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TALKING TRASH: U.S. PERSPECTIVES ON THE LANGUAGE OF WASTE REDUCTION

NATIONAL SURVEY RESULTS

PREPARED BY

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

Municipal solid waste is an often-ignored source of greenhouse gas emissions, air and water pollution, habitat destruction and degradation, and public health risk. As human population and consumption continue to grow, the burden of waste grows too. Here in the United States, we have just 5% of the global population but create 30% of all waste. Our outsized consumption makes identifying effective ways of improving waste-reduction and waste-management practices extremely important.

Understanding the general public's motivations and actions toward waste-reduction practices and policy can help waste-management professionals identify which language and images to use in education campaigns. Considering the public's perception and comprehension of related policy can also help waste-management professionals determine where further engagement and additional research is needed.

Recognizing the need for additional information to address critical waste-reduction messaging strategies and existing policies, the Center for Biological Diversity conducted research in 2021 via a combination of nationwide and targeted online surveys to learn more about perceptions of effective language for the prevention of waste, policies that help prevent the creation of waste in the first place, and motivations surrounding the support of these topics. The survey was distributed to the public in the United States through an online marketplace that compensates people for participating in surveys called MTurk. The results from the survey of the general public are referred to as "the public" or "MTurk." The survey was also distributed to employees, partners, and members of the Center for Biological Diversity. This survey was unpaid and is referred to as the "national convenience sample."

KEY FINDINGS

Most people prefer simple and familiar waste-reduction terms and images.

"Waste reduction" was the preferred term of both the general public (paid, MTurk sample) and the national convenience sample when talking about generating and disposing of less waste. The term "single-use" was selected by both the public and the national convenience sample as the best phrase to describe something that is used only once and then put in the trash.

When it comes to images that best represent waste prevention, a picture of a reusable water bottle resonated with both groups. Images of electronics and appliances were chosen as most accurately representing products with artificially limited useful lives.

Saving money and simplifying people's lives are strong incentives to reduce waste.

Over 75% of all survey respondents believed reducing their consumption of unneeded or single-use items was effective at eliminating waste. Both groups also said they'd be more likely to decrease their purchase of single-use items instead of unneeded items. Over 50% of all respondents said protecting nature motivates them to reduce waste. However, the general public was more likely to say they also reduce waste to save money and simplify their lives.

When it comes to waste reduction policy, the public isn't very knowledgeable.

Only 38% of the general public had heard the phrase "producer responsibility laws," of that only 36% could accurately describe what a producer responsibility law is. Another 45% of the general public had heard the phrase "right to repair laws," and of that 62% could accurately describe what a right to repair law is.

Additionally, 43% of respondents in the general public believe that a policy that ensures that recycling is actually happening correctly would be the most effective for reducing waste. However, in the national convenience sample, 60% of all respondents believe that a policy that makes the manufacturers pay for the impacts of their products would be the most effective policy for reducing waste.

Our findings suggest that people are willing to get involved in reducing waste, though they may overestimate the impact of their actions. The lack of understanding around waste prevention and the role of policy limits the effectiveness of individual efforts. But waste-management professionals can use clear, familiar language to design outreach initiatives to overcome these barriers.

SECTION 1: INTRODUCTION

The United States has 5% of the world's population but uses 30% of all resources and creates 30% of all waste.[1] According to the Environmental Protection Agency, each person in the United States creates nearly twice as much waste as a person did in 1960.[2] All that waste — and the wasted resources from producing it in the first place — contributes to the climate and extinction crises. Municipal solid waste poses significant human health and environmental hazards.

The environmental effects of landfills include methane and carbon dioxide emissions, wildlife habitat destruction, and pollutants leaching into waterways.[3] The health effects of our take-make-waste linear system can cause vector-borne diseases, asthma, and cancer.[4]

To prevent these harms to people and the environment, we must not only change how we dispose of waste but prevent its creation. That will require a transformation of our economy to shift the focus from endless growth and profit to environmental, community and human well-being.

Dealing with the large amount of waste created in the United States requires coordinated efforts among governments and community members. Much of this work is handled by government employees who are obligated to both manage the waste and educate their communities about disposal options, including household hazardous waste, recycling, waste prevention and composting.

The burden of waste continues to create growing environmental harm, threats to biodiversity and health justice challenges for vulnerable groups of people, most notably in low-income, environmental justice communities and communities in the Global South. It's important to understand the general public's perceptions of waste management in order to create effective community-driven, public facing education and advocacy campaigns on how to reduce and prevent waste through a combination of policy, corporate action, and individual behavior change.

Recognizing the importance of inspiring both individual actions and larger systemic transformation, in 2019 the Center for Biological Diversity conducted focus groups with business owners, academics, nonprofit staff, and recycling professionals to explore issues around waste prevention.

Although the focus groups showed interest in improving upstream waste-reduction initiatives, the groups expressed concerns about the feasibility of zero waste strategies, raising questions about cost, practicality, and even perceptions of the term "zero waste."[5] The comments surrounding the term "zero waste" prompted a larger discussion regarding individual action and the general public's willingness to support a larger systemic transformation in waste management.

Studies have shown that effective public-messaging campaigns can help improve successful outcomes in household waste management.[6] Many of these studies have highlighted improvements through recycling, but social marketing research into upstream efforts to prevent waste offers new opportunities to promote individual behavior change.

Understanding the motivations and perspectives of the public helps waste communicators know how to best appeal to and inspire individual action.[7] As new research into the health and environmental risks of poor waste management continue to surface, the need to identify ways to promote reuse and upstream solutions has never been more pertinent.

Individual action and behavior change alone cannot address waste-management issues, especially considering the scale of the problem. These efforts must be coupled with larger-scale systemic action, including engaging producers to minimize waste generation in the production phase. To learn more the Center conducted research about the most effective language regarding the prevention of waste, policies that help prevent the creation of waste in the first place, and motivations surrounding the support of these topics.

SURVEY METHODOLOGY

This survey was conducted in partnership with the city of Lincoln, Nebraska from June 2021 to August 2021 to increase the understanding of public perceptions around the language of waste reduction and effective waste-reduction policy.

The survey results detailed in this report include the following two survey samples:

- A national, paid, age 18+ sample of the general public conducted via Amazon Mechanical Turk (MTurk), which included oversamples in various Midwest states.
- A national, unpaid, convenience sample shared with Center for Biological Diversity members, online supporters, and employees along with friends and family and external partners, referred to as the National Convenience Sample.

Staff with the city of Lincoln, Nebraska expressed a similar interest in learning about waste reduction messaging, so an additional two samples were included in the initial research plan. These included the following:

- A Nebraska-specific, paid, age 18+ sample conducted via MTurk.
- A Nebraska-specific, unpaid convenience sample shared with City of Lincoln employees and online supporters along with friends and family and external partners.

Respondents in the paid national and paid Nebraska samples were recruited using MTurk, an online marketplace that compensates people for participating in surveys. All respondents in each of the samples completed surveys in the platform Survey Monkey and the results were processed and verified in Microsoft Excel. Respondents in the national MTurk sample were paid $0.30-$0.50 for completion.

After quality control, the national, paid MTurk sample of the general public had 153 respondents. The majority of these respondents were from California, Texas and Colorado. Due to lower numbers of Midwestern respondents and to meet the needs of the city of Lincoln, Midwestern states including South Dakota, Iowa, Missouri, Nebraska and Kansas were oversampled to ensure that all states were represented in some capacity.

The Midwestern oversample often required additional compensation to secure adequate numbers of respondents, and consequentially represented 35% of the overall paid responses.

The unpaid national convenience sample was garnered from survey links shared in Center newsletters, on personal and organizational social media pages, and on various environmental listservs. In the national convenience sample, the majority of respondents were from the coastal United States with significant numbers from California, Massachusetts and Oregon. However, nearly half of respondents opted not to answer the location question. In total 422 completed responses to the national convenience sample were processed.

In addition to the national-level samples, there were two samples specific to Nebraska, carried out in partnership with the city of Lincoln. This document will present the larger, policy-inclusive national samples, with references in the Appendix to differences in the data between the Nebraska samples and the national samples. Additionally, the city of Lincoln carried out a Facebook A/B testing campaign in order to further test the result, also available in the appendix.

Questions 1 through 8 of the surveys asked how people interpret terms and images relating to waste reduction. Questions 9-12 encouraged them to consider their actions and motivations for waste reduction. Questions 13-24 asked participants about existing waste prevention policies. Questions 25-28 were demographic questions used to determine the background of the respondents. Age was also used as a quality-control question. Respondents were asked to indicate the 4-digit year they were born. This value was compared with their self-reported age. Respondents whose birth years and ages were more than 2 years off were removed from the sample.

Several of the questions prompted respondents to write in their own responses or allowed respondents to specify “other” responses. The qualitative data written as open-ended responses were analyzed and aggregated based on similarities in language and themes. All written responses are presented with quotes with minor edits for spelling and/or clarity.

The survey results for the national, paid MTurk sample and national convenience sample are presented below in Section II, including overall summaries of the trends observed in the qualitative open-ended questions and quantitative data from the multiple-choice responses. Survey data from the Nebraska samples are not included in the main report sections, but additional information relating to A/B testing and Nebraska results can be found in the appendix. A sample of the survey instrument is also in the appendix.

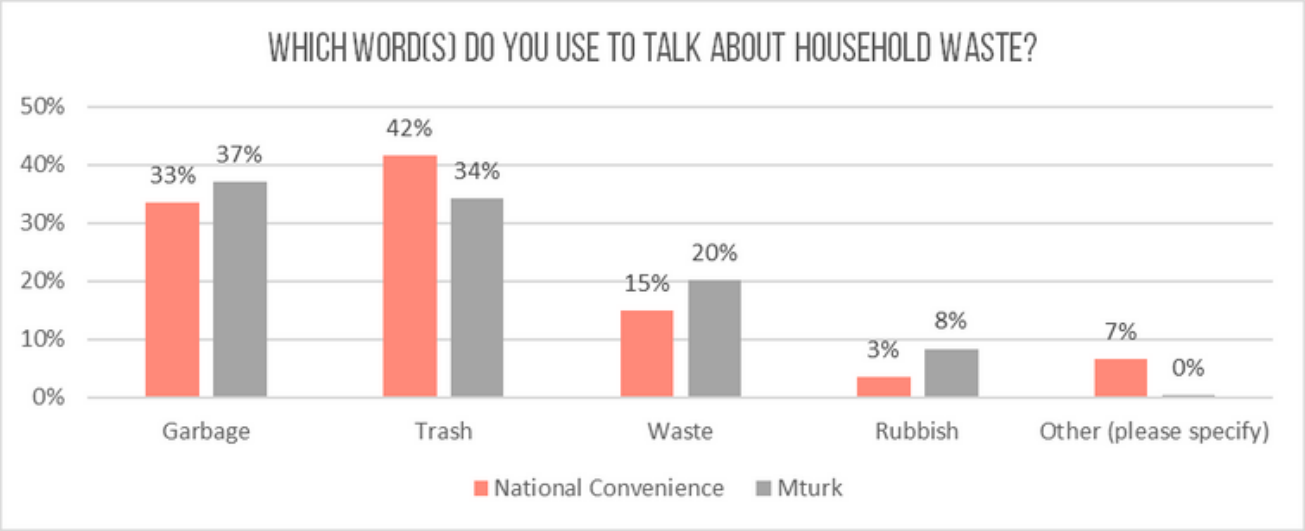
SECTION II. MESSAGE TESTING RESULTS

A. WASTE-REDUCTION MESSAGING (QUESTIONS 1-8)

Question 1: Which word(s) do you use to talk about household waste?

Participants were able to select multiple responses for the words that they use to discuss household waste. The majority of respondents from all samples selected garbage and trash as their top answers.

Graph 1: Which word(s) do you use to talk about household waste?



