

Envisioning Sustainability: Exploring Young People's Visions of the Future

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Abstract

The complex problem of climate change and its related issues calls for a creative and nuanced solution. Envisioning has been proposed as a method for deriving potential pathways forward, especially in exploring the facets of the future that people feel hopeful or pessimistic about. This study used both surveys (n=75) and interviews (n=21) to explore how environmentally-concerned young people at a large Midwestern university envision the most likely and best-case scenarios for the future, offering insights into potential sources of hope and action plans for this population. Findings from this work suggest that there is no one shared vision among environmentally-concerned young people, but that technological advancements, top-down change, and a focus on climate anxiety and hope are all critical facets for consideration of the future. These findings point to the enormous potential for universities and other institutions to use this exercise to inspire individuals to action, especially those that will live well into the future and deal with its consequences.

Table of Contents

Abstract	1
Table of Contents	2
INTRODUCTION	3
BACKGROUND	5
Envisioning	5
Education Systems	7
Hope	8
Young People	8
Research Objectives	10
METHODS	10
Demographics	11
Survey Measures and Analysis	13
Interview Methods	14
Interview Measures and Analysis	14
SURVEY RESULTS	17
Technology & Energy	17
Transportation	17
Food & Agriculture	18
Material Use & Consumption	19
Community & Well-Being	21
Most and Least Likely Futures	23
SURVEY DISCUSSION	24
INTERVIEW RESULTS	27
Optimism/Pessimism	29
Drivers of Change	31
System Overhauls	34
Lifestyle Shifts	38
Long Road Ahead	40
Well-Being and Climate Change	41
Learning through Envisioning	43
INTERVIEW DISCUSSION	43
OVERARCHING THEMES	47
FUTURE RESEARCH	48
LIMITATIONS	49
CONCLUSION	50
REFERENCES	53
ACKNOWLEDGEMENTS	56
APPENDIX A – SURVEY QUESTIONNAIRE	57
APPENDIX B – INTERVIEW STRUCTURE	67

INTRODUCTION

The climate crisis is rapidly finding its place at the forefront of everyday concerns. Extreme weather events are occurring more frequently, oceans are warming, and people are increasingly becoming displaced—to name just a few of the myriad issues facing our warming planet (IPCC, 2014). Climate change is not the only prominent environmental issue of this time. Numerous environmental and social problems have arisen, some creating a domino effect as they exponentially contribute to worsening human health and the health of the planet. Among these are biodiversity loss, pollution, soil degradation, food insecurity, waste management issues, and worsening mental health as a result of these problems (UNEP, 2012; Paolo et al., 2020). The global population is increasing, and the world is struggling to keep up with energy and resource demands (UNEP, 2012).

The underlying cause of these problems is human activity. According to the IPCC, it is 95 percent certain that humans are the leading cause of global warming and that human impact is “growing” and poses a real threat to the security of the future (IPCC, 2014). Scientists predict that the warming of the planet will reach 1.5 degrees Celsius by the early 2030s, regardless of any efforts to reduce greenhouse gas emissions (Diffenbaugh & Barnes, 2023). It is clear that unless drastic changes occur soon, climate warming and its associated environmental and social consequences will continue to worsen, becoming a persistent problem well into the twenty-first century.

Though there is such an overwhelming scientific consensus about climate change, the world has struggled to agree on a path forward, still relying on fossil fuels as a primary source of energy and favoring an economic growth model of consumerism and globalization over a drastic shift toward renewable energies and technologies, resource conservation, and long-term

sustainability. The innumerable variables at play make this problem far more complicated than one global agreement to reduce carbon emissions—cooperation and creative action plans must be prioritized. A global society that is both ill-prepared to cope with the future as it continues to worsen and unable to agree on a single way forward must turn to other, more inventive avenues for understanding and solving this problem.

It is the first time in human history that a problem like this has arisen, meaning there is no survival “toolkit” available, nor is there a guide for humans to cope with a problem of this scale. Many people are now concerned about the climate crisis, even those with right-wing political beliefs and lower levels of education, who have traditionally pushed back against the scientific evidence behind climate change more than those with left-leaning political ideology or higher education levels (Chryst et al., 2018). While Americans are generally increasingly concerned about climate change, public support of climate action is often underestimated, suggesting a “myth of indifference” that might inhibit more significant action against the problem (Sparkman et al., 2022). Moreover, in a new digital age, increased media exposure has been shown to heighten what is known as “climate or eco-anxiety,” a phenomenon borne from constant negative, frightening, or alarming messaging about the negative effects society is already experiencing (Maran and Begotta, 2021). While a moderate amount of climate anxiety can deter people from making decisions that might negatively impact the planet, too much can cause people to perceive their efficacy as far lower than it might be, making the problem feel too large to fix.

This research seeks to understand how young people think about, anticipate, and plan to cope with the future regarding climate change and other prominent environmental issues. Understanding first and foremost how this critical group of individuals perceives the future can

enlighten and improve plans for solving this crisis. One critical goal of this research is to determine how universities, schools, and organizations could leverage formal and informal environmental-focused education opportunities to generate hopeful, resilient future visions. More specifically, this research asks how future envisioning can be a tool for preparation that energizes rather than debilitates those who will live well into the twenty-first century and through its most prominent problems.

BACKGROUND

The bottom line is that society as we know it will change and continue to change due to the outlined problems above. The question is: how? We may look into and prepare for the future in an exercise known as envisioning.

Envisioning

A vision of the future is, put simply, a goal to work toward or, conversely, a scenario to avoid— picturing potential future scenarios can aid planning for potential action. As sociologist John Urry suggests in his book *What is the Future?* (2016), future envisioning has often been refrained to institutional and governmental bodies, but for maximum efficacy, it should be reclaimed both by the social sciences and by individuals in everyday thought. Luckily, envisioning is increasingly being recognized as a valuable tool to invite people to explore possibilities for the wide-open and often-daunting future, and it is a skill that can be honed and practiced, and applied to virtually any field (Meadows, 1994; Urry, 2016). In such an exercise, people are asked to use creativity and “right-brain thinking” to describe the future as they would like to see it (Meadows, 1994). More specifically, envisioning asks, “What would we like to see?” and gives an effectual pinprick of light in the distance to move toward.

David Holmgren, an environmental designer, educator, and ecological futurist, uses envisioning to imagine several scenarios for future energy use (2012). Similar to this is the Millennium Ecosystem Assessment (M.E.A.), a four-year project that synthesizes the work of over one thousand scientists in order to determine the potential consequences of climate change on humans; part of this study also involved imagining potential future scenarios (M.E.A., 2005). Each scenario imagined by these studies differs in the methods employed to reach them and in how energy use, communities, globalization, and economic growth exist in some hypothetical future date. Both Holmgren's book and the Millennium Ecosystem Assessment (as well as others who have done similar predictive work) seem to suggest that, no matter what, everyday life looks very different in the future than it does today (2012; 2005).

Because of this, communications and messaging about the future in the environmental sciences tend to be bleak and pessimistic, underscoring hardship, sacrifice, overall lower quality of life, and potential hazards. These visions cause many people to feel hopeless or apathetic toward environmental action or movements; these "worst-case" visions of the future add to the already-growing level of climate anxiety (Suttie, 2018). By focusing on a negative view of the future and by being fearful, we are limiting the peoples' capacity as creative thinkers and environmental activists. We create inspiring pathways forward by imagining bright, fulfilling, rewarding visions that provide a sense of eudemonic (purpose-driven) happiness (Meadows, 1994). We must ask: do we wish to live in a world plagued by hunger, strife, and unpredictable climates? Or, would we rather look toward a future that supports every one of humanity's needs (albeit in a different way than we do today) while respecting planetary and ecological limits and allowing for community-building and a shared sense of acceptance and purpose?

Education Systems

The images of the future that people construct are inherently affected by their knowledge, conceptions, beliefs, and desires (Guillo, 2013). An individual with a broad depth of knowledge about any one topic may be far better able to describe a rich, detailed future scenario than one who knows next to nothing about the subject. However, a certain level of creativity and extrapolation is required with envisioning. In this sense, future visions are derived from both reality and imagination (Guillo, 2013). As previously suggested, envisioning can be honed and, when used often enough and with the freedom for innovative and out-of-the-box thinking, can instill confidence in those that otherwise may not be experts in a subject.

Educational spaces like universities, therefore, hold incredible potential in the movement toward envisioning a positive future for the planet. Education is inherently a preparation for the future (Holfelder, 2019). Children, in schools and by their parents, are raised to learn skills that will prepare them for life. In college, this concept only amplifies, and young people prepare for careers and adulthood in myriad ways. Universities are spaces for exploration and originitive thought. The college experience can influence knowledge, attitudes, and behaviors during young adulthood, making this a significant cognitive development period and an ideal space for developing hopeful, resilient visions of the future (Reimers, 2021).

Educational spaces like universities, in this sense, have an explicit responsibility to not only thoroughly inform students about the climate crisis and its related issues but also to encourage new modes of thinking for fixing the most urgent and existential threat facing the planet. Specifically, such institutions should use multidisciplinary modes of education, both formal and informal, direct and creative, to inspire a new way of problem-solving (Reimers, 2021). This undoubtedly includes envisioning.

