Young adults face the future of the United States: Perceptions of its promise, perils, and possibilities

Joseph Kantenbacher [a,*], Deidra Miniard [b], Nathaniel Geiger [c], Landon Yoder [b], Shahzeen Z. Attari [b]

[a] University of South Dakota, 414 East Clark Street, Vermillion, SD 57069, USA
[b] Indiana University Bloomington, O'Neill School of Public and Environmental Affairs, 1315 East Tenth Street, Bloomington, IN 47405, USA
[c] Indiana University Bloomington, Media School, Franklin Hall, 601 E Kirkwood Ave, Bloomington, IN 47405, USA

A B S T R A C T

There are a variety of current challenges that will shape our future, such as climate change impacts, socio-economic disparities, the role of technology in society, and changing population dynamics. As ideas about the future influence actions taken today, it is important to study what possible futures young adults anticipate and how they believe those futures could be realized. In 2019, using an in-person paper survey, we asked students ($N = 193$; ages 18–26) to describe their best, most-likely, and worst possible futures for the United States in either the year 2050 or 2100. Participants were also asked questions to explore what would need to happen to achieve these futures and the actors who have influence in shaping the future. Here we explore their description of these future scenarios and pathways. Our participants' images of the future are heavily infused with concepts related to environmental sustainability, technology, and social dynamics. Further, participants frequently expressed the belief that governance, technological developments, and individuals were key factors that will determine the contours of the future. The images of the future collected by our work can help to engage productively with young adults in addressing today's pressing challenges.

1. Introduction

Young adults face a multitude of threats and opportunities in their future. Climate change and biodiversity loss are rapidly undermining the support system of modern society (IPCC, 2021). Around the world, liberal democracies are under assault, with a steep rise in autocracies (Alizada et al., 2021). In the United States, there are growing divisions in political ideology (Iyengar et al., 2019; Pew Research Center, 2017, 2020), and income inequality is increasing (Saez & Zucman, 2020). Despite inequalities in access, many also have access to improvements in science and technology, including greater worldwide access to the Internet (Roser et al., 2015) and advances in medicine that have eradicated diseases worldwide (CDC, 2020).

Whether emerging or longstanding, those who are currently young adults (whom here and in the rest of the paper we define as 18–26 years of age) will experience many of these changes and opportunities in the fullness of their lives. They will live with the consequences of today's decisions longer than members of more senior generations. Older members of Generation Z[1] are now reaching

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* Corresponding author.
E-mail address: joseph.kantenbacher@usd.edu (J. Kantenbacher).
[1] Generation Z is a term applied to the cohort of individuals born between the late 1990s and early 2010s (aged 7–22 in 2019).

an age where they are graduating from college and otherwise starting to take mature roles in society, using their agency in the marketplace, the polling booth, and in civil society at large to prevent and to prepare for the challenges ahead. Attitudes and beliefs about the future – what it will look like and how to shape it – will guide many actions today.

In this work we focus on young adults and the contents and sentiments that comprehend their visions of the future. Our work is exploratory in nature, and we do not aim to generalize our findings to the demographic cohort of our sample. Instead, we explore the futures and pathways imagined by young adults through a small sample of students from a university in the American Midwest. Our effort to map the beliefs and ideas of young adults focuses on four aspects of futures thinking: (1) perceptions of the future, (2) what issues are the most salient, (3) pathways to reach the future, and (4) emotions associated with future perceptions.

First, we seek to understand young adults' outlook on the future, both for themselves and for society at large. Such *appraisals of the future* can shape actions (or inaction) in the here and now. People are commonly more optimistic about their personal future than the global future (Kaboli & Tapio, 2018; McElwee & Brittain, 2009; Ono, 2003). Further, people are more likely to report believing that their actions can change the course of their personal life rather than having an impact on society (Hoffman, 2019). Thus, it is possible that some might choose to disengage from collective problems and focus on issues directly related to themselves and their immediate sphere of influence. Better understanding young adults' appraisals of the future provides an indication of how readily they can be engaged in tackling social challenges.

Second, beyond a general impression of the future, our work documents which specific issues and ideas young adults attend to when thinking about and forming their appraisals of the future. Where people focus their attention shapes the application of their agency (Wu, 2011; Yadav et al., 2007), making issue salience a good indicator of which problems people will be most likely to recognize and, in turn, help solve. In addition, strengthening personal connections to the future can be instrumental in fostering future-oriented behavior today (Bartels & Rips, 2010; Hershfield et al., 2011; Pronin et al., 2008; Van Gelder et al., 2015). Highly salient issues might be the topics that can be most readily used to foster a connection between the future and the present. Thus, by knowing what challenges have most captured young adults' attention, we can have a clearer understanding of the domains where they can be most expected to contribute to solutions.

In documenting ideas about the future, climate change is a challenge meriting specific attention. Though efforts to mitigate and adapt to climate change are ongoing, the effects of climate change have already begun and will be felt for decades to come. Further, climate change is an intergenerational justice issue, where younger generations will live with its major consequences despite having relatively little responsibility for historic greenhouse gas emissions (Harlan et al., 2015; Lawrence, 2014). Addressing climate change will require big changes in technology, economics, politics, and personal and social behavior (IPCC, 2021). Climate change is also connected to many other current and future challenges, including promoting justice (Levy & Patz, 2015), sustaining democracy (Dryzek & Niemeyer, 2019), and creating jobs (Montt et al., 2018). Given climate change is a central actor in the unfolding story of the future, we pay specific attention to it in our study.

Third, in addition to learning about participants' perceptions of possible futures, we also seek to learn the routes and mechanisms that participants believe would take us to those futures. That is, we want to understand perceptions of *how* better or worse futures can be realized ("pathways") and *which* factors or groups within society have the most potential to steer the course of the future ("influence"). For example, in popular imagination, technology has been seen as central to making the world a better place (Bezold, 2009; Hoffman, 2019; Ono, 2003; Pew Research Center, 2014b), though it sometimes plays a menacing role in images of the future (Bina et al., 2017; Kaboli & Tapio, 2018). Earlier cohorts of young adults have been skeptical of the influence of technology on society (Brown, 1984); how do contemporary young adults, raised in a digital landscape, see technology as fitting into the future? More broadly, knowing what young adults see as the possible pathways to and influences on the future is critical for understanding how today's young adults might seek to attain a more benevolent future.

