to explore current solutions that can transform our society by creating desirable living conditions such as peace, work, food, lodging, healthcare, or education.	0·484		0·332
30. When I see homeless people sleeping on the street, I usually start thinking about actions that could change the world to stamp out poverty, homelessness, and economic inequality.	0·482		
19. I often imagine how the world would need to be changed for the important issues we are currently facing to be resolved.	0·466	0·404	
24. Encountering public protests against social injustice on the street usually inspires me to think about how I could change our world into a better place.	0·436		
54. It motivates me to think about key practices that would be found in a political system that creates a just world for everyone.	0·417		
15. Thinking about how to transform society by creating high living standards for all human beings stimulates me.	0·351		0·324

38. I feel energized and motivated to support alternative solutions that can help improve our current malfunctioning economic system.	0·329		
53.* I feel that there are many alternative social and economic activities that could resolve current social issues if they were widely adopted.		0·813	
4 I support initiatives that aim to create a transformed society that would be just for everyone.		0·767	
35. I can't help thinking that solutions to address most of our pressing economic, social, and environmental problems already exist but are not taken seriously enough by governments and political authorities.		0·712	
2.* I often feel that there are new ways of living that would create social and economic justice for everyone.		0·712	
39* I often get the impression that the future of our society could be better if some existing solutions to transform economic and social reality were scaled up.		0·666	
59. My instinct tells me that some social or political practices that are not currently mainstream could in the future lead to a world where the dignity of all human beings will be achieved.		0·642	
57. I have the intuition that there are alternative approaches to social life and politics that could lead to new institutions capable of resolving the issues humanity is currently facing.		0·597	
32. Seeing people who are denied their dignity shows that our current world is imperfect and usually incites me to think about practices that could correct its flaws and transform it.		0·592	
34. I support existing social and economic activities that should be widespread to improve our society in the future by reducing inequalities and suffering.		0·585	
58. I have the impression that there are concrete solutions to achieve a world without undesirable living conditions such as war, hunger, poverty or pollution.		0·548	
28. When I see someone who is underprivileged or disadvantaged, I often start thinking about how social and political institutions could be changed to resolve this in the future.	0·428	0·510	
29. When I encounter practices that are destroying the planet, I often start thinking in practical terms about how the world could be changed to prevent this from continuing to happen.		0·343	
9.* I get excited when I encounter ideas that changed the world for the better by enabling social and economic progress.			0·717
45. I feel inspired when I hear about examples of new ways of living that can be implemented to tackle our current social, economic, or environmental problems.			0·675
20. I feel excited and energized when I come across thought-provoking ideas that offer solutions to our most pressing environmental, social, or economic issues.			0·606
50.* I feel excited when I come across propositions that could overcome our past and present economic, social, and environmental failures.			0·605

40.* I am thrilled when I come across already existing solutions that could improve the circumstances of people who are underprivileged if they were more widely adopted.			0·549		
51. I enjoy coming across alternative ways of organizing our everyday economic and social life that could eliminate the biggest ills of today's world.			0·479		
49. I look forward to coming across new forms of communication and cooperation that enable the development of concrete political projects well able to improve society in the long run.			0·448		
7. I feel energized when I encounter ideas about alternative social systems that could lead to a society where all human beings are socially and economically equal.			0·443		
42. I am amazed by the human capacity to come up with solutions that could tackle our social, economic, and environmental problems.			0·420		0·334
31. When I have the choice, I often select products that could contribute to a better future society built on social and economic justice.				0·770	
36.* Whenever I have the choice, I choose products and services that can help fix the social and environmental problems resulting from our malfunctioning economic system.				0·707	
26.* Current examples of social and economic inequality motivate me to choose ethical products that counter exploitation and injustice.				0·650	
43.* My everyday choices of products and services can help transform the economic and social life of the workers in these industries.				0·592	
33. I frequently make an effort to support currently existing products and services from organisations that treat their employees fairly and empower them to live a decent life.				0·510	
56. I have the feeling that recent technological developments will in the future resolve the most challenging social, economic, and environmental issues.					0·730
60. I sense that some of the currently existing products or technologies will change the world in the future to allow for all human beings to thrive and flourish.					0·682
% Variance Explained	29·519	16·140	11·332	7·312	2·817
Eigenvalue	36·538	1·828	1·323	1·160	1·078
Factor1	-				
Factor2	0·781	-			
Factor 3	0·793	0·769	-		
Factor 4	0·732	0·674	0·700	-	
Factor 5	0·525	0·516	0·529	0·498	-

Note. Labels F1-F5 refer to factors 1-5 respectively. Items that are in bold and labelled with * are the ones that entered the final version of the scale tested in confirmatory factor analyses. Only factor loadings ≥0·32 are reported. Coefficients for Factors 1-5 at the bottom of the table indicate correlations between the factors. Factor 1 corresponds to *Propensity for Transformative Utopian Thinking and Action*, Factor 2 to *Belief in Transformative Utopian Solutions*, Factor 3 to *Responsiveness to Transformative Utopian Solutions*, and Factor 4 to *Choice of Transformative Utopian Products and Services*.

Criteria for selecting items for confirmatory factor analysis

Because we wanted to have a scale that meets high psychometric standards but is also short and easy to administer, we decided to have three items per factor, based on recommendations that a factor should have three or more items.[30,32] Standardized factor loadings (in the exploratory factor analysis performed on Sample 1 based on which the items were selected) had to be higher than 0·50,[33–35] and cross-loadings smaller than 0·32.[30] Furthermore, for each factor, we avoided selecting items that were too repetitive or similar and sampled a relatively broad spectrum of items. Based on these considerations, items 2, 8, 9, 13, 17, 26, 36, 39, 40, 43, 50, and 53 were selected for confirmatory factor analysis. Items 17, 13, and 8 comprised Factor 1; items 53, 2, and 39 comprised Factor 2; items 50, 40, and 9 comprised Factor 3; and items 26, 36, and 43 comprised Factor 4.

Confirmatory factor analysis (CFA)

We used the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) indices to evaluate model fit.[36,37] Conservative cut-off values of these indices were used to indicate a good fit: SRMR < 0·05; CFI > 0·95; and RMSEA < 0·06.[38,39] Model fit was estimated using the MLMV maximum likelihood estimator with robust standard errors,[40] and the robust fit indices computed based on recommendations by Savalei.[41]

The preliminary CFA on Sample 1 showed that the model had a good fit, $\chi^2(48) = 49{\cdot}678$, $p = 0{\cdot}41$, SRMR = 0·018, CFI = 0·999, RMSEA = 0·011, 90% CI [<0·001, 0·039]. Standardized loadings of items on the four factors (≥ 0·768), and of each of the factors individually on the other factors (≥ 0·765), were also generally high. Therefore, CFA on Sample 1 provided initial confirmation of the factor structure. This was further supported by CFAs on Samples 2-4. As can be seen from Figure 1 in the article, all three samples met the most stringent criteria for model fit, and standardized factor loadings were also generally high. Given that the factor structure was therefore confirmed, in the next section, we showed that the model with four factors is the most appropriate one by comparing it with other possible models.

Testing alternative factor models

To examine whether the four-factor model confirmed on Samples 1-4 is the most appropriate one, we conducted additional factor analyses where we tested other possible models and compared them with this model using the *anova* function in R.[42–44] More precisely, the additional models we computed included a single-factor model; four two-factor models where each of the four factors were treated as one factor and the remaining factors were combined into the second factor; three two-factor models in which two of the four factors were combined into one factor and the remaining two factors into another factor (i.e. F1+F2 and F3+F4; F1+F3 and F2+F4; F1+F4 and F2+F3); and six three-factor models in which two of the four factors were combined into a single factor and the remaining two factors remained separate (i.e. F1+F2 and F3 and F4; F1+F3 and F2 and F4; F1+F4 and F2 and F3; F2+F3 and F1 and F4; F2+F4 and F1 and F3; F3+F4 and F1 and F2). The analyses showed that the four-factor model had a better fit than any of these models across all four samples, all ps < 0·0001. Therefore, the confirmatory factor analyses overall provided strong evidence in support of the factor structure of the Transformative Utopian Impulse for Planetary Health Scale.

Measurement invariance

To show that the construct we are measuring (i.e. the transformative utopian impulse for planetary health) is equivalent across *country* (US vs. UK) and *gender* (male vs. female), we tested all four types of measurement invariance—configural, metric, scalar, and residual—across Samples 2 and 3.[45] Sample 4 was not used in measurement invariance testing because it differed from these two samples on other characteristics, beyond the key variables of interest (i.e., country and gender), that might have potentially confounded the results of invariance testing (i.e., it was recruited roughly 15 months later, substantially larger, and included nationally representative participants). For the configural invariance, we used the same model fit criteria as for the CFA models: SRMR < 0·05; CFI > 0·95; and RMSEA < 0·06.[38,39] For metric, scalar, and residual invariance, we used the cutoff criteria by Chen: a -0·01 change in CFI, paired with changes in RMSEA of 0·015 and SRMR of 0·030 (for metric invariance) or 0·010 (for scalar or residual invariance).[46] All the models were fit using the MLMV maximum likelihood estimator with robust standard errors,[40] and the robust fit indices were computed based on recommendations by Savalei.[41] As can be seen from Table A4, all four types of measurement invariance were established for both *country* and *gender*, given that the fit criteria were met.

Table A4. Measurement invariance tests of the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) for country (US vs. UK) and gender (Male vs. Female) across Samples 2 and 3

Variable	SRMR	ΔSRMR	CFI	ΔCFI	RMSEA	ΔRMSEA
US vs. UK Sample (*N* = 902)						
Configural invariance	0·026	-	0·994	-	0·027	-
Metric invariance	0·036	0·011	0·992	-0·002	0·031	0·003
Scalar invariance	0·038	0·001	0·991	-0·001	0·032	0·001
Residual invariance	0·038	<0·001	0·991	<0·001	0·031	-0·001
Males vs. Females (*N* = 902)						
Configural invariance	0·026	-	0·991	-	0·035	-
Metric invariance	0·032	0·006	0·990	<0·001	0·034	-0·001
Scalar invariance	0·033	0·001	0·990	<0·001	0·033	<0·001
Residual invariance	0·033	0·001	0·988	-0·002	0·034	0·001

Note. Sign Δ refers to a change in fit indices for one model relative to the previous model. CFI and RMSEA are robust indices calculated using recommendations by Savalei [41].

Social desirability

To ensure that the Transformative Utopian Impulse for Planetary Health Scale is not susceptible to socially desirable responding, we correlated all the individual items tested in Samples 1-3 with the Marlowe-Crowne Social Desirability Scale form C.[12] As previously indicated, this scale was not measured in Sample 4. For Sample 1, the correlations between this scale and each of the 60 Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) items were small (all *r*s ≤ 0·198); for Sample 2, the correlations between this scale and each of the 12 TUIPHS items were also small (all *r*s ≤ 0·171); finally, the correlations between the social desirability scale and each of the 12 TUIPHS items for Sample 3 were small (all *r*s ≤ 0·125). Likewise, the correlations between the four TUIPHS factors and the social desirability scale in Samples 1, (all *r*s ≤ 0·213),

2 (all rs ≤ 0·142), and 3 (all rs ≤ 0·113) were small. Therefore, across all 3 samples, we did not find evidence that social desirability would be a serious issue for our scale.

Bifactor analysis

According to Rodriguez and colleagues,[47,48] a scale captures a general underlying construct and can be scored as a single factor if the following criteria are met: a) omega hierarchical (ω_h) coefficient needs to be high, ideally > 0·80; b) factor determinacy (*FD*) value needs to exceed 0·90; c) construct replicability index (*H*) needs to be larger than 0·80; d) explained common variance (*ECV*) needs to be large, ideally > 0·70; and e) percentage of uncontaminated correlations (*PUC*) needs to be > 0·70. To compute these indices, we fit bifactor models via the *lavaan* package using the MLMV estimator for each of the three samples and then implemented the R function *omegaFromSem*.[49] For Sample 1, ω_h was 0·90, *FD* was 0·95, *H* was 0·94, *ECV* was 0·81, and *PUC* was 0·82. For Sample 2, ω_h was 0·88, *FD* was 0·94, *H* was 0·92, *ECV* was 0·77, and *PUC* was 0·82. For Sample 3, ω_h was 0·85, *FD* was 0·93, *H* was 0·91, *ECV* was 0·71, and *PUC* was 0·82. For Sample 4, ω_h was 0·89, *FD* was 0·95, *H* was 0·93, *ECV* was 0·76, and *PUC* was 0·82.

Therefore, for all 4 samples, the criteria proposed by Rodriguez and colleagues were met,[47,48] thus indicating that our scale can be scored as a single transformative utopian impulse for planetary health factor. On a side note, Cronbach's α values were also above 0·70 in Samples 1 (α = 0·938), 2 (α = 0·921), 3 (α = 0·905), and 4 (α = 0·929).

Studies 2a-2e: Nomological network

Transformative utopian impulse for planetary health and affective direction

Given that a "desire" for a better way of being and living is assumed to be the primary source of utopian thinking,[50] the transformative utopian impulse for planetary health should be related to approach temperament that captures how easily motivated people are by the prospect of positive stimuli.[51] Additionally, utopian thinking does not necessarily require that people are dissatisfied with their own life in the current society.[3,52] Thus, we do not expect the transformative utopian impulse for planetary health to be significantly related, whether positively or negatively, to life satisfaction,[53] or to life orientation, which measures generalized expectations of good versus bad outcomes in personal life [54].

Transformative utopian impulse for planetary health and imagination

Because the transformative utopian impulse for planetary health reflects a desire for an alternative and better world, it may require people to be imaginative, curious, reflective, and creative to find the appropriate solutions leading to improvement.[55] As such, it should be positively correlated with personality traits that potentiate imagination and exploration, including openness to experience,[56] and sensation seeking.[57] The transformative utopian impulse for planetary health should also be associated with other constructs such as utopianism, conceptualized as imagining one's ideal society, and negatively correlated with anti-utopianism.[52] As "social dreaming", every type of utopian thinking also includes some elements of fantasy.[3] Interestingly, such a fantasy can take two forms, a self- and a more other-oriented one. On the one hand, the transformative utopian impulse for planetary health may be associated with grandiose fantasies, which are a tendency to distort reality to achieve an overly positive view of future accomplishments.[58] By extension, it could also be related to narcissism as a predictor of "ego-promoting outcomes",[59] and to political participation,[60] since the transformative utopian impulse for planetary health can involve expressing one's own vision of a better society. On the other hand, because the transformative utopian impulse for planetary health is other-oriented as it stems from what can be improved at a societal level,[61] it requires fantasy together with empathic concern and perspective-taking.[62] Given this other-orientation, the construct should also be correlated with agreeableness, defined as being trusting, generous, sympathetic, and cooperative,[56] and with group affiliation that captures the desire to belong to groups.[63]

Transformative utopian impulse for planetary health and modes of thought

Since the transformative utopian impulse for planetary health involves a constructive criticism of the present society in consideration of a hypothetical future that is realistic and possible, it requires a "reasoned justification".[64] It should thus entail a rational mode of thinking that is analytic, reason- and justification-based.[65] Importantly, the transformative utopian impulse for planetary health is also intrinsically related to hope because it is inspired by the perceived possibility that the current world could be improved in the future.[1,6,66,67] The transformative utopian impulse for planetary health should therefore be positively correlated with the two components of hope identified in the literature—successful agency (goal-directed determination; here, toward a better world), and pathways (planning of ways to meet goals which are possible or plausible).[68]

Transformative utopian impulse for planetary health and attitudes, values, and beliefs

Importantly, the values attached to the transformative utopian impulse for planetary health can be mapped out and measured thanks to Schwartz and colleagues' theory of basic individual values.[69] The transformative utopian impulse for planetary health should be positively correlated with values linked to openness to change, which emphasize readiness for new ideas, actions, and experiences (self-direction and stimulation), and with values linked to the transcendence of self-interest for the sake of others (universalism and benevolence). Consistently, we expect a positive correlation with alternative scales measuring humanitarian and egalitarian values.[70,71]

Conversely, the transformative utopian impulse for planetary health should be negatively correlated with constructs that predict negative attitudes toward minority groups such as right-wing authoritarianism,[72,73] protestant ethic,[71] or social dominance orientation.[74] We also expect a negative correlation between the transformative utopian impulse for planetary health and conservatism: "In the conservative mind, the utopian thinking of progressives is naive and dangerous".[75] Indeed, in contrast with liberals, conservatives stress resistance to change and justification of inequality,[76] which leaves little room for utopian thinking as defined in the context of the present article (see also Haidt,[77] and Jost[78] on John Lennon's utopian song *Imagine*).

By extension, considering the classic tension between utopia and ideology, which is linked to tradition and orientation toward the past,[4,79–81] we expect that the transformative utopian impulse for planetary health is negatively correlated with economic system justification which measures the general ideological tendency to legitimize economic inequality,[78,82] and also with meritocracy,[70] and fair market ideology, defined as the tendency to view the free-market system, its processes and outcomes, as inherently efficient, fair, legitimate, and just.[83] It is worthwhile to note that utopian thinking is not, by definition, in contradiction with support for the neoliberal free-market system.[84–87] However, given that it is underpinning the economic system we currently live in (especially in Western societies), neoliberalism may now be regarded as an ideology that maintains a status quo undermining planetary health.[88–92]

Although the transformative utopian impulse for planetary health may express a critical perspective on neoliberal free-market-oriented values, we do not suggest that it leads to a complete rejection of every form of consumption.[93,94] To the contrary, socially responsible consumers buy products and services that are "perceived to have a positive (or less negative) influence on the environment" or that "attempt to affect related positive social change".[95] The transformative utopian impulse for planetary health should then be positively related to activist consumption values and choices pertaining to corporate social responsibility and environmental concern that intend to protect people and the planet, and thus may lead to positive social change.[96,97] On a similar basis, the transformative utopian impulse for planetary health should be associated with a positive attitude toward non-profit organizations that help individuals,[98] and should translate into activism.[99]

Participants, procedure, and measures

Participants' demographics are reported in Tables A1 and A2, and the exclusion criteria are detailed below (see *Exclusion Criteria* section). In each study, all participants first completed the consent form, after which they filled in TUIPHS and the relevant scales for that study. All the scales were displayed to participants in a random order. Participants completed TUIPHS along with 13 scales/subscales in Study 2a, 16 scales/subscales in Study 2b, 21 scales/subscales in Study 2c, 16 scales/subscales in Study 2d, and 13 scales/subscales in Study 2e. These scales are

listed in Table A5 and described below. The data for Study 2a were collected between 5-6 November 2018, for Study 2b on 6-7 November 2018, for Study 2c on 7 November 2018, for Study 2d on 9 November 2018, and for Study 2e on 14 November 2018.

Exclusion criteria

To determine which participants should be excluded from statistical analyses, several instructed-response items were administered in each study: seven in Study 2a, eight in Study 2b, five in Study 2c, eight in Study 2d, and eight in Study 2e.[15] Also, all participants had to answer a seriousness check at the end of the study.[14] Only participants who passed all the instructed-response items and the seriousness check were included in statistical analyses.

Determining sample size

Sample size for Studies 2a-2e was determined via power analyses (G*Power),[100] and took into account the FDR correction by Benjamini and Hochberg that was applied in each study separately depending on the total number of significance tests (i.e., correlation analyses) computed.[101] For each study, we computed the number of participants to be tested to capture a medium size correlation ($r = 0{\cdot}03$)[102] with the significance criterion corresponding to the most conservative p-value used by the FDR correction,[101] and the high power of 0·95.[a] For study 2a, 52 correlation analyses (13 scales/subscales multiplied by the four transformative utopian impulse for planetary health factors) were planned and the significance criterion was therefore 0·000962; for Study 2b, 72 correlation analyses (18 scales / subscales multiplied by the four transformative utopian impulse for planetary health factors) were planned and the significance criterion was therefore 0·000694; for Study 2c, 84 correlation analyses (21 scales / subscales multiplied by the four transformative utopian impulse for planetary health factors) were planned and the significance criterion was therefore 0·000595; for Study 2d, 64 correlation analyses (16 scales / subscales multiplied by four the transformative utopian impulse for planetary health factors) were planned and the significance criterion was therefore 0·000781; and for Study 2e, 52 correlation analyses (13 scales / subscales multiplied by the four transformative utopian impulse for planetary health factors) were planned and the significance criterion was therefore 0·000962.[b] For Study 2a, the estimated sample size was 259; for Study 2b it was 268; for Study 2c it was 273; for Study 2d it was 265; and for Study 2e it was 259. Given the large number of check items used (based on which we were expecting many exclusions), in each study we tested roughly 12-22% more participants than estimated via the power analyses to account for the participants whose data would need to be excluded because of not passing the check items (see the *Exclusion*

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[a] The most conservative p-value used by the FDR correction is computed via the formula $P_i \leq \frac{i}{m} q^*$, where P is a cut-off p-value that determines whether a significance test produced a statistically significant finding or not, i is the number of a p-value in a sequence consisting of all the significance tests ranging from smallest to largest, m is the total number of significance tests conducted, and q^* is the significance criterion used (0·05). The most conservative p-value (P_i) is therefore calculated by using m equal to the total number of significance tests computed and i equal to 1.