Hope

We must also consider how people feel about the crisis; using critical emotional awareness in educational spaces to recognize climate anxieties can allow universities to inspire young people and help them develop preferable visions of the future (Ojala, 2016). As Ojala suggests, the emotions experienced around the climate crisis are critical in shaping perceptions of the future. Hope, which is different from *optimism* (in that it is the express belief in a positive outcome against the odds), should be centered around a positive future goal, pathways to achieve said goal, and giving agency to individuals (Ojala, 2016). Hope for a sustainable future also relies on social cohesion and agreement, and thus developing a shared vision for the future can inspire more hope, and, thus, more environmental action. In turn, more frequent action can inspire individuals and boost hopeful emotions, creating a supportive cycle of positive action. Stories can inspire great amounts of hope, especially between educators and students (Hicks, 2006). Telling stories about a positive imagined future could create the same effect as those about positive events in the past, inspiring action in young people that might lack a concrete feeling of hope.

Young People

These people are in a particularly critical position—young people are growing up knowing their careers and livelihoods will be affected by climate change in irreversible ways. Young people (specifically Generation Z, or individuals born between the late 1990s and early 2010s, aged 11-26 in 2023) have seen the development of serious environmental and social damage over their lifetimes (Kantenbacher et al., 2021). Not only are these individuals preparing for a future where these issues will continue to worsen, but many are also worrying about careers

and mitigation efforts as they progress into early adulthood. They are already beginning to envision their futures and wondering what part they will take in them.

At such a precarious stage of life, many things are changing, and they are often exposed to perspectives and ways of thinking that are wildly different from what they have been exposed to in the past. Climate anxiety is especially prevalent in younger generations, especially those who have witnessed an extreme weather disaster (Paolo et al., 2020). Still, students and young people deal with the enormity of climate change in different ways, feeling angry, frustrated, but also up to the challenge (Hicks, 2006).

It is essential to prepare young people for the options ahead and the methods with which they can solve them. First, we need to understand how they think about the future, which future scenarios they can see in reality, and how hopeful they are for the future, in general. In one study, when young people were asked to describe their futures broadly (not only relating to the environment), the environment was the most commonly-mentioned topic as a theme relating to the future, indicating that these individuals are heavily interacting with these problems and almost always mention them in any vision of the future (Kantenbacher et al., 2021). Young people felt more hopeful about their personal futures than about the future of society as a whole, suggesting once again that the whole crisis may be simply too big for any one person to process (Angheloiu et al., 2020). It is a fact that environmental concern is intertwined with future thinking for these younger generations, and those formulating education plans must consider their exact concerns and focuses for maximum efficacy and support.

Research Objectives

This study aims to understand how a sample of students at a large Midwestern university perceives the future. By asking participants what they see in a hypothetical future scenario, I draw from past knowledge on the efficacy of envisioning to test whether this exercise could potentially develop into powerful preparation and coping mechanisms for those preparing to enter a career or life that will, inevitably, deal with climate change and its side effects. Findings from this research may help us better understand the future that young adults anticipate and whether, if at all, shared visions exist, which would provide an effective springboard for educational conversations across the United States and beyond. If anything, this research hopes to call attention to the attitudes, beliefs, and visions held by college students so that we may better understand their complex concerns relating to the environment and work toward alleviating climate-related anxiety and stress with hope. More broadly, this research should open the conversation about future envisioning with questions for further research about perceptions and anticipations of the future.

METHODS

Two different methods were used to investigate how young adults envision the future. The first involved distributing an electronic survey to college students at a large university in the Midwestern United States via social media (i.e., Facebook, Instagram, Slack) and through email invitations sent to multiple student groups during September and October of 2022. One hundred nine (N=109) young adults completed the 5–10-minute survey. Applying minimum survey completion requirements and attentional screening checks resulted in a final sample of seventy-five (N=75) respondents.

The second method involved conducting interviews with a subset of young adults who responded to the online survey to explore their visions of the future in greater depth. Interview participants were recruited through a question at the end of the survey that asked respondents to provide contact information if they were willing to participate in a 30-minute follow-up interview. Twenty-one (N=21) currently enrolled students were identified and interviewed—with eighteen interviews conducted virtually, two conducted in-person, and one conducted asynchronously—during October and November of 2022. Interview participants were very similar to survey respondents regarding demographic characteristics (see Table 1) and educational and environmental background (see Table 2).

All study procedures, survey questions, and interview structure were submitted to a university-affiliated Institutional Review Board (IRB) and deemed exempt from oversight.

Demographics

As shown in Table 1, the young adults represented in this study were primarily Caucasian females from more urban areas, with annual family incomes of \$100K or more and a liberal political orientation. While 33 academic majors were represented across the study, environmental studies were the most common.

Views on climate change were assessed using the short, four-question Six Americas Survey developed by Chryst et al. (2018). These four questions assessed climate change concerns based on the importance of the issue, personal concern, concern for others, and future concerns. Using the scoring categories given by the researchers, survey respondents were placed into one of six groups (“Americas”) ranging in concern from “Alarmed” to “Dismissive.” As seen in Table 2, a vast majority (over 90%) of study participants indicated they were deeply concerned about climate change.

Regarding educational and environmental background (see Table 2), this group mainly comprised upper-level undergraduate students strongly interested in environmentally related courses. The frequency of exposure to environmental coursework was measured using a 5-point scale (*never* to *very often*). In addition, interest in the environmental course content was measured using a 5-point scale (*not at all* to *extremely*) to determine respondents' enthusiasm for environmental topics in an educational setting.

Table 1. Demographics of survey and interview participants

	Survey (N=75)	Interviews (N=21)
Gender (%)		
Male	23.9	33.3
Female	71.6	66.7
Non-binary/Self-describe	4.5	--
Ethnicity (%)		
African American/Black	1.8	--
Asian American/Asian	3.6	--
White/Caucasian	87.3	93.3
Multiple Ethnicities	7.3	6.7
Age (%)		
Under 20	14.9	9.5
20-24	77.6	76.2
Over 24	7.5	14.3
Annual Family Income (%)		
Less than \$25K	6.3	10.5
\$25K - \$49.9K	12.5	10.5
\$50K - \$74.9K	7.8	--
\$75K - \$99.9K	10.9	15.8
\$100K – 149.9K	26.6	36.9
More than \$150K	35.9	26.3
Residential background (%)		
Large/Medium Urban Area	37.3	23.8
Small City	34.3	33.3
Town/Village	22.4	42.9
Rural Area	6.0	--
Political Orientation (%)		
Liberal/Very Liberal	89.4	90.0
Moderate	10.6	10.0
Conservative/Very Conservative	--	--

Table 2. Educational and environmental background of survey and interview participants

	Survey (N=75)	Interviews (N=21)
Academic Standing (%)		
Freshman/Sophomore	13.3	9.5
Junior/Senior	69.4	71.4
Recent Graduate	1.3	14.3
Graduate Student	16.0	4.8
How often have you taken courses that discussed environmental issues? (%)		
Never	--	--
Rarely	13.3	14.3
Occasionally	14.7	4.8
Often	18.7	23.8
Very Often	53.3	57.1
To what extent did you find the environmental content in your previous courses interesting? (%)		
Not at all/Slightly	1.3	--
Moderately	13.3	9.5
Very	37.3	23.8
Extremely	48.0	66.7
Global Warming's Six Americas (%)		
Dismissive/Doubtful/Disengaged	--	--
Cautious	2.7	--
Concerned	4.0	9.5
Alarmed	93.3	90.5

Survey Measures and Analysis

To begin exploring how young adults envision the future, a survey instrument was developed that consisted of multiple-choice, fill-in, and Likert-rating scale questions. The 5–10-minute survey included questions designed to assess how likely participants believed various anticipated futures would be in the year 2050, their general concern about climate change, exposure to and interest in environmentally-related coursework, and general demographic characteristics. A complete list of survey questions is available in Appendix A.

The bulk of the survey consisted of 5 question banks asking participants about their anticipated futures using a 7-point scale (*very unlikely* to *extremely likely*). Each question bank

asked participants to rate aspects of what life may be like in the year 2050 in the United States regarding Technology and Energy Use, Transportation, Food and Agriculture, Material Use and Consumption, and Community and Well-Being. The same year and country were used as a response baseline in hopes of creating more streamlined answers by making imagining the future more manageable. Drawing on the research of Kantenbacher et al. (2022), which asked young adults to describe their idea of the most likely future scenarios in interviews, the researcher and advisor wrote the items for each question bank based on what we determined were important topics and facets of the future to consider.

Descriptive statistical analysis was used to characterize survey and interview respondents based on general demographics, attitudes about climate change concerns, and exposure to environmental coursework. Descriptive statistics were also used to calculate frequencies and mean scores for endorsement of the various anticipated futures. Mean scores of anticipated futures were then used to determine the most- and least-often endorsed visions of the future.

Interview Methods

Interview Measures

A semi-structured interview procedure was developed to organize and guide interview conversations. In general, interviews began by asking participants to consider how often they thought about the future, then asked them to describe a best-case scenario for some time in the future where climate change targets had been achieved¹. Participants were also asked to describe how climate change had been addressed in the future, including the likely drivers and forces of

¹ The original interview structure mentions the year 2050, but, for most interviews, I simply asked about the general future to place more emphasis on the best-case scenario and deemphasize a specific date of achievement.

change that contributed to the success of the climate action movement. Finally, participants were asked how hopeful they were for this self-described future. Each interview question was left open-ended and up to interpretation by the interviewee, allowing for a range of answers.

Interviews were recorded and transcribed with the permission of the participants. For a complete list of interview questions, see Appendix B.

