

# ***CAPSTONE PROCESS BOOK***

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*Libby Newcomer*

*GD 426*

*Fall 2019*

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This class was a doozy. I over thought things, doubted my abilities (and my topic), but somehow made it to the end and I am pretty satisfied with the results. So here you go, all of my work this term in one book. Sorry it's 54 pages.

CHAPTER ONE

initial discovery work

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TOPIC DESCRIPTION

I spent the last 7 weeks looking at people’s habits surrounding their waste production and disposal. I asked as many questions as I could think of to try and understand how people made decisions when disposing of their items and what issues they face with the current waste management systems that they have access to. I chose to research this topic partially out of my own frustration with the habits of the people in my life, but also because the general population is quite wasteful and I am a strong believer that everyone’s individual impacts made a difference and have an impact on our planet.

RESEARCH BRIEF

Background

Our planet is overflowing with waste. Landfills, garbage cans, beaches and even the ocean are filled with items that have been discarded by their former owners. Landfills are running out of space and producing toxic chemicals that are spreading to soils and groundwater. Plastic is floating in the ocean, and its production uses fossil fuels that are polluting the earth. Waste is defined as “unwanted or unusable materials, discarded after primary use.” In today’s world, everything is made and marketed to be quick and convenient, which usually means things are packaged in plastic and discarded after one use. The majority of things that are no longer needed are automatically thrown in the garbage because it is the easiest option, even if that is not the best place for it.

Our planet is overflowing with waste, because more goods are constantly being produced to replace those that are thrown away. This is wreaking havoc on our planet and furthering the harmful effects of climate change. I care strongly about the environment and helping the planet, and want to use my knowledge of design to combat wastefulness and make our only home a better place to live.

Assumptions

I am assuming that, in relation to the definition above, the majority of waste that people create are from unwanted materials, not unusable materials. I think a lot of things that people get rid of can still be used, they just do not want them anymore and do not want to take the time to figure out how

to properly donate, reuse, or dispose of them. I am assuming that people focus on convenience when looking to get rid of their things. I also think that people do not realize their possessions still exist after they get rid of them. I would really like to think that climate change is a big concern for many people, but that they just have not aligned their personal actions with their larger beliefs. However, from my personal experience, it seems as if many people just do not care about the impact that their individual actions have.

Objectives

I want to find out what drives our choices behind how we dispose of our items. I want to know what the main factors are that people think about in relation their waste. Through my research, I want to find out as much as I can about peoples habits and why they care or do not care about their waste. I also want to know more about overall trends and habits of humans on a larger scale, and if there are differences in individual waste production within different demographics. And with all of this, I want to find the root cause of wastefulness on an individual level and see what design can do to fix it.

Audience

In relation to my subject, the general population can be divided up into two categories: those are conscious about their waste and make an effort to dispose of things properly, and those who do not. I am trying to target those who do not. Maybe they have not made the effort because they truly do not

care. Or maybe it is because they have never been properly informed on how to be less wasteful, or about the negative effects that landfills and plastic pollution have on our planet. I am trying to target as many people as I can, because everyone produces waste in some way.

**Question**

What are the main factors that people consider when they dispose of their things, and how can design motivate people to produce less waste?

**Design Context**

Climate change is the biggest crisis that humans are facing today. Politics are consumed with arguments and discussions about the validity of climate change, as well as how much it should influence how we conduct our lives and businesses. Companies are trying to appear more “green” and sustainable to please consumers, regardless of if they are actually changing their practices. Politicians and companies focus on plastic straws to divert attention away from the fact that around 100 companies cause 70% of global emissions of greenhouse gases. However, this does not negate the fact that humans are incredibly wasteful with the finite resources that the planet can provide us.

Climate change and excess waste production impacts everyone on this planet in some way, but certain demographics, typically lower income brackets and people of color, are disproportionately affected due to government policies, a general lack of resources, and geographic location, including proximity to landfills. Even though climate change has been

a hot topic for several decades now, only more recently have we started to see its disastrous effects on a global scale. There have been massive efforts focused on recycling and composting, but less so on how to properly recycle or compost items, or what actually happens to things once they are placed in the different waste receptacles.

**Methodology**

My first methodology will be a survey. This is the best way that I can reach a large number of people, and I want to ask as many people as possible about their habits regarding their waste production. My goal with the survey is to find out what factors influence how people dispose of their things properly or improperly. I want to know if people are aware of the waste management guidelines (recycling, composting, etc) in their area, and how these relate to the individual’s age, location, and occupation. I want to approach the survey as nicely as possible in hopes of getting accurate responses from everyone. With the survey results, I plan on doing an in-depth analysis of my responses by demographic, to try and figure out what the main issues are that people are running into with disposing of waste and how different outside factors play a role in that.

My second methodology will be interviews with professionals in the waste management field, as well as a lit review. I want to find out more about the general trends of college students, because they tend to have more extreme problems or habits with waste than the general population. To do this, I plan to reach out to OSU Campus Recycling about trends on campus, as well as

Republic Services to find more out about off campus trends in the area. If I feel that the information I gather from these interviews is not sufficient, I will use a lit review to fill in any gaps about waste production habits and trends of larger groups.

My third methodology will be a participatory design exercise. My goal is to find out people’s thoughts, likes, and frustrations with the current waste management systems that they have access to. I want to find out what people think about when they have things they want to dispose of on a day to day basis. I am thinking I might have people on campus analyze the labeling of current waste receptacles on campus and tell me what they like or would change about them, and also have them sort items into the different residential waste receptacles to figure out what specific issues people have in that area.