Other responses:

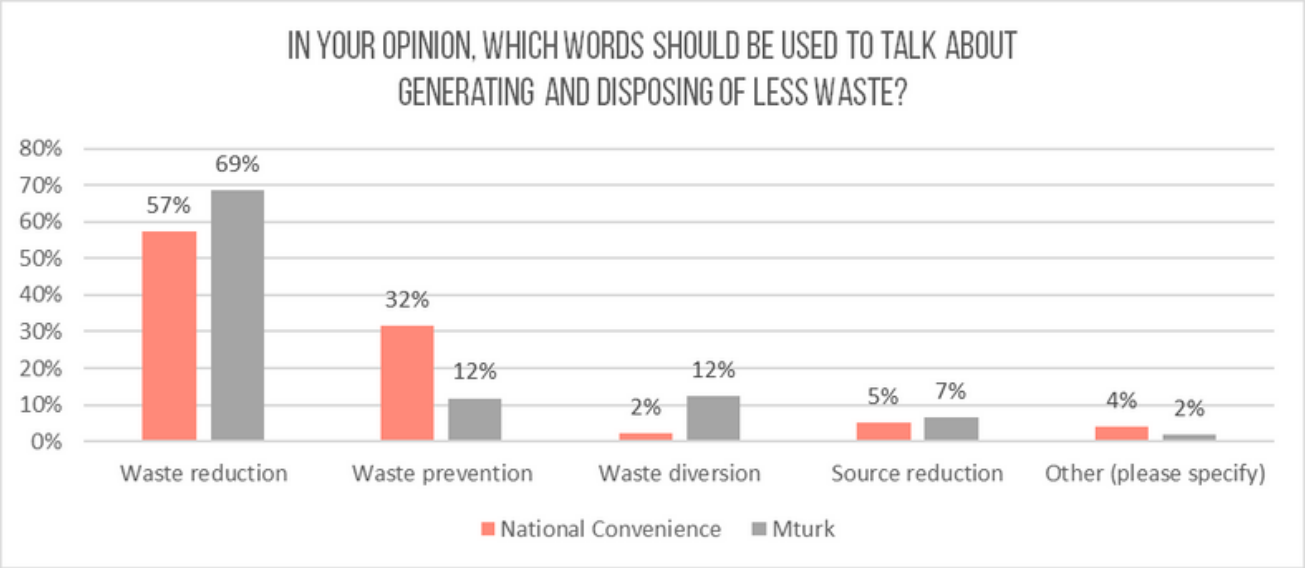
Many of the respondents who chose "other" as their response in the national convenience sample opted to write in closed-loop options for waste, such as "*recyclables/ recycling*" or "*compost*." Some respondents wrote in more technical terms commonly used in the solid-waste management industry, such as "*hazardous household waste (HHW)*" and "*detritus, junk, landfill, municipal solid waste*." One respondent wrote in "*plastic*."

The sole "other" response from the general public sample was similar to the top responses for the national convenience sample, writing in "*recyclables*."

Question 2: In your opinion, which words should be used to talk about generating and disposing of less waste?

Participants could select only one word to describe how they talk about generating and disposing of less waste. Over 50% of respondents in both samples chose waste reduction as the top response. However, nearly a third of respondents in the national convenience sample favored waste prevention as the second choice.

Graph 2: In your opinion, which words should be used to talk about generating and disposing of less waste?



Other responses:

Around 4% of the national convenience survey respondents selected "other" and wrote in their own responses. These responses included "*footprint reduction*," "*reuse*," "*waste management*," "*sustainable*," "*pollution prevention*," "*trash reduction*," and "*less waste*." One respondent also offered a critique of the present economic system, writing "*reduce consumption which means reduce production which means a maintenance not growth economy*."

Another respondent focused on zero waste and waste reduction as a means of "*saving time and money*," framing the term as "*simpler*" and able to facilitate changes in consumption.

Similar to the national convenience sample, in the MTurk general public sample, one respondent wrote in "*zero waste*."

Question 3: Why did you choose that answer?

Respondents in the national convenience sample were more likely to write in answers using the "other (please specify)" option, providing additional commentary on their answers. Several respondents who chose waste reduction described it as "*clear and concise*," "*easy to understand*" and "*realistic*." One respondent who selected waste reduction wrote:

> *"People not familiar with the industry may be confused by waste diversion (not automatically filling in the end of that term with "from the landfill"), and similar with source reduction. I think waste reduction is the easiest to understand while potentially being the most impactful. Ultimately, the sustainable goal globally is to reduce waste."*

These responses suggest that understandability and clarity for the wider public were top concerns when considering these words.

"Waste prevention" was the next most selected response in the national convenience sample, with 32% of respondents choosing it. Many respondents who selected this answer wrote about "*stopping waste before it starts*" or focusing on "*upstream*" action. One respondent who selected waste prevention wrote:

> *"I think it needs to contain the word 'waste,' but diversion generally means diverting from landfill (so it doesn't imply preventing the waste from being generated in the first place). 'Reduction' can mean a lot of things — sometimes people refer to recycling or composting as waste reduction. 'Prevention' implies stopping something before it starts, so that's the most accurate and specific word."*

Several respondents suggested that source reduction and waste diversion were less clear, too vague, or confusing. One respondent wrote in *"pollution prevention"* and explained: "*Because it communicates to an average person why they should care (pollution).*"

Similar to the national convenience sample, respondents in the MTurk general public sample selected "waste reduction" as the top answer. Several respondents wrote in that waste reduction was "*intuitive*," "*easily understood*" and "*self-explanatory*." Respondents who selected "*waste reduction*" also often expressed doubt about the ability to prevent waste as an upstream action. One respondent who selected "*source reduction*" wrote: "*I think it is more tangible to think of a source and build ideas about the physical source.*"

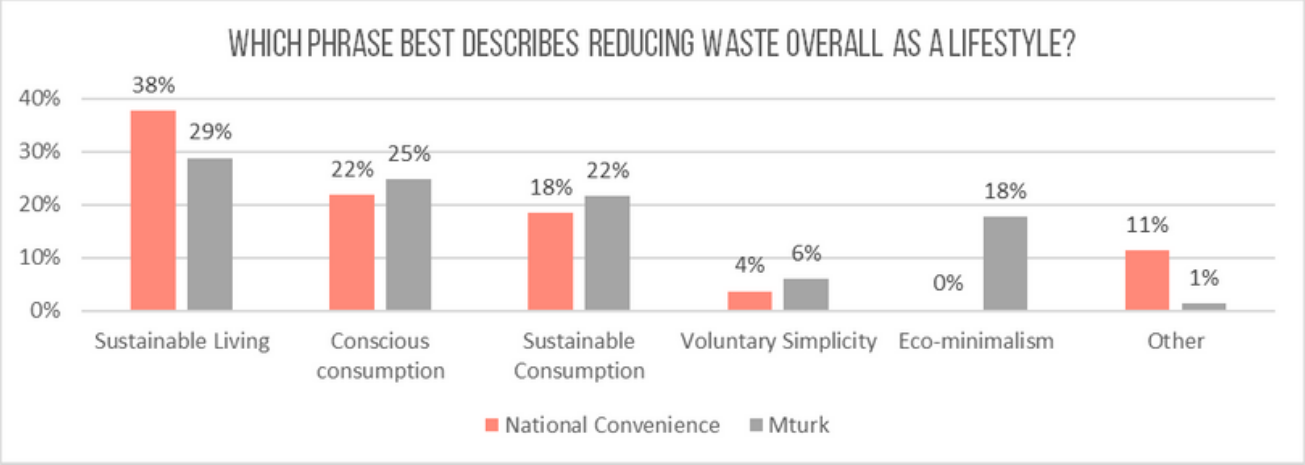
Respondents in both samples favored terms that they deemed most understandable. Clarity in language and accessibility in messaging serve as important components of successful waste messaging. While terms like waste prevention and source reduction were celebrated for depicting upstream action, outreach programs should use familiar words like waste reduction to convey upstream action goals.

Question 4: Which phrase best describes reducing waste overall as a lifestyle?

Respondents were asked to select which phrase represents a lifestyle of reducing waste. Although "sustainable living" was the most selected response in both samples, respondents in the MTurk general public sample were significantly more likely to select "eco-minimalism" and respondents in the national convenience survey were more likely to write in their own responses.

Question 4 was later tested using Facebook A/B testing in the city of Lincoln, Nebraska to see which words appealed most to local Facebook users. The results of the A/B testing were inconclusive and are available in the Nebraska section of the appendix.

Graph 3: Which phrase best describes reducing waste overall as a lifestyle?



Other responses:

National convenience sample respondents who wrote in other responses provided terms such as "*zero waste*," "*eco-living*" or "*low-waste living*."

There were also a few that didn't support any of the choices, citing the need to cater the language to a more general audience. One respondent who wrote in their response said:

> *"I think for the general public these aren't really appropriate and would be confusing. I think that a straightforward message of reduction would be best. Talking about saving money would be more clearly understood."*

Similarly, another respondent wrote:

> *"If this is for a general audience, you are not thinking basic enough. How about spending less money and being more efficient? Something like: "spending wisely," "buying wisely" or "strategic spending." Sustainable, consumption, eco-minimalism — those work fine if you are talking to people like me. But I am already spurred to action. So, you need to find words that resonate with regular people."*

There were no "other" responses in the MTurk general public sample.

Question 5: Why did you choose that answer?

When asked an open-ended question as to why they chose these answers to describe reducing waste as a lifestyle, respondents from the national convenience sample who selected "sustainable living" often wrote that it was "*easy to understand*" and "*intuitive*." It was also described as an effective umbrella term for lifestyles and a term that was approachable to most people. However, one respondent who wrote in the term "*low-waste living*" associated "*sustainable living*" with empty marketing rhetoric.

General public MTurk respondents who selected "conscious consumption" wrote in a variety of responses when asked why they chose it. Some respondents seemed to suggest that "sustainable" is a buzzword that's often misused. One respondent wrote: "*Sustainable is too triggering of a word for some who would be more amenable to conscious consumption, it could be to save them money rather than save the planet.*" Other respondents who selected "conscious consumption" wrote about how it was simpler to understand with less jargon and more appealing due to the alliteration.

While the largest percentage of respondents still selected "sustainable living" in the MTurk general public survey, the MTurk general public responses were slightly more distributed, with a substantial number of respondents selecting "eco-minimalism." Respondents who selected "sustainable living" often mentioned in the open-ended question its familiarity and recognizability in popular media. Similar to the clarity remarks made in the national convenience survey, one respondent said it sounded most like a literal explanation of the term.

Other MTurk general public respondents stressed that "sustainable living" is most reflective of a lifestyle. One respondent wrote: "*I've heard of sustainable living before. I think it gives off a more inclusive, less elitist vibe than some of the other terms like eco-minimalism.*"

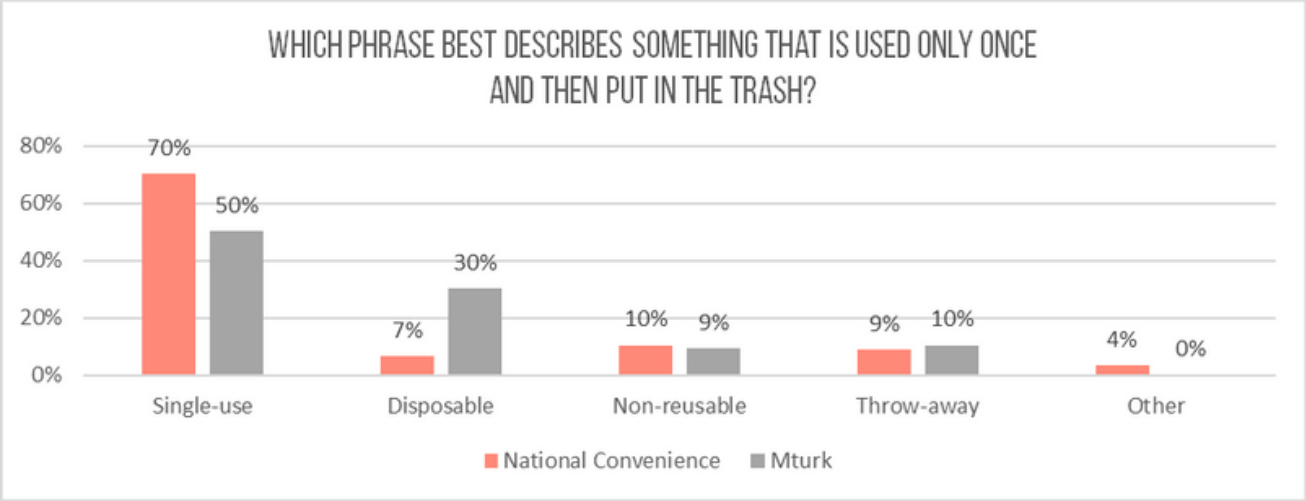
Some respondents seemed to be interested in the mindfulness component of "conscious consumption," seeing it as a key component in a healthy and balanced life. Respondents who selected "conscious consumption" seemed to find the term most reasonable: "*The word conscious refers to an act of being aware. In this case, we have to be aware of how we consume.*"

Similar to the findings of questions 2 and 3, respondents in both samples focused on clarity and accessibility. When choosing a term to represent waste reduction as a lifestyle, on the other hand, there seemed to be additional consideration of the social perceptions of popular terms and concerns that they may be perceived as exclusionary or controversial. Although "sustainable living" was the most popular term in all the survey samples to describe reducing waste as a lifestyle, the general public MTurk results were not statistically significant. Additional research is needed to understand the effectiveness of these terms with different audiences and contexts.

Question 6: Which phrase best describes something that is used only once and then put in the trash?