Best-Case Scenario Futures

This measure was also adapted from the study by Kantanbacher et al. (2022) on young adults' perceptions of the future, in which interviewees were asked to describe their best-case scenario future. Instead of asking for the most likely scenario, as was done in the survey, this envisioning exercise allowed further exploration and development of optimistic ideas of the future as described by participants. Participants were free to express their thoughts based on what came to mind.

Doing this can be difficult. As previously mentioned, Angheloiu et al. (2020) found that self-centered (or narrower) views of the future were often more hopeful than those where the entire world was in focus. This relates to the overwhelming nature of this problem—it is a forefront concern for young people, but the future is simply too broad in scope to imagine without some prompting.

Therefore, participants were subsequently prompted using the five main categories used in the survey: Technology and Energy Use, Transportation, Food and Agriculture, Material Use and Consumption, and Community and Well-Being. By offering these frames, I attempted to make envisioning easier for participants to manage.

Hope

A critical component of the interview questions was hope or pessimism for the future. After describing their best-case scenario futures, interviewees were asked how hopeful they felt for the scenario they self-described. This allows for a distinction between hopeful and pessimistic expectations. Moreover, it provides insight into how hopeful this sample population is for the future and climate action, which can help make more accurate suggestions for the next steps in this movement.

Learning through Envisioning

The nature of envisioning is that it is an exploratory exercise, allowing the participant to test the boundaries of their thinking. Intentionally, the questions were open-ended and did not prompt a positive or negative response or any particular solution.

The final question asked in each interview was, "Has this exercise told you anything about how you envision the future?" By asking participants to reflect on the conversation at the end of the interview, they were prompted to reflect on the envisioning work and how it can be used to promote productive future thinking.

Interview Analysis

Each interview was transcribed by hand using the oTranscribe web software. The single interview conducted asynchronously through written responses was treated like a transcription.

Since interview data was open-ended and qualitative, I coded responses using frequently-appearing themes to determine trends from the data. Rather than using deductive content analysis (like by Angheloiu et al., 2020), in which codes are formed based on existing codes and knowledge, I followed the more emergent and open-ended approach of Kantenbacher et al. (2022) to identify common themes.

SURVEY RESULTS

Technology & Energy

Survey results indicated that respondents anticipate a future with much more renewable energy generation and a greater focus on efficiency. However, they also foresee an energy system that is increasingly under stress, leading to periodic outages. This may suggest a more intent focus on energy conservation and frugality, especially considering the suggested vulnerability of technology and energy.

As seen in Table 3, “increasing energy demand and a stressed electrical grid” ($M=5.84$; $SD=1.09$) was the future that survey respondents decided was the most likely from the set of questions on Technology and Energy. Most of the Technology and Energy scenarios had high agreement, except for the scenario in which “everyday life hasn't changed much except for better technology,” which was more divided in terms of likelihood: 6 respondents were Neutral on this scenario, and 18 found it either Very unlikely or Unlikely, with 34 finding it either Likely or Extremely likely. This was also the future with the least endorsement ($M=4.25$; $SD=1.86$), suggesting respondents lacked agreement about the necessity of technological progress in solving these problems.

Transportation

Respondents seemed to imagine shifting modes of travel, especially in local and small-scale systems, with a move toward more densely populated areas and various transportation modes like biking, walking, and public transportation. They did not envision long-distance patterns and systems to change considerably, nor did they feel, generally, that travel distances or frequencies would decrease.

“More frequent self-transportation and public transportation and less personal vehicle use” was the future that survey respondents decided was the most likely from the set of questions on transportation, as shown in Table 3 (M=5.29; SD=1.34). Respondents were least likely to endorse a future where “most people rarely travel by air and use trains instead for long-distance travel” (M=2.51; SD=1.37).

Table 3. Likelihood of anticipated futures related to technology, energy, and transportation according to survey respondents (%)

Below are a series of statements about what life might be like in 2050 in the United States. Please indicate the extent to which you feel each statement is likely to be true.

	Very unlikely or Unlikely	Slightly unlikely	Neutral	Slightly likely	Likely or Extremely likely
Technology & Energy					
Everyday life hasn't changed much, but we have much better technology.	24.6	13.7	8.2	17.8	35.6
Advances in technology have dramatically reduced our dependence on fossil fuels.	6.8	6.8	--	39.7	46.6
Most homes and buildings have solar panels.	4.1	9.6	6.8	31.5	48.0
Increasing energy demand has stressed our electrical grid, causing occasional power outages/blackouts.	--	4.1	6.8	23.3	65.8
Most homes and buildings have been renovated to make them more energy efficient.	6.9	17.8	8.2	26.0	41.1
People are a lot more careful about wasting energy.	10.9	16.4	9.6	32.9	30.1
Transportation					
Electric vehicles have almost entirely replaced gas powered vehicles.	4.1	9.6	6.8	38.4	41.1
In populated areas, many more people rely on walking, biking, and public transit instead of personal vehicles.	4.1	5.5	9.6	26.0	54.8
Most people stay close to home and rarely travel long distances.	54.8	17.8	12.3	12.3	2.7
Air travel is rare and a lot of long-distance travel is done by train.	63.0	15.1	11.0	6.8	4.1

Food & Agriculture

Visions relating to Food & Agriculture were comparable in endorsement, with scenarios that were split between being likely and unlikely. Survey respondents were not overall optimistic

about dietary changes, indicating some potential skepticism about the likelihood of wide-scale dietary changes. However, there was an element of innovative techno-optimism represented within the more highly endorsed scenario about lab-grown meat. This suggests that it was easier to envision a future that includes innovations in agricultural technology and food science, rather than changes in personal dietary behaviors.

As seen in Table 4, on average, survey participants most highly endorsed a future in which “lab-grown meat is common and widely accepted” ($M=4.61$; $SD=1.59$), and least-endorsed the future in which “most people tend to cook meals at home and rarely rely on convenience foods or food from restaurants” ($M=2.89$; $SD=1.36$). Respondents shared the most agreement about home gardens and personal food growth, though these results were far from unanimous.

Respondents disagreed more on Food and Agriculture scenarios than in any other category. The scenario in which “most food is grown and consumed locally and seasonally” shows 29.1% of respondents finding the scenario very unlikely or unlikely and 38.9% of respondents finding the scenario slightly likely, likely or extremely likely. 43.1% of respondents found the “shift to plant-based diets” very unlikely or unlikely, and 37.5% found it slightly likely, likely, or extremely likely. A future scenario in which “people have gardens and grow their own food” also showed a split distribution, with 18.1% of respondents finding it very unlikely or unlikely, 22.2% of respondents finding it likely or extremely likely, and yet only 9.7% of respondents unsure or neutral about the scenario.

Material Use & Consumption

Scenarios relating to Material Use & Consumption can be broadly described by a strong endorsement for a change in materials use and business practices. Technology was prevalent as a

theme for a shift to more sustainable use of materials. However, it appears to supplement rather than break down global trade and supply chains and current business practices. Based on survey responses, consumerism seems to be wholly embedded into society, with a vision that trends toward similar consumption levels that are somehow made more “sustainable” through technological advancements or other changes.

As shown in Table 4, the most likely scenario for respondents relating to Material Use and Consumption, on average, was one in which “most packaging and products are recyclable instead of landfilled” ($M=4.86$; $SD=1.46$). The least likely scenario for this category was one in which “people practice frugality often and only buy what they need” ($M=2.70$; $SD=1.38$). The scenario in which “consumer goods are produced locally and made to last” was interesting: most respondents (56.5%) fell between the middle unlikely-slightly likely range, with only 11.3% indicating they believed this scenario was likely or extremely likely.

Table 4. Likelihood of anticipated futures related to food, agriculture, material use, and consumption according to survey respondents (%)

Below are a series of statements about what life might be like in 2050 in the United States. Please indicate the extent to which you feel each statement is likely to be true.

	Very unlikely or Unlikely	Slightly unlikely	Neutral	Slightly likely	Likely or Extremely likely
Food & Agriculture					
Most food is grown and consumed locally and seasonally.	29.1	19.4	12.5	25.0	13.9
Many people have shifted to a plant-based diet and only eat meat occasionally.	43.1	16.7	2.8	25.0	12.5
Most people tend to cook meals at home and rarely rely on convenience foods or go out to eat.	41.7	29.2	15.3	9.7	4.2
Many more people have gardens and grow their own food.	18.1	13.9	9.7	36.1	22.2
Lab-grown meat is common and widely accepted	15.3	6.9	12.5	30.6	34.8
Material Use & Consumption					
Most products and packages are now recycled instead of landfilled.	8.7	11.6	7.2	34.8	37.6
Nearly all businesses use sustainable practices and try to minimize or offset their impact on the environment.	14.4	13.0	13.0	29.0	30.4
Many more consumer goods are being produced locally and made to last.	31.8	17.4	14.5	24.6	11.5
It’s normal to repair or find new uses for items when they are broken, not just throw them away.	21.7	2.9	13.0	42.0	20.2
Most people practice frugality, purchasing only what they need and rarely buying things just for pleasure.	49.3	30.4	5.8	10.1	4.3
People feel less pressure to follow consumer trends and buy the latest products.	43.0	26.1	11.6	14.5	5.7

Community & Well-Being

The questions about Community & Well-Being were perhaps the most telling about respondents’ thoughts about the future. Responses overwhelmingly predicted more anxiety, difficulty, stress, and insecurity exacerbated by climate change. The highest-endorsed future scenario relating to Community and Well-Being was one in which “extreme events are more common and people are increasingly displaced from their homes and communities” (M=6.34; SD=0.86), as shown in Table 5. Within this bleak future, there was perhaps some indication that

communities may be built stronger, with a desire to be optimistic but a reluctance to embrace community action as a driver of climate action. The least-endorsed future scenario for this category was one in which “people feel a strong sense of community and innately want to help each other” (M=4.33; SD=1.44). The scenario in which “civic engagement is common and most people are involved in efforts to improve their communities” has most respondents (n=44) falling in the slightly unlikely-slightly likely range. Therefore, this suggests a reluctance for cooperation and civic involvement, though it seems there is an underlying desire for such cooperation. The endorsement of the scenario in which “communities have grown more tolerant and accepting” shows that, while there is both skepticism and optimism about positive social change, most respondents believe this is at least slightly likely.