# CHAPTER TWO

## methodology one: survey

### PROCESS

My first methodology was a survey. I created a survey because I wanted to reach as many people as I could, and a survey was the easiest way to accomplish that. I created a 31 question survey that asked about individual's recycling habits and knowledge of waste management guidelines in their area. I had more specific questions for college students, as they tend to have more extreme issues with waste than the general population, and for Corvallis residents, because I have access to more specific information about the waste management guidelines in the area.

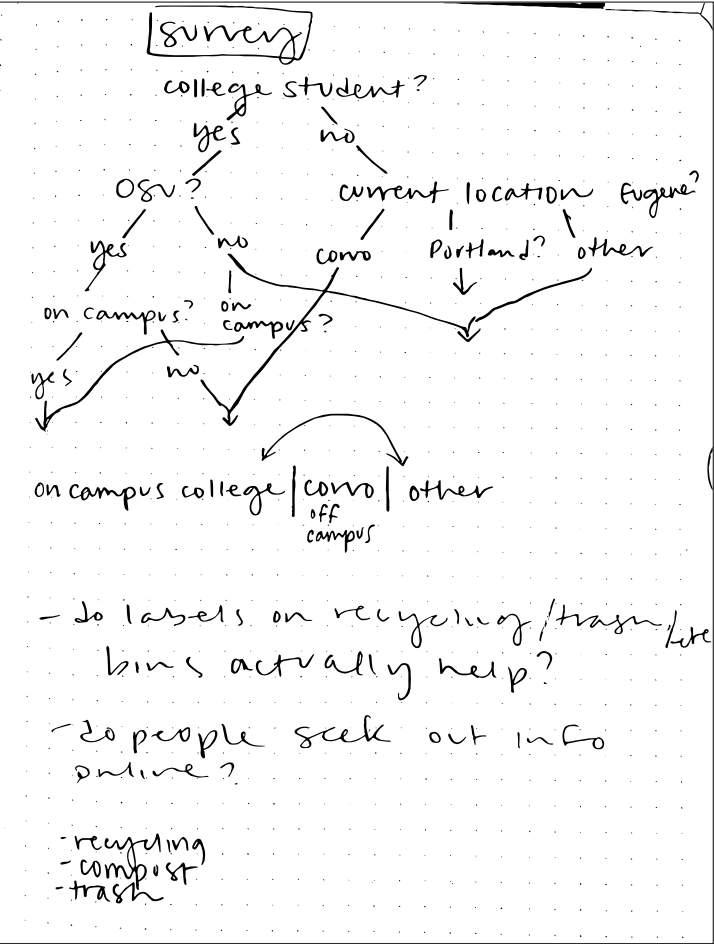
### GOALS

My goal with the survey was to find out people's habits with waste disposal and see what issues frequently come up. I wanted to find out what factors influence how people make decisions when disposing of something, properly or improperly.

Survey:

- are you a college student?
- location, age, gender
- local recycling, trash, compost systems.  
→ awareness?
- climate change?
- factors w/ disposal
- compost? → ~~more~~ food in landfill
- plastics, etc. → industrial only
- plastic, made from fossil fuels → no consumption  
not disposal

Some notes from when I was trying to determine what to include in my survey. I struggled a lot figuring out how to write questions for what I wanted to know, without offending people and in hopes that they would take it seriously.



RAW DATA

All of my data was way too much for this process book. Click [here](#) for a spreadsheet of my survey results.

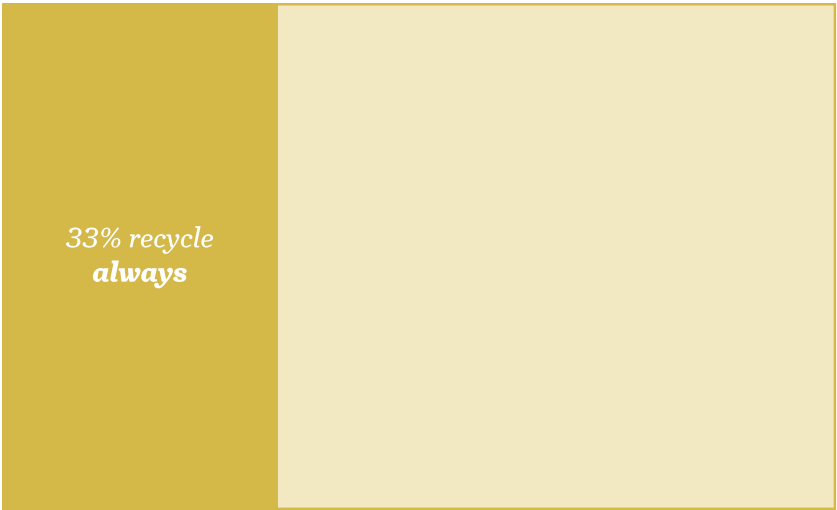
Sources:  
Newcomer, Libby. “Waste Production Capstone Survey.” Electronic Survey. 21 October 2019.