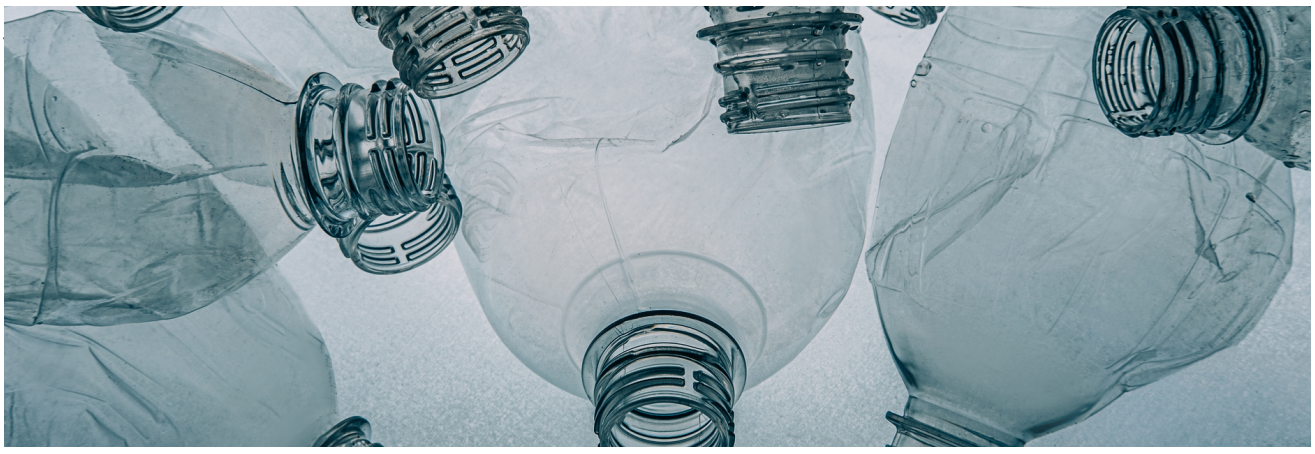
This question gauged perspectives on the language associated with items that are quickly thrown away. It provided examples of paper plates, plastic utensils and masks and asked respondents to choose only one answer. "Single-use" was the most selected response in both samples, although nearly one-third of respondents in the MTurk general public sample indicated that "disposable" was a top choice, compared to just 7% of the national convenience sample.

Graph 4: Which phrase best describes something that is used only once and then put in the trash?



Other responses:

In the national convenience survey, 4% of respondents wrote in their own responses, including "*trash generating or landfill generating*," "*non-recyclables*" and "*plastics*."



Question 7: Why did you choose that answer?

When asked an open-ended question of why they chose their answers to describe something that is used only once, respondents in the national convenience sample who selected "single-use" (the most selected answer) often described how it was "*understandable*" and had the "*strongest meaning*." One person wrote: "*some people actually reuse items meant to be 'disposable' (such as plastic spoons) so that word and similar words are not strong enough*."

"Non-reusable" was the second most selected response. Some national convenience sample respondents wrote:

- "*Non-reusable, throwaway, and single-use seem appropriate. Non-reusable seems to impress the problem more firmly. Remember when [glass] bottles were recycled for refund of deposit?*"
- "*It tells people that some things ARE reusable.*"

Although it was the second most selected response in the MTurk general public sample, "disposable" was one of the least selected responses in the national convenience sample: "*I think about our 'disposable society' since it's all about ease of use and no fuss. Just use and toss, dispose, that's the thought process.*"

Other convenience sample respondents offered a critique or wrote in their own responses. One respondent who had originally selected non-reusable wrote: "*none of the phrases are ideal...we need to coin a better phrase that makes one [think] before obtaining something.*"

Another wrote in the word "*pollution*" and said: "*Everything that can't be salvaged and reused in some way adds to the burden on this planet and ultimately decreases our quality of life until it won't be worth living!*"

"Single-use" was also the top response in the MTurk sample. Respondents often wrote in how the term was very clear: "*self-explanatory*," "*easy to understand and…not broad*," and "*Can only [be] used once… Technically, everything is reusable somehow, but 'single-use' reflects how something is meant to be used.*"

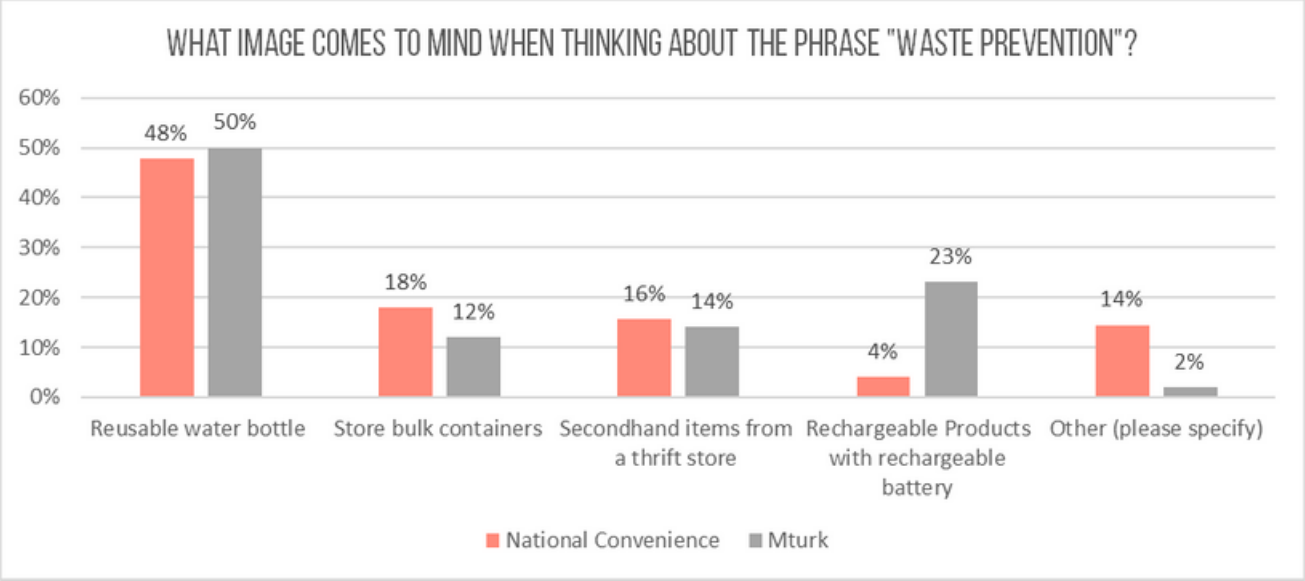
A significant proportion of respondents selected “disposable” in the MTurk general public sample. Most of the respondents emphasized how it was “commonly known,” but one respondent wrote about how the word “disposable” was associated with disposable gloves that must be disposed of after one use in clinical settings.

“Single-use” was favored in both samples for its understandability and accuracy. However, given the concerns expressed in the comments, additional research could be useful to see if other terms inspire change in how people select which goods to buy. Future campaigns should work toward increasing public education on the options for reuse in retail establishments and advocating for the expansion of reuse models through both policy and corporate change.

Question 8: What image comes to mind when thinking about the phrase "waste prevention"?

This question presented respondents with four different images of products and experiences that represent waste-prevention behaviors, including reusable or rechargeable products, secondhand goods, and bulk purchasing. See appendix for images. The image of the reusable water bottles was the top choice from both samples. The second choice was the store bulk containers in the national convenience sample and the rechargeable batteries in the MTurk general public sample.

Graph 5: What image comes to mind when thinking about the phrase “waste prevention”?



Other responses:

In the national convenience sample, a significant proportion of respondents chose "other" and wrote in their own answers. Most of the respondents wrote something along the lines of "*All of the above*" or a combination of the available options "*a medley of reusable water bottles, bags etc.*"

Some respondents wrote in comments about limiting and changing consumption, such as "*not buying something (do I really need this?)*" and "*reinventing small local grocery stores.*" One respondent sent a link to a buy nothing meme.

Other comments emphasized recycling and reuse behaviors both on the individual level and the corporate producer level, referencing the need for manufacturers to change their practices to increase the lifespans and decrease the environmental burdens of their products, writing in examples such as: "*Repurposing items on a personal level and on a larger level the end of planned obsolescence.*"

However, some respondents interpreted recycling and composting as waste prevention actions. A few respondents also wrote in answers related to improving packaging, such as "*slimmed down and reusable or recyclable packaging*," and "*plant-based containers.*" The emphasis on recycling and the ability to compost items might suggest that additional education is necessary to improve how the public understands recycling capacities.

This variety in responses shows interest for various waste reduction activities and the desire to move past disposable materials for waste prevention. Although respondents were not asked to explain their choices for this question, the results suggest that respondents favored images associated with reuse in different forms. This includes the reusable water bottle and bulk stores in which customers can use reusables to acquire their goods for the convenience sample and rechargeable batteries for the MTurk sample.

Recognizing the high levels of interest in reuse, including images associated with reuse, could increase the effectiveness of future education and outreach campaigns. Additionally, this high interest should be used to further efforts to collaborate with state and local governments on the infrastructure needed to support reuse, such as bottle filling stations and bulk stores.

One convenience sample respondent also offered a critique of the larger system: “It doesn't exist. It would be something that shows a day-to-day product with actual corporate accountability.”

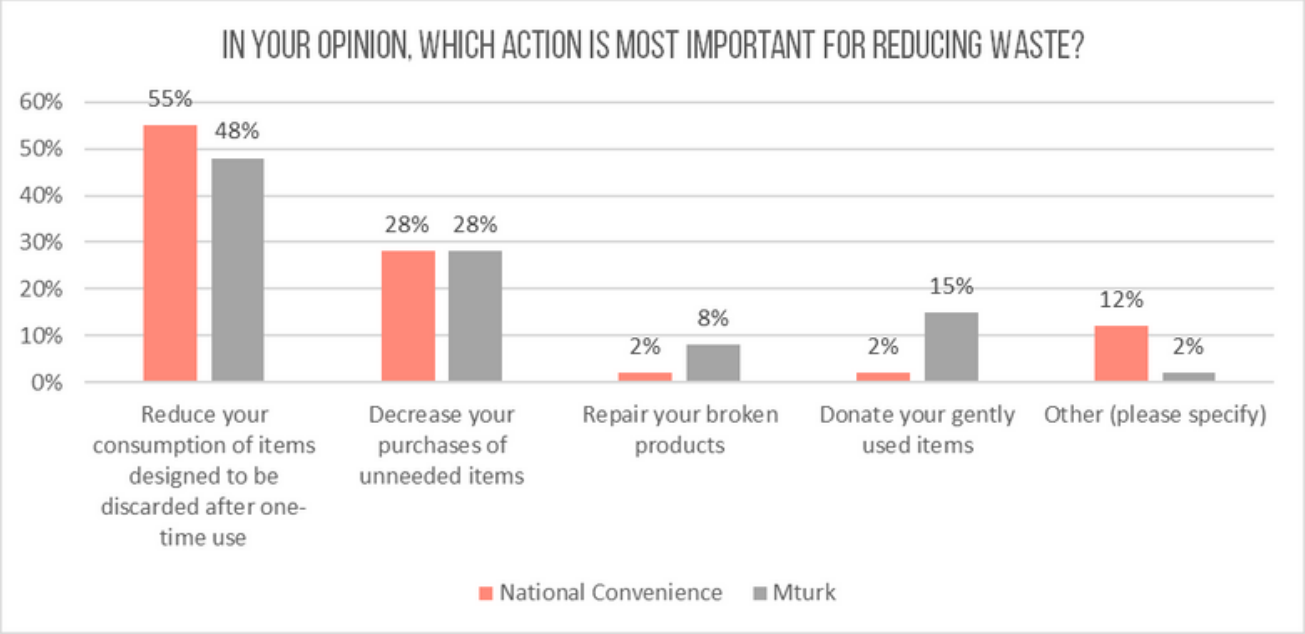
The only two general public write-in responses re-emphasized the “reusable water bottle” selection, arguing that it was the clearest option.

B. INDIVIDUAL ACTIONS AND MOTIVATIONS (QUESTIONS 9-12)

Question 9: In your opinion, which action is most important for reducing waste?

Respondents were asked to choose one answer to identify the most important waste reduction action. "Reduce your consumption of items designed to be discarded" was the top response in both samples, followed by "decrease your purchases of unneeded items." Highlighting upstream actions, over 75% of respondents in each of the samples believed reducing one's consumption of unneeded or single-use items was the most effective way to eliminate waste.

Graph 6: In your opinion, which action is most important for reducing waste?



Other responses:

"*All of the above*" was a frequent "other" response in the national convenience sample.

Other respondents described upstream and policy solutions: "*Vote for local and federal representatives that are determined to reduce the nation's footprint*," "*getting supermarkets and manufacturers to use less packaging when selling/producing products*," and "*EPR and large corporation responsibility in designing better sustainable packaging and products*."

Another group of national convenience sample respondents emphasized reducing, reusing, and repairing items. Two proposed larger changes in production and consumption, suggesting "*[pressuring] companies to not create unnecessary single-use items*" and "*only [buying] new if used is not an option*."