Fourth, we seek to understand what about the future elicits reactions on affective responses. Affective responses to the future shape personal and social preparations and plans for the future, including via protective mechanisms that blunt the reality of future threats (Rogers & Tough, 1996; Slaughter, 2006). Here we consider two anticipatory emotional responses that are likely to be elicited in response to future possibilities: hope and despair. We focus on these specific emotional reactions because of their particular future-facing orientation (e.g., Lazarus, 1999) and their prominence in the literature on responses to climate change (c.f. Geiger, Gore, Squire, & Attari, 2021; Geiger, Swim, Gasper, Fraser, & Flinner, 2021).

Hope is an anticipatory, approach-oriented emotion associated with contemplating positive future possibilities (Lazarus, 1999). Hope can play a motivational role toward solving problems such as climate change (Bury, Wenzel, & Woodyatt, 2020; Geiger, Gasper, Swim, & Fraser, 2019; Ojala, 2012; van Zomeren, Pauls, & Cohen-Chen, 2019), although in some cases, hope can serve to demotivate action when people use hope as a coping mechanism to avoid unpleasant emotions about problems that they perceive to be out of their control (Hornsey & Fielding, 2016; Marlon et al., 2019; van Zomeren et al., 2019). In contrast, despair is a negative anticipatory emotion tending to coincide with fear and sadness (Plutchik, 1991). Although despair can at times be associated with inaction (Stevenson & Peterson, 2016), recent work (Geiger, Gore, Squire, & Attari, 2021) suggests that despair can also be associated with the motivation to act on societal problems. As Geiger and colleagues note (also see Wang et al., 2018), feeling despair might sometimes coincide with a sense of meaningfulness associated with a difficult future challenge. This meaningfulness, in turn, could potentially motivate a search for a solution and a way to work one's way out of the despair that one is feeling by working together with others to solve collective challenges (see van Zomeren et al., 2008). In sum, hope and despair both appear to have the potential to either motivate or demotivate action depending on the context, though the two emotions appear to operate via different mechanisms in both cases.

Given the inconsistencies associated with hope and despair as motivating action, we also directly assess sources of individuals' inspiration to act, which is associated with emotion but is not itself an emotion (Thrash et al., 2014). Understanding what individuals

report inspires them to make the future better can allow us to begin to obtain a sense of how people become engaged with working to address societal problems and create innovations. Thrash and Elliot (2003) tripartite conceptualization says that inspiration comprehends three elements: awareness to new and better possibilities, origination external to the inspired individual, and a compulsion to achieve the new and better possibility. Thus, documenting envisaged possibilities and the sources of these visions is important to knowing how inspiration interfaces with addressing future challenges.

Here we report the results of an exploratory survey of students at a U.S. Midwest university that probed beliefs about the future. Our goals for this research are to characterize our participants' (1) appraisals of the future, (2) concepts used for imaging the future, (3) ideas about who and what will determine the course of the future, and (4) emotional responses to thinking about the future. Because we were particularly interested to see how climate change factors into ideas about the future, we included specific questions about this topic towards the end of the survey. Documenting the palette with which young adults paint their images of the future can aid efforts to better communicate and engage with this emerging cohort.

2. Methods

2.1. Participants and procedure

We recruited students ($N = 193$) to take an in-person paper survey in two undergraduate media studies courses in a large, Midwestern U.S. public university. One of the courses was at an introductory level ($n = 140$) and the other was an upper-division course ($n = 53$). All participants were undergraduate students who were at least 18 years old, the age of legal adulthood in the state in which the research was conducted. These student-participants were offered course credit for completing the survey. Data collection occurred in December 2019, a couple months before the beginning of the American presidential primaries for the 2020 presidential election and before news coverage of the Covid-19 pandemic had begun.

Power analyses using G*Power 3.1 (Faul et al., 2007) indicated adequate power for detecting small-to-medium effects (as defined by Cohen, 1988), for example, 80% power for detecting Pearson's r $\geq$ 0.20, and Cohen's d $\geq$ 0.40.

Participants were randomly assigned to one of two conditions: thinking about the future of the United States in the year 2050 ($n = 96$) or the year 2100 ($n = 97$). Comparing those who were asked about 2050 and those who were asked about 2100, there were no statistically significant differences ($ps > 0.05$) in both qualitative and quantitative analyses of interest (see appendix for analyses). For simplicity, we present all results together.

A majority of the sample (67%) identified as female, 32% identified as male, 0.5% (1 individual) indicated non-binary or other, and 1% (2 individuals) did not provide a response. The age range of our sample was 18–26 years and median of 19 years. Eleven percent of participants were international (i.e., non-American) students.

Participants self-reported their political ideology on a 5-point, "very liberal" to "very conservative" scale. The sample was somewhat more liberal than the US public: 43% identified as either "very liberal" or "somewhat liberal", 39% as moderate, and 17% as "very conservative" or "somewhat conservative."

2.2. Survey measures

2.2.1. Appraisals of future prospects

To measure general outlook on the future, we asked participants to assess current and prospective future quality of life. Participants first rated the quality of life for people like them in the United States today (seven-point scale, 1 = "very poor" and 7 = "excellent"). Next, they were asked to imagine what quality of life would be like for someone like them in the future (seven-point scale, 1 = "much worse," 4 = "about the same," and 7 = "much better").

2.2.2. Futures and pathways

Participants completed a series of open-ended questions reflecting their thoughts about where society is and where it was headed. First, participants were given an open-ended prompt to briefly describe the *best possible* future for the United States: "Imagine the best possible future for 2050 [2100]. Think about what has changed from where we are today. Write a few bullet points about what this future looks like for the United States." Next, participants were asked in an open-ended question to specify what would need to have happened to achieve the future they described: "Thinking about the years between now and 2050 [2100], what would have to happen for the best possible future that you described in [the previous question] to come true?" The same two questions were repeated for the *worst possible* future and the *most-likely* future.

After these questions, we asked participants about the positive and negative features of the most-likely future they described. For each of these questions, the space allotted for responses was relatively small, a structure which lent itself to pithier responses by participants.

2.2.3. Who and what influences the future

Participants were asked to rate the relative influence of various actors. Participants were asked "On a scale of 1 (no influence) to 5 (complete influence), how much influence do you think the following groups have in shaping the future of the United States?" Thirteen groups were listed including "scientists and engineers," "U.S. corporations," and "other countries." Next, participants were asked "On a scale of 1 (much less influence) to 5 (much more influence), how much influence do you think the following groups should have compared to how much influence they currently have in order to make a better future more likely?" for the same 13 groups.

Participants were then asked to "allocate 100 points across the following four categories according to how much of an impact you believe each category will have in shaping the future. (A value of 0 would indicate that the category will not have any impact, and higher values indicate greater impact.)" We asked participants to consider four categories of influences on the future: advances in science and technology; personal behaviors and values; government policies and economics; and corporate and business practices. This list was not intended to encompass all influences on the course of the future, but rather provide a tractable number of familiar and readily understandable concepts related to the future.