[b] In Study 2b, we initially tested 18 scales/subscales, given that in addition to the 16 measures that can be seen in Table 3 in the article the Hope Scale [68]—consisting of two subscales—was also tested. Hence, the power analysis for this study was based on 18 scales/subscales. However, due to an error, one item of the Hope Scale was missing from the survey. We therefore could not compute the analyses regarding the Hope Scale in Study 2b and the FDR correction was applied to 64 (corresponding to 16 scales/subscales, given that the two subscales of the Hope Scale were not used in statistical analyses) rather than 72 significance tests (corresponding to all 18 scales/subscales). The Hope Scale was instead tested in Study 2c, in which it was accounted for in the power analysis for that study.

Criteria section above). Overall, the number of participants who were eventually included in statistical analyses (Study 2a = 254; Study 2b = 266; Study 2c = 268; Study 2d = 263; Study 2e = 255) was close to the estimates provided by the power analyses, thus indicating that the study was highly powered to capture medium correlation effect sizes,[102] while accounting for the FDR correction.[101] More specifically, sensitivity power analyses showed that for Study 2a, the smallest effect size *r* the study was highly powered (95%) to capture was 0·302 (α = 0·000962); for Study 2b, it was 0·299 (α = 0·000781); for Study 2c, it was 0·302 (α = 0·000595); for Study 2d, it was 0·301 (α = 0·000781); and for Study 2e, it was 0·302 (α = 0·000962).

Study 2a – Measures

In this study, participants completed the TUIPHS along with 13 scales/subscales.

Transformative Utopian Impulse for Planetary Health. The 12-item *TUIPHS* developed in Study 1 was used to assess four factors, namely F1, F2, F3, and F4 (α = 0·832, 0·855, 0·899, and 0·878, respectively). For informative purposes, we also reported correlations with the general transformative utopian impulse for planetary health factor (α = 0·944).

Big Five. The *Ten Item Personality Inventory* (TIPI) was used to measure *Agreeableness* and *Openness to Experience* along with *Extraversion*, *Conscientiousness*, and *Emotional Stability*.[56] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·432, 0·578, 0·780, 0·647, and 0·750 for agreeableness, openness to experience, extraversion, conscientiousness and emotional stability, respectively).

Motivational Orientation. *Approach Temperament* was measured with the 6-item scale (e.g., "Thinking about the things I want really energizes me") developed by Elliot & Thrash.[51] An additional series of 6 items measured *Avoidance Temperament* (e.g., "I react very strongly to bad experiences").[51] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·849 and 0·912 for approach temperament and avoidance temperament respectively).

Self-Esteem. The 10-item *Rosenberg Self-Esteem Scale* (RSES) was administered to assess one's overall sense of worth as a person (e.g., "On the whole, I am satisfied with myself").[103,104] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·948).

Life Satisfaction. The 5-item *Satisfaction with Life Scale* (SWLS) was employed to measure the cognitive-judgmental aspect of subjective well-being (e.g., "So far I have gotten the important things I want in life").[53] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·921).

PANAS. As second and third components of the emotional aspect of subjective well-being,[53] *Positive* (e.g., "Interested") and *Negative Affect* (e.g., "Distressed") were assessed using the two 10-item mood subscales that comprise the *Positive and Negative Affect Schedule* (PANAS).[105] The responses were anchored on 5-point scales from 1 (*very slightly or not at all*) to 5 (*extremely*; α = 0·900 and 0·931 for positive and negative affect, respectively).

Sensation Seeking. The 8-item *Brief Sensation Seeking Scale* was administered to assess sensation seeking (e.g., "I would like to explore strange places").[106,107] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·828).

General Self-Efficacy. The 17-item *General Self-Efficacy Scale* was employed to assess the belief that one can successfully perform a certain behavior (e.g., "When I make plans, I am certain I can make them work.").[108] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·945).

Study 2b – Measures

In this study, participants completed TUIPHS along with 16 scales/subscales.

Transformative Utopian Impulse for Planetary Health. Same as Study 2a (α = 0·799, 0·875, 0·903, and 0·872, for F1, F2, F3, and F4, respectively, in this study). For informative purposes, we also reported correlations with the general transformative utopian impulse for planetary health factor (α = 0·939).

Grandiose Fantasies. The 10-item *Grandiose Fantasies Scale* was used to assess fantasies of grandeur and success (e.g., "I often feel consumed with thoughts about great things I'm going to do").[58] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·882).

Life Orientation. The 6-item *Revised Life Orientation Test* was employed to measure dispositional optimism (e.g., "I'm always optimistic about my future.").[54] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·934).

Narcissism. The 9-item *Narcissism Scale* from the *Dark Short Triad* (SD3) was administered to measure grandiose identity (e.g., "I know that I am special because everyone keeps telling me so").[59] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·846).

Utopianism and Anti-utopianism. Two 4-item scales assessing *Utopianism* and *Anti-utopianism* were used to measure positive (e.g., "It is important that people think about an ideal version of society") and negative (e.g., "It is useless to dream about what an ideal society might look like") attitudes toward thinking about an ideal society.[52] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·916 and 0·812 for utopianism and anti-utopianism respectively).

IRI. Four 7-item scales from the *Interpersonal Reactivity Index* (IRI) were employed to assess *Fantasy* (e.g., "I daydream and fantasize, with some regularity, about things that might happen to me"), *Empathic Concern* (e.g., "I often have tender, concerned feelings for people less fortunate than me"), and *Perspective Taking* (e.g., "I try to look at everybody's side of a disagreement before I make a decision"), along with *Personal Distress* (e.g., "In emergency situations, I feel apprehensive and ill-at-ease").[62] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·815, 0·927, 0·885, and 0·883 for fantasy, empathic concern, perspective taking, and personal distress respectively).

Affiliation. *Group Affiliation* motive (e.g., "Being part of a group is important to me") along with *Exclusion Concern* (e.g., "It would be a big deal to me if a group excluded me"), and *Independence* (e.g., "I like to be by myself"), were assessed using three (out of 11) 6-item subscales that measure *Fundamental Social Motives* (FSM).[63] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·886, 0·927, and 0·885 for group affiliation, exclusion concern, and independence respectively).

REI. Four 10-item subscales from the *Rational-Experiential Inventory* (REI) were administered to assess *Rational Ability* (e.g., "I have a logical mind"), *Rational Engagement* (e.g., "I enjoy intellectual challenges"), *Experiential Ability* (e.g., "I can usually feel when a person is right or wrong, even if I can't explain how I know"), and *Experiential Engagement* (e.g., "I tend to use my heart as a guide for my actions").[109] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·914, 0·942, 0·922, and 0·923 for rational ability, rational engagement, experiential ability, and experiential engagement).

Study 2c – Measures

In this study, participants completed TUIPHS along with 21 scales/subscales.

Transformative Utopian Impulse for Planetary Health. Same as Study 2a (α = 0·801, 0·872, 0·884, and 0·896, for F1, F2, F3, and F4, respectively, in this study). For informative purposes, we also reported correlations with the general transformative utopian impulse for planetary health factor (α = 0·943).

Hope. Two 4-item subscales comprising the *Hope Scale* were administered to assess *Agency*, defined as a sense of successful determination in meeting goals in the past, present, and future (e.g., "I energetically pursue my goals"), and *Pathways*, defined as a sense of being able to generate successful plans to meet goals (e.g., "Even when others get discouraged, I know I can find a way to solve the problem").[68] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·871 and = 0·886 for agency and pathways, respectively).

PVQ5X. We administered a series of 3-item scales from the *Portrait Value Questionnaire* (PVQ5X) to assess basic individual values.[69] We assessed values that comprise openness to change (*Self-direction and Stimulation*) and self-transcendence (*Universalism and Benevolence*), and are thus conceptually linked to the transformative utopian impulse for planetary health. Two scales—*Self-Direction Thought* (e.g., "It is important to her to form her own opinions and have original ideas"; α = 0·675), and *Self-Direction Action* (e.g., "Freedom to choose what she does is important to her"; α = 0·721)—were used to assess the freedom to cultivate one's own ideas and abilities and to determine one's own actions as motivational goals. The scale *Stimulation* (e.g., "She is always looking for different kinds of things to do"; α = 0·808) was used to assess excitement, novelty, and change as motivational goals. The three scales *Universalism-Concern* (e.g., "Protecting society's weak and vulnerable members is important to her"; α = 0·797), *Universalism-Tolerance* (e.g., "She works to promote harmony and peace among diverse groups"; α = 0·782), and *Universalism-Nature* (e.g., "She strongly believes that she should care for nature"; α = 0·916), were used to assess the commitment to the protection for the welfare of all people and the preservation of nature as motivational goals. The two scales *Benevolence-Dependability* (e.g., "It is important to her to be loyal to those who are close to her"; α = 0·707), and *Benevolence-Caring* (e.g., "It's very important to her to help the people dear to her"; α = 0·877), were used to assess the welfare of ingroup members as a motivational goal.

We also measured the other basic individual values developed by Schwartz and colleagues to further specify the value system, and the motivational goals associated with the transformative utopian impulse for planetary health.[69] These values were *Hedonism* (α = 0·865), *Achievement* (α = 0·763), *Power-Resources* (α = 0·856), *Power-Dominance* (α = 0·763), *Face* (α = 0·675), *Security-Personal* (α = 0·773), *Security-Societal* (α = 0·771), *Tradition* (α = 0·893), *Conformity-Rules* (α = 0·868), *Conformity-Interpersonal* (α = 0·827), and *Humility* (α = 0·600).

According to the gender they entered (male or female), participants read descriptions of a female or male person, and indicated whether the person in the description is like them. The responses were anchored on 6-point scales from 1 (*not at all like me*) to 6 (*very much like me*).

Study 2d – Measures

In this study, participants completed TUIPHS along with 16 scales/subscales.

Transformative Utopian Impulse for Planetary Health. Same as Study 2a (α = 0·775, 0·865, 0·910, and 0·835, for F1, F2, F3, and F4, respectively, in this study). For informative purposes,

we also reported correlations with the general transformative utopian impulse for planetary health factor ($\alpha = 0{\cdot}941$).

Green Scale. The 6-item *Green Scale* was administered to assess the tendency to express the value of environmental protection through one's purchases and consumption behaviors (e.g., "I would describe myself as environmentally responsible").[96] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}933$).

EMCB. Five 2-item subscales—*Eco-Buy* (e.g., "I have switched products for environmental reasons"), *Eco-Boycott* (e.g., "I do not buy household products that harm the environment"), *Recycle* (e.g., "Whenever possible, I buy products packaged in reusable or recyclable containers"), *CSRBoycott* (e.g., "I do not buy products from companies that I know use sweatshop labor, child labor, or other poor working conditions"), and *Pay More* (e.g., "I have paid more for socially responsible products when there is a cheaper alternative")—were employed to measure *Ethically-Minded Consumer Behavior* (EMCB), which concerns various consumption choices pertaining to environmental issues and corporate social responsibility.[97] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}816$, $0{\cdot}807$, $0{\cdot}782$, $0{\cdot}784$, and $0{\cdot}900$, for eco-buy, eco-boycott, recycle, CSRBoycott, and pay more, respectively).

FMI. The 25-item *Fair Market Ideology* scale (FMI) was used to measure the tendency to view market-based processes and outcomes as efficient, inherently fair, legitimate, and just.[76] The responses for the first 15 items (e.g., "The free market system is a fair system") were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*) and the responses for the last 10 items (e.g., "The fact that scarce goods tend to cost more in a free market system is…") were anchored on 7-point scales from 1 (*completely unfair*) to 7 (*completely fair*; $\alpha = 0{\cdot}908$).

Meritocracy. The 4-item *Meritocracy Scale* was employed to measure participants' general beliefs about the value of meritocracy in society (e.g., "It is okay for some people to have better lives if they earned it").[70] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}766$).

Egalitarianism. The 4-item *Egalitarianism Scale* was used to measure participants' general beliefs about the value of egalitarianism in society (e.g., "It is important to treat all individuals as equals, no matter who they are").[70] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}631$).

AICS. To measure individual differences in terms of activism, two 4-item subscales of the *Activist Identity and Commitment Scale* (AICS) were employed.[99] The *Activist Identity* subscale assessed people's self-identification with the activist role (e.g., "Being an activist is central to who I am"), and the *Activist Commitment* subscale measured people's motivation to engage in activist activities (e.g., "I go out of my way to engage in activism"). The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}972$ and $0{\cdot}963$, for activist identity and activist commitment, respectively).

AHO. The 4-item scale *Attitudes toward Helping Others* (AHO) assessed evaluations regarding helping or assisting other people (e.g., "Helping troubled people with their problems is very important to me").[98] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}865$).

ACO. In addition to the previous scale, the 5-item scale *Attitudes toward Helping Charitable Organizations* (ACO) assessed evaluations with regard to nonprofit organizations that help individuals (e.g., "Charity organizations perform a useful function for society").[98] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = 0{\cdot}855$).

MVS. Three 5-item subscales were employed to assess *Material Values* defined as the importance ascribed to the ownership and acquisition of material goods in achieving major life goals or desired states: *Materialism – Success* (e.g., "I admire people who own expensive homes, cars, and clothes"), *Materialism – Centrality* (e.g., "Buying things gives me a lot of pleasure"), and *Materialism – Happiness* (e.g., "I'd be happier if I could afford to buy more things").[110] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·875, 0·768, and 0·827, for success, centrality and happiness, respectively).

Study 2e – Measures

In this study, participants completed the TUIPHS along with 13 scales/subscales.

Transformative Utopian Impulse for Planetary Health. Same as Study 2a (α = 0·827, 0·845, 0·888, and 0·868, for F1, F2, F3, and F4, respectively, in this study). For informative purposes, we also reported correlations with the general transformative utopian impulse for planetary health factor (α = 0·940).

RWA. The 11-item version of the *Right-Wing Authoritarianism Scale* (RWA) was administered to assess the tendencies to obey authorities perceived as legitimate and to aggress against those who would disobey these authorities (e.g., "Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us").[72,73] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·927).

SDO. A series of four 2-item scales comprising the short version of *Social Dominance Orientation* (SDO) was administered to assess the pro-trait (e.g., "An ideal society requires some groups to be on top and others to be on the bottom") and con-trait indices (e.g., "No one group should dominate in society") of *SDO-Dominance* (SDO-D) which constitutes a preference for systems of group-based dominance; along with the pro-trait (e.g., "Group equality should not be our primary goal") and con-trait indices (e.g., "We should do what we can to equalize conditions for different groups") of *SDO-anti-Egalitarianism* (SDO-E) which constitutes a preference for systems of group-based inequality.[74] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·878, 0·708, 0·792, and 0·773, for SDO-D pro-trait, SDO-D con-trait, SDO-E pro-trait, and SDO-E con-trait, respectively).

Humanitarianism-Egalitarianism. The 10-item *Humanitarianism-Egalitarianism Scale* was employed to assess endorsement of the democratic ideals of equality, social justice, and concern for the well-being of other people (e.g., "A good society is one in which people feel responsible for one another").[71] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·897).

Protestant Ethic. The 10-item *Protestant Ethic Scale* was employed to assess individualistic ideology, devotion to work, and discipline (e.g., "If people work hard enough they are likely to make a good life for themselves").[71] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·857).

ESJ. The 17-item *Economic System Justification Scale* (ESJ) was administered to measure people's ideological tendency to legitimize economic inequality (e.g., "Laws of nature are responsible for differences in wealth in society").[82] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·905).

HHIS. *Household Income Satisfaction* (HHIS) was reported on a single-item scale that measures income satisfaction ("Which one of these phrases comes closest to your own feelings about your household's income these days?").[111] The responses were anchored on a 4-point scale (1 =

finding it very difficult on present income; 2 = *finding it difficult on present income*; 3 = *getting by on present income*; 4 = *living comfortably on present income*).

Political Orientation. *Political Self-identification* was reported on a single-item scale ("Please indicate on the scale below your political standing").[112] The responses were anchored on a 7-point scale from 1 (*extremely liberal*) to 7 (*extremely conservative*).

BJW. A 6-item subscale assessing *General Belief in a Just World* (e.g., "I think basically the world is a just place"), and a 7-item subscale assessing *Personal Belief in a Just World* (e.g., "I am usually treated fairly") were administered to measure *Beliefs in a Just World* (BJW) according to which the world is generally a just place and oneself is treated fairly.[113] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·895 and = 0·942 for general and personal BJW respectively).

DOG. The 20-item *Dogmatism Scale* (DOG) was used to measure unjustified certainty highly resistant to change (e.g., "If you are "open-minded" about the most important things in life, you will probably reach the wrong conclusions").[114] The responses were anchored on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*; α = 0·922).

Relationship between the transformative utopian impulse for planetary health factors and other constructs

We computed bivariate correlations between the four TUIPHS factors and the scales tested in each study (Table A5). In the table, it is indicated which initially significant raw p-values stopped being significant after the FDR correction was applied. Correlations between the general factor and the scales tested in each study are also reported for informative reasons. However, significance tests concerning the general factor were not used in the power analyses to estimate the sample size or to compute the FDR corrections in the correlation analyses, and hence only the raw p-values are reported concerning this factor.

Table A5. Correlations between each measure tested in Studies 2a-2e and the four transformative utopian impulse for planetary health factors, as well as the general transformative utopian impulse for planetary health factor

Measure	Transformative Utopian Impulse				
	F1	F2	F3	F4	General Factor
Study 2a (N = 254)					
BIG 5 – Extraversion	0·095 (0·13)	-0·029 (0·65)	0·059 (0·35)	0·057 (0·36)	0·053 (0·40)
BIG 5 – Conscientiousness	0·052 (0·41)	0·073 (0·25)	0·035 (0·58)	0·042 (0·51)	0·057 (0·37)
BIG 5 – Emotional stability	-0·042 (0·51)	-0·070 (0·27)	-0·068 (0·28)	-0·003 (0·97)	-0·050 (0·42)
BIG 5 – Agreeableness	0·118 (0·061)	0·119 (0·058)	0·170 (0·0065)	0·235 (0·00015)	0·181 (0·0038)
BIG 5 – Openness	0·220 (0·00045)	0·222 (0·00035)	0·230 (0·00022)	0·220 (0·00040)	0·251 (<0·0001)
Approach Temperament	0·227 (0·00027)	0·185 (0·0030)	0·312 (<0·0001)	0·274 (<0·0001)	0·282 (<0·0001)

Avoidance Temperament	0·103 (0·10)	0·155 (0·014)	0·152 (0·016)	0·112 (0·075)	0·146 (0·020)
Self-Esteem	-0·043 (0·49)	-0·098 (0·12)	0·007 (0·91)	0·023 (0·71)	-0·031 (0·063)
General Self-Efficacy	0·101 (0·11)	0·092 (0·15)	0·118 (0·061)	0·136 (0·030)†	0·126 (0·045)
Life Satisfaction	0·045 (0·47)	-0·108 (0·087)	0·006 (0·93)	0·065 (0·30)	0·005 (0·94)
PANAS – Positive Affectivity	0·238 (0·00013)	0·083 (0·19)	0·206 (0·0010)	0·216 (0·00054)	0·211 (0·00070)
PANAS – Negative Affectivity	0·075 (0·23)	0·050 (0·43)	-0·012 (0·85)	-0·020 (0·75)	0·026 (0·68)
Sensation Seeking	0·273 (<0·0001)	0·191 (0·0022)	0·209 (0·00078)	0·274 (<0·0001)	0·268 (<0·0001)
Study 2b (N = 266)					
Grandiose Fantasies	0·313 (<0·0001)	0·002 (0·97)	0·039 (0·52)	0·078 (0·21)	0·128 (0·037)
Life Orientation Test	0·086 (0·16)	-0·019 (0·75)	0·082 (0·18)	0·082 (0·18)	0·068 (0·27)
Narcissism	0·342 (<0·0001)	0·021 (0·73)	0·061 (0·33)	0·149 (0·015)	0·168 (0·0060)
Utopianism	0·699 (<0·0001)	0·529 (<0·0001	0·579 (<0·0001)	0·588 (<0·0001)	0·688 (<0·0001)
Anti-Utopianism	-0·053 (0·39)	-0·250 (<0·0001)	-0·195 (0·0014)	-0·078 (0·21)	-0·162 (0·0082)
IRI – Fantasy	0·306 (<0·0001)	0·320 (<0·0001)	0·309 (<0·0001)	0·259 (<0·0001)	0·341 (<0·0001)
IRI – Empathic Concern	0·372 (<0·0001)	0·454 (<0·0001)	0·589 (<0·0001)	0·486 (<0·0001)	0·543 (<0·0001)
IRI – Perspective Taking	0·267 (<0·0001)	0·350 (<0·0001)	0·417 (<0·0001)	0·414 (<0·0001)	0·413 (<0·0001)
IRI – Personal Distress	0·062 (0·31)	0·094 (0·12)	0·088 (0·15)	0·073 (0·24)	0·090 (0·14)
FSM – Affiliation (Group)	0·267 (<0·0001)	0·174 (0·0044)	0·343 (<0·0001)	0·312 (<0·0001)	0·315 (<0·0001)
FSM – Affiliation (Exclusion)	0·115 (0·060)	0·104 (0·089)	0·101 (0·10)	0·067 (0·28)	0·111 (0·071)
FSM – Affiliation (Independence)	-0·092 (0·14)	0·082 (0·18)	-0·122 (0·048)†	-0·103 (0·094)	-0·070 (0·26)
REI – Rational Ability	0·138 (0·025)	0·146 (0·017)	0·142 (0·020)	0·157 (0·010)	0·167 (0·0064)
REI – Rational Engagement	0·220 (0·00031)	0·184 (0·0026)	0·231 (0·00015)	0·250 (<0·0001)	0·254 (<0·0001)
REI – Experiential Ability	0·099 (0·11)	0·072 (0·24)	0·028 (0·65)	0·100 (0·10)	0·086 (0·16)