One national convenience respondent expanded on the "decrease your purchases of unneeded items" option, writing: "*Decrease your purchases by really looking at what you are buying and deciding if you really need it, essentially defining the phrase conscious consumption*."

The MTurk sample had significantly fewer "other" responses. But the respondents who did write in answers often wrote things that had similar themes as the national convenience sample. One participant wrote about how each of the responses was important, reminiscent of the "*all of the above*" response in the national convenience sample.

Continuing earlier trends relating to packaging in the national convenience sample, one respondent in the MTurk general public sample described necessary changes in packaging: "*Use products with biodegradable packaging*."

The final MTurk general public respondent wrote in "*Don't have kids*."

Question 10: Why did you choose that answer?

In the open-ended question to explain their choice for the most effective waste-reduction action, respondents who selected "reduce your consumption" often emphasized reduction as the easiest option, writing "seems most feasible" and "easiest place to start." Equity was also mentioned:

> "*Equity — it is easier and more affordable for all populations to buy a reusable item that has multiple purposes [than] to have a costly repair*."

Many respondents expressed frustration about current waste patterns and the products that consumers have access to, specifically about packaging.

- "*Most of our day-to-day waste is packaging of items. The items themselves we tend to keep a long time. Food packaging and takeout boxes are a biggie. This is like 90% of our household trash.*"
- "*Because I am disturbed by the lack of reusable options available to consumers. If someone wants to reuse, they have to go out of their way to find products designed for reuse. Beverage manufacturers don't even reuse glass bottles anymore. It's all on the consumer to find the solutions where manufacturers [intentionally] design their products for single-use. Producer responsibility for end of life should be law.*"

Other national convenience respondents found that "decrease your purchases of unneeded items" resonated with them. Similar to the last sentiment shared, many also critiqued present-day economic systems:

- "*Our version of capitalism depends on making us replace things that don't need replacing. This will ruin our planet.*"
- "*Everything we've ever bought likely still exists on the earth in its original form. The second you buy something (particularly new) it's immediately destined to be trash at some point in the future. Being more mindful of our initial purchases and first using what we have I think is the best target for more sustainable living. Reducing single-use items is great too but often encourages people to buy unnecessary replacements.*"

Respondents in the MTurk general public sample offered critiques of overconsumption and support for reusable options. One respondent who selected "decrease your purchases of unneeded items" wrote: "*This has to be a collective action. Theoretically, you could reduce demand for many items that generate waste.*"

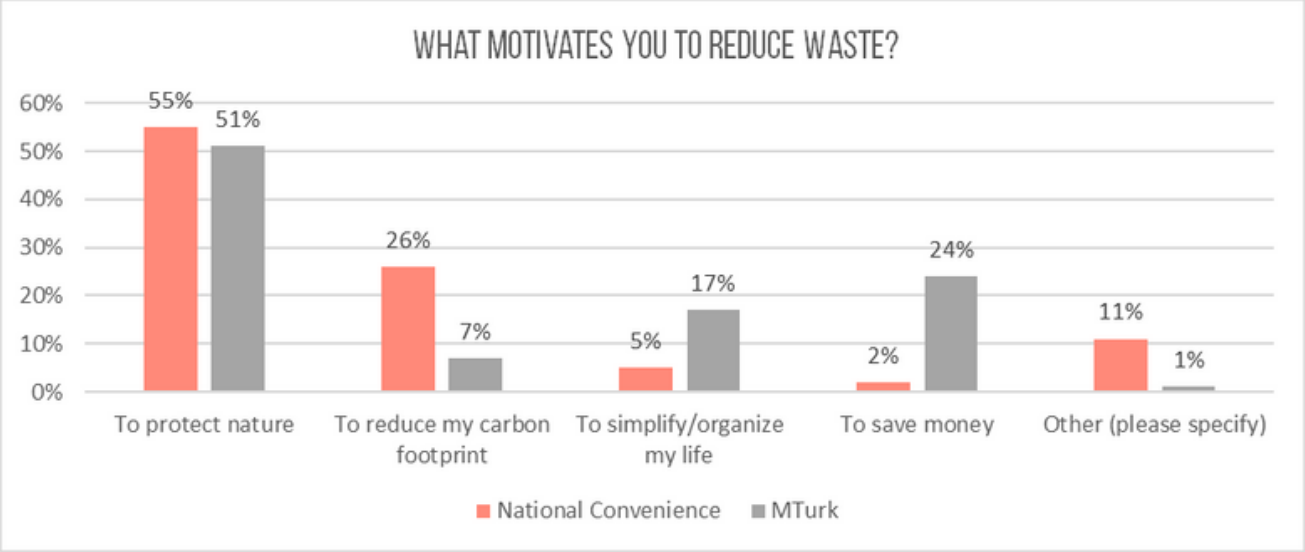
While many respondents focused on upstream considerations and managing their own waste, one respondent who selected "donate your gently used items" wrote in: "*I feel like people throw out so many reusable items, but one man's trash is another man's treasure. You're killing two birds with one stone, not throwing away, but also helping those in need*."

Respondents to this question presented a variety of perspectives. The majority of respondents found that the individual action of changing their own consumption by reducing their consumption of items designed to be used only once or forgoing unneeded items appeared to be the most feasible option. Respondents favored options that involved limiting single use and promoting reuse. Similar to previous questions, future campaigns should build off of the growing frustrations with single-use packaging from respondents in both samples to continue advocacy for investment in reuse infrastructure and education.

Question 11: What motivates you to reduce waste?

This question asked about motivations to reduce waste, seeking to evaluate how respondents considered the nature of their relationship to waste management. Although "to protect nature" was the top response in both samples, respondents in the national convenience sample were more likely to select responses aligned with environmental interests, including "protecting nature" and "reducing carbon footprints."

Graph 7: What motivates you to reduce waste?



Other responses:

The majority of "other" responses in the national convenience sample wrote in "*all of the above*." Others also wrote in combinations of the available responses: "*Protect nature and organize my life*."

Some respondents also were interested in building a sustainable, equitable, community-oriented world and were motivated by reasons not offered in the choices: "*To slow the climate crisis,*" "*to save the earth,*" "*my need to take responsibility — first do no harm*," and "*to reduce resource extraction*."

Two respondents wrote about family values: "*To leave a better world for my grandkids*" and "*to live according to a family value of not being wasteful*." Another connected to "*a spiritual morality*" of reducing waste.

One of the respondents offered a critique about the available selection: "*None of the answers are sufficiently inclusive for me*."

The MTurk sample had only one write-in response: "*All of the above*."

Question 12: Why did you choose that answer?

In the open-ended question to explain their motivation to reduce waste, national convenience respondents who selected "to protect nature" and "to reduce my carbon footprint" were aligned with eco-conscious sentiments and humanity's larger relationship with the planet. These responses often emphasized how present actions have a larger impact on the future.

- "*I equate protecting nature with reducing my carbon footprint. It's all about protecting the earth for the future*."
- "*Would like to see human beings able to survive and thrive in the future*."
- "*We can't survive without a healthy planet*."
- "*It's my overall goal… we reuse assiduously and take other action*."

One respondent considered reductions in carbon footprints as a reflection of other key actions: "*Reducing carbon footprint seems to encompass all of my motives — reducing waste, protecting the environment, and protecting the people that live on this planet*."

Respondents in the national convenience sample who selected "to simplify my life" often wrote about the benefits of decluttering: "*Again, all of the answers are true for me. But simplifying my physical space and home gives me the clarity and motivation to do the rest*."

MTurk general public respondents who selected "to protect nature" and "to reduce my carbon footprint" aligned their motivations with eco-conscious beliefs such as: "*[I am a] nature lover*," "*I want to save our planet*," and "*I don't want to have a large impact on global warming, etc*."

Similar to the national convenience sample, some respondents also mentioned the impact that children and future generations had on their motivations: "*Nature is very important, and I want my children to grow up in a nice place where they can enjoy nature*" and "*If I try, then maybe my kids will, and their kids will etc."*

A significant proportion of general public respondents were motivated by financial concerns, selecting "to save money." Associated open-ended responses were: "*Money is always the number one answer*," "*I am not a strong environmentalist*," and "*I'm more concerned by my own financial well-being than I am about saving the planet*."

Motivation is an important component to behavior change both at the individual and systems level. While "protecting nature" scored high in the survey, the desire to save money was chosen by a quarter of the general public respondents. Future campaigns should use both topics when educating the public about the need to reduce waste generation.

Additional research could also be conducted to learn how to motivate people to be involved in waste reduction while simultaneously working to get corporations to take responsibility for the waste they produce.

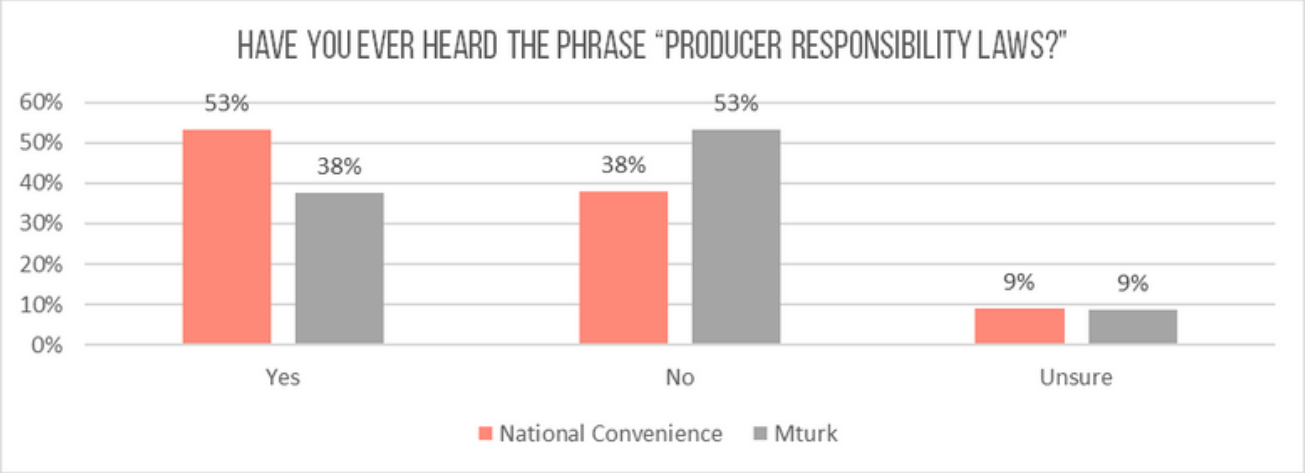
C. POLICIES AND MESSAGING FOR UPSTREAM ACTION (QUESTIONS 13-24)

Question 13: Have you ever heard the phrase "producer responsibility laws?"

The first policy question of the survey aimed to gauge knowledge of producer responsibility laws, which serve as key methods of internalizing the socioeconomic and environmental impacts of waste management. Extended producer responsibility highlights the producer's role in altering the production processes of a product to minimize the downstream burden and disposal that has historically fallen to the consumer.

Fifty-three percent of respondents in the national convenience sample had heard of producer responsibility laws whereas the same percentage of respondents in the MTurk sample had not heard of the laws. Nine percent of respondents were unsure in both categories.

Graph 8: Have you ever heard the phrase "producer responsibility laws"?



Question 14: If yes, please tell us a little about producer responsibility laws.

Respondents who selected "yes" were prompted to write in answers about what the laws mean. Many of the responses were unique and presented different examples of producer reasonability laws. In addition to being more likely to select "yes," when compared to the results of the MTurk general public sample, respondents in the national convenience sample were more likely to write in answers that were accurate and clear regarding the definition of producer responsibility laws.

Overall, 36% of the respondents who selected "yes" in the general public sample wrote a correct or clear answer compared to 88% in the national convenience sample. Some respondents in the MTurk general public sample wrote in responses that focused on improving laws in general, potentially misinterpreting the term "right to repair laws" as a tool to improve the legislative system. The majority of incomplete responses included the respondent's perspectives of right to repair laws.

Respondents in the national convenience sample often wrote about their past experiences with bottle deposits or descriptions of the potential for specific companies such as Coca-Cola to increase their involvement in the post-consumer stages of a product's life cycle with greater participation in recycling.

When asked to explain the laws, the vast majority (over 88%) of the respondents in the national convenience sample provided clear and correct answers or examples of producer responsibility laws. The majority of respondents who selected "yes" emphasized responsibility on the part of the producer to manage the end of life of its product:

- "*It means that the producer of the item has to take responsibility for how the item will be discarded, recycled, reused, refurbished, etc.*"
- "*Producers should be responsible for dealing with the waste and environmental degradation that their products and production methods cause.*"
- "*Manufacturers are held responsible for waste management of their products by modifying packaging, reducing carbon footprint or emissions, or recycling raw material.*"

Some national convenience respondents also described the producer's responsibility in the full life cycle of waste:

- "*The producer takes responsibility 'from cradle to grave' of the products that they are putting in the marketplace.*"
- "*[The] producer is responsible for the product's full life cycle. Many focus on recycling but the intent is to change design by internalizing costs that had been made external.*"

One respondent wrote about Germany as an international example: "*If you produce something, you are responsible for minimizing or taking care of the impacts of your production in a safe way. I know that Germany has had this in place for quite a long time now. You have to, as a producer, minimize the negative impact your production causes to the environment*."