2.2.4. Emotional reactions to the future

Participants completed a set of open-ended questions describing what makes them feel (a) hope about the future, (b) despair about the future, and (c) inspired to make the future better.

2.2.5. Participant profile

Participants completed a four-item set of questions about the importance of climate change derived from the Six Americas Short Survey (Chryst et al., 2018). Next, we asked how often participants engaged in activities like volunteering or contacting government officials that are meant to address issues of public concern. The questions about climate change and activism were used to contextualize the quality of life and influence data (see Tables S8, S9, and S13 in the appendix). We assumed that the survey was completed linearly, thus questions at the end of the survey (especially the climate change instrument) should not have biased responses about images of the future, which were asked at the beginning of the survey. The survey ended with a series of socio-demographic questions focused on gender, age, permanent address, political beliefs, and student status (year in college and major), which are reported in Section 2.1.

The complete survey is available in the online appendix. This research was approved by [University]'s Internal Review Board at the Office of Research Administration and informed consent was received from all participants. The data and surveys for this research are available here: https://osf.io/2vsgr/.

2.3. Coding open-ended data

We used thematic coding to identify the concepts used by participants in creating their responses to open-ended questions about the future (e.g., Saldaña, 2016). A codebook was developed and iteratively refined to both catalog the set of conceptual categories (*themes)* and to improve the consistency of coding between two coders (e.g., Olson et al., 2016). After the codebook was agreed upon by the two coders (see appendix), both coders independently applied the codes to the nine open-ended questions where participants were asked to describe (1) the future (worst, best, and most likely), (2) pathways for reaching each of these futures, and (3) their emotional responses to the future (hope, despair, and inspiration). A single response could be tagged with multiple codes.

To assess the validity and replicability of the coding process, intercoder agreement was calculated for all 73 codebook themes (O'Connor & Joffe, 2020). Intercoder agreement was 90% or greater for 66 themes. For the remaining 7 themes, the two coders reviewed and reached consensus to resolve each disagreement. After the reconciliation process, all individual themes had an intercoder agreement level above 90%, and the overall intercoder agreement level was raised from 96% (pre-reconciliation) to 97% (post-reconciliation).

After the coding reconciliation and grouping process, we made counts to assess the frequency with which each of the themes arose across our sample. Using the entire response to a single question as our unit of analysis, we tallied the number of responses where the theme was present to calculate the prevalence of the theme across all 193 responses. Separate tallies were made for each of the questions. For example, we counted 19 responses to the "best future" question that referenced education and 5 responses to the "worst future" question that referenced education. This content analysis was used to assess the relative prevalence of themes in the data rather than to make statistical judgments.

3. Results

3.1. Appraisal of future quality of life

On average, we found our participants were positive in their assessment of quality of life for people like themselves today (M = 5.4 on a 1 "very poor" to 7 "excellent" scale; SE = 0.06). Projected quality of life in the future also tended to be positive (M = 4.6 on a 1 "much worse" to 7 "much better" scale; SE = 0.09), with 56% of participants indicating that they thought the future would be better than it is today compared to 22% who thought the future would be worse. We found no significant predictors of current quality of life assessment (see Table S9 in the Appendix). However, in a multiple regression model using attitudinal, behavioral, and demographic predictors, future quality of life scores were uniquely predicted by two variables: concern about climate change had a negative relationship with optimism about future quality of life (b = −0.31, SE = 0.13, *p* = 0.018) while more frequent involvement in activism had a positive relationship with optimism about future quality of life (b = 0.28, SE = 0.12, *p* = 0.021).

3.2. Best future

3.2.1. Descriptions of the best future

When asked to imagine the best-possible future, the most frequently referenced theme was *Environment* (52% of participants). (See

Table 1 for a summary of the most frequently used codes applied to the participant descriptions of the three future scenarios. See also Fig. 1 for a summary of the major thematic content of description of the three futures and pathways scenarios.) Comments mostly painted a tranquil future ("We are treating the earth with love and respect" ID 135)[2] but some also portrayed the future more conditionally ("The planet is deteriorating but we are doing better" ID 19). Responses addressed either a source of environmental conditions, such as waste and recycling, natural resource quality and quantity, or addressed people's attitudes, behaviors, and policies. Climate change was referenced by 17% of all participants, while continuing to reflect similar choices of sources ("carbon footprint consistently reduced every year" ID 121) and behavior ("Global warming is fixed, people actually come together" ID 65) driving environmental outcomes.

Social Dynamics was the second most frequently referenced theme, present in 37% of best-future descriptions. Comments of this themes were concerned with shifts by the public in interpersonal and group-level dynamics. The majority of responses containing this theme commented on the elimination or reduction of racism, sexism, and other forms of discrimination, describing a future with general equality and equal opportunity ("everyone has equal opportunities & things like racism and classism don't exist" ID 3). A smaller number of responses referenced greater social unity and community, particularly in the forms of less political polarization, less hate, and more respect for others ("a much more loving country where killings of all kinds lower to a very minimal number, representing less hate" ID 49).

Technology was the third most common theme in the best-possible future responses (34%). Technology was typically referenced in generic ways, with participants anticipating that technology in the best future would be "advanced" or "new" or that there would simply be "more" of it ("more technology to benefit people" ID 53). The exceptions to this generic description of technology came in the form of cross-references with *Transportation and Mobility* and *Energy*, two categories with substantial overlaps with the *Environment*. In such cases, more specific technologies like electric cars and renewable energy generators were frequently referenced.

3.2.2. Pathways to the best future

When asked about pathways to the best future, the most commonly identified mechanism for reaching the best-possible future was *Governance* (40%). *Governance* pathway descriptions were concerned with leadership in government, focusing on the qualities and leadership of officeholders and the need for greater comity in politics ("Better politicians that have scruples" ID 183; "peace between political parties" ID 132; "Congress would have to come out of gridlock" ID 10). Within this theme, participants also referenced particular governmental functions, namely creating laws, regulations, and taxes. While references to needing new laws were usually generic, environmental sustainability and gun control were mentioned specifically. Responses focused almost entirely on the federal level rather than state or local government. A few responses highlighted elections as a key part of shaping the future.

Technology (29%) was the second most commonly cited pathway towards the best future. The majority of these comments were generic anticipations of continued progress ("Technology advancement will continue at a high level" ID 96). Some participants, however, mentioned particular mechanisms for fostered greater technological advancement, especially getting more people in STEM careers.

