
Recycling bias and reduction neglect

In the format provided by the
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Supplementary Information

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1. Analysis of open-ended responses

Table 1: Study 1 results for open-ended response for the “single most effective thing” you [other Americans] to (a) reduce landfill waste and (b) reduce plastic pollution in the oceans

Activity	Source Reduction or Disposal	Reduce Landfill Waste		Reduce Ocean Plastic	
		Self, %	Americans, %	Self, %	Americans, %
Recycle	D	44.9	45.5	22.4	25.1
Use fewer plastic products	SR	7.4	6.5	40.0	38.6
Reuse items / buy reusable products	SR	9.1	9.3	10.1	8.7
Reduce consumption / buy less	SR	7.1	7.9	2.5	1.8
Unspecific (e.g., “avoid waste”)	--	6.3	6.8	3.1	3.7
Compost	D	4.5	2.6	--	--
Seek out items with less or more sustainable packaging	SR	4.0	3.9	3.9	2.2
Reduce food waste	SR	3.7	4.1	--	--
Mindful purchasing	SR	2.9	2.5	0.7	0.9
Advocate for systemic change	--	1.5	1.6	4.7	4.7
Seek out biodegradable	D	1.2	0.9	1.3	0.5
Donate or sell old items	D	1.4	1.3	0.0	0.1
Burn or bury waste	D	1.1	0.5	0.0	0.4
Engage in other pro-environmental behaviors	--	1.2	2.0	0.4	0.4
Separate waste and dispose of it ‘properly’	D	0.7	0.9	1.1	1.5
The “3Rs”: Reduce, reuse and recycle	--	0.7	0.9	--	--
Don’t know/unsure	--	0.6	0.7	0.6	0.5
Reduce	SR	0.6	1.1	0.5	0.5
Don’t litter	D	0.5	0.2	5.0	7.4
Nothing	--	0.2	0.1	0.4	0.2
Die or stop existing	SR	0.2	0.1	0.1	0.1
Don’t reproduce	SR	0.1	0.1	--	--
Beach clean-ups	D	0.1	0.2	2.9	2.1
Don’t bring plastic to the beach	--	--	--	0.5	0.4
Stop eating fish	SR	--	--	0.0	0.2

Participants in Study 1 (N = 848) responded to two blocks of questions that were randomized and the order of the questions within the blocks were also randomized.

Landfill block:

What is the single most effective thing **YOU** can personally do to **reduce landfill waste**?

What is the single most effective thing **OTHER** Americans can do to **reduce landfill waste**?

Ocean block:

What is the single most effective thing **YOU** can personally do to **reduce plastic pollution in the oceans**?

What is the single most effective thing **OTHER** Americans can do to **reduce plastic pollution in the oceans**?

Responses were coded by two researchers who reviewed the first 100 survey responses together and then independently coded the remaining responses. Interrater agreement was very high for all four questions, κ 's > 0.8.

Each action was then classified as either a disposal (e.g., recycling) or source reduction behavior (e.g., buy less). Some items defied this categorization, either because they could reasonably constitute both (e.g., "the 3Rs," which is commonly understood to be the trio of actions reduce, reuse, and recycle) or neither (i.e., indirect or other pro-environmental behaviors, such as "drive more fuel-efficient vehicles").

Across the data, results show limited differences of responses by topic between self and other Americans.

Table 2: Study 2 responses for the question on the "single most effective thing YOU can do"

Activity	Source Reduction (SR) or Disposal (D)	Self, %
Recycle	D	46.9
Reuse	SR	10.6
Reduce consumption/buy less	SR	6.6
Compost	D	5.9
Reduce food waste	SR	5.1
Reduce use of plastic products	SR	5.1
Mindful purchasing	SR	3.8
Seek out items with less or more sustainable packaging	SR	3.8
Separate waste and dispose of it 'properly'	D	3.0
Reduce	SR	3.0
Indirect, other pro-environmental behaviors	--	1.9

The “3Rs”: Reduce, reuse and recycle	--	0.8
Miscellaneous/vague	--	0.8
Burn trash	D	0.6
Spread awareness	--	0.6
Activism/systems change	--	0.6
Don't litter	D	0.4
Nothing/hopelessness	--	0.2
Buy biodegradable items	D	0.2

Responses to question:

Household waste can cause many environmental problems. What is **the single most effective thing YOU can do** in your day-to-day life that helps solve this problem? (open-ended)

The first 100 responses were coded by 2 members of the research team together to determine categories, and the remaining items were coded by one researcher with the exception of items that could reasonably fit into more than one category, which were determined by the team. No interrater reliability was calculated given the team members worked together to determine categories.