KEY FINDINGS

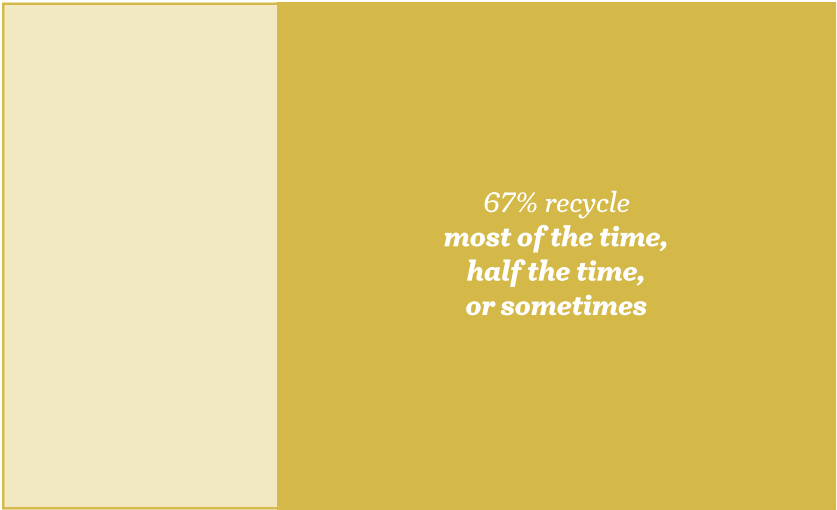


224 responses

I got a lot of responses! Definitely more than I was expecting, and there was a good mix of ages and locations. There were 109 responses from college students, and 85 of those college students go to OSU.

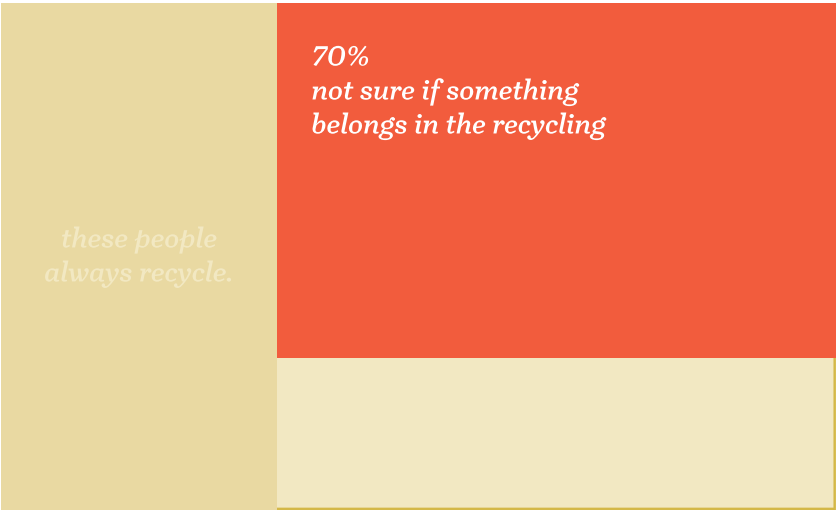


33% recycle  
always

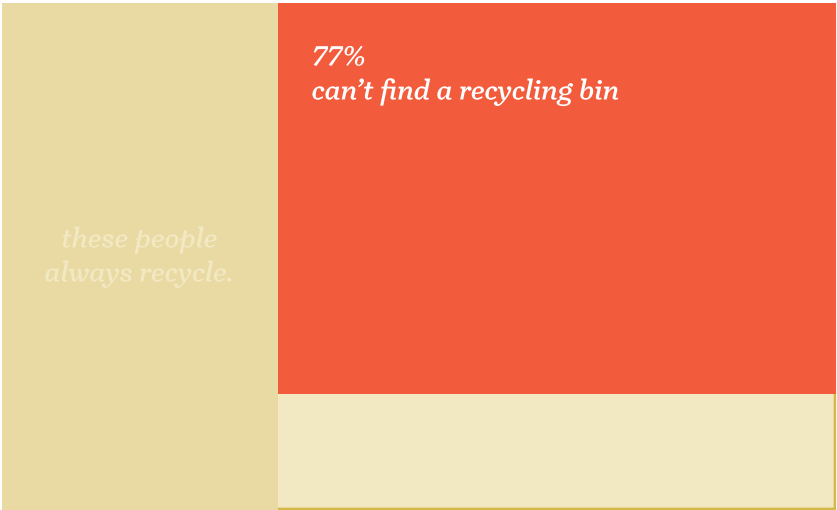


67% recycle  
most of the time,  
half the time,  
or sometimes

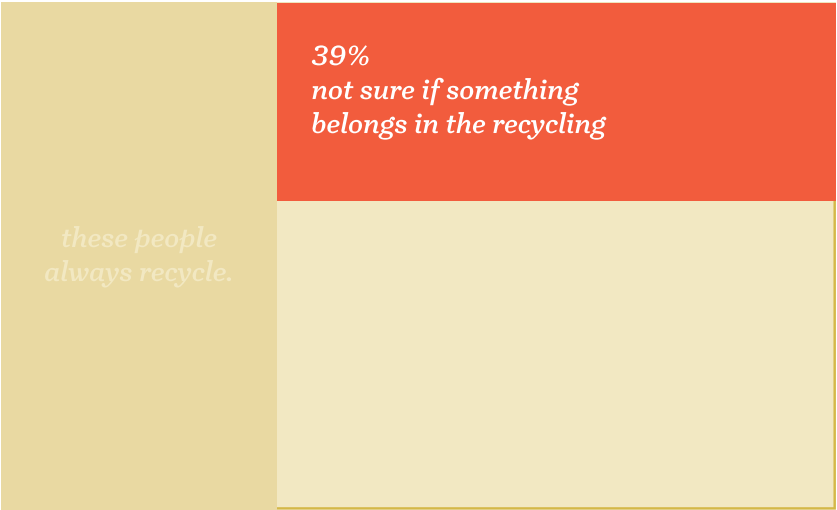
Data for how often people recycle. Apparently, nobody never recycles. This seems good, but not when it’s done wrong.