The third most prominent theme in the best-future pathways responses related to *Social Dynamics*. In total, 23% of participants referenced some form of bottom-up change as necessary for achieving the best-possible future. The majority of responses in this theme (38 of 45) focused on improvements in interpersonal relationships ("citizens would have to be more kind to one another" ID 126) and development of greater societal unity ("Everyone come together and work together instead of against one another" ID 80).

Alongside *Social Dynamics*, the *Environment* (23%) was also the third-most common pathway to the best future. Often, references to the environment were not strictly a pathway unto themselves. Instead, pro-environmental outcomes were given as the focus of actions along other pathways. Most prominently, participants looked for environmental remedy through individual actions ("People change their ways and help the Earth become more clean" ID 107). Climate change was referenced in one-third of the *Environment* descriptions.

3.3. Most-likely future

3.3.1. Descriptions of the most-likely future

When asked to imagine the most-likely future, *Environment* (50%) was the theme most commonly used to describe the most-likely future. Descriptions in this theme varied in their valence, with some envisioning progress on environmental problems ("I believe that technology will bring new innovations to help protect wildlife; using renewable energy more and more and having access to clean water for everyone" ID 34) or mixed results ("less use of harmful resources toward the environment - but many big businesses will refuse" ID 25). A plurality of statements described worsening environmental outcomes in the most-likely future ("Global warming becomes worse; Plastic covers more than half the ocean" ID 85). Climate change was featured in one-fifth of all most-likely future descriptions. References to climate change were more negatively valenced than references to general or non-climate related environmental issues, suggesting greater pessimism about the prospects for addressing climate change than other environmental problems.

Technology (46%) was the second most frequent theme used to describe the most-likely future. The majority of references to technology came in the form of general anticipation of more and advanced technology. There was a mix of sentiments, with some responses equating more technology with improvements in quality of life ("advances in tech will make our lives easier; advances in

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Table 1

Most frequently used themes found in participant descriptions of the three future scenarios (best, most likely, and worst) on the left-hand side of the table and the pathways that lead to those futures on the right-hand side of the table.

| FUTURE theme	Coding description	Trend (Best to Worst)	FUTURES			PATHWAY theme	Coding description	Trend (Best to Worst)	PATHWAY to futures		
			Best	Most Likely	Worst				Best	Most Likely	Worst
Environment	Condition of the environment and natural resources, pollution, the Earth		52%	50%	67%	Governance	Government, political offices and parties, leadership, laws, regulations, or taxes		40%	31%	35%
Social Dynamics	Societal-level relationships, including social justice, equality, and diversity		37%	34%	26%	Environment	Condition of the environment and natural resources, pollution, the Earth		23%	25%	40%
Technology	Aspect of technology, research, or innovation		34%	46%	18%	Technology	Aspect of technology, research, or innovation		29%	33%	16%
Governance	Government, political offices and parties, leadership, laws, regulations, or taxes		28%	30%	25%	Individual Factors	Personal characteristics, behaviors, beliefs, values, or morals		20%	13%	20%
Economic Conditions	Economic indicators, conditions, or dynamics at the national or global scale		29%	15%	25%	Social Dynamics	Societal-level relationships, including social justice, equality, and diversity		23%	16%	13%
Public Health	Developments in physical, mental, and social well-being		32%	22%	13%	Business as Usual	Continue on current trajectory		1%	25%	23%
International Relations	International events or relationships between countries		13%	15%	32%	International Relations	International events or relationships between countries		8%	8%	18%
Transportation and Mobility	Mode of travel or the quantity of mobility		21%	12%	2%	Education	More educated society, the overall education system, and universities		12%	8%	4%
Crime	Crime, violence, guns, gun ownership, or atrocities		12%	7%	12%	Medicine	Advances in medicine, cures to disease, cancer, illnesses, and healthcare		11%	7%	4%
Energy	Types and amounts of energy resources in use		19%	7%	2%	Economic Conditions	Economic indicators, conditions, or dynamics at the national or global scale		4%	4%	8%
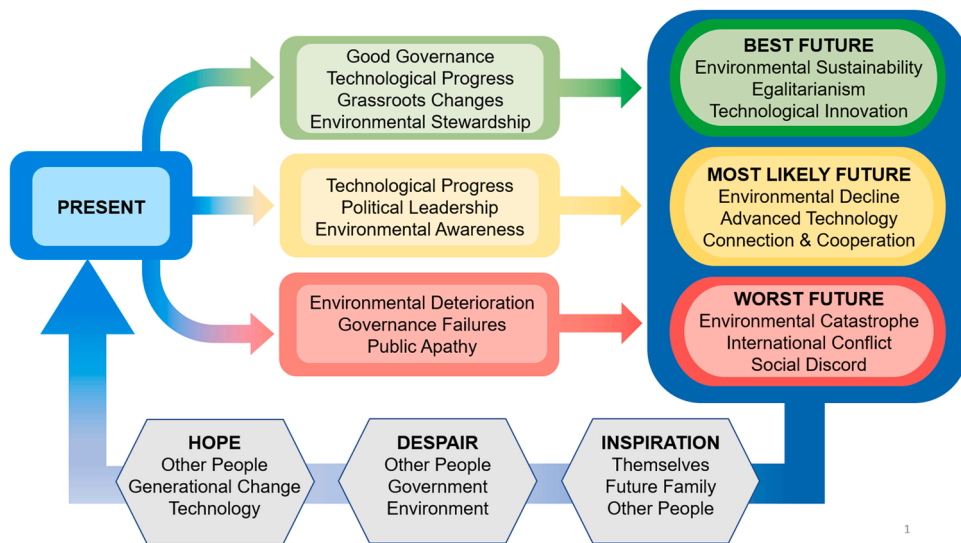
Fig. 1. Summary of the major thematic content of description of the best, most-likely, and worst future scenarios, perceived pathways of getting there, and emotional response to the future. Items within each box are the three most commonly referenced themes, ordered by frequency of occurrence. Names of items in each box have been modified from the original codebook name to more clearly indicate the major themes of the best, most-likely, and worst future scenarios.

medicine will help us live longer/healthier lives" ID13) while others identified specific harms of technology, including over-dependence on technology and joblessness due to robots and automation. Still others referred to technological advancements as a mixed blessing ("Advancement in technology makes life simpler but also may increase obesity later + job loss" ID 120).