2. Exploring individual differences

Table 3 shows correlations of responses for the most effective way to reduce landfill waste and the most effective way to reduce ocean plastic pollution compared to socio-demographic variables. Open-ended responses were coded 1 for recycling and 0 for not recycling.

Table 3: Correlation matrix showing individual relationships between sociodemographic variables and a bias towards recycling in open-ended questions (Study 1)

	Landfill Recyc. Bias	Ocean Recyc. Bias	Polit. Bel.	Male	Income	Employ.	Edu.	Age
Landfill – Recyc. Bias	1							
Ocean – Recyc. Bias	0.14	1						
Political Beliefs	0.08	0.03	1					
Male	0.00	0.03	-0.09	1				
Income	-0.04	-0.02	0.06	-0.02	1			
Employ.	0.03	0.06	-0.01	0.17	-0.08	1		
Education	-0.16	-0.17	0.01	-0.04	0.26	-0.13	1	
Age	0.14	0.02	0.09	0.12	-0.01	0.17	-0.03	1

Table 4 shows correlations of responses for the most effective personal way to help solve environmental problems associated with waste. Open-ended responses were coded 1 for recycling and 0 for not recycling.

Table 4: Correlation matrix showing individual relationships between sociodemographic variables and recycling bias in open-ended and ranking questions (Study 2)

	Op. End. R.B.	Polit. Bel.	Male	Income	Employ.	Edu.	Age
Op. End. – Recyc. Bias	1						
Political Beliefs	0.14	1					
Male	-0.01	-0.13	1				
Income	-0.01	0.07	-0.12	1			
Employment	0.06	0.01	0.10	-0.29	1		
Education	-0.11	-0.07	-0.00	0.37	-0.25	1	
Age	0.14	0.19	0.01	-0.08	0.22	0.01	1

Across both studies, we find some variables of interest, such as age is positively correlated to listing recycling and education is negatively correlated to listing recycling as the single most effective waste management strategy.

3. Additional Analysis

a. Taking away recycling as an option: Study 1

We hypothesized that taking away the option to recycle might prompt people to consider source reduction and reuse strategies. However, when active recyclers in Study 1 ($n=696$; 70% of participants) answered how they would react if recycling ceased to be available in their area (as was the case in many municipalities following passage of China's National Sword Act^{1,2}), participants continued to focus on recycling rather than source reduction. The most common participant response was that they would drive recyclables to another place that still recycles (28.9%). In sum, 53.4% of participants endorsed disposal actions compared to 23.2% that recommended source reduction strategies. Even when recycling was taken away as a local option, people still defaulted to recycling rather than source reduction or reuse.

b. Confidence of wishcyclers: Study 2

Wishcyclers who erroneously placed coffee cups and plastic bags in the recycling bin were significantly more confident than participants who correctly placed these contaminants in the trash bin. For coffee cup wishcyclers, a one-way Welch ANOVA revealed statistically significant differences among groups ($F(2, 269.55) = 3.73, p = 0.025$) and a Games-Howell post-hoc test revealed that those who erroneously placed coffee cups in the recycling were significantly more confident ($M = 70.4, SE = 1.63$) than trashers ($M = 62.32, SE = 2.47$), $p = 0.019$. Plastic bag wishcyclers were also significantly more confident ($M = 80.03, SE = 1.26$) than trashers ($M = 69.66, SE = 1.87$), $p < 0.001$ according to a one-way Welch ANOVA ($F(2, 13.54) = 11.48, p = 0.001$) and Games-Howell post-hoc test.

4. Study 1 Survey Text

Note: the data from survey 1 is not publicly available due to language included on the consent form. However, data from our second survey is publicly available at the link listed above.

[Note: the following two **blocks** are randomized]

Single most effective thing: landfill

[Note: the following two **questions** are randomized]

What is the single most effective thing **YOU** can personally do to **reduce landfill waste**?

[page break]

What is the single most effective thing **OTHER** Americans can do to **reduce landfill waste**?

[page break]

Single most effective thing: plastic pollution

[Note: the following two **questions** are randomized]

What is the single most effective thing **YOU** can personally do to **reduce plastic pollution in the oceans**?

[page break]

What is the single most effective thing **OTHER** Americans can do to **reduce plastic pollution in the oceans**?

[page break]

[Note: the following two **blocks** are randomized]

Individual

Think about your trash, recycling, and composting behaviors.

[page break]

Generated waste refers to all of the items that people put in the waste stream to be landfilled, recycled, composted, or incinerated. Generated waste can include anything from plastic bottles to food, old tires, and much more.

On average, how many pounds of waste do **YOU** as an individual **generate** per **week**? Please include all waste you generate, whether you recycle, throw away, compost, or burn it.