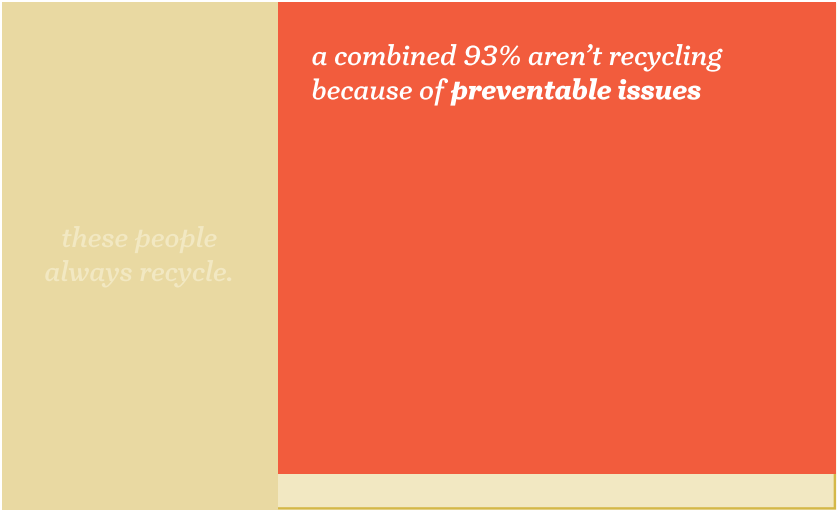
Out of the people that don't always recycle, 70% won't recycle at home if they are not sure if something belongs in the recycling.



Out of the people that don't always recycle, 77% won't recycle in a public space if they can't find a recycling bin.



Out of the people that don't always recycle, 39% won't recycle in a public space if they are not sure if something belongs in the recycling.



Out of the people that don't always recycle, a combined 93% aren't recycling because of the preventable issues of not knowing if something belongs and not being able to find a bin.



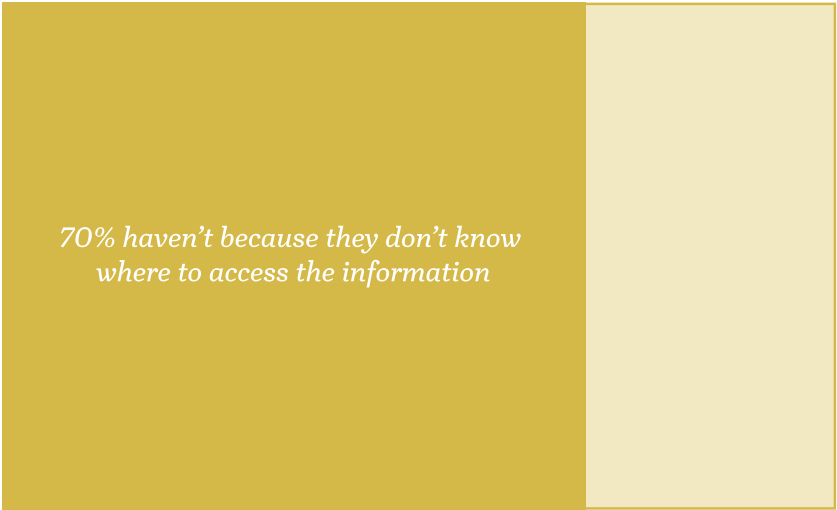
If they are in a public space and there are labels on the waste receptacles clarifying what belongs in each bin, 81% of people will always read the labels on the bins.



80% of Corvallis residents have not checked the local waste management guidelines for their residential bins.



When I asked what items from a list of non-recyclable items had they confused as recyclable, 87% selected at least one item from the list.



70% said they hadn't checked because they don't know where to access the information.

“

*I took a sustainability class, but no concrete steps to become more sustainable were taught :(*

*More recycling bins right next to the trash cans. If there is an option presented immediately for people to trash or recycle, I think they might take the time to recycle*

*There could also be better systems institutionally (e.g. students as individuals are encouraged to recycle but this doesn't always extend to the university's values/systems)*

## **- SURVEY COMMENTS**

*[comments from  
OSU students]*

## **ANALYSIS**

My survey gave me a lot of really helpful information. I have two main findings: people don't recycle a lot of the time because of preventable issues, and when people do recycle, they do it wrong.

I found that a majority of people recycle all of the time or most of the time. This is not a surprising statistic to me, because people want to "do their part" and recycle their items. When people don't recycle, it is because of barriers: a lack of knowledge about what belongs in the different waste receptacles, and a lack of access (because there is no easy way to locate bins in public spaces, if one is not in sight).

Recycling incorrectly generally happens because of two reasons: current labels on bins in public spaces are not working, and people have not looked up their local waste management guidelines. I asked Corvallis residents about their knowledge of local waste management guidelines, and most people said they have not checked specifically what is allowed in each bin. When asked why they hadn't checked the guidelines, 80% said it was because they didn't know where to find the information. Another option to check was "I don't feel like it's necessary," but only 13% of people checked that option. This leads me to believe that people recognize the importance of recycling correctly, or at least know that guidelines might vary from city to city, and have only not looked up the information because they don't know where to find it. To me this seems like valid reasoning, because the Republic Services website is somewhat confusing to navigate, especially when looking for information specific to a city, not just general Republic Services information.