Social Dynamics (34%) was the third most common theme of the most-likely future. These responses focused on how connected people would be to others in the future ("People have come together to better the planet" ID 19) and the degree of general unity or division would exist in society ("wider social class gap" ID 177; "Accepting + Loving EVERYONE" ID 20). While some participants expected that people would be more connected to others in the future, a greater share of participants forecast greater isolation, particularly due to reliance on technology (e.g., "you interact with more A.I. than real humans." ID157). More participants anticipated that the future would feature greater tolerance and acceptance of differences than forecast a widening of divisions in society (e.g., owing to political polarization). Many responses spoke about diversity and equality, often anticipating future progress towards greater racial and gender equality ("progressed a distinguishable amount as far as civil rights, but still some issues" ID 79).

3.3.2. Pathways to the most-likely future

When asked about pathways to the most-likely future, *Technology* was the theme most frequently used (33% of responses). Descriptions of this pathway keyed in on human capital and investments and research funding as being instrumental in the continuation of technological advancements ("space travel will have to be more available" ID 8; "May be 5 G or even 6 G" ID 38). In general, participants were non-specific about the types of technologies that would be developed. Additionally, some comments focused on technological dependence as a downside of the most-likely pathway ("The use of the internet for personal development causes less social talking in real life" ID 140; "Most easy jobs were replaced by A.I." ID 157).

Concepts associated with *Governance* (31%) were the second most commonly mentioned pathway to the most-likely future. The greatest share of these responses revolved around the actions and priorities of political representatives ("Politics stays on the same path" ID 112; "Bad elected officials" ID 147; "no change in gov power positions" ID 193). More participants anticipated a change in leadership as spurring progress towards solving problems ("We have a president who actually cares about our environment and starts implementing changes" ID 9), though some responses forecast a continuation of current patterns of leadership ("gov. continuing on its path" ID123), conceivably implying the continuation of any existing problems. The role of laws, taxes, and elections were mentioned in some responses.

Environment (25%) was the third most-common theme in participants' descriptions of the pathway to the most-likely future. References to the environment were most often coupled with one of three other pathway categories. Mostly commonly, the environmental sustainability pathway was linked to personal attitudes and behaviors ("I think people will become more aware of their actions on the earth" ID135). Less frequently, the environment was linked to government (in)action ("people keep being careless about the environment + don't take action -> our political system doesn't help" ID97) or technological development ("people will work hard to create new useful technology that some can benefit the environment" ID53). Climate change was mentioned infrequently, with roughly equal numbers anticipating progress and no progress on the issue.

3.4. Worst future

3.4.1. Worst futures descriptions

When asked to imagine the worst-possible future, 67% of responses fit under the theme *Environment*, which related to the decline of environmental quality. References to the environment typically described either severe repercussions from climate change ("Our planet is dead because of climate change" ID 20; "Earth is becoming (or already is) uninhabitable" ID 10; "Everyone is dead because we killed the planet" ID 66), increased pollution ("World too polluted and earth is destroyed" ID 14; "world becomes piles of trash" ID 68), or the general decline of environmental quality ("Desolate farmlands, not producing enough to sustain our population" ID 35). Climate change and its impacts were mentioned by 22% of participants, while the death or uninhabitability of Earth was included in 11% of descriptions of the worst future.

International Relations was the second most common theme in descriptions of the worst future (32% of descriptions). These descriptions were almost uniformly focused on the United States being involved in wars and other violent conflicts ("we are not allowed to leave the country because we have fought with too many other countries" ID 109), with a sizable minority of portrayals depicting World War III or the use of weapons of mass destruction ("The U.S. somehow causes a WWIII by overstepping its boundaries" ID 67).

Social Dynamics was the third most common theme of worst-future descriptions (26% of participants). Thirty-six (of 50) responses mentioned a breakdown of social relationships, including a rise of hate and civic strife ("Whole country hates each other" ID 115), while 27 responses made references to rising inequality and discrimination ("Racism and marginalization is commonplace amongst the majority of the communities. Widespread shootings and frequent violence." ID 182). *Technology* was frequently cross-referenced as a cause of isolation and disconnect ("Everyone is addicted to technology and we don't spend time with actual humans" ID 34; "technology is toxic and abused - loss of human interaction" ID 79).

3.4.2. Worst future pathways

When asked about pathways to the worst future, *Environment* (40%) was the most frequently cited element of the pathway to the worst possible future. Most commonly, participants anticipated that the worst future would be brought about by inaction on climate change by individuals and institutions ("We do nothing to alleviate climate change" ID 58; "ignore passing legislation for climate and guns" ID 25) and by increasing the amount of waste and pollution generated ("No advancement in pollution reducing technology" ID 14; "we don't stop our waste and plastic overuse" ID 28; "Destroying current environmental protection laws" ID 35). Lack of awareness of, concern about, and action on environmental issues by individuals was the most commonly named cause of future environmental degradation ("humans continue doing the same things to the environment" ID 23).

Governance was the second most frequently mentioned pathway that could bring about the worst-possible future (35%). A majority of these responses examined the role of leadership and politics ("President doesn't know what he's doing" ID 85; "people in charge continue to be hateful + stupid" ID 29); rather than the way that laws, regulations, and taxes might shape the future. A particular focus was on the qualities of people in government ("Pride and self-interest taking control of high positions in offices" ID 1) and on the
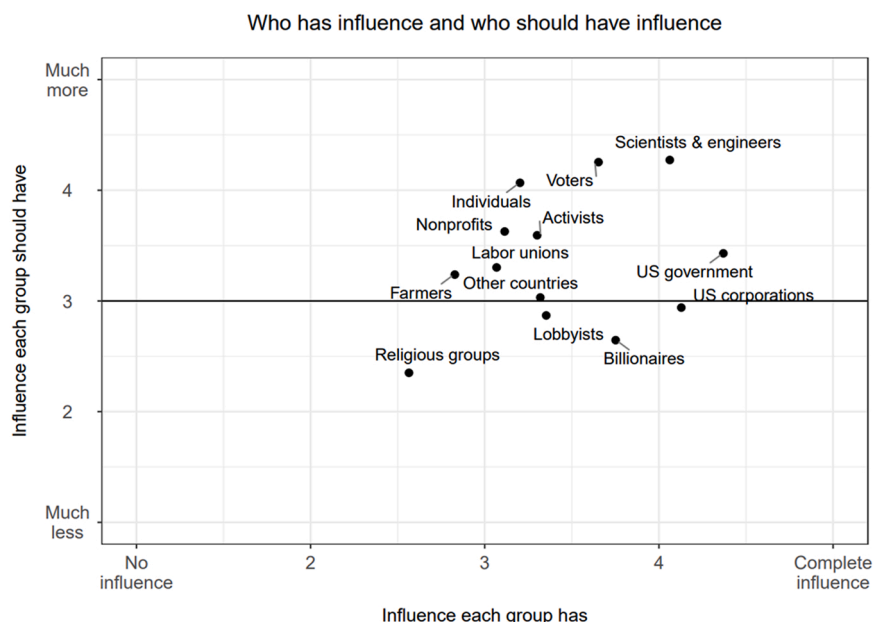

Fig. 2. Plot of mean influence scores for each group. The x axis reports the mean influence participants believe each group has currently. The y axis reports the mean influence participants believe each group should have, with numbers above 3 representing an average desire for the group to have more influence and numbers below 3 a desire for less influence (depicted by the solid horizontal line).

entrenchment of partisan gridlock ("The government continues to be too divided to actually take care of issues that actually affect the health and safety of everyone in this country and the world" ID 5).