Your best estimate is fine. Please enter whole numbers with no other text (not decimals or ranges).

[page break]

You estimated that you generate [populated number from above] pounds of waste per week. For the following questions, we will ask you to estimate what percent of your waste you throw away, recycle, or compost on **average**. Please familiarize yourself with the following definitions.

Throw away means dispose of items in designated trash bins to be sent to landfills. This includes throwing away waste in trash cans, dumpsters, or any other location where waste gets collected and taken to landfills.

Recycle means dispose of items in designated recycling bins so that they can be turned into new products. This includes disposing of recyclable items in marked curbside recycling bins, recycling dumpsters, and taking items to special drop-off recycling facilities.

Compost means disposing of food, yard, and other biodegradable waste in designated spaces to be turned into natural fertilizer. Some people compost at home while others take their compostable waste to special facilities to be composted.

[page break]

Think about how you dispose of the [populated number from above] pounds of waste you generate per week. For a reminder of the definition of the different categories, place your cursor over each question. The total must equal 100.

What percent of your waste do you throw away? _____

What percent of your waste do you recycle? _____

What percent of your waste do you compost? _____

If you dispose of your waste in another way not listed here, please describe and estimate what percent of your waste you dispose of in this way _____

Total [note: validated to equal 100] _____

Average American

Think about the average American's trash, recycling, and composting behaviors.

[page break]

Generated waste refers to all of the items that people put in the waste stream to be landfilled, recycled, composted, or incinerated. Generated waste can include anything from plastic bottles to food, old tires, and much more.

On average, how many pounds of waste do you think the **AVERAGE** American individual generates per **week**? Please include all waste you generate, whether you recycle, throw away, compost, or burn it.

Your best estimate is fine. Please enter whole numbers with no other text (not decimals or ranges).

[page break]

You estimated that the average American generates [populated number from above] pounds of waste per week. For the following questions, we will ask you to estimate what percent of their waste you think the average American throws away, recycles, or composts on **average**. Please familiarize yourself with the following definitions.

Throw away means dispose of items in designated trash bins to be sent to landfills. This includes throwing away waste in trash cans, dumpsters, or any other location where waste gets collected and taken to landfills.

Recycle means dispose of items in designated recycling bins so that they can be turned into new products. This includes disposing of recyclable items in marked curbside recycling bins, recycling dumpsters, and taking items to special drop-off recycling facilities.

Compost means disposing of food, yard, and other biodegradable waste in designated spaces to be turned into natural fertilizer. Some people compost at home while others take their compostable waste to special facilities to be composted.

[page break]

Think about how the average American disposes of the [populated number from above] pounds of waste they generate per week. For a reminder of the definition of the different categories, place your cursor over each question. The total must equal 100.

What percent of their waste do you think the average American throws away? _____

What percent of their waste do you think the average American recycles? _____

What percent of their waste do you think the average American composts? _____

Total [note: validated to equal 100] _____

[page break]

Decomposition and recycling time estimates

How long do you think it takes the following items to decompose? Please enter a number and select a unit of time from the drop down. Example: if you think one of these items takes 2 days to decompose, please write '2' and select 'days' from the drop-down menu.

If you do not think that a particular item ever decomposes, please put N/A in the box and select 'never.'

	Amount of time to decompose. Please enter a number.	Unit of time (please select days, weeks, months, or years from the drop-down).
Plastic water bottle.		
Biodegradable plastic bag.		
Plastic bag.		
Glass bottle.		
Aluminum can.		

[page break]

When you were thinking about how long it takes the following items to decompose, which type of environment did you picture them in? Please select all that apply.

	Ocean/ marine	Landfill	City/urban	River/lake/ freshwater	Streetside/ park	None of these
--	------------------	----------	------------	---------------------------	---------------------	---------------------

Plastic water bottle						
Biodegradable plastic bag						
Plastic bag						
Glass bottle						
Waxed milk/juice carton						
Aluminum can						

[page break]

When the following products are recycled, how long do you think it takes for them to be made into a new product from the time they are collected? Example: if you think one of these items takes 2 days to be made into a new product, please write '2' and select 'days' from the drop-down menu.

	Amount of time to be made into a new product. Please enter a number.	Unit of time (please select days, weeks, months, or years from the drop-down).
Plastic water bottle.		
Plastic bag.		
Glass bottle		
Aluminum can		

[page break]

Amount of plastic recycled

[Note: the following two **questions** are randomized]

Out of all of the plastic that has ever been produced, what percent do you estimate has been recycled?

Please enter a percent with no other text (not decimals or ranges).

[page break]

Out of all the plastic that has ever been produced, what percent do you estimate has ended up in landfills or the natural environment?

Please enter a percent with no other text (not decimals or ranges).