REI – Experiential Engagement	0·132 (0·032)†	0·097 (0·12)	0·075 (0·22)	0·141 (0·022)	0·127 (0·038)
Study 2c (N = 268)					
PVQ5X – Self-Direction Thought	0·358 (<0·0001)	0·444 (<0·0001)	0·556 (<0·0001)	0·454 (<0·0001)	0·507 (<0·0001)
PVQ5X – Self-Direction Action	0·118 (0·054)	0·276 (<0·0001)	0·230 (0·00015)	0·206 (0·00070)	0·230 (0·00015)
PVQ5X – Stimulation	0·386 (<0·0001)	0·350 (<0·0001)	0·358 (<0·0001)	0·381 (<0·0001)	0·417 (<0·0001)
PVQ5X – Hedonism	0·316 (<0·0001)	0·286 (<0·0001)	0·252 (<0·0001)	0·267 (<0·0001)	0·317 (<0·0001)
PVQ5X – Achievement	0·304 (<0·0001)	0·173 (0·0046)	0·202 (0·00087)	0·247 (<0·0001)	0·265 (<0·0001)
PVQ5X – Power-Resources	0·207 (0·00065)	0·033 (0·60)	0·019 (0·76)	0·115 (0·060)	0·111 (0·071)
PVQ5X – Power-Dominance	0·306 (<0·0001)	0·117 (0·055)	0·070 (0·25)	0·182 (0·0028)	0·196 (0·0012)
PVQ5X – Face	0·225 (0·00020)	0·173 (0·0045)	0·187 (0·0021)	0·246 (<0·0001)	0·236 (<0·0001)
PVQ5X – Security-personal	0·067 (0·28)	0·143 (0·019)	0·200 (0·0010)	0·208 (0·00060)	0·172 (0·0046)
PVQ5X – Security-Societal	0·081 (0·18)	-0·036 (0·55)	0·031 (0·62)	0·044 (0·47)	0·037 (0·55)
PVQ5X – Tradition	0·051 (0·40)	-0·113 (0·065)	-0·022 (0·72)	0·010 (0·87)	-0·017 (0·79)
PVQ5X – Conformity-Rules	-0·009 (0·89)	-0·129 (0·035)	-0·049 (0·43)	-0·051 (0·41)	-0·064 (0·30)
PVQ5X – Conformity-Interpersonal	0·149 (0·015)	0·251 (<0·0001)	0·258 (<0·0001)	0·230 (0·00015)	0·247 (<0·0001)
PVQ5X – Humility	0·128 (0·037)	0·218 (0·00032)	0·199 (0·0011)	0·171 (0·0049)	0·199 (0·0010)
PVQ5X – Benevolence-Dependability	0·234 (0·00011)	0·272 (<0·0001)	0·342 (<0·0001)	0·295 (<0·0001)	0·320 (<0·0001)
PVQ5X – Benevolence-Caring	0·283 (<0·0001)	0·407 (<0·0001)	0·474 (<0·0001)	0·378 (<0·0001)	0·430 (<0·0001)
PVQ5X – Universalism-Concern	0·451 (<0·0001)	0·621 (<0·0001)	0·653 (<0·0001)	0·541 (<0·0001)	0·633 (<0·0001)
PVQ5X – Universalism-Nature	0·567 (<0·0001)	0·575 (<0·0001)	0·662 (<0·0001)	0·686 (<0·0001)	0·702 (<0·0001)
PVQ5X – Universalism-Tolerance	0·523 (<0·0001)	0·578 (<0·0001)	0·617 (<0·0001)	0·562 (<0·0001)	0·640 (<0·0001)
Hope – Agency	0·258 (<0·0001)	0·225 (0·00020)	0·195 (0·0013)	0·228 (0·00017)	0·256 (<0·0001)
Hope – Pathways	0·331 (<0·0001)	0·323 (<0·0001)	0·279 (<0·0001)	0·302 (<0·0001)	0·348 (<0·0001)
Study 2d (N = 263)					

MVS – Success	0·067	-0·089	-0·061	-0·065	-0·038
	(0·28)	(0·15)	(0·32)	(0·30)	(0·54)
MVS – Centrality	-0·054	-0·128	-0·101	-0·125	-0·113
	(0·38)	(0·038)	(0·10)	(0·043)†	(0·068)
MVS – Happiness	0·045	0·031	0·070	-0·081	0·018
	(0·47)	(0·61)	(0·26)	(0·19)	(0·77)
Green Scale	0·523	0·604	0·675	0·796	0·724
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
EMCB – Eco-Buy	0·473	0·553	0·602	0·772	0·669
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
EMCB – Eco-Boycott	0·428	0·538	0·595	0·725	0·636
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
EMCB – Recycle	0·447	0·542	0·578	0·675	0·625
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
EMCB – CSR-Boycott	0·397	0·506	0·556	0·701	0·601
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
EMCB – Pay More	0·456	0·527	0·578	0·696	0·630
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Fair Market Ideology	-0·183	-0·407	-0·340	-0·239	-0·323
Scale	(0·0029)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Meritocracy Scale	-0·133	-0·278	-0·249	-0·214	-0·242
	(0·031)	(<0·0001)	(<0·0001)	(0·00048)	(<0·0001)
Egalitarianism Scale	0·449	0·574	0·553	0·560	0·595
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
AHO	0·517	0·607	0·636	0·593	0·656
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
ACO	0·276	0·269	0·305	0·340	0·333
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
AICS – Activist	0·676	0·496	0·486	0·599	0·636
Identity	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
AICS – Activist	0·658	0·473	0·476	0·611	0·625
Commitment	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Study 2e (N = 255)					
BJW – General	0·050	-0·117	0·012	0·039	<0·001
	(0·42)	(0·062)	(0·85)	(0·53)	(>0·99)
BJW – Personal	-0·063	-0·139	-0·011	-0·068	-0·079
	(0·32)	(0·026)	(0·86)	(0·28)	(0·21)
Right Wing	0·020	-0·255	-0·140	-0·131	-0·135
Authoritarianism	(0·76)	(<0·0001)	(0·026)	(0·036)†	(0·031)
Dogmatism	0·137	-0·132	-0·088	0·030	-0·006
	(0·029)	(0·035)†	(0·16)	(0·64)	(0·93)
SDO-D – Pro-trait	-0·192	-0·446	-0·367	-0·287	-0·357
	(0·0021)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
SDO-D – Con-trait	0·296	0·484	0·467	0·362	0·448
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
SDO-E – Pro-trait	-0·370	-0·542	-0·500	-0·424	-0·513

	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
SDO-E – Con-trait	0·393	0·565	0·526	0·422	0·532
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Humanitarianism-Egalitarianism	0·508	0·619	0·624	0·545	0·645
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Protestant Ethic	-0·064	-0·221	-0·067	-0·085	-0·120
	(0·31)	(0·00037)	(0·29)	(0·18)	(0·055)
Economic System Justification	-0·326	-0·556	-0·435	-0·416	-0·483
	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)
Household Income Satisfaction	-0·103	-0·204	-0·140	-0·032	-0·131
	(0·10)	(0·0011)	(0·026)	(0·61)	(0·036)
Political Orientation	-0·209	-0·348	-0·246	-0·269	-0·300
	(0·00079)	(<0·0001)	(<0·0001)	(<0·0001)	(<0·0001)

Note. The first number in each column for F1-F4 and General Factor corresponds to the Pearson correlation coefficient *r*, and the number in parentheses corresponds to the significance level (i.e., *p* value). Raw significance values are reported: symbol † indicates results that stopped being significant after the false discovery rate (FDR) correction was applied across Factors 1-4. The general transformative utopian impulse factor is reported for informative purposes—it was not involved in sample size planning based on the FDR correction and we therefore did not use the correction in relation to this factor.
IRI = Interpersonal Reactivity Index; FSM = Fundamental Social Motives; REI = Rational Experiential Inventory; PVQ5X = Portrait Value Questionnaire; MVS = Material Values Scale; EMCB = Ethically Minded Consumer Behavior Scale; CSR (in EMCB – CSR-Boycott) = Corporate Social Responsibility; AHO = Attitudes toward Helping Others; ACO = Attitudes toward Charitable Organisations; AICS = Activist Identity and Commitment Scale; BJW = Belief in a Just World; SDO-D: Social Dominance Orientation pro- and con-trait Dominance; SDO-E: Social Dominance Orientation pro- and con-trait anti-Egalitarianism.

Distinguishing the transformative utopian impulse for planetary health from highly correlated constructs

To show that the transformative utopian impulse for planetary health is distinct from the constructs with which any of the TUIPHS factors had correlations of 0·50 or higher, we performed a series of confirmatory factor analyses.[115]

First, using the *anova* function in R, we tested whether a model in which a highly correlated construct is treated as the fifth TUIPHS factor has a better fit compared to when this construct is combined with a TUIPHS factor with which it is highly correlated into the same factor. If the transformative utopian impulse for planetary health is different from other highly related constructs, then the models in which such constructs are treated as the fifth TUIPHS factor should have a better fit than models in which they are combined with the highly correlated TUIPHS factors. The analyses showed that the five-factor models had a better fit than the four-factor models in all cases, all ps < 0·0001.

Second, we tested whether a model in which one factor from TUIPHS and a highly correlated construct are treated as two separate factors has a better fit compared to a model which has only one factor that combines the TUIPHS factor and the competing construct. If the transformative utopian impulse for planetary health is different from other highly related constructs, then the models in which a TUIPHS factor and the competing construct are treated as separate factors should have a better fit than models in which the two are combined into a single factor. The analyses showed that the two-factor models had a better fit than the one factor models in all cases, all ps ≤ 0·014.

Overall, these analyses indicate that the four TUIPHS factors are distinct from the other constructs to which they were highly correlated.

Expanded discussion

As expected, Study 2a showed that the four factors comprising TUIPHS were consistently significantly positively correlated with openness to experience, approach temperament, and sensation seeking. These results supported the positive motivational orientation toward imagination and action that lies at the core of our conceptualization of the transformative utopian impulse for planetary health. Along this line of argument, every factor (but F2) was also positively correlated with positive affectivity, and none of them were significantly correlated with negative affectivity. Additionally, we found a small but significant positive correlation between two factors (F2 and F3) and avoidance temperament, which may be due to the association between the transformative utopian impulse for planetary health and the feeling that "something is missing".[116] Moreover, a positive correlation between two factors (F3 and F4) and agreeableness denotes the general concern for others' well-being associated with the transformative utopian impulse for planetary health.

As expected, Study 2b showed that the four factors comprising the transformative utopian impulse for planetary health were consistently significantly correlated with scales associated with fantasy and other-orientation (empathic concern, perspective taking, and group affiliation), and with analytical thinking and utopianism (rational engagement, rational ability, utopianism, and anti-utopianism). In this perspective, Study 2c found that every TUIPHS factor was positively significantly correlated with hope, which is conceptually related to the transformative utopian impulse for planetary health.

In line with expectations, Study 2c also indicated that values associated with openness to change and exploration of new ideas (self-direction thought and stimulation) and self-transcendence (universalism and benevolence) underpin the transformative utopian impulse for planetary health. These results are consistent with the positive correlations with openness to experience (Study 2a) and with empathic concern and perspective taking (Study 2b). The strong positive association between the transformative utopian impulse for planetary health and values underpinning openness to change was also complemented by the absence of significant positive correlation between the transformative utopian impulse for planetary health and societal-security, tradition, or conformity, which are values whose related motivational goals constrain freedom and limit social change. Unexpectedly, however, self-direction action was positively correlated with every transformative utopian impulse for planetary health factor (including the general factor) except for F1. This may be explained by the specificity of this factor. Indeed, F1 is the only factor significantly positively correlated with grandiose fantasies and narcissism (Study 2b), and with values expressing both control of material resources and dominance over people (power resources and power dominance). As such, F1 may thus not be very well-aligned with valuing the freedom to determine one's own actions that is conveyed by self-direction action. More generally, this reveals that F1 may be conceptually broader and more complex than the other TUIPHS factors.

In Study 2c, the four TUIPHS factors were also correlated with values focusing on personal outcomes and self-enhancement such as hedonism (sensory pleasure and gratification) and achievement (personal success by social standards), as well as with values focusing on social outcomes by renouncing self-interest (humility) and avoiding harm to others (interpersonal conformity). Reciprocally, various TUIPHS factors were positively correlated with face and

personal security, which indicates that people higher (vs. lower) in the transformative utopian impulse for planetary health may, to some degree, be more motivated to avoid threat or harm to one's self.

As expected, in Study 2d, every TUIPHS factor was significantly positively correlated with scales measuring altruistic attitudes (attitudes toward helping others and attitudes toward charitable organizations), activism (activist identity and activist commitment), and ethical and socially responsible consumption (green consumption values, ethically minded consumer behavior). Remarkably, the latter result suggests, as further supported by the general absence of significant negative correlations with material values (especially material success and material happiness), that the transformative utopian impulse for planetary health is not associated with a rejection of every form of product consumption but rather with a strong support for socially conscious consumption practices that could lead to positive social transformation (e.g., fairly traded or green products). Consistently, the four factors underpinning the transformative utopian impulse for planetary health were significantly negatively correlated with support for the free-market system (fair market ideology and meritocracy), and positively correlated with egalitarian beliefs.

As expected, this tendency was also observed in Study 2e, where correlation analyses showed that the four transformative utopian impulse for planetary health factors were consistently significantly positively correlated with scales measuring egalitarianism (humanitarianism-egalitarianism, and social dominance orientations con-trait dominance and con-trait anti-egalitarianism), and negatively correlated with scales measuring the tendency to legitimize economic and social inequality (economic system justification, and social dominance orientations pro-trait dominance and pro-trait anti-egalitarianism), and a conservative political orientation. These results are further complemented by the negative correlations of some factors with right-wing authoritarianism and Protestant ethic.

It is worthwhile to note that, as expected, the transformative utopian impulse for planetary health was not significantly correlated with life satisfaction (Study 2a), or with life orientation (Study 2b). Additionally, only F2 was consistently significantly (but weakly) negatively correlated with income satisfaction and personal beliefs in a just world (Study 2e). These results support the idea that people do not necessarily have to be dissatisfied with themselves or their own life, or to be specifically pessimistic (or optimistic) on a personal level, in order to engage in utopian thinking and its related concrete actions. Furthermore, the absence of a significant relationship between the transformative utopian impulse for planetary health and self-efficacy (Study 2a) suggests that the extent to which a person thinks that they can successfully accomplish their goals does not determine whether they want to engage in thoughts and actions that could lead to social transformation.

It is worthwhile to note that, contrary to our predictions, certain factors were, in few cases, negative predictors of the dependent variables. However, because these factors always had positive relationships with the dependent variables when tested in separate correlation analyses, we can conclude that the negative relationships were statistical artefacts that occurred due to high correlations among the four factors and the competing scales tested.[117–119]

Studies 3a-3d: Incremental Predictive Validity

Sample size, participants, and procedure

Sample size for Studies 3a-3d was determined via a priori power analyses that used a similar logic as for Studies 2a-2e. A detailed description of these analyses can be seen in the pre-registration document (see *Determining Sample Size* section below). Overall, we decided to test roughly 600 participants in each study, and we estimated that around 480-510 participants may be included in statistical analyses under the assumption that the data from roughly 15-20% of them may be eliminated after applying the exclusion criteria detailed below. Participants' demographics are reported in Tables A1-A2. In each study, all participants first completed the consent form, after which they filled in TUIPHS, the relevant attitudinal or behavioral questions, and the competing scales (see the *Measures* section below and Table A6). The order in which TUIPHS, the competing scales, and the attitudinal or behavioral questions were presented was randomized across participants. In the end, we assessed the covariates (age and gender). The data for Study 3a were collected between 10-11 June 2019, for Study 3b between 11-12 June 2019, for Study 3c between 12-15 June 2019, and for Study 3d between 13-15 June 2019.

Pre-registration

All the predictions, materials, and analyses for this study were pre-registered and can be accessed here: https://osf.io/ztj2f/?view_only=f4c89450ef6143c1a5bbb1ce1c9688ae.

Exclusion criteria

In each study participants received ten instructed-response items.[15] At the end, all participants had to answer a seriousness check.[14] Only participants who passed all the instructed-response items and the seriousness check were included in statistical analyses.

Determining sample size

Given that Studies 3a-3d were pre-registered, a comprehensive description of the rationale behind sample size is available in the pre-registration document. For Hypothesis 1, sensitivity power analyses (F tests -> Linear multiple regression: Fixed model, R2 increase -> Sensitivity) were computed using G*Power.[100] Analyses showed that, with the actual sample sizes recruited, and assuming the most conservative significance levels used in the FDR correction,[101] for Study 3a, the smallest effect size Cohen's f^2 the study was highly powered (95%) to capture was 0·063 (α = 0·0009259); for Study 3b, it was 0·066 (α = 0·0011111); for Study 3c, it was 0·063 (α = 0·0008333); and for Study 3d, it was 0·067 (α = 0·0010000). For Hypothesis 2, sensitivity power analyses showed that, for Study 3a, the smallest effect size Cohen's f^2 the study was highly powered (95%) to capture was 0·055 (α = 0·0002315); for Study 3b, it was 0·058 (α = 0·0002778); for Study 3c, it was 0·056 (α = 0·0002083); and for Study 3d, it was 0·059 (α = 0·0002500). For reference, medium Cohen's f^2 is 0·15, and small Cohen's f^2 is 0·02.[102] The parameters used in the sensitivity power analyses (i.e., number of predictors, significance levels, etc.) are described in detail in the preregistration under "Justify planned sample size", whereas the sample sizes implemented are the ones used in statistical analyses for Studies 3a-3d (see Tables A7-A10 below).

Measures – Behavioral and attitudinal items and their definitions

Given that we have argued that the transformative utopian impulse for planetary health is an important construct for understanding social change, we wanted to show that it predicts a range of constructs relevant to this change above and beyond the competing scales. These constructs comprised nine self-reported behaviors and ten self-reported attitudes. Their items, definitions, and supporting references are reported in Table A6 below.

Table A6. Definition and theoretical justification of the self-reported behavioral and attitudinal variables used in Studies 3a-3d.