Social Dynamics (20%) was the third major pathway to the worst-possible future identified by our participants. Comments in this theme were related to the actions and attitudes of members of the public ("people stop caring" ID 40; "laziness" ID 16; "Not promoting kindness" ID 100; "the further abolishment of religion [and] faith" ID 163). Most of the descriptions focused on indifference or ignorance of individuals, which in turn was seen to cultivate inaction in the face of problems ("people remain unconscious of global warming and not doing their parts to help" ID 128; "No one cares about guns or the economy so nothing good would happen" ID 170). Nearly one-quarter of responses indicated that business as usual was leading towards the worst future possible ("The current path we are on right now is greatly damaging the environment so if we choose not to change anything we will achieve the 'worst possible' future." ID 167).

3.5. Who and what influences the future

Participants were asked to indicate the influence they believe 13 different groups of actors have on shaping the future, and the influence they think each group should have. The mean across all participants for each group of actors is shown in Fig. 2. (Table S10 in the appendix presents means and standard errors.) On average, participants indicated that the U.S. government, U.S. corporations, and scientists and engineers have the most influence over the future of the United States. Religious groups and farmers were deemed to have the least influence over the future. In terms of preferences for entities that should have influence, participants believed voters, scientists and engineers, and individuals should have the most influence. In contrast, participants wanted billionaires, religious groups, lobbyists, and U.S. corporations to have the least influence over the future. Looking at the change between the influence each group has today and how much influence each group should have in the future, participants wanted to see the biggest increase in the influence of individuals and voters, and the largest decrease in the influence of U.S. corporations, the U.S. government, and billionaires. These findings parallel the qualitative data in which labor unions, farmers, religious groups, and billionaires were rarely mentioned but government, technology, and individuals were commonly referenced as factors or groups shaping the future.

We found significant differences in the points allocated to the four categories of phenomena that might shape the future ($F(3, 764)$ $= 37.27$, $p < 0.001$, $\eta^2 = 0.13$). After correcting for multiple comparisons (Bonferroni corrected alpha value of $0.05/6 = 0.0083$), we found that the anticipated impacts of advancing science and technology were significantly greater than the anticipated impacts of government policies and economics ($M = 31.6$ vs. $M = 26.2$, $t(376) = 4.63$, $p < 0.001$, $d = 0.47$). In turn, government policies and economics were anticipated to have more of an impact on the future than either corporate and business practices ($M = 21.4$, $t(378) = 4.19$, $p < 0.001$, $d = 0.43$) or personal behaviors and values ($M = 20.6$, $t(380) = 4.96$, $p < 0.001$, $d = 0.30$). There was no significant difference in the anticipated impacts of the private sector and personal behavior ($t(382) = 0.69$, $p = 0.40$).

3.6. Emotional responses to the future

After asking participants to describe future scenarios, we asked them to describe what makes them feel hope and despair about the future and what inspires them to make the future better (see Table 2). The most frequently cited source of hope for the future was *Other People*, with 33% of responses fitting this theme. Often, hope was derived from observing specific others working to make a positive difference in the world ("[I feel hope] when I see people make changes in their life to better the world." ID 91). Relatedly, 21% participants felt hopeful about the general potential of members of younger *Generations* – most often their own – to effect needed changes in the world ("Our generation is working to make change every day." ID 54). *Technology*, and most often its capacity to improve people's lives, was mentioned as a source of hope for 22% of participants.

Other People and the *Environment* were each cited by 27% of participants as a source of despair about the future. The despair related to other people was most often grounded in viewing others as adhering to and being unwilling to change negative beliefs and attitudes. Similarly, references to despair related to the environment often focused on the indifference and anti-environmental attitudes (e.g., climate denialism) held by others. ID 5 articulated despair stemming from both the state of the environment and the nature of other

Table 2

Frequency with which "emotional response" codes were applied to questions about hope, despair, and inspiration. Categories listed in order of frequency of mentions as sources of hope.

Category	Coding description	Emotional Response to the Future		
		Hope	Despair	Inspiration
Other People	The experience, characteristics, actions, or motivations of other people	33%	27%	13%
Technology	Aspect of technology, research, or innovation	22%	13%	7%
Generations	Distinct generations, including a change of or divide between generations	21%	5%	8%
Internal Factors	An individual's own experience, characteristics, or understanding of the world	11%	7%	40%
Other	All concepts that did not fall in the other 23 categories	10%	12%	13%
Environment	Condition of the environment and nautral resources, pollution, the Earth	9%	27%	6%
Social Dynamics	Societal-level relationships	8%	9%	1%
Governance	Government, political offices and parties, leadership, laws, regulations, or taxes	5%	13%	2%
Prominent People	Politicians, activists, celebrities, social advocates, or companies	5%	6%	3%
Prospective Family	Family, children, future children, spouses, partners	4%	1%	22%

people in writing, "History shows that humans, especially when they are [desperate], are capable of doing some really bad things. Also I've already noticed some people give up on things like recycling and not using plastic."

When asked about what inspired them to "make the future better," 40% of participants referenced a factor internal to themselves (*Internal Factor*), such as their aspirations for their own life, their desire to build a future they would want to live in, or their dissatisfaction about the state of the world ("I try to use the things that upset/anger me about the world + channel the anger into activism for change." ID 101). The welfare of *Prospective Family*, especially one's own children, was the second most commonly cited source of inspiration (22% of participants; "What I want the world to look like for my kids, loved ones. I know I play a part in that." ID 113.).

4. Discussion

4.1. Appraisals of the future

Evidence from this study about participants' appraisal of the future is mixed. On the one hand, when asked to anticipate quality of life for people like themselves in the future, a majority of participants stated that they thought the future would be better than it is today. Given that quality of life today was also typically rated fairly high, the typical response to close-ended questions could be read as an optimistic outlook on the future. However, it should be noted that the close-ended questions asked about "someone like you," and past research has indicated that people tend to be more optimistic about their own prospects than those of society in general (Kaboli & Tapio, 2018; McElwee & Brittain, 2009; Ono, 2003).