[page break]

Recycling knowledge

[Note: the following two **questions** are randomized]

How much do **YOU** know about recycling?

For example: what can and can't be recycled, how items are recycled, and where recyclable items go?
(None at all --- A little --- A moderate amount --- A lot ---A great deal)

How much do you think the **AVERAGE** American knows about recycling?

For example: what can and can't be recycled, how items are recycled, and where recyclable items go?
(None at all --- A little --- A moderate amount --- A lot ---A great deal)

[page break]

Recycling Knowledge Images

[Note: some images have been changed from the original survey to provide creator attribution]

Now we are going to show you images of common items. Please indicate whether or not you think that each item is **recyclable**. [Note: Bolded indicate acceptable answers. Recyclability of each item was assessed using the website Earth911 (earth911.com)'s recycling guide, a website that the EPA links to on their "How Do I Recycle?" page for users to find recycling resources and locations (1).]

[Note: the following questions are randomized]



Image by topntp26 on Freepik. Note: Survey image that appeared to participants was a paper coffee cup without a lid.

Paper Coffee Cup

- ☐ Recyclable at almost all recycling facilities
- ☐ **Recyclable, but only at select recycling facilities**
- ☐ Not recyclable anywhere



Image by shantalao on Freepik.

Cardboard

- ☐ **Recyclable at almost all recycling facilities**
- ☐ Recyclable, but only at select recycling facilities
- ☐ Not recyclable anywhere



Image by fabrikasimf on Freepik. Note: image shown to participants featured an open, empty tin/steel can.

Tin (steel) can

- ☐ **Recyclable at almost all recycling facilities**
- ☐ Recyclable, but only at select recycling facilities

- o Not recyclable anywhere



Image credit: adapted from Dids, Pexel.

Lightbulb

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Note: image shown to participants was a mostly empty peanut butter jar. Image not able to be shown here due to license restrictions.

Glass peanut butter jar that still has peanut butter in it

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Image credit: adapted from Karolina Grabowska on Pexels.

Coffee pods

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Image credit: the authors.

Plastic water bottle

- o **Recyclable at almost all recycling facilities**
- o Recyclable, but only at select recycling facilities
- o Not recyclable anywhere



Image credit: Freepik.

Styrofoam food container

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Image credit: upklyak, Freepik.

Aluminum can

- o **Recyclable at almost all recycling facilities**
- o Recyclable, but only at select recycling facilities
- o Not recyclable anywhere



Image credit: Adapted from Engin_Akyurt, Pixabay.

Aluminum foil

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Image credit: Wirestock, freepik.

Glass bottle

- o **Recyclable at almost all recycling facilities**

- o Recyclable, but only at select recycling facilities
- o Not recyclable anywhere



Image credit: the authors.

Greasy cardboard pizza box

- o Recyclable at almost all recycling facilities
- o Recyclable, but only at select recycling facilities
- o **Not recyclable anywhere**



Note: image shown to participants was an empty, foil-lined bag. Image not able to be shown here due to license restrictions.

Empty chip bag

- o Recyclable at almost all recycling facilities
- o **Recyclable, but only at select recycling facilities**
- o Not recyclable anywhere



Image credit: the authors.

Paper towel

- o Recyclable at almost all recycling facilities
- o Recyclable, but only at select recycling facilities
- o **Not recyclable anywhere**



Image credit: Mahesh Patel, PxHere.

Used diaper

- o Recyclable at almost all recycling facilities
- o Recyclable, but only at select recycling facilities
- o **Not recyclable anywhere**



Image credit: PxFuel.

Electronic cords

- ☐ Recyclable at almost all recycling facilities
- ☐ **Recyclable, but only at select recycling facilities**
- ☐ Not recyclable anywhere



Image credit: Adapted from Divotomezove, Pixabay.

Plastic bag

- ☐ Recyclable at almost all recycling facilities
- ☐ **Recyclable, but only at select recycling facilities**
- ☐ Not recyclable anywhere

[page break]

[Note: the following questions are randomized]

Products remade

What type(s) of products do you think **plastic bottles** get made into when they are recycled? Please list as many as you can think of.

What type(s) of products do you think **glass bottles** get made into when they are recycled? Please list as many as you can think of.

[page break]

Cessation of recycling

How important is recycling to **YOU**?

(Not at all important --- Somewhat important --- Moderately important --- Important ---Extremely important)

How important do you think recycling is to the **AVERAGE** American?

(Not at all important --- Somewhat important --- Moderately important --- Important ---Extremely important)

Do you currently recycle?

(Yes --- No)

If yes → Why do you recycle?

If no → Why don't you recycle?

If yes → If recycling were no longer offered in your area, would you change any behaviors?