Constructs	Items	Definition and theoretical justification
Collective change [b]	- Have you ever argued that the economic status quo is endangering our society and/or planet? - Have you ever said that our current rules and/or laws contribute to reproducing social and economic inequalities?	This construct measures how frequently people express a critical point of view about economic and social status quo. This construct exemplifies the critical dimension at the core of utopian thinking as a rejection of system justification.[52,66,78,92,120]
Collective imagination [b]	- Have you ever argued that we need more people who think about what a better society might look like? - Have you ever said that our society could be improved if everyone tried to think about new ways of living together?	This construct measures how frequently people express the need for collective imagination, which is acknowledged as a source of societal transformation.[92,121–125]
Individual change [b]	- Have you ever left your comfort zone to take action for change and support a cause you care about? - Have you ever changed things in your life to focus more on what you believe could transform the world for the better?	This construct measures how frequently people have been willing to change their habits to contribute to social transformation. This has been illustrated in the literature by the need for radical changes in terms of food and energy consumption, for instance.[126–128]
Knowledge [b]	- Have you ever bookmarked a website or subscribed to a newsletter or a mailing list that covers alternative practices aimed at tackling some of the issues humanity is currently facing? - Have you ever bought magazines, reports, or books that propose alternative views on how to tackle pressing societal problems? - Have you ever informed yourself about current initiatives that could be rolled out to improve our society in the future by satisfying the most critical needs of people? - Have you ever looked up historical initiatives that led to radical societal transformations?	This construct measures how frequently people collect information to learn about past or current concrete utopian initiatives and solutions to economic, social, and environmental problems that could transform the future.[129,130]

	- Have you ever informed yourself about current initiatives that could be rolled out to bring about greater equality between social groups in the future?	
Localism [b]	- Have you ever avoided buying products in chains in order to support independent local shops? - Have you ever gone out of your way to avoid buying products from a large retail grocery chain? - Have you ever supported small producers by buying local products? - Have you ever bought locally grown products and brands? - Have you ever bought books from independent and socially conscious publishers?	This construct measures how frequently people buy products from local and independent producers or stores. It illustrates utopian aspirations associated with the "re-localization" of the economy as a source of economic and social transformation toward more sustainable consumption.[93,131–135]
Public [b]	- Have you ever publicly expressed your views about our greatest societal concerns (e.g., via a website, blog, chat room, newspaper, radio, or in some other way)? - Have you ever displayed and/or worn badges/stickers/signs that promote a more just and equitable world? - Have you ever participated in protests against current problems related to environment, economy, or social life?	This construct measures how frequently people publicly advocate some political cause and engage in actions associated with economic, social, and political transformation toward a more sustainable society.[99,136]
Research [b]	- Before purchasing a product, have you ever investigated how the company producing it treats its employees? - Before buying products or services from a company, have you ever researched whether this company negatively impacts local communities? - Have you ever examined the consequences that particular brands have for the wider society or the environment?	This construct measures how frequently people collect information about the economic, social, and environmental conditions of production and the implications of the consumption associated to products and services. This construct exemplifies utopian aspirations associated with socially conscious consumption as a source of economic, social, and environmental transformation.[93,95,137]

	- Have you ever checked whether different products or services you are using could create positive change in the world?	
Sacrifice [b]	- Have you ever done something that is for the benefit of society or the planet even if it disadvantaged you in some way (e.g., in terms of income, career opportunities, life quality, personal relationships, etc.)? - When applying for a job position or deciding what to study, have you ever prioritized whether it can help you change the world, rather than make you more money?	This construct measures how frequently people undertake personally costly actions for present and future public good. It exemplifies the altruistic orientation that motivates utopian aspirations and actions in favor of planetary health.[138–140]
Tolerance [b]	- Have you ever argued that we will never solve the most pressing issues that the world is facing if we do not understand everybody's point of view? - Have you ever argued that we will never improve our society if we do not listen to everybody, even people with whom we disagree? - Have you ever argued that we cannot neglect other people's point of view because we disagree with their views about what a better society would look like?	This construct measures how frequently people argue in favor of democratic tolerance, which is a key ingredient to adopt solutions for the betterment of society.[141,142] This construct illustrates the universalism values that are related to the transformative utopian impulse for planetary health.[50,143–145]
Commitment [a]	- Have you ever thought that, whatever their outcome, it is key to take part in protests and initiatives that aim to change our society? - Have you ever thought that we should be ready to resist and defend the planet against the government? - Have you ever thought that we should never miss an opportunity to protest against and resist any organization that prioritizes profit over people and the planet?	This construct measures how frequently people have thoughts expressing a commitment to initiatives or protests in favor of social change and against anti-social or unsustainable institutional decisions. This construct expresses the association between collective action and sustainability.[146–148]

Contempt [a]	- Have you ever been angry at people who ignore the voices of those who are disadvantaged? - Have you ever been infuriated by economic actions that could further undermine social cohesion?	This construct measures how frequently people experience anger at those who show contempt for others or the society. This construct exemplifies anger as a source of motivating action for social change.[149,150]
Degrowth [a]	- Have you ever thought that, instead of focusing on endless economic growth, we should focus on our personal growth to create a better world? - Have you ever thought that our current obsession with economic growth is detrimental for people and the planet? - Have you ever felt that we will never change the world if we do not abandon our illusions about economic growth as the primary purpose of our society?	This construct measures how frequently people think that we should reduce our economic production and consumption to transform society and favor self-actualization and planetary health.[132,133,140,151–153]
Empowerment [a]	- Have you ever felt that we have to take action to solve global challenges rather than wait for the governments or people in positions of power to do it? - Have you ever thought that the world will never solve important global problems if it does not give people the opportunity to be imaginative and creative? - Have you ever thought that it is our duty as human beings to empower ourselves and change the world without waiting for people in positions of authority to do it?	This construct measures how frequently people have felt or thought that bottom-up implementations and solutions are sources of societal transformation.[129,154]
Immersion [a]	- Have you ever been enraptured by programs or documentaries that explore solutions to some of the critical challenges that our society needs to overcome? - Have you ever been engrossed in literature on social and economic ways of living that could	This construct measures how frequently people experience feelings of immersion when they learn about solutions to economic, social, and environmental issues. It illustrates the fantasy and the experience of flow that are associated with the transformative utopian impulse for planetary health.[61,122]

	tackle some of the most alarming issues of our time? - Have you ever been absorbed by radio programs or podcasts about social and economic initiatives that could lead to societal change? - Have you ever been captivated by events, meetings, or conferences discussing propositions that could help solve societal or environmental challenges? - Have you ever been immersed in exhibitions displaying creative and innovative propositions that could make our future society flourish?	
Life improvement [a]	- Have you ever thought that your living conditions would be better in a more just society? - Have you ever thought that you would like to change things in our current economic system to have a better life? - Have you ever thought that our current society should be transformed because it does not provide everyone with an equal chance of building the life of their choice? - Have you ever thought that, as long as consumerism is driving our society, people will not be able to reach their full potential?	This construct measures how frequently people have thoughts related to social justice and societal transformation to have a better life.[94,155–157]
Personal autonomy [a]	- Have you ever thought that our current society should be improved to guarantee everyone's personal autonomy? - Have you ever wished to live in a different society where personal autonomy is facilitated?	This construct measures how frequently people think that everyone should have the right to govern themselves or to organize their own activities, which is associated with the concrete utopia of human rights.[130,158]
Perspective taking [a]	- Have you ever imagined yourself in the shoes of those who are less privileged than you to understand their lived experience?	Perspective taking measures how frequently people experience empathy toward others in need, which is associated with the transformative utopian impulse for planetary health.[61] This construct exemplifies empathy

	- Have you ever been interested in a social cause that intends to defend or protect someone who is in a difficult or vulnerable position? - Have you ever been touched by stories and/or pictures of kids who are faced with economic hardship?	as a source of motivation toward action for social change.[150]
Refugees [a]	- Have you ever been disturbed by refugees' situation? - Have you ever been upset by what refugees are going through?	This construct measures how frequently people experience empathy toward refugees, whose situation is associated with the concrete utopia of human rights.[130,158]
Urgency [a]	- Have you ever thought that we need to undertake urgent action to counter some of the biggest global issues or it will be too late? - Have you ever thought that you will no longer enjoy the beauty of the planet if we do not take action now to radically change our consumerist society?	This construct measures how frequently people think that we have to adopt immediate and radical societal transformations in order to live in a better society.[89,120,132,138]

Note. Constructs that contain superscript [b] indicate behavioral variables, and constructs that contain superscript [a] indicate attitudinal variables.

Competing scales

In Studies 3a-d, we used all scales (or subscales of the scales that consist of multiple subscales) that were highly correlated ($r \geq 0{\cdot}50$) with TUIPHS in Studies 2a-2e. In particular, in Studies 3a and 3c (see Tables A7 & A9), we used the scale measuring *Utopianism*,[52] the *Empathic Concern* subscale of the *Interpersonal Reactivity Index*,[62] the *Green Scale*,[96] all subscales of the *Ethically Minded Consumer Behavior Scale,*[97] the *Egalitarianism Scale*,[70] and the *Self-direction Thought*, *Universalism-Concern*, *Universalism-Nature*, *and Universalism-Tolerance* scales of the *Portrait Values Questionnaire*.[69] In Studies 3b and 3d (see Tables A8 & A10), we used the *Attitude toward Helping Others Scale*,[98] all the subscales of the *Activist Identity and Commitment Scale*,[99] the *Humanitarianism-Egalitarianism Scale,*[71] *the SDO-Egalitarianism Scale* pro- and con-trait indices*,*[74] and the *Economic System Justification Scale.*[82]

All the scales were assessed using a response scale from 1 (*strongly disagree*) to 7 (*strongly agree*), except for the subscales of the *Portrait Values Questionnaire* that were assessed on a response scale from 1 (*not at all like me*) to 6 (*very much like me*).

Covariates

We used two essential demographic characteristics—gender (male vs. female) and age—that are known to be linked to many constructs and are typically added as covariates in incremental predictive validity studies.[159]

Regression analyses

To test Hypotheses 1 and 2, we used hierarchical linear regressions with three steps. In Step 1, only the covariates (gender and age) were included in the model. In Step 2, a competing scale was included. If the competing scale consisted of several subscales, all the subscales were included in this step. Finally, in Step 3, the four TUIPHS factors were added. Regarding Hypothesis 1, we focused on whether the change in R^2 for Step 3 was significant. Hypothesis 2 was tested by probing which of the four TUIPHS factors included in Step 3 were significant as predictors.

Detailed results

For both hypotheses, Tables A7-A10 report the raw p-values and indicate which ones stopped being significant after applying the FDR correction.[101] For informative purposes, Tables A7-A10 also report whether the general transformative utopian impulse for planetary health factor that was probed in a different set of hierarchical regression analyses was a significant predictor. However, because the general factor was not used in sample size planning, we report only the raw significance values but do not implement the FDR correction in relation to it.

Table A7. Incremental predictive validity in Study 3a

Competing Scale (CS)	ΔR^2 Covariates	ΔR^2 CS	ΔR^2 TUIPHS	Significant Factors
Research (α = 0·906)				
Utopianism	0·016 (0·015)	0·200 (<0·0001)	0·238 (<0·0001)	F1 (<0·0001), -F3 (0·049)†, F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·016 (0·015)	0·055 (<0·0001)	0·382 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green Scale	0·016 (0·015)	0·390 (<0·0001)	0·109 (<0·0001)	F1 (<0·0001), -F3 (0·025)†, F4 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·016 (0·015)	0·473 (<0·0001)	0·071 (<0·0001)	F1 (<0·0001), F4 (0·034)†, GF (<0·0001)
Egalitarianism Scale	0·016 (0·015)	0·093 (<0·0001)	0·344 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·016 (0·015)	0·308 (<0·0001)	0·161 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Localism (α = 0·823)				
Utopianism	0·014 (0·029)	0·100 (<0·0001)	0·194 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·014 (0·029)	0·045 (<0·0001)	0·248 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green Scale	0·014 (0·029)	0·350 (<0·0001)	0·038 (<0·0001)	F1 (<0·0001), GF (0·00090)
EMCB (all subscales)	0·014 (0·029)	0·435 (<0·0001)	0·018 (0·0017)	F1 (0·00015), GF (0·012)
Egalitarianism Scale	0·014 (0·029)	0·047 (<0·0001)	0·247 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·014 (0·029)	0·248 (<0·0001)	0·092 (<0·0001)	F1 (0·0026), F4 (<0·0001), GF (<0·0001)
Public (α = 0·788)				
Utopianism	0·015 (0·018)	0·190 (<0·0001)	0·177 (<0·0001)	F1 (<0·0001), -F3 (0·0054), F4 (0·0061), GF (<0·0001)

IRI – Empathic Concern	0·015 (0·018)	0·027 (0·00014)	0·346 (<0·0001)	F1 (<0·0001), -F3 (0·036)†, F4 (0·0033), GF (<0·0001)
Green Scale	0·015 (0·018)	0·161 (<0·0001)	0·211 (<0·0001)	F1 (<0·0001), -F3 (0·0050), GF (<0·0001)
EMCB (all subscales)	0·015 (0·018)	0·195 (<0·0001)	0·188 (<0·0001)	F1 (<0·0001), -F3 (0·012), GF (<0·0001)
Egalitarianism Scale	0·015 (0·018)	0·135 (<0·0001)	0·247 (<0·0001)	F1 (<0·0001), -F3 (0·0049), F4 (0·0098), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·015 (0·018)	0·191 (<0·0001)	0·183 (<0·0001)	F1 (<0·0001), -F3 (0·0042), F4 (0·024), GF (<0·0001)
Knowledge (α = 0·869)				
Utopianism	0·008 (0·14)	0·297 (<0·0001)	0·181 (<0·0001)	F1 (<0·0001), F4 (0·020), GF (<0·0001)
IRI – Empathic Concern	0·008 (0·14)	0·065 (<0·0001)	0·404 (<0·0001)	F1 (<0·0001), F4 (0·011), GF (<0·0001)
Green Scale	0·008 (0·14)	0·259 (<0·0001)	0·228 (<0·0001)	F1 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·008 (0·14)	0·279 (<0·0001)	0·219 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·008 (0·14)	0·130 (<0·0001)	0·341 (<0·0001)	F1 (<0·0001), F4 (0·020), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·008 (0·14)	0·291 (<0·0001)	0·188 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Sacrifice (α = 0·659)				
Utopianism	0·006 (0·23)	0·130 (<0·0001)	0·220 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·006 (0·23)	0·049 (<0·0001)	0·300 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green Scale	0·006 (0·23)	0·273 (<0·0001)	0·126 (<0·0001)	F1 (<0·0001), -F3 (0·040)†, GF (<0·0001)
EMCB (all subscales)	0·006 (0·23)	0·274 (<0·0001)	0·122 (<0·0001)	F1 (<0·0001), GF (<0·0001)

Egalitarianism Scale	0·006 (0·23)	0·072 (<0·0001)	0·278 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·006 (0·23)	0·195 (<0·0001)	0·161 (<0·0001)	F1 (<0·0001), F4 (0·00011), GF (<0·0001)
Individual Change (α = 0·751)				
Utopianism	0·005 (0·30)	0·161 (<0·0001)	0·195 (<0·0001)	F1 (<0·0001), F4 (0·00029), GF (<0·0001)
IRI – Empathic Concern	0·005 (0·30)	0·039 (<0·0001)	0·322 (<0·0001)	F1 (<0·0001), F4 (0·00019), GF (<0·0001)
Green Scale	0·005 (0·30)	0·208 (<0·0001)	0·166 (<0·0001)	F1 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·005 (0·30)	0·236 (<0·0001)	0·153 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·005 (0·30)	0·079 (<0·0001)	0·279 (<0·0001)	F1 (<0·0001), F4 (0·00036), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·005 (0·30)	0·256 (<0·0001)	0·126 (<0·0001)	F1 (<0·0001), F4 (0·023), GF (<0·0001)
Collective Imagination (α = 0·813)				
Utopianism	0·010 (0·077)	0·372 (<0·0001)	0·114 (<0·0001)	F1 (<0·0001), F2 (0·020), F4 (0·0071), GF (<0·0001)
IRI – Empathic Concern	0·010 (0·077)	0·121 (<0·0001)	0·327 (<0·0001)	F1 (<0·0001), F2 (0·00081), F4 (0·0042), GF (<0·0001)
Green Scale	0·010 (0·077)	0·204 (<0·0001)	0·244 (<0·0001)	F1 (<0·0001), F2 (0·00062), F4 (0·042)†, GF (<0·0001)
EMCB (all subscales)	0·010 (0·077)	0·227 (<0·0001)	0·224 (<0·0001)	F1 (<0·0001), F2 (0·00044), GF (<0·0001)
Egalitarianism Scale	0·010 (0·077)	0·181 (<0·0001)	0·274 (<0·0001)	F1 (<0·0001), F2 (0·014), F4 (0·0066), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·010 (0·077)	0·324 (<0·0001)	0·143 (<0·0001)	F1 (<0·0001), F2 (0·0025), F4 (0·015), GF (<0·0001)
Collective Change (α = 0·795)				
Utopianism	0·009 (0·11)	0·303 (<0·0001)	0·163 (<0·0001)	F1 (0·00010), F2 (<0·0001), F3 (0·0070), GF (<0·0001)

IRI – Empathic Concern	0·009 (0·11)	0·112 (<0·0001)	0·341 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F3 (0·0030), GF (<0·0001)
Green Scale	0·009 (0·11)	0·207 (<0·0001)	0·253 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F3 (0·0042), GF (<0·0001)
EMCB (all subscales)	0·009 (0·11)	0·219 (<0·0001)	0·251 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F3 (0·0016), -F4 (0·034)†, GF (<0·0001)
Egalitarianism Scale	0·009 (0·11)	0·300 (<0·0001)	0·200 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F3 (0·0039), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·009 (0·11)	0·335 (<0·0001)	0·149 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F3 (0·018), GF (<0·0001)
Tolerance (α = 0·876)				
Utopianism	0·006 (0·20)	0·191 (<0·0001)	0·070 (<0·0001)	F1 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·006 (0·20)	0·065 (<0·0001)	0·181 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Green Scale	0·006 (0·20)	0·087 (<0·0001)	0·158 (<0·0001)	F1 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·006 (0·20)	0·115 (<0·0001)	0·136 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·006 (0·20)	0·043 (<0·0001)	0·204 (<0·0001)	F1 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·006 (0·20)	0·273 (<0·0001)	0·072 (<0·0001)	F1 (<0·0001), GF (<0·0001)

Note. ΔR^2 = change in R^2. CS = Competing scale; TUIPHS = Transformative Utopian Impulse for Planetary Health Scale. The first number in each column labelled with ΔR^2 indicates change in R^2. The numbers in parentheses in all columns correspond to the significance levels (i.e., *p* values). Raw significance values are reported. Symbol † indicates results that stopped being significant after the false discovery rate (FDR) correction was applied across ΔR^2 for the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) and Factors 1-4. *Significant Factors* column contains information concerning which individual factors were significant as predictors—whenever a factor has - sign in front of it, this means its relationship with a dependent variable was negative rather than positive. GF in this column indicates the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) scored as a general factor. It is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because GF was not involved in sample size planning based on the FDR correction, we did not use the correction in relation to this factor. IRI = Interpersonal Reactivity Index; EMCB = Ethically Minded Consumer Behavior; PVQ5X = Portrait Value Questionnaire; SDT = Self-Direction Thought; UNC = Universalism-Concern; UNN = Universalism-Nature; UNT = Universalism-Tolerance.

Table A8. Incremental predictive validity in Study 3b

Competing Scale (CS)	ΔR^2 Covariates	ΔR^2 CS	ΔR^2 TUIPHS	Significant Factors
Research (Cronbach's α = 0·900)				
AHO	0·034 (0·00024)	0·126 (<0·0001)	0·321 (<0·0001)	F1 (0·00015), F4 (<0·0001), GF (<0·0001)
AICS (all subscales)	0·034 (0·00024)	0·292 (<0·0001)	0·193 (<0·0001)	F4 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·034 (0·00024)	0·140 (<0·0001)	0·307 (<0·0001)	F1 (0·00012), F4 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·034 (0·00024)	0·065 (<0·0001)	0·386 (<0·0001)	F1 (0·00021), F4 (<0·0001), GF (<0·0001)
Economic System Justification	0·034 (0·00024)	0·083 (<0·0001)	0·365 (<0·0001)	F1 (0·00012), F4 (<0·0001), GF (<0·0001)
Localism (Cronbach's α = 0·803)				
AHO	0·002 (0·61)	0·078 (<0·0001)	0·209 (<0·0001)	F4 (<0·0001), GF (<0·0001)
AICS (all subscales)	0·002 (0·61)	0·158 (<0·0001)	0·151 (<0·0001)	F4 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·002 (0·61)	0·078 (<0·0001)	0·208 (<0·0001)	F4 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·002 (0·61)	0·041 (<0·0001)	0·259 (<0·0001)	F4 (<0·0001), GF (<0·0001)
Economic System Justification	0·002 (0·61)	0·036 (<0·0001)	0·253 (<0·0001)	F4 (<0·0001), GF (<0·0001)
Public (Cronbach's α = 0·745)				
AHO	0·015 (0·026)	0·120 (<0·0001)	0·226 (<0·0001)	F1 (<0·0001), F4 (0·0047), GF (<0·0001)
AICS (all subscales)	0·015 (0·026)	0·374 (<0·0001)	0·071 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·015 (0·026)	0·118 (<0·0001)	0·226 (<0·0001)	F1 (<0·0001), F4 (0·0031), GF (<0·0001)
SDO-E (pro- and con-trait)	0·015 (0·026)	0·066 (<0·0001)	0·278 (<0·0001)	F1 (<0·0001), F4 (0·0025), GF (<0·0001)
Economic System Justification	0·015 (0·026)	0·160 (<0·0001)	0·202 (<0·0001)	F1 (<0·0001), F4 (0·0043), GF (<0·0001)
Knowledge (Cronbach's α = 0·865)				

AHO	0·010 (0·085)	0·159 (<0·0001)	0·269 (<0·0001)	F1 (<0·0001), F4 (0·00060), GF (<0·0001)
AICS (all subscales)	0·010 (0·085)	0·311 (<0·0001)	0·157 (<0·0001)	F1 (<0·0001), F4 (0·0077), GF (<0·0001)
Humanitarianism-Egalitarianism	0·010 (0·085)	0·144 (<0·0001)	0·283 (<0·0001)	F1 (<0·0001), F4 (0·00023), GF (<0·0001)
SDO-E (pro- and con-trait)	0·010 (0·085)	0·079 (<0·0001)	0·350 (<0·0001)	F1 (<0·0001), F2 (0·047)†, F4 (0·00018), GF (<0·0001)
Economic System Justification	0·010 (0·085)	0·141 (<0·0001)	0·287 (<0·0001)	F1 (<0·0001), F4 (0·00040), GF (<0·0001)
Sacrifice (Cronbach's α = 0·646)				
AHO	0·002 (0·64)	0·131 (<0·0001)	0·240 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
AICS (all subscales)	0·002 (0·64)	0·252 (<0·0001)	0·146 (<0·0001)	F1 (0·00036), F4 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·002 (0·64)	0·116 (<0·0001)	0·255 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·002 (0·64)	0·051 (<0·0001)	0·329 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Economic System Justification	0·002 (0·64)	0·082 (<0·0001)	0·288 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Individual Change (Cronbach's α = 0·773)				
AHO	0·002 (0·57)	0·140 (<0·0001)	0·285 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
AICS (all subscales)	0·002 (0·57)	0·343 (<0·0001)	0·135 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·002 (0·57)	0·123 (<0·0001)	0·299 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·002 (0·57)	0·055 (<0·0001)	0·373 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Economic System Justification	0·002 (0·57)	0·069 (<0·0001)	0·353 (<0·0001)	F1 (<0·0001), F4 (<0·0001), GF (<0·0001)
Collective Imagination (Cronbach's α = 0·789)				