Another respondent focused on Maine as a domestic example: "*Maine has passed [a producer responsibility law]. Every state should pass one*."

Although most respondents in the general public sample wrote unclear, incorrect, or incomplete answers, some wrote in answers that emphasized the manufacturer's role in the full product lifespan — most specifically the disposal — of their goods, describing "*environmentally responsible*" manufacturing processes, creating products that are "*biodegradable*" or otherwise easily recyclable and reusable.

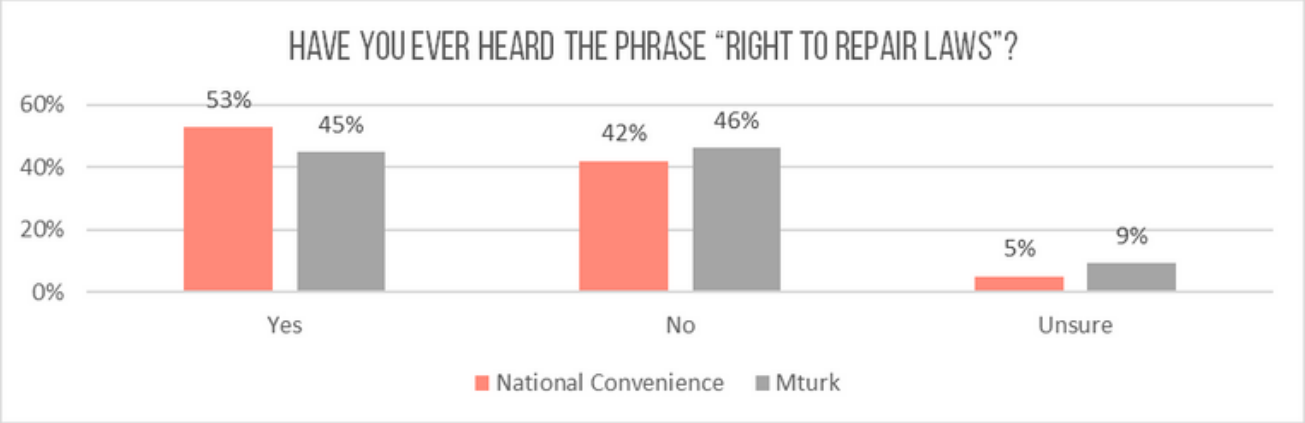
Several of the respondents who selected "yes" also focused on manufacturer responsibilities in relation to plastic and recycling: "*[These] laws make it mandatory for companies to collect back and recycle their plastic*."

Unsurprisingly, nearly 15% more respondents in the national convenience sample had heard of producer responsibility laws and could provide an example than those in the MTurk general public sample. Waste reduction professionals have much work to do in bringing the public up to speed on this policy option.

Question 15: Have you ever heard the phrase "right to repair laws"?

This question aimed to gauge knowledge of right to repair laws which allow consumers to repair their own products without having to go to the manufacturer or an authorized dealer. Over 50% of respondents in the national convenience sample indicated that they had heard of right to repair laws, compared to 45% of MTurk general public respondents. Compared to the previous question, a greater percentage of respondents in the national convenience sample selected "no" instead of unsure. A greater number of respondents in the general public sample had heard of right to repair laws (45%) compared to producer responsibility laws (38%).

Graph 9: Have you ever heard the phrase "right to repair laws"?



Question 16: If yes, please tell us a little about right to repair laws.

Over 90% of respondents who selected "yes" in the national convenience sample correctly identified or provide examples of right to repair laws. Many respondents contextualized their understanding of right to repair laws by mentioning a brand (most commonly, Apple):

- "*Some corporations (such as Caterpillar or Apple) restrict customers from repairing their items. For example, repairing the item can void the warranty.*"
- "*If electronics (iPhone, etc.) or other goods stop working, owner can [fix], not have to buy new product.*"
- "*Apple. Amazing products but can't be easily repaired and replacement is less expensive. All this does is enhance the sales of new products to bolster the bottom line and provide dividends to investors backing the company.*"

Other respondents mentioned a bill (most commonly the vehicle right to repair law passed in Massachusetts by a 2020 ballot initiative):

> "*I'm in Massachusetts, and this was on our last ballot. It extends the range of car mechanics who can repair your [electric] vehicle, so you don't have to only rely on the dealership which often costs more money.*"

One national convenience respondent was focused on the individual consumer's experience with the product and giving the consumer more power over the lifespan of the products they purchased: "*Empowers the consumer to fix products through things like open-source software and plans.*"

In addition to more MTurk general public respondents indicating that they had heard of right to repair laws, respondents were more likely to provide clear and correct answers when asked to explain. While less than 40% of general public respondents wrote in correct and/or clear answers for producer responsibility, 62% wrote in correct responses on right to repair laws.

Similar to the national convenience sample, some MTurk general public respondents referenced a corporation:

> "*Heard it used in reference to iPhones where Apple only wants some to work on them in hopes the [customer] will just buy another phone, making them more money, ties in with planned obsolescence.*"

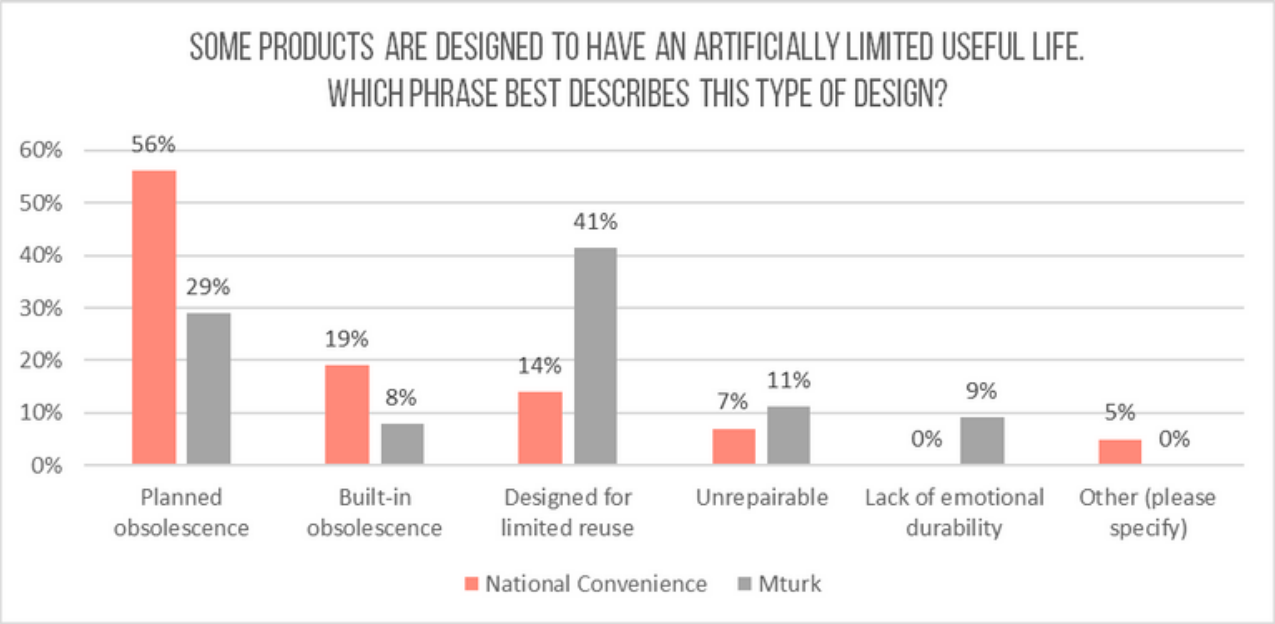
The results for questions 15 and 16 suggest that there is slightly more understanding of right to repair laws among the general public compared to producer responsibility laws. Similar to the previous section, slightly more respondents in the national convenience sample indicated that they had heard of right to repair laws and could provide an accurate example as compared to general public respondents.

Observing the trend that suggests people are only familiar with right to repair when related to a few companies or products, this is another waste-prevention policy that requires more education and outreach to the general public to allow for greater understanding of the full scope and potential of the issue.

Question 17: Some products are designed to have an artificially limited useful life. Which phrase best describes this type of design?

This question focused on terms used to describe products with artificially limited life spans. "Planned obsolescence" was the top response in the national convenience sample, while "designed for limited reuse" was the top response for the MTurk sample.

Graph 10: Some products are designed to have an artificially limited useful life. Which phrase best describes this type of design?



Other responses:

Similar to previous questions, the national convenience sample also included "other" responses, many of which contained the respondent's critiques of systemic shortcomings from "*greedy*" manufacturers:

> "*Worst Waste Product — No plan or process in place to recycle, repair or otherwise re-use its component parts. Also, has toxic materials which you would not want in a food production, urban area, water way or sensitive habitat.*"

Aligned with the sentiments of the respondent who wrote in "*worst waste product*," other respondents offered negative descriptions of the product itself: "*Made Not to Last*" and "*negligent creation*."

One national convenience respondent wrote in a critique of the larger system: "*Negative capitalism*." The MTurk sample had no "other" responses.

Question 18: Why did you choose that answer?

For the open-ended question asking why they chose their top answer describing the artificially limited useful life of products, respondents in the national convenience sample selected "planned obsolescence" as the top response, stating that the term has "*been around a long time*" used by "*repair people*," and "*is the common term and shows the intention of the producer*."

Given that many of the respondents in the national convenience sample were likely to also work in the environmental field, some respondents with technical knowledge of the subject likely selected it as a frequently used term. One respondent wrote: "*Because I am in the sustainability community it is the jargon we use to talk about this. 'Designed for the dump' is a better phrase for public engagement*."

"Built-in obsolescence" was the next most selected response. Respondents who selected this answer wrote in how it was clear and understandable: "*It seemed the easiest to understand the concept*."

Building on the trend of differences between the occupational demographics of the national convenience sample and the general public, some national convenience respondents were concerned about the level of clarity in some of the more popular responses. One respondent who selected "designed for limited reuse" wrote in: "*I think it's clearest to the average person, but I've only ever heard the phrase planned obsolescence*." Another who selected "unrepairable" wrote: "*No questions asked about what this means. However, I like planned obsolescence better because I understand what it means. I don't think everyone would*."

Additionally, when asked why they selected their answer, the respondent who wrote in "*Made Not to Last*" described how the other options were "*too hard to spell or understand*."

"Designed for limited reuse" was the top response for the MTurk general public survey. Many of the respondents who selected this answer focused on its clarity and understandability, claiming that it's "*pretty straight forward*" and "*simple*."

Similar to the national convenience sample, "planned obsolescence" (the second most selected choice in the general public sample) was described as frequently encountered, writing that it was a "*common phrase I've heard a lot*" and that they had "*heard it before*." Finally, "unrepairable" was the third most selected response by the general public, which was also described as "*easy to understand*."

As noted, the language used to describe waste reduction is very important. It needs to be clear and self-explanatory. While "planned obsolescence" is the technical term for a product designed to have a short life, "designed for limited reuse" is a better phrase to use with the public.

However, despite concerns about the accessibility of the term "planned obsolescence" in the convenience sample, a significant portion (29%) of the general public MTurk sample found it understandable. This suggests that there is some general knowledge of these terms and that education campaigns could further improve understanding of these concepts.