Table 5. Likelihood of anticipated futures related to community and well-being according to survey respondents (%)

Below are a series of statements about what life might be like in 2050 in the United States. Please indicate the extent to which you feel each statement is likely to be true.

	Very unlikely or Unlikely	Slightly unlikely	Neutral	Slightly likely	Likely or Extremely likely
Community & Well-Being					
Most people feel a strong sense of community and feel that we need to cooperate and help one another.	14.9	9.0	20.9	37.3	17.9
Civic engagement is common and most people are involved in efforts to improve their communities.	13.4	14.9	14.9	35.8	20.9
Most communities have grown more tolerant and accepting, believing everyone has something to contribute regardless of gender, ethnicity, or income.	10.4	17.9	9.0	29.9	32.9
Most people feel anxious and worried about the state of the world.	--	3.0	6.0	14.9	76.1
Extreme events have become more common, causing many people to be displaced from their homes and communities.	--	1.5	3.0	7.5	88.0
The health and well-being of most people has declined over the last few decades.	7.5	6.0	13.4	22.4	49.9
Many people have difficulty fulfilling basic needs (i.e., food, water, shelter).	3.0	4.5	9.0	19.4	64.2

Most and Least Likely Futures

Some scenarios stood out from the rest due to their especially high or low endorsement. These may provide a better insight into which visions of the future are most common among respondents.

Survey participants believed that extreme events, climate anxiety, stress on the electrical grid, difficulty fulfilling basic human needs, active transportation, and overall worsened health were the most likely futures from the options presented. They determined that air travel, long-distance travel, and consumer trends decreasing were least likely and that frugality, plant-based diets, and home-cooked meals increasing were the least likely futures from the options presented.

Generally, respondents picture a future that is overall more difficult and dangerous, with altered local transportation modes, more renewable energy generation methods, and an approach to diets and consumption similar to what exists today. Most of the change envisioned relates to weather, energy, and health and well-being, which may indicate that these topics are more manageable for respondents to form visions about or that they are more pressing concerns, thus stirring a desire for change in those areas. Food is a topic that causes the most disagreement among participants for future visions. In all, though there is considerable agreement in some categories, there is no absolute consensus about any of these visions, which is unsurprising yet still interesting.

Table 6. Most and least likely anticipated futures across all categories according to mean endorsement by survey respondents.

	Mean (S.D.)
Most Likely Anticipated Futures	
Extreme events have become more common, causing many people to be displaced from their homes and communities.	6.34 (.86)
Most people feel anxious and worried about the state of the world.	6.01 (1.02)
Increasing energy demand has stressed our electrical grid, causing occasional power outages/blackouts.	5.84 (1.09)
Many people have difficulty fulfilling basic needs (i.e., food, water, shelter).	5.61 (1.24)
The health and well-being of most people has declined over the last few decades.	5.33 (1.54)
In populated areas, many more people rely on walking, biking, and public transit instead of personal vehicles.	5.29 (1.34)
Advances in technology have dramatically reduced our dependence on fossil fuels.	5.21 (1.26)
Most homes have solar panels.	5.21 (1.27)
Electric vehicles have almost entirely replaced gas powered vehicles.	5.11 (1.28)
Least Likely Anticipated Futures	
Air travel is rare and a lot of long-distance travel is done by train.	2.51 (1.37)
Most people practice frugality, purchasing only what they need and rarely buying things just for pleasure.	2.70 (1.38)
Most people stay close to home and rarely travel long distances.	2.71 (1.39)
Most people tend to cook meals at home and rarely rely on convenience foods or go out to eat.	2.89 (1.36)
People feel less pressure to follow consumer trends and buy the latest products.	2.97 (1.54)
Many people have shifted to a plant-based diet and only eat meat occasionally.	3.31 (1.78)
Many more consumer goods are being produced locally and made to last.	3.55 (1.65)
Most food is grown and consumed locally and seasonally.	3.67 (1.63)

SURVEY DISCUSSION

The survey aimed to assess which visions of the future young people deemed most *likely*. Generally, these anticipated futures predicted more difficulty and were in many ways similar to current themes and trends in society. Five of the six most highly-endorsed visions of the future related explicitly to lives with worse mental health, heightened climate anxiety, more frequent extreme events, and an inability to meet basic needs. Climate anxiety is already relatively high, and extreme events are becoming more common each year, so it seems logical that this survey's participants believe that these problems are likely in their anticipated future (Maran and Begotta, 2021; UNEP, 2012). While this is not surprising, it does paint a worrying picture of the stress

inherently placed on this population—they can most readily imagine futures where life is more difficult. As Meadows (1996) writes in her paper about the efficacy of envisioning, by imagining negative futures, we gravitate towards them, sometimes subconsciously.

The sixth most highly-endorsed future scenario is related to transportation. Deeming walking and biking far more common in a most-likely scenario for the future shows a belief that entire structural systems will change in American society. Survey participants envisioned a future where personal vehicle use was less common, meaning a deemphasizing of cars, even those that are electric. It is important to note that many of these respondents came from urban hometowns, and most, if not all, of them reside in the city of Ann Arbor during the school year (when this survey was distributed) and thus perhaps find it easier to envision a future where walking and biking is more common. Again, as Guillo (2013) mentions, personal experiences can strongly influence visions for the future, for better or worse. Ann Arbor is a walkable and increasingly-bikeable city with free student public transportation—it may be easier for the participants of this survey to imagine a situation in which everyone walks and bikes and uses public transportation over cars simply because that is what they are used to. In this case, this is not necessarily bad, but it may result in a future scenario that cannot be widely applied to broader areas. Nevertheless, there seems to be widespread belief among survey participants that public transportation and walking and biking will become more prevalent in the future, which is inspiring.

The least-endorsed scenarios for the future are perhaps even more interesting than those highly endorsed because they show a metaphorical “digging of heels” where survey participants believe change will *not* occur, either because they do not deem it important or because they are reluctant to accept it. Two of the least-endorsed visions of the future were related to travel: traveling less by air and traveling fewer long-distance trips. In a world that is so global, it is

understandable that these young people (particularly the more affluent participants of this survey) may be uncomfortable with the notion of giving up long-distance or global travel, especially by air. Many people that attend the University of Michigan come from other states (or even from out of the country) and rely on air travel to attend school. The truth is that long-distance travel, *particularly* air travel, is incredibly costly in terms of carbon emissions (Lee et al., 2021). It would be beneficial for greenhouse gas emissions if air travel and long-distance travel were drastically lowered. However, based on these results, it may be challenging to convince highly global populations to change their behaviors in this way.

Another two least-endorsed anticipated future scenarios relate to consumption: the notion that frugality will be more common and that consumer trends will be less burdensome. Social media and its impacts could explain this strict hold on consumerism in the future. In the digital age of social media, consumption is almost glorified, especially among young people, who scroll on sites and apps like Instagram and TikTok that continuously try to sell users the latest trend (Pellegrino et al., 2022). It may be strange to imagine a society that is not moving by the whims of advertisements on television or cell phones. It also may be strange or uncomfortable for these survey participants to imagine a future in which purchasing is driven primarily by “need” rather than “want.” In a society where overconsumption is equated with prosperity, status, and success, it is not unusual to see pushback from young people when imagining a future where material consumption is significantly reduced.

The final two least-endorsed anticipated futures were related to food: more home-cooked meals and more plant-based diets. The scenario where “home-cooked meals are more common and individuals rely less on convenience foods or food from restaurants” may be unusual for college-aged people who often choose to rely on convenience foods or take-out food. Cooking

most meals at home requires preparation and dedication and, first and foremost, knowledge of how to do so, not to mention may be more costly upfront, so there is an understandable hesitation with this behavior for this population. Plant-based diets being lower-endorsed is interesting because the results were not wholly skewed one way. Some participants believed that widespread plant-based diets were very likely in the future, and some believed they were not likely at all. As previously mentioned, it is likely that participants who already practice eating less meat or eating an entirely plant-based diet anticipate this dietary change in society in the future and that those who do not eat plant-based may feel it is too difficult or too much to ask. Food is a richly cultural facet of life and may inherently be more difficult to change than other behaviors. This is an interesting avenue for further exploration, especially for determining how likely certain populations are to change their diet-related behaviors.

Lastly, the scenario relating to community and civic engagement being less-endorsed provides insight into how this population perceives society today. Perhaps there is a sense of perceived social unrest and lack of cooperation in today's society, and therefore an inability to imagine a society in the future where that is not the case. From the survey results, it seems that there is a desire to embrace such social cohesion, but it may be difficult to imagine this for the future given a lack of trust in current societal institutions.