For a different survey question, I provided a long list of non-recyclable items that are often confused as recyclable. I asked people to check off any item that they have confused as recyclable in the past, and a large majority of people selected at least one item. This leads me to believe that even though people do read the labels on bins in public spaces, they are often vague and misleading, which results in contamination across bins. Additionally, only a small percentage of people make sure their items are always clean and dry before recycling, which means the majority of people are contributing to recycling contamination, even if they are only putting "recyclable" items in the bin.

I also had some helpful comments that people left on my survey. People have not been taught how to take small steps to become more sustainable, which is something that could definitely help with getting people to dispose of their things in the proper bins. On OSU's campus, there are a plethora of trash cans that do not have any other bins near them. When this is the case, I think people will put recyclable items in that bin because it is the only close option. I saw this happen in person last week- someone had placed a perfectly clean and empty cardboard box on top of a trash can near Student Health because there were no other bins around it. And finally, individuals should only be expected to go so far to make sustainable choices in institutions are not meeting those efforts. OSU has some changes they need to make!

# CHAPTER THREE

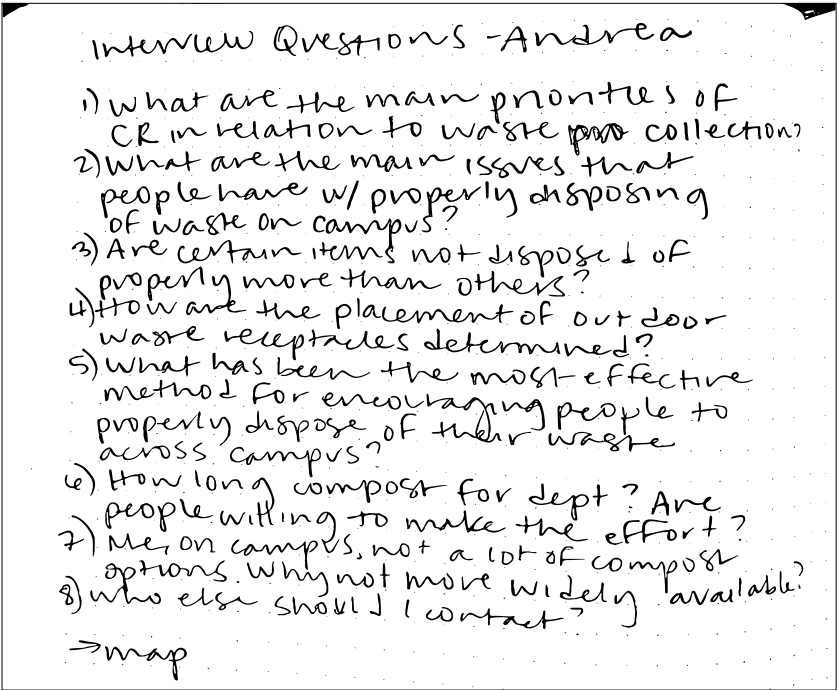
## methodology two: interviews

### PROCESS

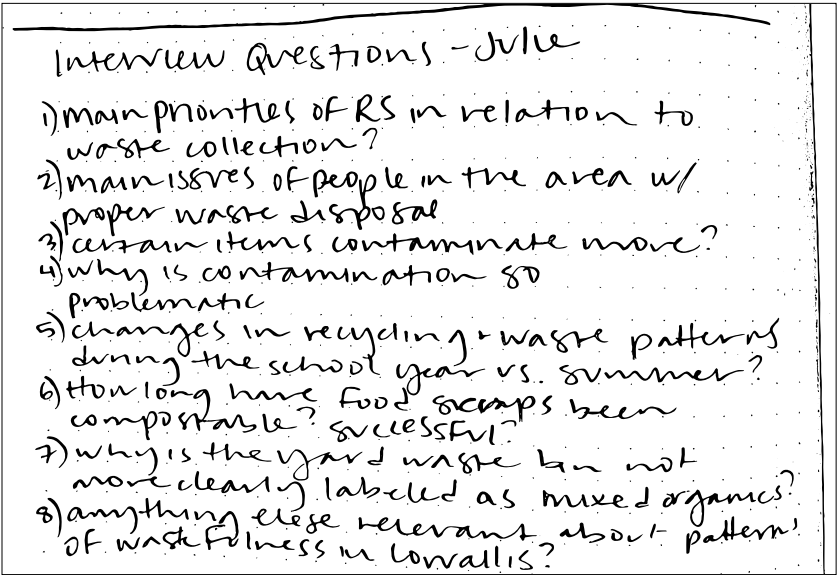
My second methodology was interviews. I first interviewed Andrea Norris from OSU Campus Recycling about issues and trends pertaining to waste management on OSU's campus. She then referred me to Julie Jackson at Republic Services in Corvallis. I asked Julie questions about trends in Corvallis and more general issues related to recycling and trash disposal. Once I interviewed both of them I loosely transcribed the interviews to refresh my memory of what was discussed and then made a Venn diagram to highlight key points and find commonalities between what they each discussed.

### GOALS

From the interviews I wanted to get a better sense of the general picture of waste management issues from the experts (as I am not really an expert, as much as I might like to think I am). I wanted to see if there were bigger issues that popped up both on campus at OSU and off campus in Corvallis and other areas. Turns out, there are. More on that later.



My interview questions for Andrea. I also emailed her a more presentable version ahead of time.



My interview questions for Julie. I also emailed her a more presentable version ahead of time.