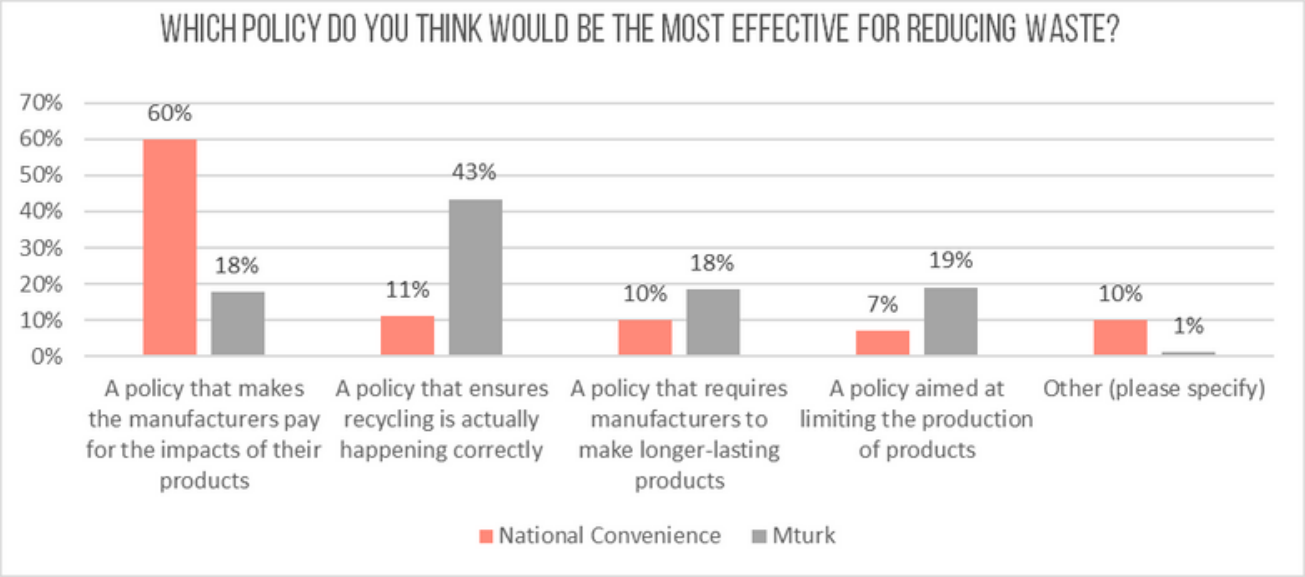
Additional investigation is necessary to determine how effective these terms can be when used together, with "designed for limited reuse" used as the more descriptive term.

Question 19: Which policy do you think would be the most effective for reducing waste?

This question asked respondents to compare and prioritize potential waste reduction policies and there was considerable discrepancy in the top choice. Respondents in the national convenience sample favored options that focused on increasing manufacturer responsibility in the management of waste.

Respondents in the MTurk general public sample favored downstream options for the consumer to support successful recycling initiatives. This could reflect the success of past recycling campaigns directed at the public and could indicate a need for additional investment in public outreach for more upstream solutions, building on the results from questions 13-15 on public knowledge of existing policies.

Graph 11: Which policy do you think would be the most effective for reducing waste?



Other responses:

Similar to other questions, "all of the above" or a combination of results was the most common "other" response. Conversely, one respondent expressed doubt in the capacity for change: "*I don't think you can force producers to do any of these things*."

Various respondents in the national convenience sample focused on the potential for economic incentives to encourage manufacturers to improve their management of waste and regulate the negative impacts of waste.

- "*A policy that rewards manufacturers with tax breaks or other incentives and public awards for reducing waste*."
- "*A policy that encourages more sustainable and less polluting solutions for packaging of mass-consumed products*."

Carbon taxes and offsets appeared in two other national convenience respondent's answers. Finally, other respondents proposed larger changes to linear, profit-oriented economic models.

- "*Encouraging B Corporations that have a flattened approach to profit*."
- "*A circular economy: where products are designed such that, after their useful life, their original materials can be recovered*."

The MTurk sample had one respondent who wrote in: "*No easy 'one size fits all' answer to this*."

Question 20: Why did you choose that answer?

When asked why they chose their answers for the most effective waste-reduction policy, respondents in the national convenience sample who selected "a policy that makes manufacturers pay for the impacts of their products" often noted how manufacturers are self-interested and will only make changes with regulation. Two respondents wrote:

- "*Manufacturers have no motivation to make their products longer lasting or repairable unless they have to pay.*"
- "*If producers have to pay for the damage they cause, self-interest will make them better environmental citizens.*"

Respondents who selected "ensures recycling is actually happening correctly" (the second most selected response for this group) often wrote about how recycling in its present, corporate form, is often improper or lacking transparency: "*Most companies that say they recycle do not recycle properly.*"

Some national convenience respondents thought that improving recycling was a "feasible" effort in changing individual behavior and end-of-life management practices:

> "*It's tough to assume that the mindset of capitalistic consumption could change as quickly as needed to mitigate climate change, so ensuring products must have a 'recycling plan' before they are allowed in production would hopefully work backwards in changing consumption patterns while increasing awareness.*"

"Requiring manufacturers to make longer-lasting products" was the third most popular response in the national convenience survey. Respondents who selected this answer often saw it as the most reasonable answer for avoiding additional costs or pushback from consumers:

- "*[Longer-lasting products] would lead to fewer purchases (reduce and reuse over recycling)*."
- "*Any additional fees charged to manufacturers will only be passed on to consumers. You will never be able to confirm that all products are recycled no matter what you state in policy*."

Although "limiting production" was the least selected response for the national convenience sample, two respondents wrote in critiques about the consequences of continuous development of products.

> "*There is a glut of items. You can't tell me something new happens in the mattress world, kitchen appliances or even cars for that matter. Don't make people feel they have to have 'the latest' of everything, when what they are using is sufficient*."

A significant proportion of the national convenience respondents selected "other (please specify)" and wrote in their own responses. A popular write-in response was "all of the above." One respondent wrote:

> "*Limiting production could not be applied rationally as product need and use change constantly.... Even if manufacturers wanted to make longer lasting products problems could occur beyond manufacturers control that shorten the life of the product. The best way is mandate producer responsibility for their products end of life*."

One national convenience respondent critiqued the larger growth economic model, instead saying that we need a "*maintenance economy*." Another respondent who wrote in "*circular economy*" also critiqued the larger system of consumption and production:

> "*I've begun hearing about people working for a circular economy. Unless we can get rid of capitalism, and I don't see that happening any time soon, I don't see much hope in limiting production. Companies are very good at getting us to want their products*."

In the MTurk general public sample, "ensures recycling is actually happening correctly" was the most selected response. When asked why they selected the answer, respondents described the policy as "*least invasive*" and most effective at minimizing the burden of waste. One respondent wrote: "*I think education is more important than forcing businesses to pay more to the government which overall is generally ineffective at solving problems."* One respondent wrote: *"Don't be wasteful if it's not needed*."

Conversely, a larger percentage of respondents in the MTurk public sample than the national convenience sample selected limiting production (19% compared to 7%). The large difference between the general public and the convenience sample's perceptions of limiting production could warrant additional investigation into the feasibility of policies aimed at regulating manufacturing, specifically considering ways to shift the public's perspectives and expectation about the number of products on the market.

The two policies that explicitly mentioned regulating manufacturers were the two least selected responses, tied at 18%. Respondents who selected "makes manufacturers pay for the impacts of their products" often focused on internalizing the costs of the disposal of their products:

> "*Manufacturers would think more about making sustainable products if they had to deal with the impact of their own wastefulness, rather than expecting consumers to carry that cost*."

Additionally, MTurk general public respondents who selected "requires manufacturers to make longer-lasting products" focused on how products created "*before [the era of] planned obsolescence seem to be working*" and how not buying new products "*should mean a reduction in waste*."

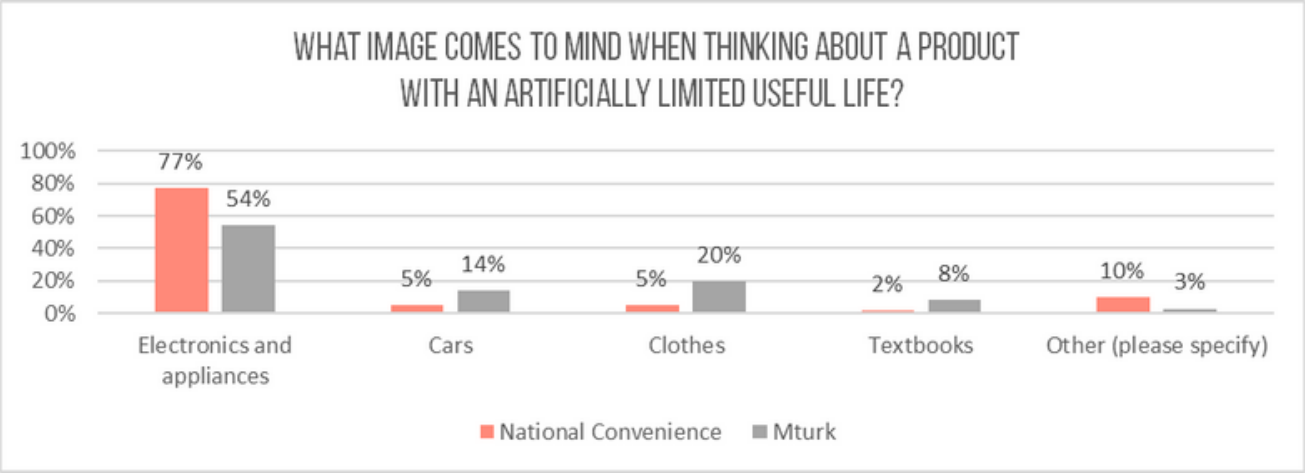
This series of questions showed another divide between respondents in the national convenience sample and the general public sample. The national convenience sample favored options that focused on increasing manufacturer responsibility in the management of waste. The MTurk sample more frequently highlighted the need to limit production, which is also an upstream solution, but didn't assign responsibility for who would limit that production.

Waste-reduction proponents need to continue to advocate for manufacturer's responsibility at end of life but should also consider how to design policies and campaigns that make waste prevention the default behavior. This would make waste prevention the easiest option while achieving outcomes such as limited production (i.e., replacing single-use products with reusable alternatives would result in decreased fossil fuel use for single-use plastics).

Question 21: What image comes to mind when thinking about a product with an artificially limited useful life?

Respondents were asked what image represents a product with an artificially limited useful life. The majority of respondents in both samples selected electronics and appliances. While the second most popular response was clothes for the MTurk general public sample, the second most selected response in the national convenience sample was "other."

Graph 12: What image comes to mind when thinking about a product with an artificially limited useful life?



Other responses:

As the second most selected response in the national convenience sample, the "other" response featured a wide variety of items including food and product packaging: "*packaging*," "*dispensers for liquid soap*," "*plastic silverware/food containers*," and "*paper coffee cup*."

One national convenience respondent specified "*computers and cellphones*," while others suggested poorly or cheaply made items: "*anything at a dollar store*" and "*anything made of plastic: ball point pens, plastic coated paper plates. I understand you may have meant bigger ticket items*."

The MTurk general public sample had very few "other" responses, but two respondents wrote in "*batteries*" and "*fast fashion*."

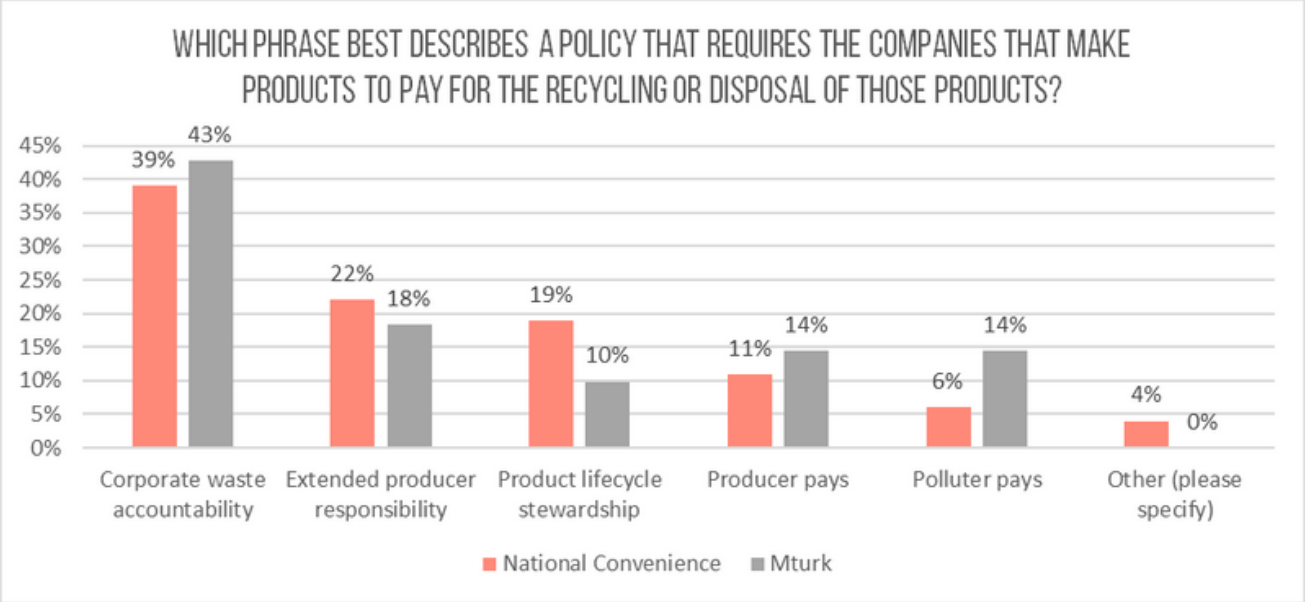
Although questions 13 and 15 revealed limited levels of understanding for right to repair and producer responsibility laws in the general public, question 21 suggests that there is knowledge of the ways in which electronics and appliances have artificially limited lifespans.