INTERVIEW RESULTS

There were 6 general themes that emerged from the envisioning exercise interviews; these are further broken down into categories and sub-categories in Table 7 and explained in further detail below.

Table 7. Interview themes with categories and sub-categories.

Themes & Description	Categories	Sub-Categories (if applicable)
<p>Optimism/Pessimism <i>The level of hopefulness/hopelessness for a best-case scenario future</i></p>	<ul style="list-style-type: none"> • Hope for the future (n=7) • Lack of hope for the future (n=5) • Ambiguous response/not sure (n=9) 	
<p>Drivers of Change <i>Where change will come from</i></p>	<ul style="list-style-type: none"> • Bottom-up approaches (n=6) • Top-down approaches (n=8) • Both bottom-up and top-down approaches (n=7) • The US is not a main driver of change (n=8) • Environmental education (n=8) 	<ul style="list-style-type: none"> ○ Community action (n=10) ○ Voting (n=3) ○ Businesses and corporations (n=6) ○ Governments (n=5) <ul style="list-style-type: none"> ▪ Policy and legislation (n=7) ▪ Recent legislation (n=4) ○ Corporations <i>and</i> governments (n=7)
<p>System Overhauls <i>Larger, system-scale changes</i></p>	<ul style="list-style-type: none"> • Energy systems • Transportation systems • Agriculture/food systems • Waste systems 	<ul style="list-style-type: none"> ○ Renewable energy (n=17) ○ Nuclear energy (n=5) ○ Public transportation (n=18) ○ Electric vehicles (n=10) ○ Local/seasonal diets (n=10) ○ Smaller/localized farms (n=3) ○ Recycling (n=9) ○ Plastic use/single-use (n=7)
<p>Lifestyle Shifts <i>Changes to individual behaviors and cultural norms</i></p>	<ul style="list-style-type: none"> • People consume less energy (n=7) • Transportation • Food and agriculture habits • Consumption habits 	<ul style="list-style-type: none"> ○ Walking and biking (n=5) ○ People travel less (n=6) ○ Plant-based/low-carbon diets (n=8) ○ People grow their own food (n=2) ○ People consume less, in general (n=6)
<p>Long Road Ahead <i>Climate action will generally be very costly, long, and/or difficult</i></p>	<ul style="list-style-type: none"> • Getting to a best-case scenario will take a very long time (n=7) • Getting to a best-case scenario will be very difficult (n=9) 	<ul style="list-style-type: none"> ○ Disaster/wake-up call event (n=6) ○ Difficult to imagine path forward (n=4)
<p>Well-Being and Climate Change <i>Mental and physical health is improved if climate change is solved</i></p>	<ul style="list-style-type: none"> • Better mental health (n=11) • Better physical health (n=11) 	<ul style="list-style-type: none"> ○ Taking action (n=3) ○ Climate anxiety (n=4) ○ More time in nature (n=7) ○ Physical activity (n=2) ○ Environmental pollutants (n=4) ○ Food availability/quality (n=7)

Optimism/Pessimism

Interviewees expressed varied feelings of optimism when asked about their level of hope for a best-case scenario future. Most respondents were neither fully optimistic nor fully pessimistic for the future, but rather presented ambiguous or varied responses to my question of hope (n=9). This may suggest that participants feel varying levels of hope for different facets of climate action, or that the question was too broad and it was too difficult for participants to articulate their level of optimism for the future as a whole. One participant stated that she felt different levels of optimism about different parts of the future²:

“In some ways I’m optimistic. I’m optimistic that people care more, that we’ll be able to improve some things... But in other ways I’m very pessimistic. Just looking around me at things happening... in the last 10 years my house had to be evacuated twice for fires.” – ID1³

Participants who were generally hopeful (n=7) mentioned feeling that way because of their own level of environmental knowledge, confidence in societal behavioral shifts, and belief that drastic positive changes will occur in the future, to name a few reasons. One participant specifically called attention to her environmental education as a reason for positive futures-thinking:

“Even a few years ago I used to be a lot more doomed, but I think going through the [environment] major and learning about what is being done... I feel like I have more of a

² Some interview quotes have been minorly edited for format and to remove filler words.

³ Each participant has been assigned a number ID to identify their responses and protect anonymity.

positive mindset because I have a relatively realistic idea of the changes that can and should be made to help the environment.” – ID15

In many cases, even those that said they were hopeful expressed feelings of pessimism or doom. Even though best-case scenarios were described, negative views of the future still came to light:

“I'd say I hope but I don't think [getting to a best-case scenario] is very realistic. I think if we did implement different things that it's very possible. It's just, at this state and with our policies and with companies that really drive everything, I'm not very hopeful.” – ID8

This is an interesting theme that was highlighted through the interviews by the nuanced nature of responses, and poses a question about whether those that are hopeful for the future are truly only hopeful with conditional statements like the one presented above.

Those that expressly lacked hope (n=5) indicated feeling that way because society has not seen its peak problems yet, or that the drivers of change and time frame were barriers to real change. Some were adamant that this issue was unsolvable:

“I'm 0% hopeful. I think it's always going to be an issue for us. I'd love a world where we solved it all but I think there's a lot worse to come.” – ID7

Most of the responses (both positive and negative) that related to hope were associated with drivers of change, and almost always centered on some other party (whether that be other individuals or larger entities) than the interviewee themselves. For example, one participant said their hope was conditional upon whether individuals realized their impacts on the planet:

“As long as more people think about what impact they have on the global scale, I'm very hopeful that people can help solve the climate crisis in their own way.” – ID2

Another participant, who was less hopeful, attributed that lack of hope to effort from others:

“People just don't want to act on it... For some people, like the big corporations, it's just too much effort.” – ID17

These responses perhaps highlight the out-of-reach feeling that many young people associate with climate change. The problem at hand is just so large and far-reaching that a person does not believe their individual impact holds any water, meaning the blame falls to all other parties.

Drivers of Change

Who is going to solve this problem? This was an important question posed to interviewees, and allowed them to articulate *who*, if anyone, could be responsible for reaching a best-case scenario. Essentially, this interview question inquired after whom participants place their faith in. The responses were highly varied, but there was some agreement between participants on the broad “bottom-up” (community action, grassroots nonprofits, and individualized, localized movements) and “top-down” (larger governments, policy and corporations) approaches.

Communities working in tandem (n=10) seemed to be a well-endorsed vision for the future. One participant said, about her best-case scenario:

“I see community engagement and community resilience where we all work together and have centralized empathy for each other and the environment.” – ID14

One theme that emerged was the notion that these “grassroots” approaches could push larger entities like governments and corporations to change:

“At the end of the day, companies won't change unless there's a demand to change. If anything would happen from the top it's because the people from the bottom are supporting.” – ID4

Conversely, some respondents felt that a top-down approach was more likely to cause real change because of the laggard nature of human behavior change:

“I don't perceive it starting from the bottom, because I think that if less people are forced to change their habits, they're not going to.” – ID16

Those that believed the top-down approach was more likely (n=8) were in favor of new legislation and policy change, alternate business practices that place higher importance on sustainability, and more restrictions set by governments on businesses and people. Businesses were believed to be crucial in setting examples for their consumers and driving change through alternate material use and actions toward emissions reductions. Generally, visions about top-down approaches were coupled with skepticism that these changes would happen, but with a strong belief that it is the most important way to achieve actual change. For example:

“In an ideal world the companies that contribute the most emissions to climate change would make those changes on their own, but I don't think that'll realistically happen.” – ID10

“Knowing the intentions and the incentives of government, I think it'd be a lot of long hard battles, but I think policy is the biggest thing that we need.” – ID9

There tended to be more hope for governmental change and legislation across responses, especially due to new policy conversations happening during the time these interviews were conducted. Specifically, the Biden Administration's Inflation Reduction Act was mentioned several times by participants who felt that this was a positive step in the right direction for the United States. Some even noted more optimistic trends in course topics and conversations with professors. The hope that this new legislation inspired suggests that if more positive change occurs, attitudes about climate change might continue to shift toward less anxiety and more optimism:

“That was the first time I've been excited again about [climate action], like, ‘Oh, my country's actually trying to do something now.’” – ID13

This brought into question another interesting theme that arose related to the United States and its impacts on the future. I asked participants whether they believed the U.S. had the potential to serve as a leader in the fight for climate action, and many did not believe it was likely due to polarized political views, the culture of consumption, and the inequality of resource distribution. Others expressed some hope for the U.S.'s potential to inspire global change, citing the country's economic potential and a new generation of activism.

Overall, perhaps one of the most important results from these interview questions related to the necessity for cooperation, whether that was between governments and businesses (i.e., between different types of top-down approaches) or between all actors, bottom-up and top-down. One interviewee's statement captures the sentiment:

“All cooperation is needed, but I think everyone would have different roles. People would all shift in mindset and cooperation.” – ID15

Whether this was through voting, demands for change, or systemic alterations and regulations, collaboration and partnership seemed to be a highly-endorsed vision for getting to a best-case scenario. Environmental education, though I did not mention it or ask about it, was often also mentioned by participants and was endorsed as an important catalyst for change. Interviewees mentioned education relating to waste, food, business practices, consumption, and time spent in nature, to name a few. The theme was evident: more knowledge meant more positive change.

A participant even expressed his endorsement in the envisioning exercise he had participated in:

“I think really using this [envisioning] framework to kind of educate people about climate change is incredibly important.” – ID2

Where the change comes from is important to consider for the future—who do we push to make these changes? The insights offered by these participants shows that the solution will not be simple, but that each party at play has enormous potential.