On the other hand, participants' depictions of the future tended to reveal less optimism than their quality-of-life ratings. We found, for example, that the concept of maintaining the status quo into the future was associated with the pathway to the worst future for 23% of participants, whereas "business as usual" was featured in just 1% of pathways to the best possible future. Further, while descriptions of the most-likely future tended to contain a mix of positively and negatively valenced concepts, negative projections tended to be more common in certain prominent topics, particularly *Environment*. More generally, compared to the best future, we found that references to specific topics tended to be more vivid and concrete in the worst future, suggesting that the negative instantiations of these topics were more accessible and salient (D'Argembeau & Van der Linden, 2004; Trope & Liberman, 2010). For example, descriptions of *Technology* were more specific about how technology could contribute to the worst future (e.g., social isolation and job losses) whereas mentions of *Technology* in best future scenarios tended to be more generic and abstract. When people can easily imagine negative outcomes, people have a tendency to shift away from optimism (Sweeny et al., 2006)(Sweeny et al., 2006), indicating that greater vividness of worst-case scenarios could be an implicit signal of a pessimistic appraisal of the future. In total, we found the narratives that participants used to navigate possible futures to be substantially less optimistic than their quality-of-life forecasts alone would indicate.

4.2. Future-relevant topics

The second goal of this research was to document where our participants' future-oriented attention was focused. Overall, we found that environment, social dynamics, and technology were consistently prominent in all three futures scenarios. The stability of prominence across the three scenarios may suggest that these topics would be the most relevant onramps to conversations about the future with our participants.

The high incidence of references to environmental sustainability, or lack thereof, across all scenarios reflects the notion that many participants consider the topic as a key descriptive feature of the future. Our findings are consistent with other work showing that those with a future-oriented temporal orientation are more engaged with environmental issues (Geiger, McLaughlin, & Velez, 2021; Joireman & Liu, 2014), as they suggest that the tendency to consider environmental issues is prominent when individuals are prompted to think about the future. Indeed, many Americans see environmental issues such as climate change as major problems, though more people think climate change is the most important problem to address in the future compared to today when asked to choose among important voting issues (Miniard, Kantenbacher, & Attari, 2020).

A particular motivation for this study was on the role of climate change in ideas of the future. While we found that environmental sustainability did feature prominently in articulations of the future – most participants referenced the environment in at least one of their three futures – it was not the case that *climate change* received the bulk of attention in this space. Rather, issues related to waste production and disposal (including recycling) were more commonly cited. One possible reason for this finding is that climate change actions may be less salient to participants than other topics such as plastics pollution. In contrast to many other environmental topics, most Americans rarely hear about climate change from the media or others they know (Leiserowitz et al., 2020). Some who are concerned about climate change may lack the knowledge and vocabulary to discuss climate change (Swim, Geiger, Fraser, & Pletcher, 2017) and might default to waste even if concerned about climate change (APA, 2020). Indeed, the most common behavior changes that people mention to address climate change is reducing waste (ibid.). Similarly, in the related domain of energy conservation, there is a deficit of awareness concerning which actions are highly effective (Attari, DeKay, Davidson, & Bruin, 2010; Lundberg, Tang, & Attari, 2019; Wynes, Zhao, & Donner, 2020). This awareness and motivation deficit underscores the potential value of better narratives about how to effectively shape the future, individually and collectively.

4.3. Perceived levers of change

In contrast to other work indicating that contemporary young adults may view politics as playing a minimal role in shaping the

future (e.g., Hoffman, 2019), our data suggests that participants view the government as a key mechanism for shaping the future. Government was the most commonly referenced factor in open-ended descriptions of what shapes the future and the "U.S. government" received the highest average rating in response to the Likert scale question about various groups' influence over the future.

A key differentiator between governing in the best and worst futures was not the types of legislation passed but rather the character and personalities of the people in government themselves. That is, partisan, polarized, or self-centered politicians and political processes were common features of the road to the worst future, whereas politicians who cared about unity and the common good were seen as heralds of the best future. We observed a similar dynamic play out with *Social Dynamics*, where unity versus division was frequently presented as the differentiator between a good and bad future. Between *Governance* and *Social Dynamics,* our participants frequently framed the future in terms of a dichotomy of harmony and conflict, wherein a pivot in either direction would decide the nature of the future.

We also found that technology is assumed to play a substantial role in shaping the future, with advances in science and technology being rated as significantly more impactful than government policies, business practices, or individual actions. In addition, technology was a frequent term used to describe the future and seen as a cornerstone of how the future would develop. This prevalence is consistent with past work showing that technology plays significant and impactful roles, either as a force for good or evil, in ideation of the future (Bina et al., 2017; Kaboli & Tapio, 2018). Technology was more frequently referenced in the context of the best rather than the worst future, which might indicate a generalized optimism about the probable influence of technology on the future. While such techno-optimism has been observed elsewhere (Bezold, 2009; Ono, 2003), even specifically with contemporary young adults (Hoffman, 2019; Kaboli & Tapio, 2018; Pew Research Center, 2014a), our data also hints at a certain wariness about technology.

Descriptions of technology in the worst future were more concrete (though less frequent) than those in the best future. At a minimum, the more detailed articulation of technology in the worst future indicates that our participants were more clearly able to identify how technological "advances" could in fact impoverish the future than they were to see how more technology could be of benefit. That is, assumptions about the beneficence of technology may be more broadly held, but they may be fairly shallow, as well, compared to understanding the potential perils of technological developments.

4.4. Emotional reactions

In contrast to the outcomes and pathways descriptions, we found relatively little overlap in the specific concepts that were sources of hope, despair, and inspiration. The notable exception to this general trend related to *Other People*, which was the top source of both hope and despair for our participants. The basis of the hope or despair derived from other people was qualitatively different between the two responses; hope for the future more often came from observing the positive actions undertaken by others where despair was sourced in the perceived attitudes and beliefs of others, possibly rooted in the systematic misperceptions of others' opinions or behaviors that has been noted in other futures work (Lewandowsky et al., 2021). Curiously, participants were much more likely to cite themselves as their own inspiration to make the future a better place, which contrast to previous conceptualizations marking inspiration as an external force (Thrash & Elliot, 2003).

Though there was little in the way of shared specific causes of affective reactions to the future, the overarching trend was for participants to cite some set of human and social elements as their main basis for the emotional responses we targeted. While a few more technical topics were prominent – *Technology* was a frequent source of hope and the *Environment* was a frequent source of despair – participants' affective responses to the future were by and large rooted in people in one form or another. That is, participants responded emotionally to people rather than other categories of concepts associated with the future.