Respondents often framed their responses around specific examples of existing policies and practices (i.e., the Massachusetts bill or Apple's limited repair policy). Waste-reduction campaigns would benefit from contextualizing action in terms of existing examples and frameworks that consumers might be familiar with. This could serve as a useful tool in considering the reception and accessibility of new environmental initiatives.

Question 22: Which phrase best describes a policy that requires the companies that make products to pay for the recycling or disposal of those products?

This question sought to gauge perspectives on terms for policies that promote financial involvement of corporate actors in the end-of-life management of their products. "Corporate waste accountability" was favored in both samples, followed by the well-known industry term "extended producer responsibility."

Graph 13: Which phrase best describes a policy that requires the companies that make products to pay for the recycling or disposal of those products?



Other responses:

The majority of the national convenience sample "other" responses featured phrases that built on the existing responses. For example, one respondent wrote about the "*polluter pays*" option: "*Polluter pays has a much more authoritative and understandable message*."

Two national convenience respondents built on the language of "product lifestyle stewardship" by emphasizing the product as the main driver of policy: "Product stewardship/ product sustainability or product responsibility" and "company product disposal policy."

One respondent focused on corporate motivation: "*Carbon Footprint Reduction Rewards (corporations and business are motivated by what they can get).*" However, two respondents didn't support any of the provided answers and wrote in about how they "*didn't think any of these are clear to regular people*." There were no "other" responses in the MTurk sample.

Taking a complex policy like extended producer responsibility and making it easy to understand for the general public can be difficult but is also important for future waste reduction campaigns. The phrase "corporate waste accountability" should be tested in future education and outreach campaigns.

Question 23: Which of the following slogans do you think best represents the current need to make sure recycling is successful?

This question aimed to identify which slogans were most representative of recycling reform. "ReThink Recycling" was popular in both samples, although nearly a quarter of respondents in the MTurk general public sample found that "Reclaim Recycling" was a strong second choice. Similar to previous questions, 14% of the national convenience sample wrote in their own responses, presented below.

Graph 14: Which of the following slogans do you think best represents the current need to make sure recycling is successful?

Other responses:

Several of the national convenience sample "other" responses offered critiques about the slogans presented or wrote they didn't want to choose any of the presented options:

- "*None of the above terms captures that the purpose is around making sure recycling is *successful.* I would try to incorporate that so that the slogan can be more self-explanatory*."
- "*Recycle Right (consumer messaging) and yes, politically folks need to understand its infrastructure. ReThink Recycling makes it sound like you're questioning its value.*"'

Other national convenience respondents wrote in their own slogans that downplayed recycling, including: "*Circular Use (maybe avoid the term recycling all together)*" and "*Reusability not recycling*."

However, some national convenience respondents wrote in phrases that emphasized improving recycling or maintaining recycling in their messaging: "*Revolutionize Recycling*," "*Recycle for Future Generations*," "*Advance Recycling, Recycling Upgrade, Revised Recycling*," and "*Recycling: How hard can it be?*"

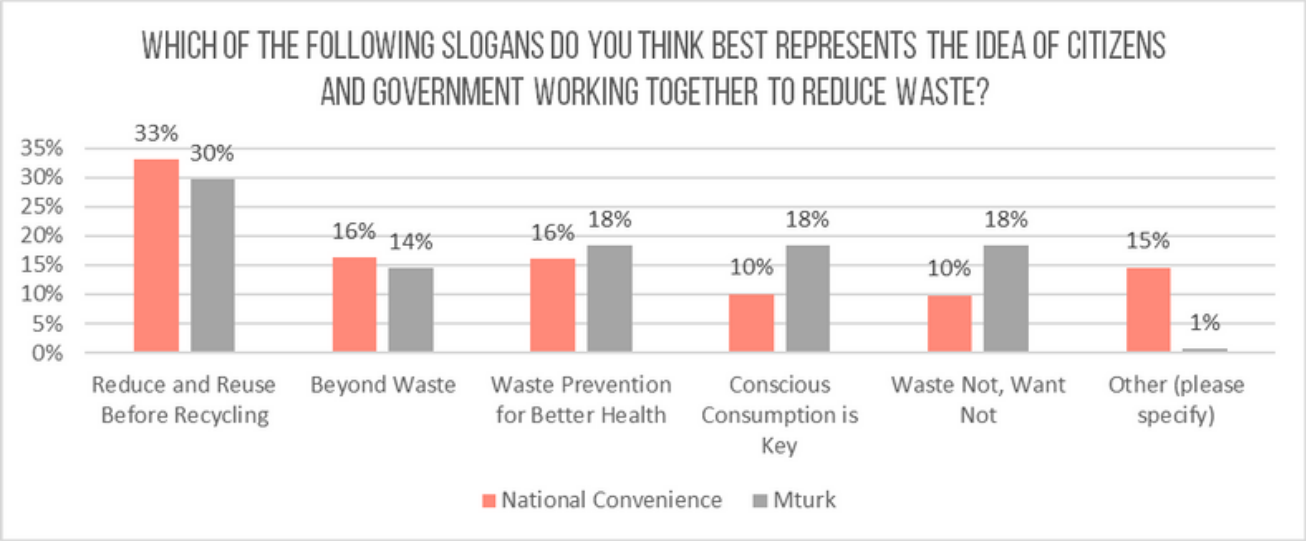
There were no "other" responses in the MTurk general public sample.

The results for this question present a wide spread of data and suggest that additional investigation is necessary for more conclusive results. Several of the write-in responses on questions throughout the survey that address recycling indicate that there may be concerns about how it's perceived as a whole — whether people understand how it works or whether it's an effective solution. Campaigns would benefit from helping people better understand the role of recycling today — including where it can be successful and its limitations — in waste prevention.

Question 24: Which of the following slogans do you think best represents the idea of citizens and government working together to reduce waste?

This question asked about larger-scale collaboration for waste reduction. About one-third of respondents in the national convenience sample and the MTurk general public sample favored the slogan that re-emphasized the waste hierarchy, prioritizing reduction and reuse before recycling.

Graph 15: Which of the following slogans do you think best represents the idea of citizens and government working together to reduce waste?



Other responses:

In the "other" responses, various national convenience sample respondents wrote in answers that alluded to partnership, collaboration, or shared responsibilities: "*Civic*" or "*Collective Responsibility*," "*Waste Collaboration*," "*Collaboration on Waste*" or "*Public-Private Waste Reduction Partnership*," and "*Shared responsibility for waste reduction*."

One national convenience sample respondent focused on efforts to shift responsibility more fully toward companies and policymakers and to help people connect to the issue on a more personal level:

> "*I think businesses and government need to do the work. But if I had to choose, I feel the most effective slogan would be 'Waste Prevention for Better Health' because most folks only take action when they see the direct connection to themselves*."

Other national convenience respondents were focused on recycling ("*Recycling United*") or reductions in other key metrics like the carbon footprint.

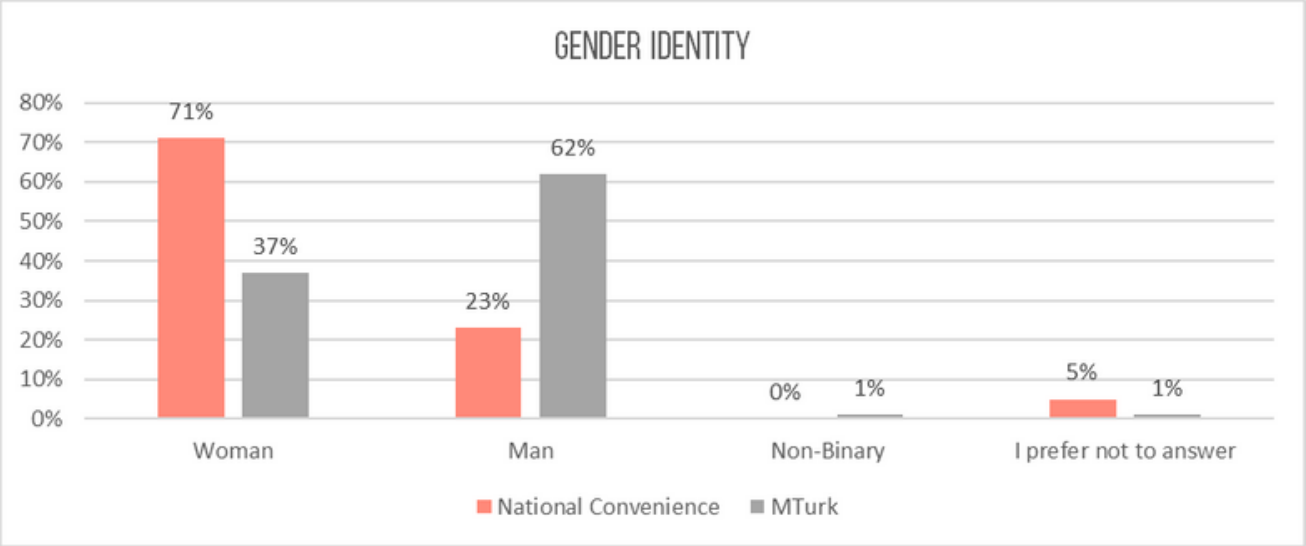
There were no clear "other" responses in the MTurk sample.

The results for this question present a wide spread of data and suggest that additional investigation is necessary for more conclusive results.

SECTION III: DEMOGRAPHIC QUESTION RESULTS

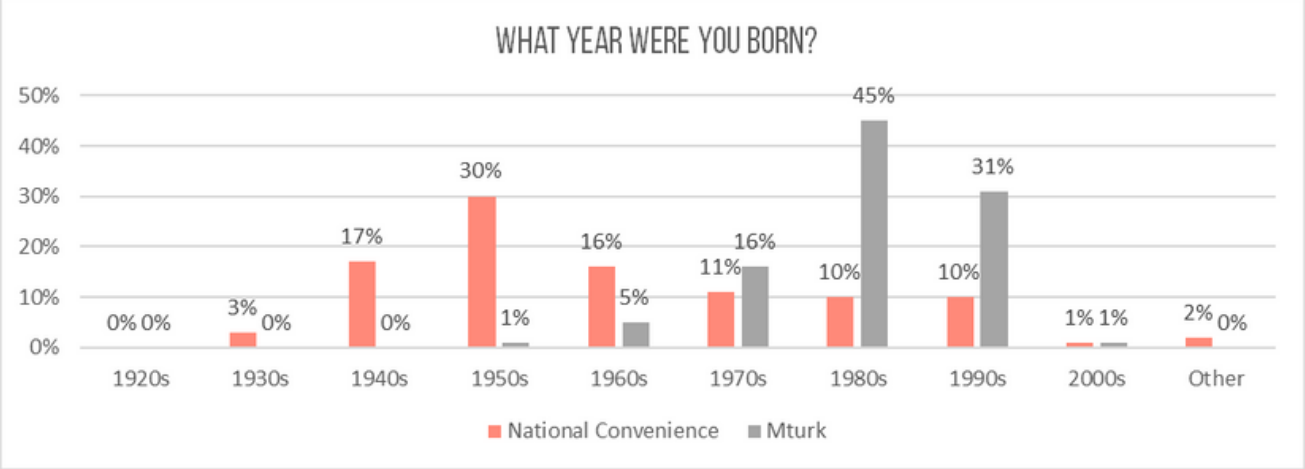
Questions 26 and 27: Do you identify with the gender you were assigned at birth? What is your gender identity?

Graph 16: What is your gender identity?



Questions 25 and 28: What is your age? What year were you born?

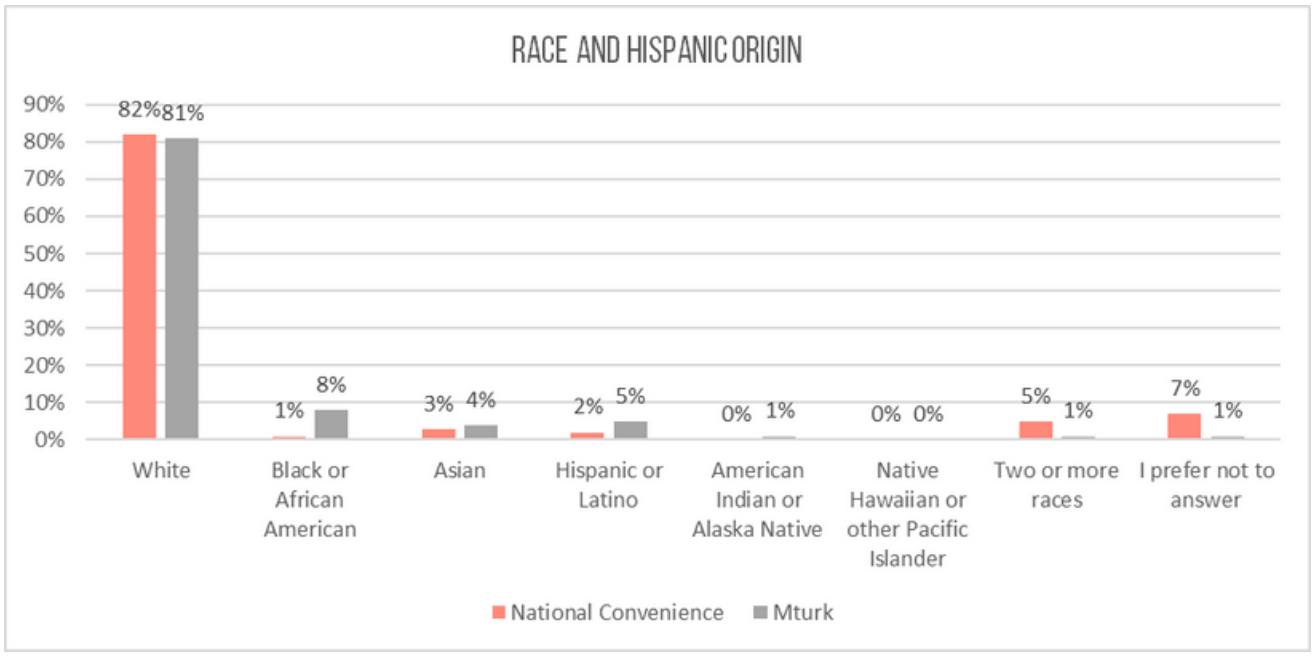
Graph 17: What year were you born?