System Overhauls

Energy Systems

Large, systematic changes are undoubtedly necessary for the scale of change required, and several themes emerged from interviews relating to this. A vision shared by almost all participants related to renewable energy systems in a best-case scenario future (n=17). Most of these visions mentioned solar power (n=13), but some also mentioned wind and hydropower:

“It's not going to happen overnight because there are so many economic benefits short-term to oil and coal. I think we need to start getting people to think more long-term about the economic benefits of solar, wind, geothermal, etc.” – ID2

Several visions of the future involved nuclear power, either as a transition energy source or an efficient or backup source of power, nuclear power was described in several best-case scenario futures:

"I envision a lot more nuclear plants because those are key to having some sort of base power that is a good source of energy." – ID11

Renewable energy is a commonly discussed potential option for the future, and continues to place high levels of faith in technology. This would also require an enormous shift in infrastructure and attitudes away from the current fossil fuel usage, but it is interesting that so many of the interviewees were confident that renewable energy existed in a best-case scenario.

Transportation Systems

Another large-scale system change envisioned for the future related to transportation. The highest-endorsed vision of the future across all interviews in any category was one in which public transportation is a central focus (n=18). These were described as a higher frequency of buses and trains, rideshare systems, and less individual car ownership. The safety, accessibility, and efficacy of public transportation were also mentioned as necessary changes. By far the most commonly-endorsed transportation shift was the use of electric vehicles (n=15). Whether due to the inevitability of cars or the shift to renewable sources of energy, electric vehicles were often envisioned in best-case scenario futures, especially due to the layout of the United States and the ease personal vehicles give people:

“Things are so spread out to the point where our infrastructure doesn't allow for public transit all that much... so, having a car at least at this point in time is kind of necessary.”

– ID2

Electric vehicles were also a point of concern for some participants, especially concerning batteries and sourcing of materials. However, there was a general agreement among participants that electric vehicles were a step in the right direction.

Agriculture & Food Systems

System-wide changes associated with food related most often to localization and seasonality, especially with an adjustment to consuming produce seasonally and losing the trade systems in place that require food to be shipped great distances. Some expressed a desire for more education on seasonal and local eating and for encouraging regulations on food imports and exports in order to regulate these changes:

“The globalization and industrialization of agriculture have created this huge industry of production and food production that requires a monoculture to be grown in one specific spot, packaged, shipped, across the nation, across the world, to various locales. We wouldn't be able to do that anymore.” – ID18

Smaller-scale farming was also a highly favored vision, especially on local scales. These visions involved less factory farming, monoculture, and “big” agriculture, with an increased emphasis on creative farming methods like urban and vertical farming. “Cash” crops that dominate the agricultural landscape in the United States were generally frowned upon, with hope for localized farms that primarily feed those in the immediate area:

“People will need to start producing food within urban areas and not relying on large farms.” – ID9

This is a change that would require immense overhauls of current agricultural systems, and while regulation was mentioned with regard to food imports, very few participants mentioned the direct governmental intervention that is necessary for these changes in food and agriculture systems to happen, suggesting that this may simply not be within the scope of this sample's view or understanding.

Waste Systems

Plastic and single-use material eradication was frequently mentioned as a systematic change that leads to a best-case scenario future. Recycling and composting were also often mentioned, with a call for more education on how these processes work and why they are beneficial:

“[We should] replace Styrofoam packing peanuts with biodegradable ones or stick to more cardboard mailers that can be recycled. Landfills and recycling systems would have to change because a lot of our current landfills don't promote decomposition and if they did it would probably solve some of our issues.” – ID10

Visions dealt often with “reducing” waste by replacing harmful materials with biodegradable or “more sustainable” options, which is not a poor vision for the future, but perhaps lack out-of-the-box thinking when it comes to waste reduction. In this case, the system changes required are large, but still allow for a business-as-usual approach (more often than not).

Lifestyle Shifts

Personal Energy Use

Several participants envisioned less individual reliance on an energy grid and less use for energy, in general:

“When it comes to [energy] use on a personal level I think that would be something that would have to be knocked down a lot.” – ID9

These visions were often more surface-level and described, simply, a future where individuals consumed less energy, but did not go deep into details about other ways humans might acquire energy or how such a reduction in energy consumption might be achieved.

Transportation

A behavior change that was most often described in relation to transportation was an increased focus on walking and biking, with better infrastructure to support a more self-mobile population and a culture centered around getting around on foot or by bike:

“I see expanded sidewalks so that walking becomes a mode of transportation but there's also 'bike highways' so bikes become a main transportation source.” – ID11

Some participants, though fewer, also imagined less travel, in general, especially global travel and travel done by air. As in the survey, this was not a highly-endorsed vision for the future, which indicates that a localized way of life may be a more difficult future to imagine, especially with United States' societal importance placed on global travel.

Food & Agriculture Habits

Plant-based diets were commonly mentioned as a personal behavior change in a best-case scenario future. Some participants were in favor of plant-based diets and others indicated they did not believe they were necessary to solving environmental problems. Others still felt that even if plant-based diets became more popular, it would not be enough of a change.

Generally, visions for the future relating to food emphasized a need for self-reliance, especially in the form of community and backyard gardens and a return to pre-modern knowledge and skill-learning. The COVID-19 pandemic was also, interestingly, cited by one participant as an encouragement to rediscover skills lost to industrialization, such as making foods from scratch after the closures of many restaurants:

“Giving people the opportunity to experiment with a lot of changes now and helping people familiarize with them can be super helpful. In that way I think the pandemic actually made a bit of progress. For example, a lot of people know how to make bread now. They didn't know how to make bread before, right?” – ID18

A shift to autonomous food production is an enormous one, especially considering the lack of free time in many modern lifestyles, but the emphasis on self-sufficiency points to a desire for a smaller-scale food system and less dependency on larger agricultural firms.

Consumption Habits

Behavioral changes regarding consumption often mentioned the “Rs of sustainability”: reducing, reusing, and recycling. Creativity and resourcefulness were also mentioned by several participants, especially with mindfulness and consumption habits:

“The things that we use should be the things that we need.” – ID5

Social media was commonly mentioned as a perpetrator of current harmful consumption trends, especially with the Internet's influence on almost every part of life. One potential solution to this appeared several times as a theme and seems to highlight a return to past behaviors, again:

“If we went back to a much slower, much less consumptive society, we'd all find that happiness that we're striving to find now.” – ID8

This response, and others, indicate a potential for happiness and well-being to be closely related to the harmful consumption patterns that exist today. Though it was not a common vision, looking to past behaviors to adapt to a turbulent future might provide potential solutions to the climate crisis.

Long Road Ahead

Many expressions of optimism or pessimism were paired with an assessment of timeline, with several participants stating that they were hopeful for their best-case scenarios to come true but that the 50-year (and even 100-year) deadlines set by climate scientists were unrealistic. Many were concerned with the time frame of this issue and were therefore skeptical that major change could occur before 2050 or 2100:

“It would probably be long term until a best-case scenario and would involve a lot of things changing beforehand.” – ID21

The path toward a best-case scenario was also often described as incredibly difficult and taxing due to all of the issues humanity is facing, with timelines and strategies for change that are difficult to envision. Another theme was the disbelief in the likelihood that attitudes and behaviors would change enough, and quickly enough:

“The majority of people [don't want to change] so I find it very hard, especially in the time frame it needs to be done, to see it.” – ID11

The difficulty associated with movement into the future was paired with a theme in interviews about disaster or “wake-up call” events. Several participants, though at times reluctantly, admitted that they believed this was necessary to jump-start climate action:

“A crisis needs to happen in the first world, in the U.S. Obviously that's sad, but I feel like it's the only way to get people to realize that it's an important issue.” – ID12

For this sample, which is made up of individuals that are already concerned about climate change, this sentiment shows a frustration with those that deny the existence of these problems or those that have dragged their feet in taking action. This, too, relates back to the notion that experiencing extreme events makes one more likely to care about environmental issues.

Unfortunately, the scope of these problems is so large that some interviewees expressed feeling utterly lost:

“I can't even begin to picture what we're going to do.” – ID12

Envisioning becomes difficult when there is a lack of hope and when there are so many variables at play, so it is understandable that interview participants found this exercise difficult at times. This is something to be constantly mindful of when considering other applications of envisioning, and why specific prompts can help reduce the overwhelmingness of these questions.

Well-Being and Climate Change

This was an important facet of the interview questions because while I only asked about well-being, in general, most participants took it upon themselves to answer in two parts: physical

and mental health. Both physical and mental health were described to be improved in a best-case scenario where climate change is no longer a problem, and this was a widely agreed-upon vision for the future, indicating that these are issues that are relevant to these young people.

Better mental health was attributed to involvement in climate action (i.e., feeling better about the crisis by working to solve it), a stronger sense of community, and increased time spent in nature. More broadly, participants strongly believed that climate anxiety would be reduced or eradicated in a best-case scenario future:

“People would be a lot better mentally if they witnessed the solutions happen for the climate.” – ID15

Better physical health was attributed to increased walking and biking habits, as described by changing transportation habits, and higher activity levels resulting from a greater emphasis on self-sufficiency (in gardens and with materials repair, for example). Decreased environmental toxins and pollutants were also mentioned for improving physical health, and several participants called specific attention to current environmental justice issues such as the Flint, Michigan water crisis:

“I also think of health in response to environmental justice issues or pollution in the air, like the Flint water crisis and the Kalamazoo river oil spill. I see an absence of toxicity in our resources, absence of toxicity in our air, in our water, in our food” ID14.”