(Yes --- No)

If yes → Please describe how you think you would change your behaviors if recycling were no longer offered in your area. List as many examples as you can think of.

[page break]

Wishcycling

[Note: the following two **questions** are randomized]

How often do **YOU** put something in the recycling that you are NOT sure is recyclable?

(Never --- Rarely --- Occasionally --- Often --- Very Often)

[page break]

How often do *you* think the **AVERAGE** American puts something in the recycling that they are NOT sure is recyclable? (Never --- Rarely --- Occasionally --- Often --- Very Often)

[page break]

Purchasing Decisions

How often do *you* take into account how you will dispose of an item when you decide to purchase it?

(Never --- Rarely --- Occasionally --- Often --- Very Often)

If an item you wanted came in packaging that was not recyclable or compostable, would you still purchase that item?

(I would definitely not buy it --- I would probably not buy it --- I might or might not buy it --- I would probably buy it --- I would definitely buy it)

How often do *you* decide **NOT** purchase something because you are concerned about creating waste?

(Never --- Rarely --- Occasionally --- Often --- Very Often)

How often do you buy products specifically because they are made out of recycled materials?

(Never --- Rarely --- Occasionally --- Often --- Very Often)

If rarely – occasionally – often – very often What products do you buy specifically because they are made out of recycled materials?

[page break]

Recycling contaminants

[Note: the following three **questions** are randomized]

If someone does not know whether or not something is recyclable, it is better for them to **put it in a recycling bin** than to throw it away.

(Strongly agree --- Somewhat agree--- Neither agree nor disagree --- Somewhat disagree --- Strongly disagree)

If someone does not know whether or not something is recyclable, it is better for them to **throw it away** than to put it in a recycling bin.

(Strongly agree --- Somewhat agree--- Neither agree nor disagree --- Somewhat disagree --- Strongly disagree)

Items are still easy to recycle even if they are not totally clean.

(Strongly agree --- Somewhat agree--- Neither agree nor disagree --- Somewhat disagree --- Strongly disagree)

When recycling, it is not a big deal if items have some food residue left on them.

[page break]

Attention/Bot Check

Please select 'No' if you are reading this question. (Yes --- No)

[page break]

China's National Sword Policy

Now we are going to ask you some questions about recycling policy. Please answer to the best of your ability without searching the internet or other sources.

[page break]

Have you heard about recent policy changes that have impacted recycling in the U.S.? (Yes --- No)

[page break]

If no ☐ For many years, China was the single largest consumer of recyclable materials generated in the United States. Starting in January 2018, China has implemented a series of bans and strict new standards and has greatly decreased how much recyclable material they import. These policy changes have caused upheaval in U.S. recycling. Some municipalities have increased the costs of recycling programs or have shut them down altogether. Others are continuing to collect recyclable materials, but are storing them in warehouses, landfilling them, or incinerating (burning) them.

Now that you are more familiar with these changes to recycling, do you think you would change any of your behaviors? (Yes --- No)

If yes ☐ Please describe how you would change your behaviors. List as many examples as you can think of.

[page break]

If yes ☐ (Have you heard . . .) Please briefly describe this policy change to the best of your knowledge.

[page break]

For many years, China was the single largest consumer of recyclable materials generated in the United States. Starting in January 2018, China has implemented a series of bans and strict new standards and has greatly decreased how much recyclable material they import. These policy changes have caused upheaval in U.S. recycling. Some municipalities have increased the costs of recycling programs or have

shut them down altogether. Others are continuing to collect recyclable materials, but are storing them in warehouses, landfilling them, or incinerating (burning) them.

If yes ☐ Have these changes in recycling prompted a change in any of your behaviors? (Yes --- No)

If yes and yes ☐ Please describe how these changes in recycling have prompted a change in your behaviors. List as many examples as you can think of.

[page break]

Numeracy

To answer the following questions, please enter whole numbers or decimals with no other text (not ranges or percent signs).

Imagine that we flip a fair coin 1,000 times. What is your best guess about how many times the coin would come up heads in 1,000 flips?

In the BIG BUCKS LOTTERY, the chance of winning a \$10 prize is 1%. What is your best guess about how many people would win a \$10 prize if 1000 people each buy a single ticket from BIG BUCKS?

In ACME PUBLISHING SWEEPSTAKES, the chance of winning a car is 1 in 1,000. What percent of tickets to ACME PUBLISHING SWEEPSTAKES win a car?

[page break]

New Ecological Paradigm

The following set of questions pertain to environmental attitudes.