For the age questions and other demographic questions, many respondents in the national convenience sample wrote in ranges for their ages, generations, or N/A, often citing the desire to not provide information about their demographics. However, for those that did provide an age, many of the respondents in the MTurk general public sample were significantly younger than the respondents in the national convenience sample. The median age in the general public sample was 35 (born in 1986) compared to the national convenience sample median age of 62 (born in 1959). The average ages in the general public and national convenience samples were 37 and 58, respectively.

Question 29: Race and Hispanic origin: How would you describe yourself? (Choose all that apply)

Graph 18: How would you describe yourself? (Choose all that apply)



APPENDIX

Appendix A: Nebraska and Midwest Graphs

There were two additional Nebraska samples. One sample was composed of paid responses from MTurk with compensation ranging from $0.20-$0.60. The Nebraska sample often required higher rewards to encourage additional submissions in response to low completion rates. Ultimately, after quality control, we had a small sample of 42 Nebraska respondents. The second sample involved an unpaid convenience survey of City of Lincoln employees and partners. Following quality control, the Nebraska convenience survey had 77 respondents. The Nebraska-specific sample was limited to the message testing questions and thus excluded many of the policy questions. Since the paid Nebraska sample was so small, we oversampled other Midwestern states.

Nebraska Facebook A/B Message Testing

In addition to the survey, the city of Lincoln carried out A/B testing for question 4 (Which phrase best describes a lifestyle of reducing waste?), a testing method used to identify a single winning response of two available options. A/B testing is often conducted through the form of ads on social media platforms such as Facebook. The ad campaign, which prompted viewers to visit the city government waste-reduction website, had an estimated reach of 10,000 with a $50 budget. Survey moderators are able to view reports of the success of the ads through the number of impressions (the number of people that see the ad) and link clicks (the number of people who click on the ad to lean more). The winning ads are the ones that receive the greatest numbers of link clicks and high reach.

The Facebook A/B message testing results revealed that although “sustainable living” was the top choice for question 3 in the survey samples itself, it received significantly fewer clicks in the A/B testing trials when tested against “eco-minimalism,” “conscious consumption,” and “low-waste living.” Although “low-waste living” wasn’t included in the initial survey, it was identified as a potential option in discussions following the launch of the survey.

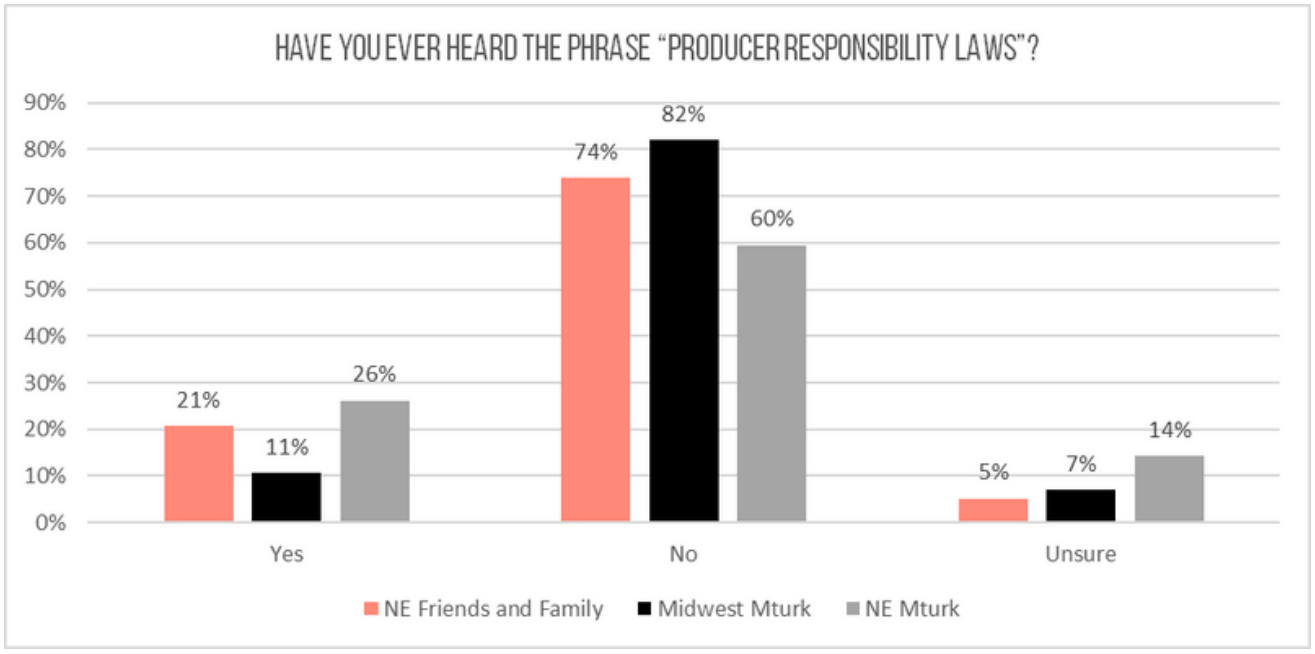
Numerically, eco-minimalism received the largest number of clicks and was favored over sustainable living in the social media test. There appears to be a significant proportion of people who favor eco-minimalism in the Nebraska MTurk and A/B testing samples whereas both the city of Lincoln and the national convenience respondents were considerably less likely to favor eco-minimalism.

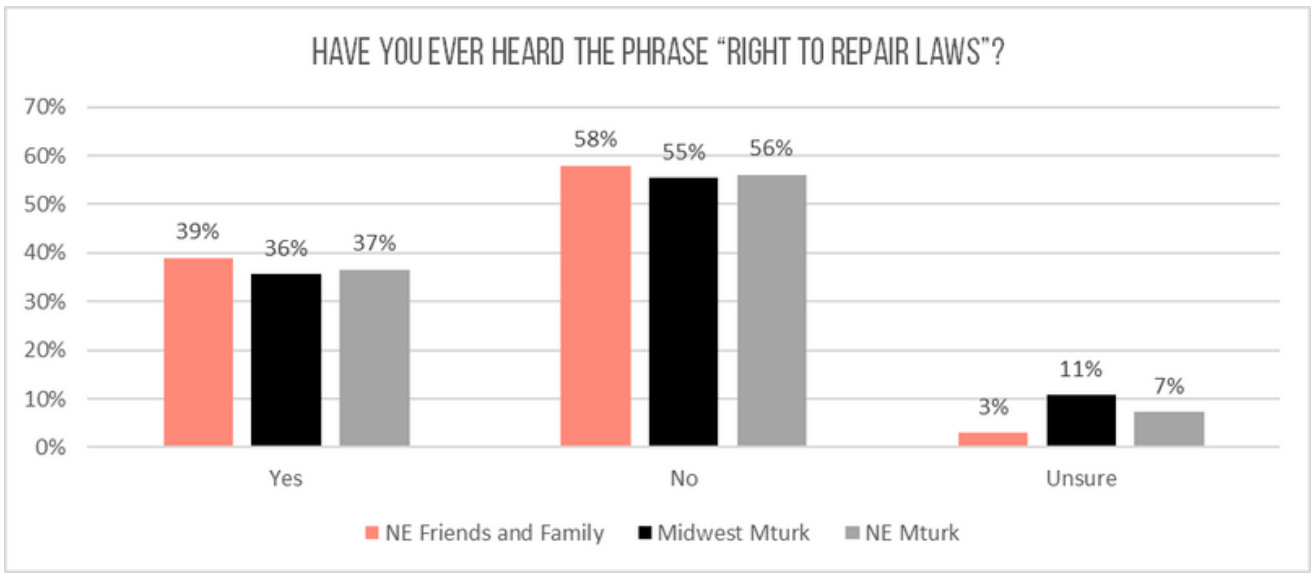
CAMPAIGN NAME	REACH	AD NAME	LINK CLICKS
Sustainable Living vs. Sustainable Consumption	24076	Sustainable Consumption	17.00
		Sustainable Living	17.00
Eco-minimalism vs. Sustainable Living	32580	Eco-minimalism*	20.00
		Sustainable Living	13.00
Sustainable Living vs. Conscious Consumption	16847	Conscious Consumption	7.00
		Sustainable Living	2.00
Sustainable Living vs. Low-waste Living	19814	Low-waste Living	13.00
		Sustainable Living	11.00

*Winning terms are highlighted.

In the Nebraska samples most questions had similar results to the national paid and convenience samples except those questions noted below.

Compared to the Nebraska convenience and Nebraska MTurk samples, respondents in the national convenience samples reported higher levels of familiarity with producer responsibility and right to repair laws. While 53% of the national convenience sample and 38% of the national MTurk sample reported "yes" to suggest that they had heard of producer responsibility laws, 21% of the Nebraska convenience sample and 26% of the Nebraska MTurk sample reported "yes."





Appendix B: Survey Questions

Questions used across all samples:

1. Which word(s) do you use to talk about household waste? (choose all that apply)
2. In your opinion, which words should be used to talk about generating and disposing of less waste? (choose only one answer)
3. Why did you choose that answer? (open-ended)
4. Which phrase best describes a lifestyle of reducing waste? (choose only one answer)
5. Why did you choose that answer? (open-ended)
6. Which phrase best describes something that is designed to be discarded after one-time use? (For example, paper plates, plastic utensils, masks) (choose only one answer)
7. Why did you choose that answer? (open-ended)
8. What image comes to mind when thinking about the phrase preventing waste? (choose only one answer)
9. Which action is most important to you to limit your waste? (choose only one answer)
10. Why did you choose that answer? (open-ended)
11. What motivates you to reduce your waste? (choose only one answer)
12. Why did you choose that answer? (open-ended)
13. Have you ever heard the phrase “producer responsibility laws”? Yes or No
14. If yes, please tell us a little about it. (open-ended)
15. Have you ever heard the phrase “right to repair laws”? Yes or No
16. If yes, please tell us a little about it. (open-ended)

Additional Policy Questions from the National MTurk and National Convenience Samples (not featured in NE or Midwest Samples):

17. Some products are designed to have an artificially limited useful life. Which phrase best describes this type of design? (choose only one answer)
18. Why did you choose that answer? (open-ended)
19. Which policy do you think would be the most effective for reducing waste? (choose only one answer)
20. Why did you choose that answer? (open-ended)
21. What image comes to mind when thinking about a product with an artificially limited useful life? (choose only one answer)
22. Which phrase best describes a policy that requires the companies that make products to pay for the recycling or disposal of those products? (choose only one answer)
23. Which of the following slogans do you think best represents the current need to make sure recycling is successful? (choose only one answer)
24. Which of the following slogans do you think best represents the current need to make sure recycling is successful? (choose only one answer)

Demographic Questions:

1. What is your age?
2. Do you identify with the gender you were assigned at birth?
3. What is your gender identity?
4. What year were you born?
5. Race and Hispanic origin: How would you describe yourself? (choose all that apply)

Appendix C: Images from Question 8

Below are the pictures used in question 8.

Image 1: Reusable Water Bottle

Worlds Direction, CC0, via Wikimedia Commons
This file is made available under the Creative Commons CC0 1.0 Universal Public Domain Dedication

Image 2: Store Bulk Containers

BCMom via Flickr
This file is made available under Creative Commons Attribution 2.0 Generic

Image 3: Secondhand Items From a Thrift Store

Orin Zebest via Flickr "Thrift Store, Lower Haight"
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Image 4: Rechargeable Batteries

Free Stock Images via Flickr
"Rechargeable Batteries"
This file is made available under Creative Commons Attribution 2.0 Generic

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