Food was also an important measure of better physical health, with more local, seasonal, and organic produce becoming a focus in everyday diets. Generally, the best-case scenario visions for the future relating to health were overly positive, especially in comparison to other categories.

Learning through Envisioning

At the very end of the interview, I asked interview participants whether taking part in the envisioning exercise opened their eyes to anything new or inspired any thinking that they might not have arrived at otherwise. Some told me that they had never thought about some of these issues in a future scenario before, and that by talking through some potential options for the future, they were able to piece it apart in a more digestible way to interact with these very broad and difficult topics:

“I feel like I came in knowing I'm not super positive about this, but I think in trying to explain myself about it I kind of realized that if I don't know the answer, I'll kind of assume the worst. It makes me feel worse about it when I don't know what the solution is.” – ID12

Most participants had never taken part in an exercise like this one before, and found it difficult to envision a best-case scenario future on the spot, especially when there are so many variables one could consider. One participant mentioned the exercise feeling like the children's film “The Lorax,” in which the concept of a best-case scenario future is so beyond the scope of general understanding that a childlike sense of idealism is the only way to describe it. Of the 21 participants, 14 stated that by imagining a best-case scenario future they learned something new, indicating that they left feeling more hopeful about the future, more open to concepts they had written off, and more understanding of their own anxieties.

INTERVIEW DISCUSSION

One of my questions of interest was the level of hope young people hold regarding climate change. While interview participants were split on their level of hope, many more were

hopeful or felt more optimistic about the future than I expected. However, this was only the case for some participants. Many were still pessimistic, mentioning things like natural disasters and personal experiences with such events in their pessimistic views of the future. Participants' pessimism about the future because of extreme natural disaster events relates to the notion set forth by Paolo et al. (2020) in which young people who have experienced such events feel more worried about the future. A direct experience with a negative side effect of climate change makes the problem seem more real.

The reasons for hope, or lack thereof, were often coupled with an explanation that dealt with the actions of others, namely regular citizens and major actors like governments or corporations. Participants were either hopeful because of changing attitudes (the idea that others are changing their opinions for the better, so more action may occur) or fearful that attitudes would not change quickly enough to cause substantial positive change. Others believed that lack of action from major corporations, politicians, or other governmental bodies holds change back. This suggests a lack of focus on personal impacts and behaviors, whether that be because individuals believe the actions of one person do not make enough of a difference or because it is easier to place "blame" on other entities. Either way, it is concerning that there is a lack of focus on one's own potential impacts, especially considering that no change is possible if most people believe nothing they do will make a difference. As Angheloiu et al. (2020) found, focusing on oneself gave young people more confidence in positive future outcomes. It would be interesting to ask a similar population in a follow-up study about how they believe their impacts and actions could move society toward a best-case scenario future in order to determine more accurately how these young people feel about their personal place in the climate action movement.

Similar to this was the question participants were asked about drivers of change—there was no consensus among participants about which driver of change held the most power. Some suggested bottom-up approaches were most crucial, and others believed the power indeed sits with top-down approaches like those by corporations or governments. Some believed individuals simply did not hold enough weight in society to enact real change, and others expressed a frustration over the inaction by governments and corporations without an upward push from individuals. It seems like interview participants feel like they are at a stalemate between several major players—they do not generally have high hope for any one entity, including, again, themselves. Without a firm hope in their generation for enacting change, it may be challenging to motivate and inspire even these highly-concerned individuals to take action, let alone those who are considered “Disengaged” or “Doubtful” by the Six Americas scoring categories (Chryst et al., 2018). Whether this is related to a general anxiety about the problems at hand or, again, the fact that this population feels highly overwhelmed about these problems is unclear.

Some visions for a best-case scenario future were much richer and more detailed than others, and this usually indicated that the participant had thought about the future within that topic before (i.e., a participant concentrating on sustainable food studies in school may have much more to say about what a sustainable food system would look like than others would). This sentiment reflects the notion that increased environmental knowledge might offer more hope to those preparing for the future. As Holfelder (2019) writes, education prepares one for the future, and giving young people adequate knowledge can clear the fog from pathways into the future. It is clear that visions for the future could therefore become much richer and more detailed in general with environmental education and freedom for creative envisioning.

They may also become richer when shared with others. One of the most striking discoveries from the conversations with college students about their visions of the future was the lack of one shared vision. Multiple ideas were expressed across each larger topic discussed, and beyond the very frequent future visions of public transportation and electric vehicles, no two participants envisioned the same best-case scenario future across all or most categories. Visions of the future, therefore, may hugely benefit from a process of collaborative generation. These interview participants already deemed collaboration on climate action highly important. Since envisioning is one way to prepare for the future, this exercise could also be done effectively in a group setting. In a study where people were placed in focus groups and asked to share their sources of hope for the future with each other, Hicks (2006) found that people left this exercise feeling more hopeful than they were when they began. Though visions of the future differ among these participants, discussions about each of their ideas of resilience and hope may inspire further conversation and futures-thinking.

One of my interests was evaluating how successful an exercise like this may be for conversations about climate action. These results highlight a new, interesting insight into the minds of the participants of this study on their own, but I also wanted to ask the participants themselves to evaluate how it felt to envision a best-case scenario future. As suggested by the responses of the interviewees, I strongly believe that since this exercise, at the very least, encouraged participants to think more closely about the future. It subdued some feelings of dread, and is therefore an exercise that can be widely applied to others, both to ease climate anxiety and to motivate individuals to action.

OVERARCHING THEMES

In general, since interview participants were sampled from a subset of survey participants, most participants of both elements of this study were very highly concerned about climate change and involved in some way with environmental coursework or extracurriculars. Therefore, it is also unsurprising that many common themes can be drawn between the survey and interview. This sample of young people share worries about the future and can see some scenarios more clearly in the future than others, finding those that are deeply ingrained in today's consumerist culture especially difficult to let go of. These scenarios often correlate to personal beliefs—for example, an individual who sticks to a plant-based diet may have an easier time envisioning a future where all people only consume plant-based foods. This supports Guillo's (2013) perspective on envisioning being influenced by knowledge and experience.

In general, participants associate climate change with anxiety and poorer well-being. They are in agreement that solving this issue would alleviate stressors and make life better as a whole, which supports findings from Maran and Begotta (2021) about the link between climate change and anxiety. In line with the potential future scenarios imagined by Holmgren (2012) and the Millennium Ecosystem Assessment (2005), participants find that the future looks different in many ways, placing heavy importance on technological and innovative changes and having more faith in systematic overhauls than in personal behavior changes. It was easier for participants to imagine governments and businesses driving change in many ways. However, the importance of bottom-up and community-led approaches was well-recognized, highlighting the necessity for a highly varied approach to these issues. Finally, though there was not enough data to compare levels of environmental knowledge against types of visions of the future, these findings suggest

that a closer interaction with environmental topics prepares individuals better for an unpredictable future.

Overall, visions for the future vary widely, even among a population of highly-concerned individuals. Whether it is more sensible to encourage highly varied approaches or work on streamlining an approach to the future, I cannot say, though this may be an interesting question to explore in further research. I can suggest that inquiring after the futures that people anticipate and hope for can be a compelling way to explore solutions to perhaps one of the most important and universal issues humanity has faced.

FUTURE RESEARCH

One goal of this research is to open doors for further exploration and research into perceptions of the future under climate change and how they can shape our plans for climate action and preparation for the future.

The questions asked in this research study through the survey and envisioning exercise can be adapted and applied to virtually any population who might offer a new perspective and valuable insights on climate action and the world's future under climate change. This is useful for determining overlapping visions among age groups, locations, education levels, and more. Studying populations who may lack a general understanding of climate change will provide insights into the gaps in climate communication; studying populations from different demographics will provide insights into how different groups are preparing for the future, if at all; studying populations of different ages might fill gaps in research about how the environmental thinking of these groups differs. Gathering an understanding of the shared or fragmented visions of the future by humans from all varying perspectives brings the conversation

one step closer to completion—it provides a framework for continued discussion and preparation for an unpredictable future.

LIMITATIONS

The sample for this study consisted of students from a large, public Midwestern university using a convenience sampling method. As a result, survey and interview participants are unlikely to be representative of how all young people (or even all young people at this university) anticipate the future. Participants of this study were enrolled in college, primarily white, from fairly wealthy backgrounds, and felt very worried about climate change. Interview participants were self-selected, all with very similar demographics to the survey participants. Given this, there may be response bias because students with a more vested interest in climate action may feel more compelled to complete a survey or participate in the 30-minute interview. Those willing to share their opinions about the future with an environmental lens are likely generally more eager to share those thoughts in the first place.

I chose to focus on students at the University of Michigan for sampling convenience, using social media and email lists to recruit participants. These students came from various majors and academic backgrounds, but there was not enough distinction to compare groups by academic major or by exposure to environmental coursework, which may have provided some interesting results if the sample size was larger or more deliberate grouped sampling strategies had been used.

The fact remains that almost all students that participated in this study were very concerned about climate change, which says more about the reason they volunteered to participate than it does about the consensus of University of Michigan students—though, the

school generally attracts students that are politically active and more liberal, so this is not unusual for the population (“Survey shows,” 2017).