Please indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
We are approaching the limit of the number of people the earth can support.					
Humans have the right to modify the natural environment to suit their needs.					
When humans interfere with nature it often produces disastrous consequences.					
Human ingenuity will ensure that we do NOT make the earth unlivable.					
Humans are severely abusing the environment.					
The earth has plenty of natural resources if we just learn how to develop them.					

Plants and animals have as much right as humans to exist.					
---	--	--	--	--	--

[page break]

Please indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
The balance of nature is strong enough to cope with the impacts of modern industrial nations.					
Despite our special abilities, humans are still subject to the laws of nature.					
The so-called "ecological crisis" facing humankind has been greatly exaggerated.					
Humans were meant to rule over the rest of nature.					
The balance of nature is very delicate and easily upset.					
Humans will eventually learn enough about how nature works to be able to control it.					
If things continue on their present course, we will soon experience a major ecological catastrophe.					

[page break]

Waste Services

Where you live, which of the following waste services are available? If you are not sure whether or not it is available, do not select it.

- Curbside recycling pick-up
- Drop-off recycling center
- Recycling dumpster at my housing unit
- In-home (self) composting
- Curbside composting pick-up
- Drop-off composting center
- Curbside garbage pick-up
- Drop-off garbage station
- Garbage dumpster at my housing unit

[page break]

Of these, which do you use? [carry-forward choices from above question]

Where you live, are you charged based on the amount of garbage you throw away?
(Yes --- No--- Unsure)

Has your cost of garbage gone up in the past year? (Yes --- No--- Unsure)

Has your cost of recycling gone up in the past year? (Yes --- No--- Unsure)

Where I live, finding information on what can and cannot be recycled is easy.
(Strongly agree --- Mildly agree--- Unsure --- Mildly disagree --- Strongly disagree)

How often do you look up information on what can be recycled?
(Never --- Rarely --- Occasionally --- Often --- Very Often)

[page break]

Demographics

How many people are there in your household (including yourself)?

How would you describe your political beliefs? (Very liberal --- Liberal --- Slightly liberal --- Moderate --- Slightly conservative --- Conservative --- Very conservative)

What is your gender? (Male --- Female --- Other (please specify))

During 2018, what was your yearly household income before tax? Your best estimate is fine.

- ☐ Did not have an income
- ☐ Less than \$20,000
- ☐ \$20,000 - \$49,999
- ☐ \$50,000 - \$79,999
- ☐ \$80,000 - \$109,999
- ☐ \$110,000 - \$139,999
- ☐ \$140,000 - \$169,999
- ☐ Greater than \$170,000

Which statement best describes your current employment status?

- ☐ Working (paid employee)
- ☐ Working (self-employed)
- ☐ Not working (temporary layoff from a job)
- ☐ Not working (looking for work)
- ☐ Not working (retired)
- ☐ Not working (disabled)
- ☐ Not working (other) _____
- ☐ Prefer not to answer

What is the highest level of education you have attained?

- ☐ Some schooling, but no diploma or degree.
- ☐ High school diploma or GED
- ☐ Some college
- ☐ College degree
- ☐ Some graduate school
- ☐ Graduate degree

What is your year of birth?

What type of home do you live in?

- Single family house
- Apartment building

- Condominium
- Townhouse
- Duplex
- Student residential housing
- Other (please describe)

Have you lived at your current address for one year or more? (Yes --- No)

In which state do you currently reside? (Drop-down menu)

What is your zip code?

Do you have any thoughts to share or comments? (open-ended)

5. Study 2 Survey Text

Demographics

How many people are there in your household (including yourself)? _____

How would you describe your political beliefs?

- Very Liberal (1)
- Liberal (2)
- Slightly Liberal (3)
- Moderate (4)
- Slightly Conservative (5)
- Conservative (6)
- Very Conservative (7)

How would you describe yourself?

- Asian or Pacific Islander (1)
- Black or African American (2)
- Hispanic or Latino (3)
- Native American or Alaskan Native (4)
- White or Caucasian (5)
- Multiracial or Biracial (6)
- Other (please describe) (7) _____

What is your gender?

- Male (1)
- Female (2)
- Other (please specify) (3) _____

During 2021, what was your yearly household income before tax? Your best estimate is fine.

- Did not have an income (1)
- Less than \$20,000 (2)
- \$20,000 - \$49,999 (3)
- \$50,000 - \$79,999 (4)

- \$80,000 - \$109,999 (5)
- \$110,000 - \$139,999 (6)
- \$140,000 - \$169,999 (7)
- Greater than \$170,000 (8)

Which statement best describes your current employment status?

- Working (paid employee) (1)
- Working (self-employed) (2)
- Not working (temporary layoff from a job) (3)
- Not working (looking for work) (4)
- Not working (retired) (5)
- Not working (disabled) (6)
- Not working (other) (7) _____
- Prefer not to answer (8)

What is the highest level of education you have attained?