One of the more remarkable contrasts shown in Table 2 is the frequency of the *Internal Factors* theme in the inspiration category (40% of responses) relative to hope and fear (11% and 7%, respectively). One potential cause of the disparity of frequencies may stem from differences in the framing of the questions; the hope and despair questions were about the future in general while the inspiration question asked participants what "inspires [them] to make the future better." Past research suggests that young people have historically had more optimistic reflections on their futures than the future of society and in general (Hicks, 1996) and that people see more control over their own lives than over the course of society (Hoffman, 2019). Given that, it is conceivable that our participants saw more capacity to "make the future better" for their own lives and thus the source of inspiration for a better life was more centered on themselves than was the case for hope and despair. A sense of personal agency may have applied less to our participants' understandings of hope and despair, explaining why reflections were more externally oriented (e.g., observing other people or trends in the environment and technology.).

4.5. Connections with past research

We see continuity between past work documenting young adult attitudes towards and beliefs about the future and the results of our survey work, particularly in the domains of technology and the environment.

As it was for our participants, technology has historically been a prominent part of young-adult future visions. In one early example, Brown (1984) survey of British 16- and 18-year-olds documented that most participants anticipated a high-technology future while at the same time expressing unease about this prospect. Ono (2003) similarly found technology to highly prominent in both positive and negative images of the future held by students at Taiwanese and U.S. universities. A more recent study, however, documents a "re-enchantment" with technology, with Australian young adults viewing technology as a domain of progress and a vehicle for their faith in humanity (Cook, 2016). Overall, our participants shared with their historical counterparts a blend of concern and optimism about the role of technology in shaping the future.

Concern for the environment has also been a prominent, typically negatively valenced part of past cohorts of young adults' ideas about the future. Hicks (1996), for example, found that the theme *Green* was evident in 79% of the preferred futures descriptions of his sample of British university students. Research from the last several decades has shown across time and geography a consistency of concern about the environment and/or desire for greater environmental sustainability (c.f., Angheloiu et al., 2020; Brown, 1984; Hicks, 1996; Holden, 1997; Rubin, 1998 cited in Ono, 2003). It is difficult to compare the particulars of content of this past environmental concern with what we document in this study, as most environmental concerns in past studies have typically been described in general terms of "pollution." As noted above, pollution, particularly trash, was a frequent feature of our participants' thematic references to the environment. What may be unique about the current work is the specific attention given to *plastic* pollution, an issue receiving heightened exposure in public media around the time our data was collected (Keller & Wyles, 2021; Males & Van Aelst, 2021).

4.6. Limitations

There are several important limitations of the present work. First, our generalizability is limited by our sample, which as noted above consists of primarily media majors attending college in the US Midwest. Certain findings might be specific to this audience of media majors, such as reporting relatively low techno-pessimism and high techno-optimism. Further, findings might be different if the study were conducted in other parts of the country. In addition, as we did not collect data on race or ethnicity due to concerns about preserving anonymity in a sample with low racial diversity, we cannot speak to how that characteristic may affect future outlooks. As whites see more progress toward racial equality than non-whites (Eibach & Ehrlinger, 2006), further studies might expect to find differences in what is possible/likely in the near future when stratified sampling captures racial data. In sum, rather than representative of any broader defined group, the data collected in this study is more appropriately viewed as exploratory of possible dynamics that would be revealed with a more systematic sampling regime.

Second, it seems likely that our participants' thoughts about the future might be influenced by specific events occurring around the time of elicitation. For example, our data was collected in the run-up to the 2020 U.S. presidential campaign, during which there would have been above-average media coverage and heightened attention to political polarization and tensions surrounding campaigning. Conversely, perhaps if data had been collected several months later in Spring 2020, after Covid-19 was widespread around the world, disease and pandemics could have emerged as a salient theme. Having experienced the pandemic, hopes and expectations for a sustainable future may have shifted to a progressive future ("build back better") rather than a return to normal (Lewandowsky et al., 2021). Follow-up research should collect data at different time points to how various themes occur and change over time.

Third, the qualitative data we collected is in part a function of the method by which participants were asked to express their thoughts. In this case, participants were asked to provide bullet points of their thoughts – a simple method that allowed us to collect data from our sample. We note, however, that it is possible that the bullet point format could have encouraged an overly simplistic depiction of participants' potentially more detailed thoughts. Future work could consider using established scales to quantify levels of hope (Snyder et al., 1991), despair, and inspiration (Thrash & Elliot, 2003). Additionally, using narrative methods (such as focus groups or photo elicitation) may elicit richer descriptions of futures and pathways (cf. van de Goor et al., 2020) that "probe beneath the surface" (Slaughter, 2002, p. 506). Such work may also probe affective constructs other than hope, despair, and inspiration, further broadening our understanding of the affective responses elicited by "the future."

5. Conclusion

One approach to teaching someone how to ride a bicycle is to ask them to look at where they are going and then pedal hard. The present work provides important insights into where young adults are looking when they are prompted to consider the future. Engaging young adults on the problems that face the world – and that they will spend a lifetime dealing with – means recognizing and engaging with their beliefs of how the world works and assessing issues that are most salient to them. The possible futures and pathways can create narratives, which are powerful tools for education, persuasion, and prompting behavior change (Hinyard & Kreuter, 2007). Tailoring narratives based on the target audience's pre-existing "lexicon" can enhance the effectiveness of narratives in engaging the audience (Shanahan et al., 2019). Here, we find that our young-adult participants are worried about the environment, socio-political divisions, and the welfare impacts of technology. Conversations with young adults about the future might most productively be framed around themes that are salient.

Our work also highlights questions for future investigation: why do young adults find plastic pollution more salient than climate change? How does thinking about best, most-likely, and worst future scenarios and pathways actually shape the future to come? What role does hope, inspiration, and despair play in shaping these worlds? Much of the technical research on futures modeling has focused on specific climate scenarios (such as the Representative Concentration Pathways (van Vuuren et al., 2011) or Shared Socioeconomic Pathways (O'Neill et al., 2014)) to help policy makers understand how greenhouse gas emissions and policy choices today can lead to different outcomes. Here we start exploring how young adults believes certain factors will shape different futures. Far more work is needed to understand how these visions of the future get translated into our reality.

Authors contribution

J.K, D.M., N.G., L.Y., and S.Z.A designed the research; J.K. and N.G. collected the data; J.K., D.M., and N.G. analyzed data; J.K., D. M., N.G., L.Y., and S.Z.A. wrote the paper.

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Declarations of interest

None.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.futures.2022.102951.

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