# INTERVIEW NOTES - ANDREA NORRIS

→ reduction  
↳ waste hierarchy

- 4,000 bins

\* contamination  
↳ highest "on the go"  
↳ outside, res hall, classroom halls

→ res halls, not knowing where to bring certain room trash, recycling

→ cardboard supposed to go outside

\* cups! → always in the wrong space  
↓  
not kind → messy

- recycling in bags → fucks everything up

- simple signage by opening of the bin  
→ give us on what you have options from faraway

/ → res hall recycling info

education ≠ behavior change

peer pressure ↓  
removal of barriers

compost - no contamination acceptable

Click [here](#) for the audio recording of the interview.

# TRANSCRIPT

## What are the main priorities of Campus Recycling?

Trying to move in a direction with more emphasis on waste prevention, reduction, and reuse. And less total investment in just recycling, composting, and diverting waste we've already created. We look to the waste hierarchy in terms of how we believe we should be prioritizing our work. There is basically science out there that says if you're preventing the waste in the first place, that's how you affect the most positive environmental change. Our mission as an organization is to have a waste management program that is guided by the priorities of the waste hierarchy, and sees trash disposal as the last resort. And then running those programs in a way that is cost effective. We do service almost 4,000 bins a week across campus, we're hitting every building about once a week, we're hitting the residence halls every single day. I think right now when I think about waste collection, I think that we are most focused on educating people to recycle right, just in a general, normal recycling bin. We are putting less emphasis on developing new programs to collect obscure items.

We're finding that the contamination rates in our recycling are unacceptable. We did a big educational push about a year ago, we spent the entire term doing a broad recycling education campaign. It centered on telling people, one, that recycling has changed, and letting people know that if you're one of those people that feels like you kinda know it, and you're doing it, we'd also like you to pay attention. That was done through putting slides on screens, social media, and presentations to targeted groups (food service).

We've been looking at signage, and slowly putting together everything we understand to be the best version of signage to present. We are intentionally not going out and installing it yet across campus because of the market changes. We did a lot of best practice research on what kinds of signage get people to recycle properly. The most commonly recyclable items are probably not going to change, like bottles and jugs and paper and cardboard, like those core things. We talk about the most common items because we could probably get more recycling accomplished if we got everyone to do the most common [items] correctly.

## What are the main issues that people have with properly disposing of things?

We've done some audits of different parts of campus and we do find that are highest contamination rates are for on the go recycling, so that's outdoor units or units in the hallways of classroom buildings. So on the go is really high, and residence halls. We find the lowest contamination was in administrative buildings that are all staff.

The main issues with people properly disposing of waste are putting the right thing in the recycle bin. Another issue is that we still do see recyclables in the trash, so there's contamination in both directions. We do have issues in the residence halls about people not knowing where to bring their different types of waste. Through the education they're receiving or not receiving, or not hearing, they are not knowing where to bring their room trash, their personal cardboard, and also where to bring their recycling. So putting stuff in the right place in general is an issue.

**Are there certain items that people put in the wrong place most often?**

Cups of all kinds. Paper cups in the paper [recycling] and plastic cups in the bottles and cans. Often not empty and not rinsed, so there's layers of issues that that causes. [Plastic cups] are probably our number one contaminant. No vendor currently available to us recycles any type of cup regardless of material type, and no vendor currently available to us composts any type of cup either. They are garbage.

For one, you're putting your trash [in the recycling], which means that you're increasing the cost of recycling programs, because you're saying "here recycler, take my trash that you now have to use the labor to handle and you have to pay a bill to dispose of it as trash." So you basically just sent it on a really long and expensive trip to the landfill. The other place that that burden is carried is by the workers in the sorting facility, who already have a very difficult and messy job, so it's not particularly kind to the people who are helping sort our materials. And then often because it has residue and liquid in it, it's not contaminating other recycling, and it's introducing pests into people's work environments, it's introducing mold and mold spores into people's work environments. So there's all kinds of reasons why getting cups [in the recycling] is problematic.

Some other common contaminants are plastic bags, like takeout type bags, but we do sometimes have people bagging their recycling and then putting the whole bag in. Sorting facilities are like a complex conveyor belt that uses mechanical means, human sorting, and other technology to sort. Plastic bags are the worst thing you can put in that system because there's all these rotating and moving parts, and so it gets tangled up in

the equipment. And then that means that the sorting facility could have to possibly shut down, stop running for a little bit, and then they have to have people climb on equipment, which is very dangerous to the employees.

**What are the most effective methods for getting people to properly dispose of their items?**

What we have determined is that the most key is to have very simple signage wherever the opening of the bin is. Supposedly the majority of people are making a decision on whether or not they're going to recycle something when they're standing in front of the bin. Putting it wherever your hand and therefore your eye is going is usually the most effective. Our goal is to have a sign at the bin opening plus an 11x17 on the wall above. The idea is that people should be able to visually cue in to what their options are from a distance as they are approaching a set of bins. Ideally it is best also to have bins together, so people are able to make that determination so people don't have to guess. Our signage has specific color coding, a prominent recycling symbol, and the largest text is the header labeling the type of bin. Otherwise it is not meant to be text heavy, the next most prominent things are the pictures of the items.

Because we're one of the oldest recycling programs, we've been recycling at OSU for over 50 years, we have a peppering of so many different kinds of bins. We know that people will recycle more when they have bins to do it in, but then the question is whether they are going to do it right with the bins that they have. We just launched an online canvas based training that every res hall student has been asked to complete by the end of this term. (22 min)

**Tell me about composting on campus.**

I'd say [departmental composting] is not highly successful, mainly because participation rates are kind of low. It is very much an opt in program, we don't want people who don't want to compost, they probably won't do it right. We do have people drop out, because it does take kind of a champion to empty it, and talk to their coworkers to encourage them to use it.