- Some schooling, but no diploma or degree. (1)
- High school diploma or GED (2)
- Some college (3)
- College degree (4)
- Some graduate school (5)
- Graduate degree (6)

What is your year of birth? _____

Have you lived at your current address for one year or more?

- Yes (1)
- No (2)

In which state do you currently reside?

- Drop-down list

What is your zipcode? _____

[page break]

Single Most Effective Thing: Disposal Block

Household waste can cause many environmental problems. What is **the single most effective thing YOU can do** in your day-to-day life that helps solve this problem? (open-ended)

[page break]

Three R's Block

There are many strategies to manage waste. We are interested in which waste management strategies you think are **best for the environment**. Please drag the choices so that **1 = best for the environment** and **4 = worst for the environment**.

	Drag items here in order of best for the environment (1) to worst for the environment (4)
Source reduction of waste and reuse Recycling and composting waste Converting waste to energy Landfilling waste	

[page break]

Which of the following actions do you think is the **best for the environment**? Please drag the choices so that **1 = best for the environment and 3 = worst for the environment**.

	Drag items here in order of best for the environment (1) to worst for the environment (3).
Reduce Reuse Recycle	

[page break]

Which of the following actions do **YOU PERSONALLY** do most often? **Please drag the choices so that 1 = action you do most often and 3 = action you do least often.**

	Drag items here in order of what YOU do most often (1) to what YOU do least often (3).
Reduce Reuse Recycle	

[page break]

Sorting Measure Block

Note: due to copyright, some images and graphics shown here are slightly altered from those that originally appeared in the survey to participants.

For the following questions, please drag each item into typical recycling, trash, or compost bin based on how you would normally dispose of these items.

Assume you have access to each of the following bins. How would you dispose of a typical disposable coffee cup? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

--	--

Disposable Coffee Cup 	
--	---

Image credit: topntp26 on Freepik. Note: image shown to participants did not have a lid.

Graphics created by the authors. Note: graphics differ slightly than those shown to participants due to icon licensing restrictions.

How certain are you that you placed the coffee cup in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

Assume you have access to each of the following bins. How would you dispose of clean aluminum foil? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Clean aluminum foil. 	Recycling
	Compost
	Trash

Image credit: Adapted from Engin_Akyurt, Pixabay.

How certain are you that you placed the aluminum foil in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

Assume you have access to each of the following bins. How would you dispose of an empty aluminum can? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Empty aluminum can. 	Recycling
	Compost
	Trash

Image credit: upklyak, Freepik.

How certain are you that you placed the aluminum can in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

Assume you have access to each of the following bins. How would you dispose of an empty foil lined chip bag? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Foil-lined chip bag.	Recycling
	Compost
	Trash

Note: image shown to participants was an empty, foil-lined chip bag. We are not able to show it here due to license restrictions.

How certain are you that you placed the chip bag in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

[page break]

Assume you have access to each of the following bins. How would you dispose of an apple core? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Apple Core 	Recycling
	Compost
	Trash

Image credit: the authors.

How certain are you that you placed the apple core in the correct bin?

Completely uncertain ----- | ----- Completely certain
 0 50 100

Assume you have access to each of the following bins. How would you dispose of a conventional used baby diaper? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Used Diaper 	Recycling
	Compost
	Trash

Image credit: Evoae, Pxfuel.

How certain are you that you placed the used diaper in the correct bin?

Completely uncertain ----- | ----- Completely certain
 0 50 100

Assume you have access to each of the following bins. How would you dispose of a glass bottle? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Empty Glass Bottle 	Recycling
	Compost
	Trash

Image credit: Wirestock, freepik.

How certain are you that you placed the glass bottle in the correct bin?

Completely uncertain ----- | ----- Completely certain
 0 50 100

[page break]

Assume you have access to each of the following bins. How would you dispose of a disposable mask? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Disposable Mask 	Recycling
	Compost
	Trash

Image credit: adapted from Ryutaro Tsukata, Pexels.com

How certain are you that you placed the disposable mask in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

Assume you have access to each of the following bins. How would you dispose of a light bulb? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Light Bulb 	Recycling
	Compost
	Trash

Image credit: Adapted from Dids, Pexels.com

How certain are you that you placed the light bulb in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

Assume you have access to each of the following bins. How would you dispose of clean cardboard? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Clean cardboard. 	Recycling
	Compost
	Trash

Image credit: shantalao on Freepik.

How certain are you that you placed the clean cardboard in the correct bin?

Completely uncertain ----- | ----- Completely certain

0

50

100

Assume you have access to each of the following bins. How would you dispose of a plastic bag? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Plastic Bag 	Recycling
	Compost
	Trash

Image credit: Adapted from Divotomezove, Pixabay.