AHO	0·017 (0·017)	0·168 (<0·0001)	0·248 (<0·0001)	F1 (<0·0001), F2 (0·00011), GF (<0·0001)
AICS (all subscales)	0·017 (0·017)	0·207 (<0·0001)	0·216 (<0·0001)	F1 (<0·0001), F2 (0·00010), GF (<0·0001)
Humanitarianism-Egalitarianism	0·017 (0·017)	0·189 (<0·0001)	0·226 (<0·0001)	F1 (<0·0001), F2 (0·00020), GF (<0·0001)
SDO-E (pro- and con-trait)	0·017 (0·017)	0·147 (<0·0001)	0·270 (<0·0001)	F1 (<0·0001), F2 (0·00056), GF (<0·0001)
Economic System Justification	0·017 (0·017)	0·148 (<0·0001)	0·265 (<0·0001)	F1 (<0·0001), F2 (0·00047), GF (<0·0001)
Collective Change (Cronbach's α = 0·790)				
AHO	0·022 (0·0049)	0·171 (<0·0001)	0·280 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
AICS (all subscales)	0·022 (0·0049)	0·239 (<0·0001)	0·229 (<0·0001)	F1 (0·00078), F2 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·022 (0·0049)	0·228 (<0·0001)	0·225 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·022 (0·0049)	0·206 (<0·0001)	0·255 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Economic System Justification	0·022 (0·0049)	0·354 (<0·0001)	0·160 (<0·0001)	F1 (<0·0001), F2 (0·00077), GF (<0·0001)
Tolerance (Cronbach's α = 0·879)				
AHO	0·005 (0·33)	0·108 (<0·0001)	0·125 (<0·0001)	F1 (<0·0001), F3 (0·017), GF (<0·0001)
AICS (all subscales)	0·005 (0·33)	0·112 (<0·0001)	0·120 (<0·0001)	F1 (<0·0001), F3 (0·0041), GF (<0·0001)
Humanitarianism-Egalitarianism	0·005 (0·33)	0·101 (<0·0001)	0·127 (<0·0001)	F1 (<0·0001), F3 (0·0090), GF (<0·0001)
SDO-E (pro- and con-trait)	0·005 (0·33)	0·086 (<0·0001)	0·151 (<0·0001)	F1 (<0·0001), F3 (0·014), GF (<0·0001)
Economic System Justification	0·005 (0·33)	0·032 (<0·0001)	0·202 (<0·0001)	F1 (<0·0001), F3 (0·0022), GF (<0·0001)

Note. ΔR^2 = change in R^2. CS = Competing scale; TUIPHS = Transformative Utopian Impulse for Planetary Health Scale. The first number in each column labelled with ΔR^2 indicates change in R^2. The numbers in parentheses in all columns correspond to the significance levels (i.e., *p* values). Raw significance values are reported. Symbol † indicates results that stopped being significant after the false discovery rate (FDR) correction was applied across ΔR^2 for the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) and Factors 1-4. *Significant Factors* column contains information concerning which individual factors were significant as predictors—whenever a factor has - sign in front of it, this means its relationship with a dependent variable was negative rather than positive. GF in this column indicates the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) scored as a general factor. It is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because GF was not involved in sample size planning based on the FDR correction, we did not use the correction in relation to this factor. AHO = Attitudes toward Helping Others; AICS = Activist Identity and Commitment Scale; SDO-E: Social Dominance Orientation pro- and con-trait anti-Egalitarianism.

Table A9. Incremental predictive validity in Study 3c

Competing Scale (CS)	ΔR^2 Covariates	ΔR^2 CS	ΔR^2 TUIPHS	Significant Factors
Immersion (Cronbach's α = 0·862)				
Utopianism	0·041 (<0·0001)	0·275 (<0·0001)	0·199 (<0·0001)	F1 (<0·0001), F3 (0·037)†, GF (<0·0001)
IRI – Empathic Concern	0·041 (<0·0001)	0·080 (<0·0001)	0·384 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Green Scale	0·041 (<0·0001)	0·199 (<0·0001)	0·264 (<0·0001)	F1 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·041 (<0·0001)	0·214 (<0·0001)	0·256 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·041 (<0·0001)	0·186 (<0·0001)	0·284 (<0·0001)	F1 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·041 (<0·0001)	0·342 (<0·0001)	0·154 (<0·0001)	F1 (<0·0001), GF (<0·0001)
Commitment (Cronbach's α = 0·807)				
Utopianism	0·046 (<0·0001)	0·243 (<0·0001)	0·181 (<0·0001)	F1 (<0·0001), F2 (0·0022), F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·046 (<0·0001)	0·078 (<0·0001)	0·337 (<0·0001)	F1 (<0·0001), F2 (0·00011), F4 (0·00010), GF (<0·0001)

Green Scale	0·046 (<0·0001)	0·248 (<0·0001)	0·171 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·046 (<0·0001)	0·248 (<0·0001)	0·172 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·046 (<0·0001)	0·237 (<0·0001)	0·198 (<0·0001)	F1 (<0·0001), F2 (0·013), F4 (0·0011), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·046 (<0·0001)	0·328 (<0·0001)	0·112 (<0·0001)	F1 (<0·0001), F2 (0·0014), GF (<0·0001)
Empowerment (Cronbach's α = 0·775)				
Utopianism	0·029 (0·00049)	0·232 (<0·0001)	0·184 (<0·0001)	F2 (0·00071), F3 (0·00080), F4 (0·0077), GF (<0·0001)
IRI – Empathic Concern	0·029 (0·00049)	0·120 (<0·0001)	0·290 (<0·0001)	F1 (0·0032), F2 (<0·0001), F3 (0·036)†, F4 (0·012), GF (<0·0001)
Green Scale	0·029 (0·00049)	0·261 (<0·0001)	0·154 (<0·0001)	F1 (0·0022), F2 (<0·0001), F3 (0·021), GF (<0·0001)
EMCB (all subscales)	0·029 (0·00049)	0·271 (<0·0001)	0·153 (<0·0001)	F1 (0·0024), F2 (<0·0001), F3 (0·013), GF (<0·0001)
Egalitarianism Scale	0·029 (0·00049)	0·222 (<0·0001)	0·193 (<0·0001)	F1 (0·0023), F2 (0·0011), F3 (0·013), F4 (0·041)†, GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·029 (0·00049)	0·393 (<0·0001)	0·072 (<0·0001)	F1 (0·037)†, F2 (<0·0001), GF (<0·0001)
Perspective Taking (Cronbach's α = 0·747)				
Utopianism	0·048 (<0·0001)	0·193 (<0·0001)	0·146 (<0·0001)	F3 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·048 (<0·0001)	0·351 (<0·0001)	0·117 (<0·0001)	F1 (0·015), F3 (0·044)†, GF(<0·0001)
Green Scale	0·048 (<0·0001)	0·207 (<0·0001)	0·126 (<0·0001)	F1 (0·0073), F2 (0·028)†, F3 (0·00028), GF (<0·0001)
EMCB (all subscales)	0·048 (<0·0001)	0·193 (<0·0001)	0·141 (<0·0001)	F1 (0·0090), F2 (0·024), F3(0·00020), GF (<0·0001)
Egalitarianism Scale	0·048 (<0·0001)	0·168 (<0·0001)	0·164 (<0·0001)	F1 (0·0074), F3 (0·00016), GF (<0·0001)

PVQ5X (SDT, UNC, UNN, & UNT)	0·048 (<0·0001)	0·447 (<0·0001)	0·021 (0·00025)	F3 (0·026)†, GF (<0·0001)
Refugees (Cronbach's α = 0·869)				
Utopianism	0·029 (0·00053)	0·135 (<0·0001)	0·159 (<0·0001)	F3 (0·00082), F4 (0·012), GF (<0·0001)
IRI – Empathic Concern	0·029 (0·00053)	0·257 (<0·0001)	0·123 (<0·0001)	F2 (0·035)†, F4 (0·012), GF (<0·0001)
Green Scale	0·029 (0·00053)	0·213 (<0·0001)	0·092 (<0·0001)	F2 (0·016), F3 (0·0023), GF (<0·0001)
EMCB (all subscales)	0·029 (0·00053)	0·209 (<0·0001)	0·107 (<0·0001)	F2 (0·0082), F3 (0·0011), GF (<0·0001)
Egalitarianism Scale	0·029 (0·00053)	0·258 (<0·0001)	0·085 (<0·0001)	F3 (<0·0012), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·029 (0·00053)	0·405 (<0·0001)	0·013 (0·020)	F3 (0·050)†, GF (0·0027)
Contempt (Cronbach's α = 0·732)				
Utopianism	0·013 (0·034)	0·234 (<0·0001)	0·259 (<0·0001)	F2 (<0·0001), F3 (0·00012), GF (<0·0001)
IRI – Empathic Concern	0·013 (0·034)	0·223 (<0·0001)	0·298 (<0·0001)	F1 (0·026)†, F2 (<0·0001), F3 (0·0062), GF (<0·0001)
Green Scale	0·013 (0·034)	0·269 (<0·0001)	0·225 (<0·0001)	F1 (0·015), F2 (<0·0001), F3 (0·00031), GF (<0·0001)
EMCB (all subscales)	0·013 (0·034)	0·256 (<0·0001)	0·248 (<0·0001)	F1 (0·0085), F2 (<0·0001), F3 (0·00023), GF (<0·0001)
Egalitarianism Scale	0·013 (0·034)	0·372 (<0·0001)	0·168 (<0·0001)	F1 (0·012), F2 (0·00026), F3 (0·00017), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·013 (0·034)	0·467 (<0·0001)	0·088 (<0·0001)	F2 (<0·0001), F3 (0·0077), GF (<0·0001)
Life Improvement (Cronbach's α = 0·836)				
Utopianism	0·042 (<0·0001)	0·327 (<0·0001)	0·216 (<0·0001)	F2 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·042 (<0·0001)	0·129 (<0·0001)	0·394 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)

Green Scale	0·042 (<0·0001)	0·251 (<0·0001)	0·272 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·042 (<0·0001)	0·242 (<0·0001)	0·283 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·042 (<0·0001)	0·438 (<0·0001)	0·159 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·042 (<0·0001)	0·415 (<0·0001)	0·139 (<0·0001)	F1 (0·00034), F2 (<0·0001), GF (<0·0001)
Personal Autonomy (Cronbach's α = 0·731)				
Utopianism	0·039 (<0·0001)	0·253 (<0·0001)	0·103 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·039 (<0·0001)	0·042 (<0·0001)	0·290 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Green Scale	0·039 (<0·0001)	0·116 (<0·0001)	0·215 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·039 (<0·0001)	0·133 (<0·0001)	0·205 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·039 (<0·0001)	0·204 (<0·0001)	0·151 (<0·0001)	F1 (<0·0001), F2 (<0·0001), -F4 (0·039)†, GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·039 (<0·0001)	0·232 (<0·0001)	0·122 (<0·0001)	F1 (<0·0001), F2 (<0·0001), GF (<0·0001)
Degrowth (Cronbach's α = 0·856)				
Utopianism	0·016 (0·016)	0·241 (<0·0001)	0·232 (<0·0001)	F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·016 (0·016)	0·070 (<0·0001)	0·396 (<0·0001)	F1 (0·0024), F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green Scale	0·016 (0·016)	0·298 (<0·0001)	0·178 (<0·0001)	F1 (0·0027), F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·016 (0·016)	0·306 (<0·0001)	0·186 (<0·0001)	F1 (0·00095), F2 (<0·0001), GF(<0·0001)
Egalitarianism Scale	0·016 (0·016)	0·303 (<0·0001)	0·189 (<0·0001)	F1 (0·0025), F2 (<0·0001), F4 (0·0011), GF (<0·0001)

PVQ5X (SDT, UNC, UNN, & UNT)	0·016 (0·016)	0·360 (<0·0001)	0·128 (<0·0001)	F1 (0·013), F2 (<0·0001), GF (<0·0001)
Urgency (Cronbach's α = 0·829)				
Utopianism	0·028 (0·00059)	0·211 (<0·0001)	0·222 (<0·0001)	F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
IRI – Empathic Concern	0·028 (0·00059)	0·087 (<0·0001)	0·336 (<0·0001)	F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
Green Scale	0·028 (0·00059)	0·348 (<0·0001)	0·114 (<0·0001)	F2 (<0·0001), GF (<0·0001)
EMCB (all subscales)	0·028 (0·00059)	0·329 (<0·0001)	0·139 (<0·0001)	F2 (<0·0001), GF (<0·0001)
Egalitarianism Scale	0·028 (0·00059)	0·289 (<0·0001)	0·163 (<0·0001)	F2 (<0·0001), F4 (<0·0001), GF (<0·0001)
PVQ5X (SDT, UNC, UNN, & UNT)	0·028 (0·00059)	0·403 (<0·0001)	0·077 (<0·0001)	F2 (<0·0001), GF (<0·0001)

Note. ΔR^2 = change in R^2. CS = Competing scale; TUIPHS = Transformative Utopian Impulse for Planetary Health Scale. The first number in each column labelled with ΔR^2 indicates change in R^2. The numbers in parentheses in all columns correspond to the significance levels (i.e., *p* values). Raw significance values are reported. Symbol † indicates results that stopped being significant after the false discovery rate (FDR) correction was applied across ΔR^2 for the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) and Factors 1-4. *Significant Factors* column contains information concerning which individual factors were significant as predictors—whenever a factor has - sign in front of it, this means its relationship with a dependent variable was negative rather than positive. GF in this column indicates the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) scored as a general factor. It is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because GF was not involved in sample size planning based on the FDR correction, we did not use the correction in relation to this factor. IRI = Interpersonal Reactivity Index; EMCB = Ethically Minded Consumer Behavior; PVQ5X = Portrait Value Questionnaire; SDT = Self-Direction Thought; UNC = Universalism-Concern; UNN = Universalism-Nature; UNT = Universalism-Tolerance.

Table A10. Incremental predictive validity in Study 3d

Competing Scale (CS)	ΔR^2 Covariates	ΔR^2 CS	ΔR^2 TUIPHS	Significant Factors
Immersion (Cronbach's α = 0·869)				
AHO	0·057 (<0·0001)	0·111 (<0·0001)	0·369 (<0·0001)	F1 (<0·0001), F3 (0·0014), GF (<0·0001)

AICS (all subscales)	0·057 (<0·0001)	0·347 (<0·0001)	0·163 (<0·0001)	F1 (<0·0001), F3 (0·00057), GF (<0·0001)
Humanitarianism-Egalitarianism	0·057 (<0·0001)	0·149 (<0·0001)	0·333 (<0·0001)	F1 (<0·0001), F3 (0·0033), GF (<0·0001)
SDO-E (pro- and con-trait)	0·057 (<0·0001)	0·110 (<0·0001)	0·374 (<0·0001)	F1 (<0·0001), F3 (0·0026), GF (<0·0001)
Economic System Justification	0·057 (<0·0001)	0·163 (<0·0001)	0·322 (<0·0001)	F1 (<0·0001), F3 (0·0028), GF (<0·0001)
Commitment (Cronbach's $\alpha = 0{\cdot}785$)				
AHO	0·051 (<0·0001)	0·139 (<0·0001)	0·299 (<0·0001)	F1 (<0·0001), F4 (0·0031), GF (<0·0001)
AICS (all subscales)	0·051 (<0·0001)	0·348 (<0·0001)	0·127 (<0·0001)	F1 (<0·0001), F2 (0·021), F3 (0·028), GF (<0·0001)
Humanitarianism-Egalitarianism	0·051 (<0·0001)	0·176 (<0·0001)	0·269 (<0·0001)	F1 (<0·0001), F4 (0·0052), GF (<0·0001)
SDO-E (pro- and con-trait)	0·051 (<0·0001)	0·110 (<0·0001)	0·329 (<0·0001)	F1 (<0·0001), F3 (0·047)†, F4 (0·0061), GF (<0·0001)
Economic System Justification	0·051 (<0·0001)	0·178 (<0·0001)	0·268 (<0·0001)	F1 (<0·0001), F4 (0·0068), GF (<0·0001)
Empowerment (Cronbach's $\alpha = 0{\cdot}797$)				
AHO	0·031 (0·00047)	0·175 (<0·0001)	0·304 (<0·0001)	F1 (0·00065), F2 (<0·0001), F3 (0·0036), F4 (0·0012), GF (<0·0001)
AICS (all subscales)	0·031 (0·00047)	0·222 (<0·0001)	0·258 (<0·0001)	F1 (0·021), F2 (<0·0001), F3 (0·00080), F4 ((0·011), GF (<0·0001)
Humanitarianism-Egalitarianism	0·031 (0·00047)	0·220 (<0·0001)	0·264 (<0·0001)	F1 (0·00046), F2 (<0·0001), F3(0·00059), F4 (0·0021), GF (<0·0001)
SDO-E (pro- and con-trait)	0·031 (0·00047)	0·189 (<0·0001)	0·292 (<0·0001)	F1 (0·00019), F2 (<0·0001), F3 (0·0027), F4 (0·0033), GF (<0·0001)
Economic System Justification	0·031 (0·00047)	0·234 (<0·0001)	0·251 (<0·0001)	F1 (0·00020), F2 (0·00013), F3 (0·0024), F4 (0·0028), GF (<0·0001)
Perspective Taking (Cronbach's $\alpha = 0{\cdot}755$)				
AHO	0·051 (<0·0001)	0·298 (<0·0001)	0·133 (<0·0001)	F1 (0·00060), F3 (<0·0001), GF (<0·0001)

AICS (all subscales)	0·051 (<0·0001)	0·213 (<0·0001)	0·161 (<0·0001)	F3 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·051 (<0·0001)	0·290 (<0·0001)	0·130 (<0·0001)	F1 (0·00014), F3 (<0·0001), GF (<0·0001)
SDO-E (pro- and con-trait)	0·051 (<0·0001)	0·172 (<0·0001)	0·201 (<0·0001)	F1 (<0·0001), F3 (<0·0001), GF (<0·0001)
Economic System Justification	0·051 (<0·0001)	0·190 (<0·0001)	0·184 (<0·0001)	F1 (<0·0001), F3 (<0·0001), GF (<0·0001)
Refugees (Cronbach's α = 0·887)				
AHO	0·036 (0·00013)	0·285 (<0·0001)	0·125 (<0·0001)	F3 (0·00016), GF (<0·0001)
AICS (all subscales)	0·036 (0·00013)	0·194 (<0·0001)	0·161 (<0·0001)	F2 (0·026), F3 (<0·0001), GF (<0·0001)
Humanitarianism-Egalitarianism	0·036 (0·00013)	0·295 (<0·0001)	0·112 (<0·0001)	F1 (0·026), F3 (0·00013), GF (<0·0001)
SDO-E (pro- and con-trait)	0·036 (0·00013)	0·202 (<0·0001)	0·165 (<0·0001)	F1 (0·0075), F3 (<0·0001), GF (<0·0001)
Economic System Justification	0·036 (0·00013)	0·270 (<0·0001)	0·125 (<0·0001)	F1 (0·00067), F3 (<0·0001), GF (<0·0001)
Contempt (Cronbach's α = 0·760)				
AHO	0·060 (<0·0001)	0·286 (<0·0001)	0·208 (<0·0001)	F1 (0·030), F2 (<0·0001), F3 (0·010), F4 (0·0068), GF (<0·0001)
AICS (all subscales)	0·060 (<0·0001)	0·198 (<0·0001)	0·255 (<0·0001)	F2 (<0·0001), F3 (0·00016), GF (<0·0001)
Humanitarianism-Egalitarianism	0·060 (<0·0001)	0·305 (<0·0001)	0·188 (<0·0001)	F1 (0·012), F2 (<0·0001), F3 (0·0089), F4 (0·022), GF (<0·0001)
SDO-E (pro- and con-trait)	0·060 (<0·0001)	0·233 (<0·0001)	0·240 (<0·0001)	F1 (0·0033), F2 (<0·0001), F3 (0·00088), F4 (0·046)†, GF (<0·0001)
Economic System Justification	0·060 (<0·0001)	0·338 (<0·0001)	0·165 (<0·0001)	F1 (0·0024), F2 (0·0013), F3 (0·0016), F4 (0·036)†, GF (<0·0001)
Life Improvement (Cronbach's α = 0·854)				
AHO	0·079 (<0·0001)	0·230 (<0·0001)	0·207 (<0·0001)	F1 (0·00093), F2 (<0·0001), F4 (0·0016), GF (<0·0001)