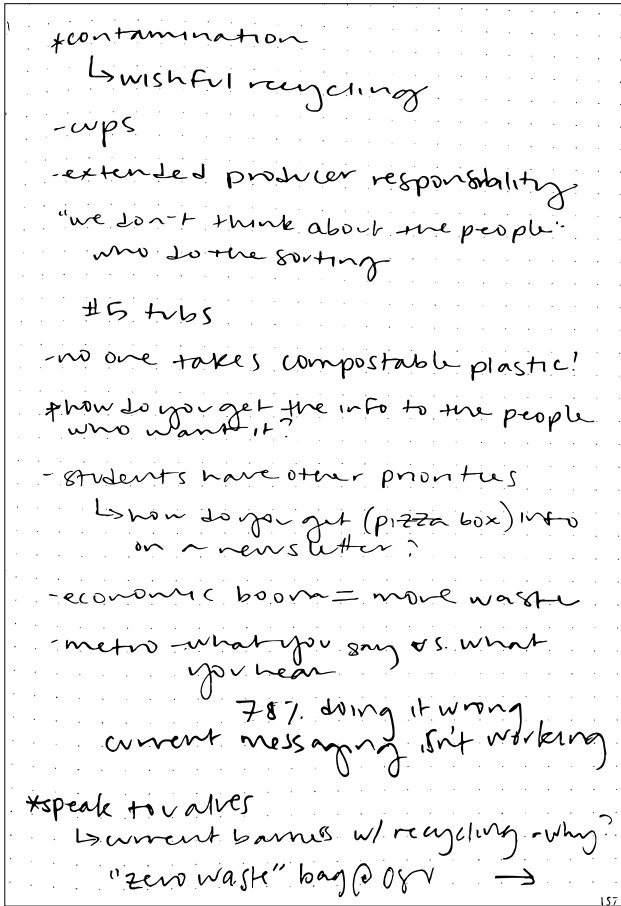
I know that a lot of behavior change research shows that education has no impact on behavior. From what I've seen in research, usually what has an effect on people is some form of peer pressure that's demonstrating to people, everyone else is doing it, be with it, or removal of barriers. So if there's something that people perceive as a barrier that is not, clarify that, or if there is a barrier people truly have and there is a way to remove it, those are statistically more likely to result in behavior change.

Sources:

Norris, Andrea. Personal Interview. 30 October 2019.



# INTERVIEW NOTES - JULIE JACKSON



Click [here](#) for the audio recording of the interview.

# TRANSCRIPT

## What are the main priorities of Republic Services?

We've decided our real focus is is not becoming the largest, but being the biggest protector of the environment. We try as hard as we can to keep the environment in mind with everything we do. Every innovation, every new truck, all of those things, the environment is really the important thing to us.

The main issue we have is getting people to put the right material in the right carts, and to really put an end to wishful recycling. So for years and years we've known people have always kind of looked at something and gone "oh, I don't know, I'm going to put it in [the recycling] and hope it gets recycled." The problem with that is that we have thought that our material is all going to China and other Asian markets, and they're dealing with it, so it's okay, but what we now know is how they were dealing with it is not very environmentally sound. Maybe plastics they couldn't recycle were being burned, but the worse issue is that plastics were being shipping to smaller countries where they built economies on piles of plastics on riverbanks that flood and that end up in the ocean.

I've been talking to a lot of groups about this and I always say "who throws plastic in the ocean?" and of course no one raises their hand, but the truth is, that wishful recycling has ended up, from Corvallis, OR and other places, has ended up in the ocean, because nobody wants our trash. (3:05) I think right now there's this huge opportunity, this window, where people are listening, and we have this opportunity to really change the way we do this and what we send to recycling. People have

been putting the wrong stuff in for a long time, and we're really not good at forcing them not to, because somebody was taking it. But now there's no recycling going to China. So say you've got these three carts, and a glass bin. And if you have 100 pounds of waste, 30 in one, 30 in another, 40 in another. If you move more to the recycle, so you take 20 out of garbage and put it in the recycle cart, that's good, but it's not really moving the needle. To move the needle you need to have a total of 70 pounds of waste, that's how we move the needle. Recycling is a solution, but it's not the ultimate solution. It won't get us there, it's a good partner, but we need to stop making so much waste.

## What are the issues with contamination?

People put everything in the recycling. When there are recyclable materials in the trash, that's a loss, but we can deal with that. It doesn't really impact people. When [trash] gets in the recycling, we start to see an impact. It's too contaminated and companies won't take it. It costs more money because there's more sorting that has to be done. [The number on the bottom of plastics] was never meant to indicate if something is recyclable. That number was developed by the plastics industry to indicate the general resin content. But it's sort of like saying number one's are soup, and there's a million kinds of soup. And they don't all get mixed together and taste good. And that's kind of how recycling is.

Extended producer responsibility, more programs where the manufacturer of the material is responsible for discarding or the end of life of that material. - more legislation (13 min)

For our material, it could be a week before it goes from the bailing facility [to the recycling center], and they have to sort through it. It can be moldy by then, and it's not a good job. And those people are sorting our waste, it's not theirs. It's all of ours. We don't tend to think about the people who have to do these kind of creepy jobs, and it's hard work. So we really want to keep it empty, clean, and dry.

The plastics industry is huge, and they are wealthy, and they have lots of money to fight [our efforts]. So we're talking about straws all the time, and the plastics industry really wants us to think about straws. Because if we talk about straws, we're not talking about all this giant plastic out there. We're just gonna focus on straws, which is about 0.2% of the plastic in the ocean.