How certain are you that you placed the plastic bag in the correct bin?

Completely uncertain ----- | ----- Completely certain
 0 50 100

[page break]

Assume you have access to each of the following bins. How would you dispose of a typical coffee pod? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Coffee Pods 	Recycling
	Compost
	Trash

Image credit: Adapted from Karolina Grabowska on Pexels.

How certain are you that you placed the coffee pods in the correct bin?

Completely uncertain ----- | ----- Completely certain
 0 50 100

Assume you have access to each of the following bins. How would you dispose of a typical paper towel used to clean up water? Please drag it into the bin you would normally use. These are **standard** recycling, compost, and trash bins.

Used Paper Towel 	Recycling
	Compost
	Trash

Image credit: the authors.

How certain are you that you placed the paper towel in the correct bin?

Completely uncertain ----- | ----- Completely certain
0 50 100

[page break]

Recycling Vs. Source Reduction Block

How certain are you that items you put in recycling bins actually get recycled?

Completely uncertain ----- | ----- Completely certain
0 50 100

Which of the following options do you think is **better for the environment?** (drag slider positioned at neutral)

Recycling waste is much better 1	Recycling waste is somewhat better 2	Neutral 3	Preventing waste is somewhat better 4	Preventing waste is much better 5
-------------------------------------	---	--------------	--	--------------------------------------

Which of the following options do **YOU do more often?** (drag slider positioned at neutral)

I recycle waste much more often	I recycle waste somewhat more often	I do them both equally	I prevent waste somewhat more often	Preventing waste is much better 5
---------------------------------	-------------------------------------	------------------------	-------------------------------------	--------------------------------------

1	2	3	4	
---	---	---	---	--

Which of the following options do you think is easier **for individuals?** (drag slider positioned at neutral)

Recycling waste is much easier 1	Recycling waste is somewhat easier 2	They are equally easy 3	Preventing waste is somewhat easier 4	Preventing waste is much easier 5
-------------------------------------	---	----------------------------	--	--------------------------------------

[page break]

Systems Thinking Block

Household waste can cause many environmental problems. There is a long process for products that eventually become waste, beginning with resource extraction and ending with disposal.

At what stage in this process do you think **it is most important** for efforts to focus to solve this problem? Please click on the **ONE** stage you think is the **most important**.



Graphic created by the authors.

Note: due to copyright, graphics shown here are altered from those that originally appeared in the survey to participants.

At what stage in this cycle do you think **YOU as an individual** can have the most impact on solving this problem? Please click on the **ONE** stage you think **YOU can have the most impact** on this problem.



Graphic created by the authors.

Note: due to copyright, graphics shown here are altered from those that originally appeared in the survey to participants.

How did you make the decision for which of these stages was most important to focus on? Please share as much information as possible about your thought process when making these decisions. (open-ended)

[page break]

Waste at Purchase Block

Imagine that you are away from your house and are getting thirsty. You are in a store that sells beverages in plastic bottles. Based on your normal behavior, what would you be most likely to do?

- I would not purchase a beverage in a plastic bottle
- I would purchase a beverage in a plastic bottle and reuse it when empty
- I would purchase a beverage in a plastic bottle and recycle it when empty
- I would purchase a beverage in a plastic bottle and compost it when empty
- I would purchase a beverage in a plastic bottle and throw it in a trash bin when empty
- I would purchase a beverage in a plastic bottle and litter it when empty

Imagine that you are going to a costume party and you do not already have a costume. Based on your normal behavior, what would you be most likely to do?

- I would make a costume from items I already own
- I would purchase a new costume
- I would buy items from a thrift or second hand store to make a costume
- I would borrow a costume from someone
- Other (please describe) _____

[page break]

Attention Check

The color test you are about to answer is very simple. Please select the color 'Green.' This is an attention check.

Based on the text above, which color have you been asked to select?

- Yellow (1)
- Blue (2)
- Purple (3)
- Green (4)
- Orange (5)

[page break]

Helm Reduced Consumption Measure

Please indicate how much you agree or disagree with each of the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

If a product
has the
recycling
triangle on
it, it can
always be
recycled
(11)

○ ○ ○ ○ ○ ○ ○

[page break]

Attention Check & Feedback

In your own words, please describe what this survey was about. (open-ended)

Do you have any thoughts to share or comments? (open-ended)

References

1. Lieber, C. Hundreds of US cities are killing or scaling back their recycling programs. *Vox*
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(2019).
 2. Corkery, M. As Costs Skyrocket, More U.S. Cities Stop Recycling. *The New York Times* (2019).
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