AICS (all subscales)	0·079 (<0·0001)	0·202 (<0·0001)	0·209 (<0·0001)	F1 (0·035)†, F2 (<0·0001), F4 (0·022), GF (<0·0001)
Humanitarianism-Egalitarianism	0·079 (<0·0001)	0·277 (<0·0001)	0·173 (<0·0001)	F1 (0·00033), F2 (<0·0001), F4 (0·0052), GF (<0·0001)
SDO-E (pro- and con-trait)	0·079 (<0·0001)	0·266 (<0·0001)	0·189 (<0·0001)	F1 (<0·0001), F2 (<0·0001), F4 (0·023), GF (<0·0001)
Economic System Justification	0·079 (<0·0001)	0·379 (<0·0001)	0·119 (<0·0001)	F1 (<0·0001), F2 (0·0013), F4 (0·012), GF (<0·0001)
Personal Autonomy (Cronbach's α = 0·784)				
AHO	0·057 (<0·0001)	0·135 (<0·0001)	0·180 (<0·0001)	F1 (<0·0001), F2 (0·0045), F4 (0·015), GF (<0·0001)
AICS (all subscales)	0·057 (<0·0001)	0·190 (<0·0001)	0·126 (<0·0001)	F1 (0·0046), F2 (0·00068), GF (<0·0001)
Humanitarianism-Egalitarianism	0·057 (<0·0001)	0·119 (<0·0001)	0·188 (<0·0001)	F1 (<0·0001), F2 (0·0031), F4 (0·020), GF (<0·0001)
SDO-E (pro- and con-trait)	0·057 (<0·0001)	0·109 (<0·0001)	0·200 (<0·0001)	F1 (<0·0001), F2 (0·0046), F4 (0·032), GF (<0·0001)
Economic System Justification	0·057 (<0·0001)	0·180 (<0·0001)	0·146 (<0·0001)	F1 (<0·0001), F4 (0·034)†, GF (<0·0001)
Degrowth (Cronbach's α = 0·829)				
AHO	0·066 (<0·0001)	0·116 (<0·0001)	0·245 (<0·0001)	F1 (0·042)†, F2 (<0·0001), F3 (0·0072), F4 (0·0021), GF (<0·0001)
AICS (all subscales)	0·066 (<0·0001)	0·144 (<0·0001)	0·216 (<0·0001)	F2 (<0·0001), F3 (0·0035), F4 (0·0051), GF (<0·0001)
Humanitarianism-Egalitarianism	0·066 (<0·0001)	0·138 (<0·0001)	0·223 (<0·0001)	F1 (0·038)†, F2 (0·00012), F3 (0·00083), F4 (0·0026), GF (<0·0001)
SDO-E (pro- and con-trait)	0·066 (<0·0001)	0·104 (<0·0001)	0·256 (<0·0001)	F1 (0·035)†, F2 (<0·0001), F3 (0·0036), F4 (0·0026), GF (<0·0001)
Economic System Justification	0·066 (<0·0001)	0·234 (<0·0001)	0·153 (<0·0001)	F1 (0·019), F2 (0·019), F3 (0·013), F4 (0·0063), GF (<0·0001)
Urgency (Cronbach's α = 0·771)				
AHO	0·064 (<0·0001)	0·160 (<0·0001)	0·262 (<0·0001)	F2 (<0·0001), F3 (0·00067), F4 (0·0040), GF (<0·0001)

AICS (all subscales)	0·064 (<0·0001)	0·193 (<0·0001)	0·234 (<0·0001)	F2 (<0·0001), F3 (<0·0001), F4 (0·039)†, GF (<0·0001)
Humanitarianism-Egalitarianism	0·064 (<0·0001)	0·199 (<0·0001)	0·227 (<0·0001)	F2 (<0·0001), F3 (0·0010), F4 (0·0066), GF (<0·0001)
SDO-E (pro- and con-trait)	0·064 (<0·0001)	0·209 (<0·0001)	0·224 (<0·0001)	F2 (<0·0001), F3 (0·00074), F4 (0·015), GF (<0·0001)
Economic System Justification	0·064 (<0·0001)	0·278 (<0·0001)	0·171 (<0·0001)	F2 (0·00061), F3 (0·00070), F4 (0·013), GF (<0·0001)

Note. ΔR^2 = change in R^2. CS = Competing scale; TUIPHS = Transformative Utopian Impulse for Planetary Health Scale. The first number in each column labelled with ΔR^2 indicates change in R^2. The numbers in parentheses in all columns correspond to the significance levels (i.e., *p* values). Raw significance values are reported. Symbol † indicates results that stopped being significant after the false discovery rate (FDR) correction was applied across ΔR^2 for the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) and Factors 1-4. *Significant Factors* column contains information concerning which individual factors were significant as predictors—whenever a factor has - sign in front of it, this means its relationship with a dependent variable was negative rather than positive. GF in this column indicates the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) scored as a general factor. It is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because GF was not involved in sample size planning based on the FDR correction, we did not use the correction in relation to this factor. AHO = Attitudes toward Helping Others; AICS = Activist Identity and Commitment Scale; SDO-E: Social Dominance Orientation pro- and con-trait anti-Egalitarianism.

Study 4: Longitudinal predictive validity

Participants and procedure

Participants' demographics are reported in Tables A1 and A2. The exclusion criteria and the rationale behind the sample sizes as well as additional sensitivity power analyses are detailed below (see sections *Exclusion Criteria* and *Determining Sample Size*). Participants first filled the consent form, after which they completed several dependent variables measuring self-reported intentions, attitudes and behaviors toward the Build Back Better (BBB) and Black Lives Matter (BLM) movements, and responded to several questions assessing covariates pertaining to the impact of COVID-19 on their lives (see the *Measures* section below). The order in which questions assessing dependent variables and COVID-19 related covariates were presented was randomized across participants, and the presentation of the questions about BBB and BLM was counterbalanced—so that half of the participants were first presented with the BBB-related items, and the other half with the BLM-related items. At the end, participants completed the seriousness check,[14] were presented with links to the BBB (www.buildbackbetter.org.uk) and BLM (https://blacklivesmatter.com) movements' webpages, and were encouraged to write any comments they had regarding the study in a text box. The data for this study were collected on 3-6 July 2020. Note that participants' TUIPHS scores, along with their age, gender, political orientation, income, and ethnicity, have been collected 23 weeks earlier, on 3-7 February 2020, as part of Study 1 (Sample 4).

Exclusion criteria

This study was collected only among the pool of 1,395 participants from the UK representative sample who were included in the statistical analyses of Study 1 Sample 4 (see Tables A1 and A2). Participants who did not pass the seriousness check at the end of Study 4 were not included in statistical analyses.[14]

Determining sample size

Considering that, similar to Study 3, we aimed to compute several significance tests to probe Hypotheses 3 and 4, we used the FDR correction to minimize the chance of type I error as in that study.[101] For Hypothesis 3, the total number of significance tests conducted (m) was 7 (one per each of the seven dependent variables). Therefore, the most conservative *p*-value used by FDR (i = 1) when testing Hypothesis 3 was 1/7 x 0·05 = 0·00714. For Hypothesis 4, the total number of significance tests conducted (m) was 28 (four per each of the seven dependent variables). Therefore, the most conservative *p*-value used by FDR (i = 1) when testing Hypothesis 4 was 1/28 x 0·05 = 0·00179. These significance levels were used in the power analyses for the corresponding hypotheses to guide sample size for the present study.

As in Study 3, we used G*Power (F tests -> Linear multiple regression: Fixed model, R^2 increase -> a priori).[100] For Hypothesis 3, number of tested predictors was set to 4, which corresponds to the four transformative utopian impulse for planetary health subscales that should together significantly improve R^2 when included in hierarchical regression, whereas the total number of predictors was set to 17, which corresponds to all predictors included in the model. Power was set to 0·95 and the effect size Cohen's f^2 to 0·15 (i.e., medium). The analysis showed that 178 participants should be tested. For Hypothesis 4, number of tested predictors was set to 1, which corresponds to one TUIPHS subscale, given that Hypothesis 4 focuses on individual effects of either of the four TUIPHS subscales, whereas the total number of predictors was set to 17, which

corresponds to all predictors included in the model. Power was set to 0·95 and the effect size Cohen's f^2 to 0·15 (i.e., medium). The analysis showed that 158 participants should be tested. Therefore, the power analyses indicated that testing 178 participants is sufficient to obtain a medium effect size for either hypothesis, assuming the power of 0·95.
Given that, despite sufficient power, this is a relatively small sample size, we decided to recruit a maximum number of participants we could afford to test (800) to be able to capture potentially smaller effects. Sensitivity power analyses conducted in G*Power (F tests -> Linear multiple regression: Fixed model, R^2 increase -> sensitivity) showed that, with this sample size, the study would have the power of 0·95 to capture an effect (Cohen's f^2) of 0·0321158 regarding Hypothesis 3, and of 0·0285941 regarding Hypothesis 4. According to Cohen, these effects are close to the cut-off for small effects (i.e., 0·02).[102] Considering that the final sample size used in statistical analyses was close to 800 and ranged between 794-798 (depending on the missing data), the study was sufficiently powered (0·95) to capture effects that are close to small.

Measures
This study comprised seven dependent variables, five in relation to the BBB campaign, and two in relation to the BLM movement. Two additional exploratory measures were included in relation to the BLM movement.
BBB campaign. Support for the BBB campaign was measured via four different items answered on a 5-point Likert scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). These items were extracted from the *Build Back Better Statement* signed by more than 350 people.[160] Participants read "*The coronavirus outbreak and its consequences on our lives have led to various calls for building a better society*", and then were asked to indicate to what extent they agreed or disagreed with the following statements: "*We should ensure health, social care, housing and other vital public services are properly resourced and able to meet our future needs*" (hereafter, "*Future needs statement*"); "*We should mend the inequalities in our society so that everyone, no matter their background or race, can live a decent, fulfilling life*" (hereafter, "*Fulfilling life statement*"); "*We should create secure, well-paid and rewarding jobs for all who want them, particularly for young people*" (hereafter, "*Rewarding jobs for all*"); and "*We should not just aim to build our resilience to future pandemics, but to tackle the climate and environmental emergency already upon us*" (hereafter, "*Resilience and climate emergency*"). An additional item measured participants' desire for a different economic structure after COVID-19 (1 = *strongly disagree* to 5 = *strongly agree*): "*I think that the economy should no longer be structured as it was before the COVID-19 crisis*" (hereafter, "*New economic structure*").
BLM movement. The two dependent variables pertaining to the BLM movement were measured via three items.[161] Participants read: "*Anti-racist protests associated with the Black Lives Matter movement have been recently held in various cities across the UK*", and were asked to indicate: "*To what extent do you support or oppose these kinds of protests to support racial justice for Blacks?*" (from 1 = *strongly oppose* to 5 = *strongly support*), and "*How often have you shown your support for these kinds of protests through social media (e.g., Facebook, Twitter etc.)?*" (1 = *never*, 2 = *at least once*, 3 = *two or three times*, 4 = *four or five times*, 5 = *more than five times*). These two items measured *Support for the BLM movement* (α = ·664). An additional item measured their *Intention to participate in BLM protests* in the future ("*How likely are you to participate in these kinds of protests in the future?*"; from 1 = *extremely unlikely* to 5 = *extremely likely*).

Exploratory measures. Two final items were also measured for exploratory purposes, and assessed past participation in protests ("*Have you already participated in a protest associated with the Black Lives Matter movement?*"; 0 = *I have participated in no protests*, 1 = *I have participated in 1 protest*, 2 = *I have participated in 2 protests*, 3 = *I have participated in 3 protests*, 4 = *I have participated in 4 protests*, 5 = *I have participated in more than 4 protests*), and past initiatives ("*Have you yourself been involved in organizing an initiative relevant to the Black Lives Matter movement (e.g., at work, privately)?*"; *Yes / No*). These measures were exploratory for two main reasons. First, protests in the UK did not achieve the same momentum as in the US.[162] Second, we collected this dataset during a lockdown period in the UK, which limited people's capacity to protest and organize initiatives during that time frame.[163] Therefore, we did not expect that many participants would have taken part in these events, and that it would be possible to conduct meaningful hypothesis testing on these variables.

COVID-19. Finally, participants completed a series of five questions which measured the impact of COVID-19 on their lives (hereafter, "*COVID-19 impact*"). Participants were asked whether, because of COVID-19, they have been made redundant, were (or are) furloughed, were (or are) working from home, have suffered (or are suffering) a loss of income, and their wellbeing has been negatively affected (*Yes / No*).

Transformative Utopian Impulse for Planetary Health Scale. Participants' scores on the 12-item TUIPHS (α = 0·929) measured 23 weeks earlier (as part of Study 1, Sample 4) were used as a predictor.

Covariates. Covariates were also measured 23 weeks earlier as part of Study 1 (Sample 4) and involved participants' *age*, *gender* (male vs. female vs. other; *note*: no participant who completed Study 4 identified themselves as "other"), *political orientation* (from 0 = *Left* to 10 = *Right*),[164] and *personal annual income (after taxes)* expressed in £1,000s on a continuous scale from £0 to £100,000 or more.

Ethnicity. Participants' *ethnicity* (*Asian*, *Black*, *Mixed*, *Other, White*) was provided by Prolific.co.

Regression analyses

To test Hypotheses 3 and 4, we used hierarchical linear regressions with four steps. In Step 1, four covariates measured 23 weeks earlier (gender, age, political orientation, and personal income) were included in the model. In Step 2, four variables measuring ethnicity (Asian, Black, Mixed, Other) were included (White was coded 0 as baseline). In Step 3, the five items measuring the impact of COVID-19 on daily lives were included. Finally, in Step 4, the four TUIPHS factors were included. This step was key for testing our hypotheses.

Exploratory results

Descriptive statistics indicate that, out of 799 participants, only 18 (2·25%) took part in BLM protests, and only 17 (2·13%) organized BLM-related initiatives. Results on these variables are thus reported for informative purposes only (Table A11), since our sample is not sufficiently powered for testing very small effect sizes. Exploratory analyses indicate that none of our hypotheses are supported in relation to these two variables. As can be seen in Table A11, it is only when TUIPHS is scored as a general factor, and tested in separate set of regression analyses, that TUIPHS significantly predicts Participation in BLM protests (p = 0·048, not corrected for FDR).

Table A11. Longitudinal predictive validity on participation in BLM protests and organization of BLM initiatives in Study 4 (exploratory results)

Dependent variables	ΔR^2 Covariates	ΔR^2 Ethnicity	ΔR^2 COVID	ΔR^2 TUIPHS	Significant Factors
Participation in BLM protests	0·020 (0·0033)	0·015 (0·018)	0·001 (0·97)	0·006 (0·26)	GF (0·048)
Organization of BLM initiatives	0·025 (0·00042)	0·018 (0·0049)	0·007 (0·30)	0·005 (0·43)	-

Note. ΔR^2 = change in R^2. COVID = COVID-19 impact on daily life; TUIPHS = Transformative Utopian Impulse for Planetary Health Scale; BLM = Black Lives Matter movement. *Significant Factors* column contains information concerning which individual factors were significant as predictors. The first number in each column labelled with ΔR^2 indicates change in R^2. The numbers in parentheses in all columns correspond to the significance levels (i.e., *p* values). Raw significance values are reported. GF in the column *Significant Factors* indicates the Transformative Utopian Impulse for Planetary Health Scale (TUIPHS) scored as a general factor. It is reported for informative purposes and its significance levels were computed in a different hierarchical regression analysis in which only this factor rather than the four individual factors was included as a predictor. Because these analyses are exploratory, we did not examine whether the *p* value concerning GF remains significant after the false discovery rate (FDR) correction is applied.

Expanded discussion

Interestingly, BBB and BLM are two social movements linked to various constructs correlated with the scale. As shown in Studies 2b-2e (Table 1), the transformative utopian impulse for planetary health is strongly positively correlated with activism,[99] and with universalist,[69] humanitarian,[71] and egalitarian values.[70,74] In contrast, it is strongly negatively correlated with economic system justification, which is the general ideological tendency to legitimize economic inequality.[82] Moreover, as shown in Studies 3a-3d (Tables A7-A10), TUIPHS predicts, above and beyond these competing scales, the experience of anger (at those who show contempt for others)—an emotion felt so intensely after the killing of George Floyd on 25 May 2020 that sparked protests associated with BLM across the world.[165] Further to this, TUIPHS predicts, above and beyond competing scales, the expression of a need for collective imagination, which lies at the core of the BBB campaign.[160] Taken together, these results illustrate the complementary of the various studies which each other to have a better understanding of the transformative utopian impulse for planetary health in social change.

Study 5: Degrowth vs. investment

In the previous studies, we focused on the four TUIPHS factors to understand the nomological network as well as the attitudinal and behavioral correlates of this psychological construct. However, given that in Study 1 we established that our scale can be scored as a single general factor, we aimed to conduct additional studies that would focus on this factor itself. In this regard, we found it appropriate to investigate whether it moderates the influence of various relevant experimental manipulations on dependent variables of interest. Indeed, when researchers probe which constructs moderate the influence of their interventions, it is typically more efficient to have one measure per construct rather than testing its multiple components,[166] which may reduce experimental power, complicate the analyses, and in some cases make the results difficult to interpret. We therefore assumed that showing that TUIPHS, scored as a single general factor, can moderate the impact of a range of manipulations on relevant outcome variables would make this scale useful for research aiming to understand how individual differences determine the effectiveness of psychological interventions on intentions and behavior.[167,168] More specifically, in Study 5 we focused on the general factor as a moderator of the influence of degrowth (vs. investment) on attitudes and behavior, whereas in additional Studies 6 and 7 we focused on its moderating role in the context of consumer behavior linked to societal transformation.

In the current study, we focused on the theme of degrowth because Studies 3c and 3d showed that the transformative utopian impulse for planetary health is linked to this construct, but also because of the practical importance that degrowth plays for tackling climate change.[151,169] In that regard, understanding whether the utopian impulse determines the extent to which people may support this movement could have various practical implications when it comes to reconceptualizing, restructuring, and relocalizing our society and its economic system to pave the way toward a sustainable future.[132] As the opposing theme to manipulate in the present study, we focused on investment. We selected *investment* rather than *growth* as a contrasting theme for several reasons. Like degrowth, investment is linked to economic behavior and our economic system. However, unlike the concept of growth, which may influence attitudes or behavior because it is the linguistic antonym of degrowth, we found investment decisions to be more neutral while at the same time having various real-world implications and consequences.

In Study 5, we also wanted to go beyond our previous studies by focusing on a dependent variable that captures a measured rather than self-reported behavior. In this regard, previous research in the realm of scale development and validation typically focused on a writing behavior (e.g., participants writing their opinions regarding a cause or feedback for nonprofit organizations to help improve their campaigns)[31] because it can be easily measured both offline and online and involves participants making an effort concerning an issue or a topic they care about. Whereas in the previous literature writing was typically treated as a dichotomous dependent variable (i.e., whether participants did vs. did not write), in the present study we wanted to treat this variable in a more nuanced way and quantify the number of ideas participants wrote in a writing task.

Overall, in the present study we investigated whether reading a text introducing degrowth versus basic investment strategies would influence both participants' attitudes regarding the text and their writing behavior. More specifically, the writing task involved asking them to list different ideas regarding how people in their country could implement degrowth-related practices into their daily living (degrowth condition) or regarding how people in their country could best invest their money in an efficient way (investment condition). If the utopian impulse is indeed linked to

the construct of degrowth, then TUIPHS scored as a general factor should moderate the influence of the degrowth (vs. investment) condition on both the attitudes (*Hypothesis 5*) and behavior (*Hypothesis 6*). More precisely, the positivity of attitudes and the number of ideas written in the degrowth relative to the investment condition should increase as the moderator scores increase. We did not have a specific hypothesis regarding the main effect given that this could not be clearly predicted based on previous literature.

Participants and procedure

Participants demographics are reported in Tables A1 and A2. The exclusion criteria and the rationale behind the sample sizes as well as additional sensitivity power analyses and stimuli are detailed below (see sections *Exclusion Criteria* and *Determining Sample Size*). All participants first completed the consent form, after which they were randomly allocated to either the degrowth or the investment condition. In the degrowth condition, they read a brief 293-word text introducing degrowth. This text was a transcription of the two-minute degrowth video by Jason Hickel recorded for the British Broadcasting Corporation (BBC).[170] In the investment condition, we used a text of similar length (291 words) and structure that introduced three essential types of investment—ownership, lending, and cash equivalents—and was adapted from an article on the popular website, *Investopedia.com*.[171] Both stimuli are reported below. Immediately after reading the text, participants were given a check item probing what the text was about, after which they were asked to answer the questions measuring the first dependent variable—their attitudes toward the text. Thereafter, we measured the second dependent variable—behavior—and participants subsequently filled in TUIPHS and responded to several questions assessing covariates as well as to the remaining check items (see the *Measures* section below). At the end, all participants were encouraged to write any comments they may have regarding the study in a text box. The data for Study 5 were collected between 12-13 September 2019.

Exclusion criteria

We used five check items. These involved two instructed-response items;[15] one understanding check item where participants in both conditions had to identify—among six different options (degrowth/investment, advertising, physics, biology, art, and drug addiction)—what the text they read was about; a seriousness check;[14] and a captcha item at the end to stop any bots from completing the survey. Only participants who passed all the checks were included in statistical analyses.