The external validity of this study would have been improved if I had sampled from several universities or purposely sampled students from several areas of study to allow for more variation in the data, but the results presented still provide interesting insights into the way some young people are thinking about the future as it relates to environmental issues. The study eventually benefited from its focus on students with a vested interest in environmental issues—these individuals are most likely to take action in the future, especially in their careers.

The interview data was especially interesting for better understanding the sample and their feelings about the future. Having the participants' thoughts articulated verbally in an open-ended way made it clearer to underscore some more prominent themes in the survey data, and unexpected links appeared between responses. These responses also required more thought and attention than the multiple-choice survey questions, so students could share their authentic thoughts about the study topic.

Thus, though I cannot make any broad claims about all young people and their anticipated futures or level of hope for the future, I believe the data presented offer an insight into the minds of environmentally-concerned young people that may very well be at the forefront of the fight for a more sustainable future.

CONCLUSION

Humanity is at a vital tipping point with the complex problem that is anthropogenic environmental degradation. As we consider the future and the actions that must be taken to propel society into a livable and enjoyable future scenario, it is crucial to investigate how the people who will live well into the next generation perceive and feel about the future.

One of the primary goals of this research study was to determine how young people perceive the future under several frames of environmental topics, given their knowledge of climate change and their involvement with environmental coursework and extracurricular activities. This study was intentionally exploratory, allowing trends and themes to emerge from survey and interview data rather than testing for a single independent variable. Mostly, this research aimed to answer the question: “Where do we go from here?”

The findings from this study suggest that envisioning could be a powerful tool for environmental action planning, specifically in higher education spaces. Allowing young people to develop visions of the future based on their knowledge and feelings of worry about the climate crisis invites more introspection into, and potential solutions to an issue that tends to be too complex to solve with just one approach.

Focusing on hope as a driver for change emerged as a robust way forward; climate anxiety is enmeshed within this conversation, and young people are both experiencing it and often thinking about it. Inaction and a lack of hope are the two killers of solutions to this problem—without a drive to move forward into a better future, it will simply not happen. By assessing the described visions of this sample of individuals, I assessed how a broader implementation of an envisioning exercise within educational spaces, institutions, companies, or everyday life could inspire more hope and, thus, more action among this population.

This project contributes to existing works about the efficacy of envisioning. It provides an understanding of the perceptions of a population highly concerned about the climate crisis and who is, therefore, perhaps more likely to be involved with the movement in later life. With a better understanding of their varied visions for the future, we can characterize plans of action and

determine methods for creating more coherent, shared, and resilient visions so that this population may be optimally inspired to target this major crisis.

As suggested by the countless avenues for potential research, this conversation is only the beginning of envisioning a method for driving climate action. While it is increasing among American populations, climate concern is not the final nail in a proverbial coffin of inaction. This study's participants were highly concerned and yet still held a moderate level of hope when envisioning best-case scenario futures. Many participants also learned from and felt inspired by this exercise, further suggesting the efficacy of this strategy for inspiring action.

Far more work can and should be done to determine possibilities with envisioning and future-centered thinking. As I have suggested countless times, a multi-faceted approach that mobilizes many different groups is absolutely essential. Trusting people to provide their ideas—no matter how involved or worried they initially are with the problem—is a foolproof way to ensure that inspiration and hope continue to flourish well into the future.

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APPENDIX A – SURVEY QUESTIONNAIRE

Thank you for participating in this study. The purpose of this survey is to explore how college students envision the future, given the environmental and social challenges we are likely to face. Please answer these questions as completely and honestly as possible. This survey should take about 10 minutes to complete.

*What is your current academic standing?

Select one ▼

- Freshman
- Sophomore
- Junior
- Senior
- Grad Student
- Recent Graduate

*Have you declared an academic major/area of study?

- No, I'm undecided
- Yes, I have declared an academic major/area of study

Display This Question:

If Have you declared an academic major/area of study? = Yes, I have declared an academic major/area of study

*Please list your major(s)/area(s) of study:

*Have you declared any academic minors?

- No, I have not declared any academic minors
- Yes, I have a declared academic minor(s)

Purchasing green/sustainable products when possible

Eating a low carbon/plant-based diet to reduce emissions

Seeking out information on environmental issues (e.g. news, books, documentaries, podcasts, etc.)

Supporting or working with an environmental organization, group, or club

*How much do you think climate change will harm future generations of people?

Not at all Only a little A moderate amount A great deal

*How important is the issue of climate change to you personally?

Not at all important Slightly important Moderately important Very important Extremely important

*How worried are you about climate change?

Not very Somewhat Very

*How much do you think climate change will harm you personally?

None at all A little A moderate amount A great deal

*Please indicate how much you agree with the following statements.

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
I can easily imagine a world in which we supply all our energy needs without harming the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to imagine a world where we no longer use fossil fuels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can imagine a world where we exclusively use agricultural practices that protect the natural habitats of animals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can imagine a world where politicians care more about minimizing the population’s negative impact on the environment than economic growth.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can think of numerous methods of achieving a world where carbon emissions are reduced below current levels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can easily imagine a system in which the government reflects the interests of the natural environment rather than interests of the wealthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can easily imagine a world where people see themselves as integrated with nature, rather than masters over the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I imagine what an ecologically sustainable existence for humans would look like, I can picture it in detail.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A harmonious relationship between humans and the natural world is easy for me to imagine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*What is your gender?

- Man
- Woman
- Non-binary / third gender
- Prefer not to say
- Prefer to self-describe

*What is your age?

*Which of the following would you use to describe yourself? Check all that apply.


- African American/Black
- Asian American/Asian
- Hispanic/Latinx
- Native American/Alaskan Native
- Native Hawaiian/Pacific Islander
- White/Caucasian
- Other (please specify)
- Prefer not to answer

*Approximately, what is the annual household income of your family before taxes?

Select one


- Less than \$25,000
- \$25,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$149,999
- More than \$150,000
- Don't know/Not sure

*Which of the following best describes the area in which you grew up?

Select one 

- Large urban area (over 500,000 people)
- Medium-size city (50,000 to 500,000 people)
- Small city (10,000 to 50,000 people)
- Town/Village (under 10,000 people)
- Rural, outside of any city/village
- Don't Know/Not sure

*In general, how liberal (left-wing) or conservative (right-wing) are you?

Select one 

- Very liberal
- Liberal
- Moderate
- Conservative
- Very conservative
- Don't know/Not sure

Thank you for completing this survey. Would you be willing to participate in a 30 minute follow-up interview about some of the issues addressed in this survey?

No

Yes

Display This Question:

If Thank you for completing this survey. Would you be willing to participate in a 30 minute follow-up interview about some of the issues addressed in this survey? = Yes

Please provide your email so the researcher can contact you about setting up an interview at a time and location that is most convenient for you.

APPENDIX B – INTERVIEW STRUCTURE

Interview Semi-Structure*

*This interview will follow the natural flow of conversation depending on where the interviewee's interests lie, and these questions serve to act as guiding prompts for discussion.

Pre-Interview Audio Recording Consent: Thank you for meeting me today to participate in this interview. In order to accurately capture your thoughts and perspectives, I would like to record audio of our discussion. This recording will only be used to transcribe the interview and will be deleted as soon as transcription is complete. I will not collect any personally identifying information during this interview and you will not be personally identified in any reports, materials, or summaries that draw on this interview data. Please feel free to tell me if you do not feel comfortable being recorded. In this case, I will take interview notes manually during our conversation. Do you consent to be recorded?

Questions:

1. How often do you think about the future, and in which contexts?
 - a. → How does thinking about the future usually make you feel?
 - b. → Does thinking about the future give you hope?
 - c. → To what extent do you think that the future you think of will become reality?
2. Based on your current understanding of climate change and climate action, when you picture the future of the environment, how do you feel?
3. I'd like you to imagine that it's the year 2050 and that our society has achieved net zero emissions. This means that no new greenhouse gases are being emitted into the atmosphere and the worst impacts of climate change can now be largely avoided. When you think about this best-case scenario, what is the first thing you imagine or see in that future?
 - a. → Ask follow-up questions based on what the interviewee talks about. i.e., If the interviewee seems interested in energy, ask more questions about what that might look like in the future. The goal is to allow the student to picture this future in detail and go beyond surface-level statements like "Everything will be more sustainable."
 - b. → Follow up questions about the following topics that are also addressed on the survey:
 - i. Energy: "What do you think energy systems will look like in this best-case scenario?"
 - ii. Transportation: "What do you think transportation will look like in this best-case scenario?"
 - iii. Food: "What do you think food systems will look like in this best-case scenario?"
 - iv. Waste/Material Consumption: "What do you think consumption will look like in this best-case scenario? How do you think waste will be handled?"
 - v. Well-Being: "What do you imagine overall human well-being to look like in this best-case scenario?"
 - c. → Follow-up: What do you think has to happen in order to get to that best-case scenario? What has to change? What is the path from now to then? Will it be an individual effort? Local? State-wide? International?
4. To what degree do you feel hope for the best-case future you have described and envisioned? Why? What about it gives you hope/despair?
5. To what extent do you believe the best-case future you have described and envisioned is actually likely to occur? Why?

- a. → [If participant says the best-case scenario future is not likely or unlikely to occur]: To what degree do you feel hope for the future you believe to be most likely?
6. Has this exercise told you anything about the way you envision the future?
7. Is there anything else you'd like to add that I didn't mention or ask about, or any other context you'd like to give to your answers? Are there any questions you have for me?