Determining sample size

Considering that, in Study 5, we were testing a behavioral variable, we assumed that effect sizes may be small given that there may be a large variability in terms of whether and how much people are willing to write down their ideas. To determine the sample size to probe Hypotheses 5 and 6, we therefore decided to recruit the maximum number of participants we could afford to test, which was roughly 960. We estimated that, in the worst-case scenario, up to 20% participants would need to be excluded from statistical analyses after applying the exclusion criteria, which could lead to the minimum sample size of 768. We then performed a sensitivity power analysis to determine the smallest interaction effect (Cohen's f^2) that could be detected with this sample size,[172] assuming the power of 0·95 and significance level of 0·05. The analysis indicated that the effect was 0·017, which can be considered a small effect size, given that the cut-off point for small Cohen's f^2 is 0·02.[102] When the sensitivity power analysis was conducted

on the actual sample included in statistical analyses (n=847), it was revealed that our study was sufficiently powered to detect a small interaction effect (f^2) of 0·015.

Stimuli

Degrowth condition[170]

Our addiction to economic growth is killing us.

Right now, the entire global system is captive to a single idea – economic growth. Politicians rise and fall on their ability to increase GDP year-on-year. They promise that growth will make our lives better.

But there's a catch. We can't have infinite growth on a finite planet. We are already overshooting our planet's biocapacity by nearly 60%. The consequences are all around us: climate change, deforestation, and rapid rates of extinction. This crisis is due almost entirely to overconsumption in rich countries. They use more than three times their fair share of biocapacity. Scientists warn that the only way to prevent ecological collapse is for rich countries to scale down their consumption. This is called "planned de-growth".

Degrowth is not the same as austerity. The goal is to increase human well-being and happiness while reducing our economic footprint. Instead of intensifying our plunder of the earth, we can share what we already have more fairly. We can cut excess consumption by curbing advertising and taxing carbon. Introducing a basic income and a shorter working week would allow us to get rid of unnecessary jobs and redistribute labor. But the first step is to overthrow the tyranny of GDP.

GDP is a crude measure of progress. When we slice down our forest for timber, when we strip our mountains for coal, GDP goes up. When natural disasters strike, or hospital visits rise, GDP goes up. It ignores environmental and social costs. It's time for a more sensible metric like the Genuine Progress Indicator, which takes GDP and subtracts these negative outcomes. It accounts for the costs of growth. We need an economic model that promotes human flourishing in harmony with the planet on which we depend.

Investment condition[171]

Defining the three types of investment.

Investment can be divided into 3 distinct groups: ownership, lending and cash equivalents. Ownership is most associated with investing. Broadly speaking, all traded securities, including futures and currency swaps, are ownership investments, even though an owner may simply have a contract to show for it. Stocks, which are certificates that say the owner owns a portion of a company, and has a right to a portion of its value, are also in this group. These are the most volatile and profitable investments. The money that goes into starting a business is an ownership investment. Houses, apartments and other properties are ownership investments. Precious objects like gold, rare art and other collectibles, are more examples.

Bonds are lending investments. A bond will pay a set amount for a number of years but, during that time, the company stock may triple in value and pay far more than a bond. On the other hand, the company may go bankrupt, which will allow bondholders to retrieve their money but leave stockholders with nothing.

Your savings account is a loan you make to the bank and it demonstrates the key take away regarding lending investments: they pose a low risk but provide little in return. A savings account returns next to nothing, but the chances of losing that investment are virtually zero.

Cash equivalents can quickly be converted into cash. Money market funds, which earn a small interest rate while maintaining their net asset value, are good examples. It's impractical to stretch the meaning of investment to include purchases. Cars, furniture, and appliances that naturally depreciate are not investments. Clever ads can convince buyers they aren't buying something; they're making an investment. But savvy investors can tell the difference.

Measures

The first dependent variable (*attitudes toward the text*) was measured via four items answered on a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*) that required participants to indicate how convincing and interesting they found the text, how much they enjoyed it, and how much they agreed with it ($\alpha = 0{\cdot}857$). The *behavioral dependent variable* involved a writing task in which participants were given the option to write up to seven ideas either regarding how people in their country could implement degrowth-related practices into their daily living (degrowth condition), or regarding how people in their country could best invest their money in an efficient way (investment condition). This variable could therefore range from 0-7, depending on how many ideas people wrote. To avoid the difficulty of having to code what counts as one idea, which could be subjective, we gave participants seven text boxes for each idea: the first text box was labeled as *Idea 1*, the second as *Idea 2*, and so on.

The 12-item TUIPHS scored as a general factor was used as a moderator. As covariates, we assessed participants' *age*, *gender* (male vs. female vs. other), and their *personal annual income (after taxes)* expressed in $1,000s on a continuous scale from $0 to $100,000 or more.

Results

To test Hypothesis 5, we computed an interaction between the degrowth versus investment condition and the general TUIPHS factor as a moderator. The pattern of the interaction was probed using the Johnson-Neyman technique,[173] and the FDR correction was applied.[174] As predicted, the condition interacted with the moderator (*Multiple* $R^2 = 0{\cdot}30$) in influencing the attitudes toward the text, $t(843) = 9{\cdot}105$, $b = 0{\cdot}459$, 95% CI [0·360, 0·558], $p < 0{\cdot}0001$, *Cohen's* $f^2 = 0{\cdot}098$. As can be seen in Figure A1 below, above (below) the cut-off value of the general factor of 5·195 (4·711), people had more positive (negative) attitudes toward the degrowth versus the investment text. Within these two cut-off values, the effect was not significant. The interaction between the condition and the moderator (*Multiple* $R^2 = 0{\cdot}31$) remained significant after controlling for the covariates, $t(839) = 9{\cdot}282$, $b = 0{\cdot}465$, 95% CI [0·367, 0·564], $p < 0{\cdot}0001$, *Cohen's* $f^2 = 0{\cdot}103$. Overall, these results showed a convincing support for Hypothesis 5.

Figure A1. The influence of degrowth vs. investment condition on attitudes

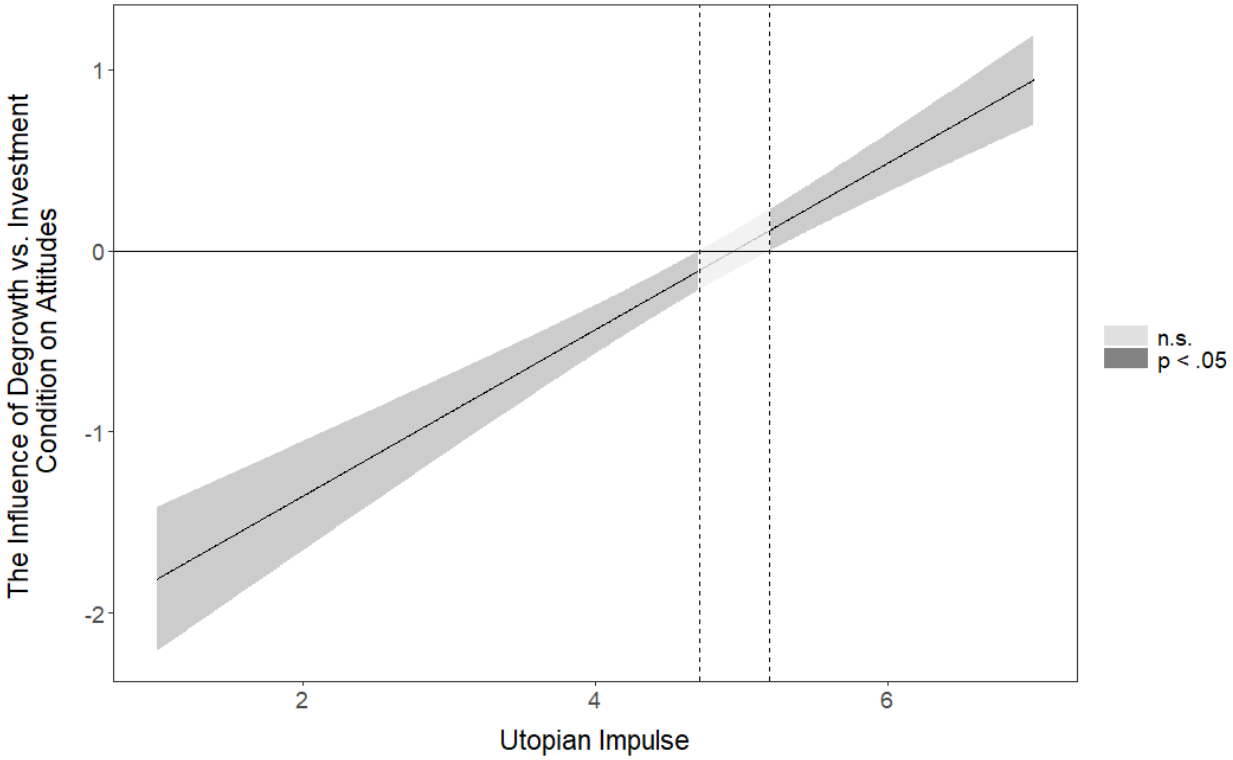

Figure A1. The influence of degrowth versus investment condition on attitudes toward the text that introduced either degrowth (degrowth condition) or three essential investment types (investment condition) depending on participants' level of the general transformative utopian impulse for planetary health factor (Study 5).

To test Hypothesis 6, we performed the same analyses as for Hypothesis 6. Considering that we excluded 46 ideas (out of 2526 ideas that participants wrote in total) across both conditions due to either participants writing the same ideas multiple times or writing meaningless responses, in the footnote we also report the results without exclusions to ensure that any effects we obtained remained significant.[3] As predicted, the condition interacted with the moderator (*Multiple* R^2 = 0·07) in influencing the writing behavior, $t(843) = 2{\cdot}736$, $b = 0{\cdot}483$, 95% CI [0·136, 0·829], $p = 0{\cdot}0063$, *Cohen's* $f^2 = 0{\cdot}009$. As can be seen in Figure 5, as the moderator scores increased, the number of ideas written in the degrowth relative to the investment condition increased: below the cut-of value of 4·704, degrowth resulted in relatively fewer ideas being written, whereas above the cut-off point participants in both conditions wrote a similar number of ideas. The interaction effect (*Multiple* $R^2 = 0{\cdot}09$) remained significant after controlling for the covariates, $t(839) = 2{\cdot}818$, $b = 0{\cdot}492$, 95% CI [0·149, 0·835], $p = 0{\cdot}0049$, *Cohen's* $f^2 = 0{\cdot}009$. Hypothesis 6 was therefore supported.

[3] When all ideas were included in the analysis, the interaction between the condition and the moderator (*Multiple* R^2 = 0·07) in influencing the writing behavior was almost identical, $t(843) = 2{\cdot}985$, $b = 0{\cdot}526$, 95% CI [0·180, 0·872], $p = 0{\cdot}0029$, *Cohen's* $f^2 = 0{\cdot}011$.

Figure A2. The influence of degrowth vs. investment condition on (writing) behavior

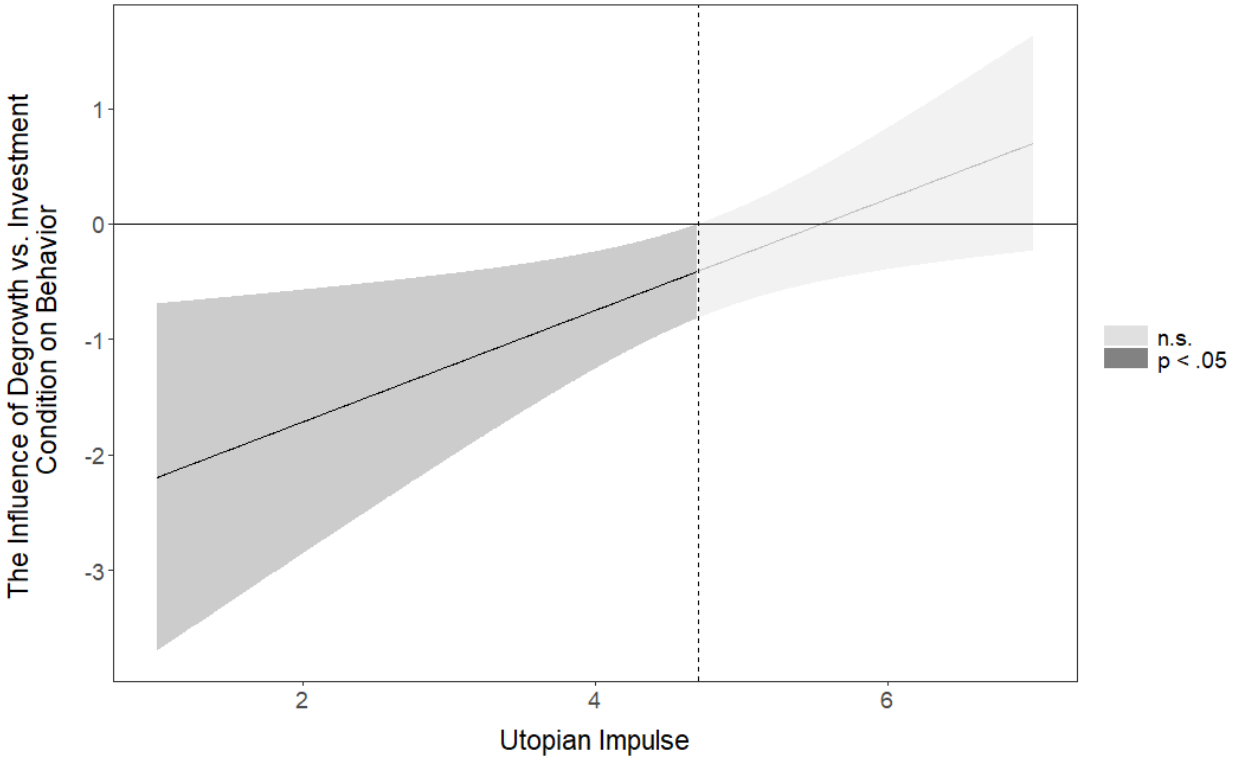

Figure A2. The influence of degrowth versus investment condition on behavior—the number of ideas that participants wrote regarding how people in their country could implement degrowth-related practices into their daily living (degrowth condition), or regarding how people in their country could best invest their money in an efficient way (investment condition)—depending on participants' level of the general transformative utopian impulse for planetary health factor (Study 5).

Finally, to determine whether there was a main effect of the condition on the attitudes and behavior, we performed two independent samples t-tests (two-tailed). The analyses indicated the absence of the main effects for both DVs (all *p*s > 0·099).

Discussion

The findings of Study 5 supported our predictions. TUIPHS scored as a general factor moderated the influence of the condition on both attitudes (Hypothesis 5) and behavior (Hypothesis 6). Both the positivity of participants' attitudes and the number of ideas they wrote in the degrowth (vs. investment) condition increased as the moderator scores increased. When it comes to the specific pattern of the interactions, there were slight differences between the two dependent variables. At lower levels of the transformative utopian impulse for planetary health, degrowth led to less positive attitudes than investment, whereas this effect reversed at the higher levels. For the behavioral variable, degrowth made participants write fewer ideas at the lower levels, whereas this effect reversed at the higher levels but was not statistically significant. One possible explanation for the absence of the effect on the behavioral variable for participants high in the utopian impulse is that they saw both generating ideas regarding how people in their country could best invest their money and implement degrowth-related practices into their daily living as

something that could contribute to the collective good (e.g., by helping people to be better off or to adopt practices that can have positive environmental or societal effects). Hence, the quantity of ideas written was similar across both conditions. Regardless, the present results indicate that the utopian impulse is a valuable individual difference for understanding degrowth because it can switch people's attitudes and behavior in relation to this construct.

To conclude on this study, it is worthwhile to note that if, in the degrowth literature, explicit references to "concrete utopia" have been made in various places,[132] the transformative utopian impulse for planetary health, and more largely, utopian thinking, encompass conceptualizations beyond degrowth. For instance, the decoupling of greenhouse gas emissions and economic growth, which is rather criticized in the degrowth (or post-growth) literature,[175] can be considered as utopian.[176] Importantly, although some of the items comprising our scale express a critique of the current economic system (e.g., item 36), they are not bound to a degrowth position. For instance, such items can be associated to some economic tools such as crypto-currencies, which, like ADA from Cardano, aim to be "*a blockchain platform for changemakers, innovators, and visionaries, with the tools and technologies required to create possibility for the many, as well as the few, and bring about positive global change*" (https://cardano.org/).

Second, this article primarily concerns societal transformations rather than technological change or the concept of transition which is "*primarily addressing the technological systems*".[177] We gave priority to the concept of societal transformation in our work, and related illustrations such as degrowth, because there is also some form of skepticism in the literature in relation to the power of technological change to help tackle climate change.[175,177,178] However, we are aware of the importance of technology, and future research might explore whether our scale predicts responses to some forms of technological change. Our items can encompass technological solutions. For instance, this is the case for items 9 and 39. Such items may refer to "techno-fixes",[179] which could be considered as an illustration of utopian techno-optimism in capitalist societies. This perspective also echoes similar forms of "energetic utopias" that have been described in relation to the "atomic society" and the hydrogen economy.[180]

Finally, as a limitation to this study, it should be reminded that the concept of degrowth can be understood differently in political economy and in cultural settings. For instance, in cultural settings, degrowth can be associated with sufficiency, "*buen vivir*", or "voluntary simplicity", and can be expressed in the form of "new commons" such as eco-communities, cooperatives, urban gardens, community currencies, time banks, barter markets, or associations of child or health care.[181] Although our scale items from Factors 1, 2, 3 and 4 can be associated to such practices, their phrasing does not imply the abolition of private property, wage labor and economic growth which can be advocated in the degrowth literature, or the downscaling of production and consumption which is promoted by degrowth proponents in terms of political economy.[181] Our scale items may also refer to micro-finance and the "bank for the poor" initiated by the Peace Nobel Prize winner Mohamed Yunus, whose proposal was initially considered a "utopian idea",[182] but is not degrowth oriented.

Study 6: Ethical vs. unethical consumption

Utopian scholars, such as Bauman[183,184] and Jameson,[185] have identified our current society as a consumer-oriented society. In this perspective, Jameson emphasized the importance to understand the utopian impulse in relation to the economic context, labelled "mass culture" (or "commercial culture"): "*ignoring the Utopian components of mass culture, ends up with the empty denunciation of the latter's manipulatory function and degraded status. But it is equally obvious that the complementary extreme–a method that would celebrate Utopian impulses in the absence of any conception or mention of the ideological vocation of mass culture–simply reproduces the litanies of myth criticism at its most academic and aestheticizing and impoverishes these texts of their semantic content at the same time that it abstracts them from their concrete social and historical situation.*"[185] This position invited us to develop items referring to our current economic system, and more specifically to consumption, in our scale. Moreover, since we live in a consumer society, it is acknowledged that consumption choices that everyone makes on a daily basis can have a significant impact on other people and the planet.[186] Consistently, in the UN 2030 Agenda, whose aim is to transform the world, SDG 12 is to "ensure sustainable consumption and production patterns".[187] In their famous report on planetary health, Whitmee and colleagues have indicated that promoting "*sustainable and equitable patterns of consumption*" by supporting "*sustainable business models that address social, environmental, and commercial goals*" has been identified amongst the essential steps that can contribute to transforming our societies.[188] On a similar note, green consumerism is identified as a prominent example of ecologically related utopia.[176] The various movements that underpinned the creation of fair-trade certifications, for instance, have been associated to utopia as a search for "*alternatives to mass consumption*".[93] Likewise, in his book on real utopias, Wright considered that: "*Fair trade and equal exchange movements that attempt to connect consumers in the North with producers in the South that adopt fair labor and good environmental practices"* can help *"build alternative global economic networks free from the economic power of multinational corporations*."[94]

Against this background, in the present study, we focused on TUIPHS as a moderator of purchase intentions in the context of ethical consumption, and more specifically fair-trade products, a utopian practice that can contribute to economic, social, and environmental transformation.[93,94,189,190]

In light of the literature on ethical consumption,[191] we expected that participants in the ethical versus unethical condition would have higher intentions to buy the product (Hypothesis 7). Most importantly, however, we expected that the general transformative utopian impulse for planetary health factor would moderate this influence, which should increase as participants' scores on this factor increase (Hypothesis 8).

Pre-registration

All the predictions, materials, and analyses for this study were pre-registered and can be accessed here: https://osf.io/gcvb2/?view_only=78f07eac214441dcb26bcdf49df7ca58.

Participants and procedure

Participants' demographics are reported in Tables A1 and A2. The exclusion criteria and the rationale behind the sample sizes are detailed below. All participants first completed the consent form, after which they were randomly allocated to either the ethical or unethical condition. In the

ethical condition, they read a vignette about a product—chocolate—produced by a fictitious company (the Petersen Company) that is known for ethical business practices. In the unethical condition, the vignette followed a similar logic with the difference being that the company was known for unethical business practices. The manipulations were based on Schuldt and colleagues.[192] Thereafter, the dependent variable—participants' intention to buy the product—was measured, after which they completed TUIPHS and answered several questions assessing covariates as well as the check items (see the *Measures* section below). In the end, all participants were informed that the Petersen Company is a fictitious brand but has been modelled on companies with similar business practices that have been observed in the industry. They were also encouraged to write any comments they may have regarding the study in a text box. The data for Study 6 were collected on 9 July 2019.

Exclusion criteria

We used four check items. After reading the ethical or unethical vignette, participants in both conditions were asked to identify the product in which the Petersen Company specializes (cotton vs. chocolate vs. coffee beans vs. "I do not remember"). Moreover, two instructed-response items were embedded within TUIPHS,[15] and at the end all participants had to answer a seriousness check.[14] Only participants who passed all four check items were included in statistical analyses.

Determining sample size

Sample size was determined via two power analyses, one regarding Hypothesis 7 and one regarding Hypothesis 8. Our rationale was to design a study that has a high power of 0·99 to demonstrate both hypotheses, assuming a medium effect size. Both analyses were conducted in G*Power.[100] For Hypothesis 7, we used an a priori power analysis for difference between two independent means (two-tailed t-test). Effect size Cohen's *d* was set to 0·50, significance level to 0·05, and allocation ratio N2/N1 to 1. The analysis showed that it is necessary to test 296 people to probe the hypothesis. For Hypothesis 8, we used an a priori power analysis for linear multiple regression (Fixed Model, R^2 Increase). The effect size Cohen's f^2 was set to 0·15 and significance level to 0·05. Number of tested predictors was set to 1, which denotes the interaction term, and total number of predictors was set to 3, which denotes a predictor, a moderator, and their interaction.[172] The analysis showed that it is necessary to test 125 people to probe the hypothesis. Overall, the power analyses indicated that it is enough to test 296 people to investigate either of the hypotheses. Considering that, based on our previous studies, we expected that data from around 15% of participants would need to be eliminated from statistical analyses after applying exclusion criteria (see the *Measures* section below), we concluded that roughly 350 participants would need to be tested to reach a sample size of 296. When sensitivity power analyses were conducted on the actual sample included in statistical analyses (n=324), it was revealed that our study was sufficiently powered (0·99) to detect a medium effect for Hypothesis 7 (Cohen's $d = 0{\cdot}478$),[102] and a small to medium effect for Hypothesis 8 (Cohen's $f^2 = 0{\cdot}057$).[102]

Measures

The dependent variable (*intention to buy the chocolate*) was measured via four items,[193] answered on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*), in which participants had to indicate to what extent they would be likely to purchase the product, they

would be willing to buy the product, they would make the product one of their first choices in this product category, and they would exert a great deal of effort to purchase the product (α = 0·970). The 12-item *TUIPHS* was assessed on a Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*), and scored as a single factor to be used as a moderator. As covariates, we assessed participants' *age*, *gender* (male vs. female vs. other), *body mass index* (BMI), which was computed from participants' self-reported weight and height using the formula by,[194] and *frequency of eating chocolate per week* on a scale from 0 (*no days*) to 7 (*7 days per week*). The check items are reported above in the *Exclusion Criteria* section.

Results

To test Hypothesis 7, we performed an independent samples t-test (two-tailed). As predicted, participants in the ethical condition (M = 5·57; SD = 1·03) had higher intentions to buy the chocolate compared to participants in the unethical condition (M = 2·38; SD = 1·63), $t(322)$ = 21·025, $p < 0·0001$, d = 2·336, 95% CI [2·053, 2·620].

Figure A3. The influence of ethical vs. unethical condition on the intention to buy the product

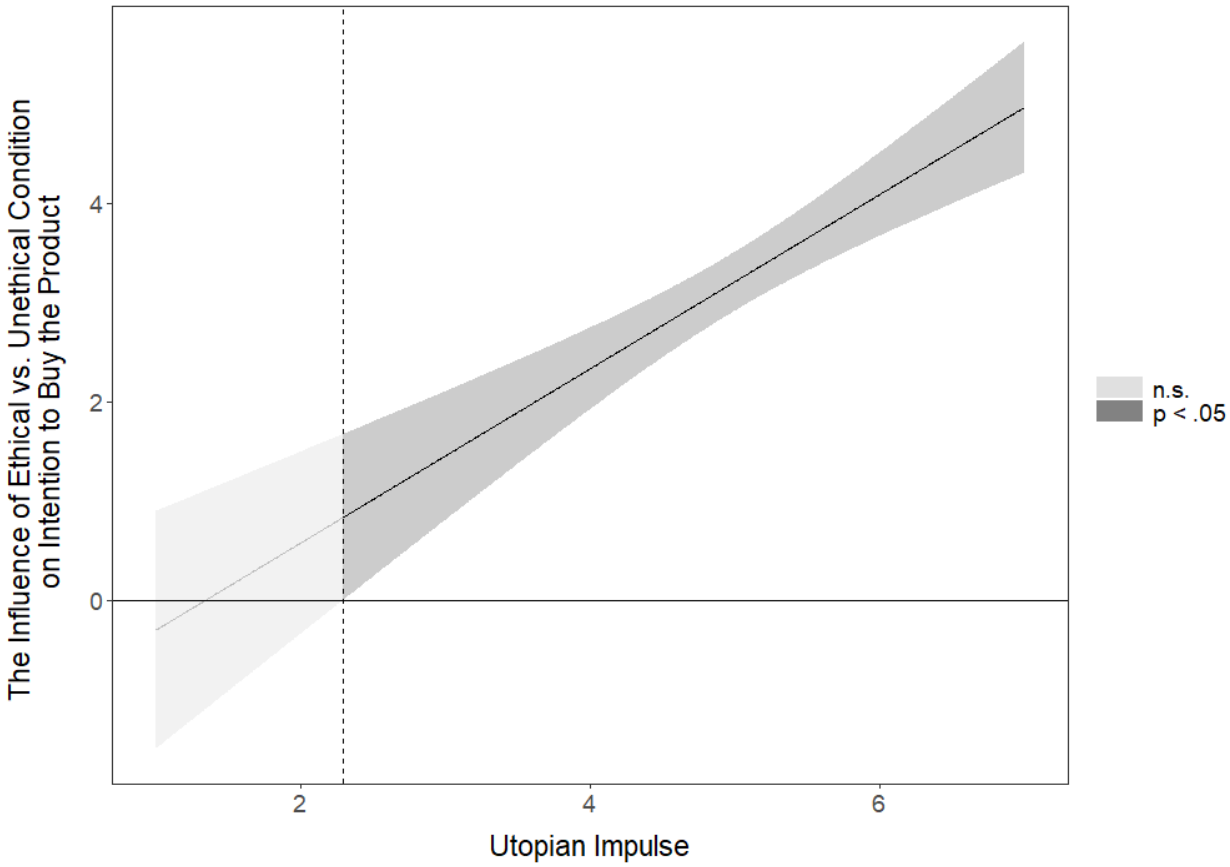

Figure A3. The influence of ethical versus unethical condition on intention to buy the product (chocolate) depending on participants' level of the general transformative utopian impulse for planetary health factor (Study 6).

To test Hypothesis 8, we computed an interaction between the ethical versus unethical condition and the general transformative utopian impulse for planetary health factor as a moderator. The pattern of the interaction was probed using the Johnson-Neyman technique,[173] which is implemented via the *interactions* package in R.[195] Considering that this technique is analogue to making multiple comparisons, a false discovery rate correction developed by Esarey & Sumner was applied.[174] As predicted, the condition interacted with the moderator (*Multiple* $R^2 = 0{\cdot}63$) in influencing the intentions to buy the chocolate, $t(320) = 6{\cdot}241$, $b = 0{\cdot}879$, 95% CI [0·602, 1·156], $p < 0{\cdot}0001$, Cohen's $f^2 = 0{\cdot}122$. As can be seen in Figure A3, after the cut-off value of the transformative utopian impulse for planetary health equal to 2·296, ethical versus unethical condition increased the intention to buy the product, whereas below the cut-off point there was no effect. The interaction between the condition and the moderator (*Multiple* $R^2 = 0{\cdot}65$) remained significant after controlling for the covariates, $t(316) = 6{\cdot}227$, $b = 0{\cdot}856$, 95% CI [0·585, 1·126], $p < 0{\cdot}0001$, Cohen's $f^2 = 0{\cdot}123$. The cut-off value of the transformative utopian impulse for planetary health after which the ethical versus unethical condition increased the intention to buy the product remained similar (2·198). Overall, these results indicated that the support for Hypothesis 8 was robust.

Discussion

Overall, the findings supported both predictions. Participants in the ethical condition had higher intentions to buy the product than those in the unethical condition (Hypothesis 7). Importantly, as expected from Hypothesis 8, TUIPHS moderated this influence, which increased as participants' scores on this scale increased, and was not significant for those with low scores (< 2·296). All the findings were robust, given that they remained significant after controlling for the covariates (age, gender, BMI, and the weekly frequency of eating chocolate).

Study 7: Socially conscious vs. fashionable consumption

Whereas the previous study was specifically about a fairly traded product, in the present study we wanted to focus on a manipulation based around a product that helps tackle a wider range of global issues. This study was inspired by a concrete utopian initiative, *Conscious Step*, a sock brand created in 2012 whose purpose is to foster positive social change. More specifically, it aims to "create a tangible impact in making the world a better place" (https://consciousstep.com/), and to meet the United Nations Sustainable Development Goals,[196] by tackling various social issues ranging from fighting poverty and hunger to preventing transmission of HIV/AIDS, and protecting the rainforests and the oceans, to name but a few. Considering that addressing a variety of existing global issues to transform the current society is at the core of the transformative utopian impulse for planetary health, and that Empathic Concern,[62] Attitudes toward Helping Others,[98] Humanitarianism-Egalitarianism,[71] Universalism,[69] Activism,[99] and Green Consumption Values[96] are strongly correlated with TUIPHS (Studies 2b-2e), in this study we focused on a "utopian" sock brand that supports a variety of different nonprofit organizations, from those helping to preserve the rainforests such as *Conservation International* to those helping to end poverty such as G*lobal Citizen*. This "utopian" sock brand was contrasted with a fashionable sock brand that has the primary mission to be a fashion leader and collaborates with fashion suppliers that work on international runway shows to produce high-quality socks with different patterns that can be worn on every occasion. Similar to Study 6, the goal of Study 7 was to probe whether the general transformative utopian impulse for planetary health factor moderates the impact of these two conditions on the intentions to purchase the product.

If the utopian (vs. fashion) socks condition indeed activates the construct of transforming society by addressing a range of different issues, then the impact of this condition on purchase intentions should be moderated by TUIPHS scored as a general factor. The higher the participants' scores on this scale, the more positive the influence of the utopian (vs. fashion) condition on purchase intentions should be (Hypothesis 9). In the present study, we did not have a specific hypothesis regarding the main effect given that this could not be clearly predicted based on previous literature.

Pre-registration

All the predictions, materials, and analyses for this study were pre-registered and can be accessed here: https://osf.io/t46dj/?view_only=08f4fd2fc1a94f0ca0054e22324df5c7 .

Participants and procedure

Participants demographics are reported in Tables A1 and A2. The exclusion criteria and the rationale behind the sample sizes are detailed below. All participants first completed the consent form, after which they were randomly allocated to either the utopian or fashionable socks condition. In the utopian condition, they read a vignette about a sock brand—Step Up—whose primary mission is to serve a social purpose by bringing more awareness to the problems faced by the world today and collaborating with nonprofit organizations that fight these problems. In the vignette, it was indicated that each pair of socks sold supports a different nonprofit organization, and five examples of socks accompanied by images were shown (e.g., "These tribal patterned socks help protect 20 rainforest trees through Conservation International"). The vignette for the fashion condition was identical in the structure and content, except that Step Up

was presented as a brand with a primary mission to be a fashion leader that makes high-quality socks that can be worn on every occasion and collaborates with fashion suppliers that work on international runway shows. In the vignette, it was indicated that each pair of socks has a unique pattern created from a selection of different colors and shapes, and five examples of socks accompanied by images were shown (e.g., "Decorated with tribal patterns on a green base, these socks will add some color to your outfit"). The sock brand in the utopian condition was inspired by the actual sock brand "Conscious Step" that produces socially conscious socks. Images of their socks were used in both conditions but were presented differently depending on the condition.

After being exposed to the corresponding manipulation, participants were presented with the questions assessing the dependent variable—their intention to buy the socks—after which they filled in TUIPHS and responded to several questions assessing covariates as well as to the check items (see the *Measures* section below). In the end, participants in the fashion condition were informed that Step Up is a fictitious brand, whereas those in the utopian condition were informed that, although the company is a fictitious brand, it was based on a real brand with the same mission. They were also encouraged to write any comments they may have regarding the study in a text box. The data for Study 7 were collected on 20 August 2019.

Exclusion criteria

We used five check items. More specifically, participants in both conditions were asked to identify the primary mission of Step Up ("to serve a social purpose" vs. "to be a fashion leader" vs. "I do not remember"). Moreover, two instructed-response items[15] were embedded within TUIPHS, and all participants had to answer a seriousness check[14]. We also included a captcha item at the end to stop any bots from completing the survey. Only participants who passed all the check items were included in statistical analyses.

Determining sample size

To determine the necessary sample size to test the hypothesis, we relied on the effect size (Cohen's f^2) concerning the interaction between the experimental manipulation and TUIPHS from Study 6, which was 0·1217194. To be on the safe side, we assumed an effect size (Cohen's f^2) of 0·10 in the current study. Using the procedure from the previous study, we therefore computed the necessary sample size to obtain this effect with the high power of 0·999 and significance level of 0·05. The analysis was again implemented via G*Power,[100] and showed that 258 people would need to be recruited. To be on the safe side and ensure that this sample size is reached, we assumed that, in the worst-case scenario, data from up to 25% of participants may need to be excluded from statistical analyses due to the exclusion criteria (see the *Measures* section below). We therefore decided to test roughly 344 participants to reach the sample size of 258 with certainty. When sensitivity power analyses were conducted on the actual sample included in statistical analyses (n=266), it was revealed that our study was sufficiently powered (0·999) to detect an interaction effect smaller than the one obtained in the previous study (Cohen's $f^2 = 0·097$).

Measures

The dependent variable (*intention to buy the socks*) was measured via four items similar to the ones from Study 6, answered on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*).[193,197,198] Participants had to indicate to what extent they would be likely to purchase the

product, they would be willing to buy the product, they would exert a great deal of effort to purchase the product, and they would be likely to recommend it to others (α = 0·916). The 12-item *TUIPHS,* assessed on a response scale from 1 (*strongly disagree*) to 7 (*strongly agree*), was again scored as a single general factor to be used as a moderator. As covariates, we assessed participants' *age* and *gender* (male vs. female vs. other). The check items can be seen above under *Exclusion Criteria*.

Results

To test the hypothesis, we computed an interaction between the utopian versus fashion condition and the general transformative utopian impulse for planetary health factor as a moderator. As in Study 6, the pattern of the interaction was probed using the Johnson-Neyman technique,[173] which is implemented via the *interactions* package in R,[195] and the false discovery rate correction developed by Esarey & Sumner was applied.[174] As predicted, the condition interacted with the moderator (*Multiple* R^2 = 0·40) in influencing the intentions to buy the product, $t(262) = 3{\cdot}790$, $b = 0{\cdot}463$, 95% CI [0·222, 0·703], $p = 0{\cdot}00019$, Cohen's $f^2 = 0{\cdot}055$. As can be seen in Figure A4, after the cut-off value of the general transformative utopian impulse for planetary health factor equal to 3·874, the utopian versus fashion condition increased the intention to buy the product, whereas below this value the effect was not significant. The interaction between the condition and the moderator (*Multiple* R^2 = 0·41) remained significant after controlling for the covariates, $t(259) = 3{\cdot}711$, $b = 0{\cdot}456$, 95% CI [0·214, 0·698], $p = 0{\cdot}00025$, Cohen's $f^2 = 0{\cdot}053$. The cut-off value of the general factor after which the utopian versus fashion condition increased the intention to buy the product remained similar (3·878). Overall, these results showed a convincing support for the hypothesis.

Figure A4. The influence of utopian vs. fashion condition on intention to buy the product

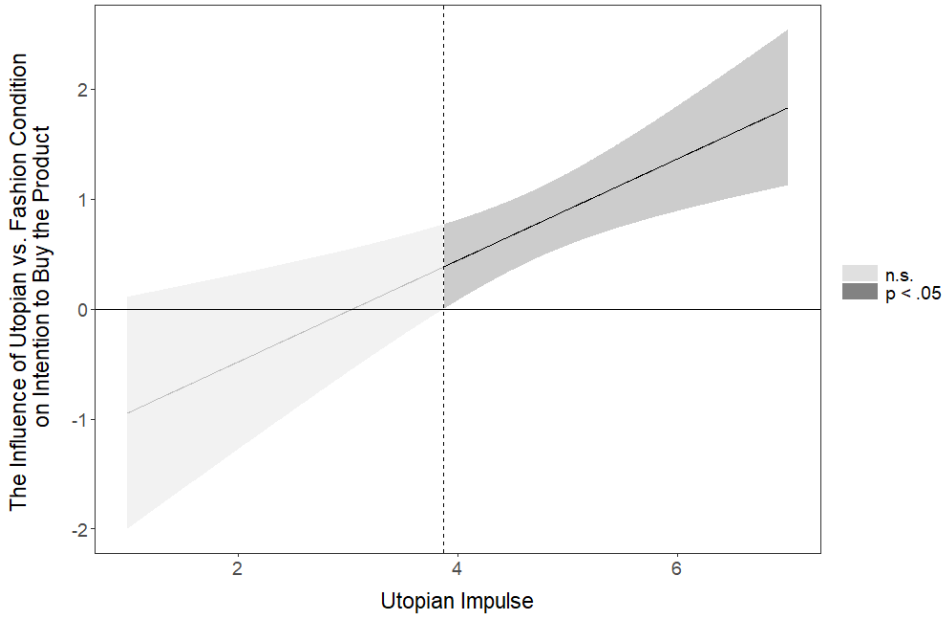

Figure A4. The influence of utopian versus fashion condition on intention to buy the product (socks) depending on participants' level of the general transformative utopian impulse for planetary health factor (Study 7).

Finally, to determine whether there was a main effect of the condition on the intentions to buy the product, for which we did not have a clear prediction, we performed an independent samples t-test (two-tailed). Participants in the utopian condition (M = 5·02; SD = 1·40) had higher intentions to buy the socks compared to participants in the fashion condition (M = 4·07; SD = 1·36), $t(264) = 5·606$, $p < 0·0001$, $d = 0·689$, 95% CI [0·440, 0·939].

Discussion

The findings of Study 7 supported our prediction (Hypothesis 9). TUIPHS scored as a general factor moderated the influence of the utopian versus fashion condition on the intentions to buy the socks: this influence increased as participants' transformative utopian impulse for planetary health scores increased, and was not significant for those with scores below 3·874. Finally, we found that the main effect was highly significant: participants in the utopian (versus fashion) condition had higher purchase intentions across the entire sample. Overall, this study strongly supported our prediction and the importance of the transformative utopian impulse for planetary health for a wide range of social causes that manifest concern for others and for the planet.

Expanded general discussion

In the research context, TUIPHS can be embedded into the broader literature that aims to understand psychological processes associated to social change. Previous research in that regard can be broadly categorized into four domains: 1) understanding characteristics of a prospective future society that predict or determine people's intentions or actions that promote or prevent such a society;[199] 2) understanding how group membership and identity motivate collective action;[150,200] 3) understanding how to situationally influence people's intentions and action to change society;[201] and 4) understanding individual characteristics such as personality or values that predict support for and engagement in actions relevant to social change.[202]

The present research makes the most significant contribution to the fourth domain. Thus far, when it comes to the contribution of individual differences to the understanding of social change, research has investigated the role of either broad personality constructs (e.g., openness)[203] and values (e.g., basic individual values)[202] or specific individual differences capturing particular aspects of social change such as activism[99] and socially conscious consumption.[96,97] This research introduces a new conceptualization, the transformative utopian impulse for planetary health, which allows specific predictions about people's intentions, attitudes, and behaviors associated with societal transformation at economic, social, and political levels.

In addition to these theoretical contributions, it is important to emphasize other strengths of our scale that concern the methodological rigor with which it was developed. First, in the process of scale development, we used highly powered (.999999) confirmatory factor analyses as indicated via a Monte Carlo simulation based on the data from the initial exploratory factor analysis.[21] Although using simulations to determine sample size when developing a scale is recommended,[204] such procedures have rarely been employed so far. Another methodological strength is that, in addition to demonstrating excellent fit of the scale, we established configural, metric, scalar, and residual invariance in relation to US versus UK participants and male versus female gender. This is the strictest form of measurement invariance and thus indicates the equivalence of the construct the scale tackles—the transformative utopian impulse for planetary health—across both variables.[45,46] Moreover, in multiple studies, we employed pre-registration that, although recommended due to recent replication issues,[205] has not been frequently used in personality psychology. Another methodological strength of our scale is that we employed bifactor statistical indices to demonstrate that, despite comprising four factors as demonstrated via exploratory and confirmatory factor analyses, it can also be scored as a single general factor and thus captures the transformative utopian impulse for planetary health as a unified theoretical construct.[47,48]

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