A lot of people love that compostable [plastic] idea. David Allaway has done a life cycle analysis of compostable materials and he'll tell you that you're better off to buy fossil fuel based plastic and throw it away, then you are to buy compostable and hope it gets composted. It doesn't break down fast enough, you can't tell if [a plastic] is compostable or not. A compostable cup is a number 7, which just means other. So it could be compostable, it could be polystyrene, it could be a lot of things. We just can't tell the difference, so when they're ground up, even the compostable stuff doesn't break down or not. We don't know if those little bits of plastic are going to break down or not, it just doesn't work in our system. (greenwashing)

**Tell me about composting in Corvallis.**

Food scraps have been accepted since 2010. Corvallis was the first city in Oregon to allow food scraps at the curb. Block 15 composts everything! Market of Choice, the co op

**What can you tell me about the general trends/patterns in Corvallis?**

We know that recycling down around campus is far more contaminated than anything else. In your yard debris cart, we've always said you could put your pizza boxes in. We're not really saying that anymore, because we're in the business of composting organic material, we're not in the paper composting business. A little bit is okay, but half a cart full of pizza boxes isn't okay. I can talk to you about this and have it make sense, but how you get that in a flyer and get people to understand is tough.

We know that students have other priorities and recycling isn't necessarily one of them, but they're not the only ones [with issues].

One interesting thing that happens in terms of waste is when the economy is good, the amount of waste increases. But even in Corvallis, where people are very aware of reducing waste, that has continued to increase [since 2008]. Everything we buy makes waste. I guess we have to find ways to feel successful without buying more things.

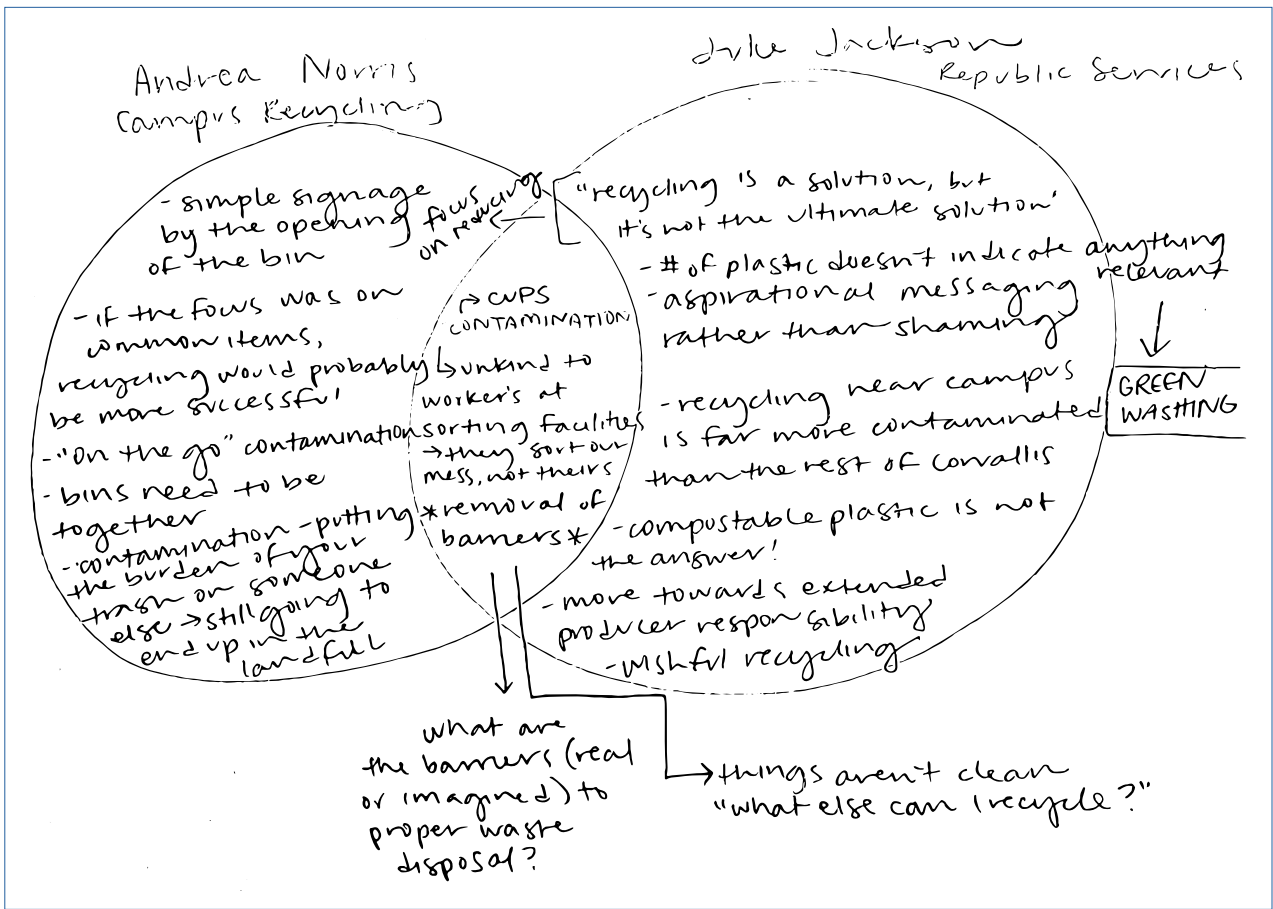
Metro - what you say vs. what they hear  
People believe that recycling more is better than recycling right, which is exactly the opposite of what is right.  
Broad confusion about what is recyclable  
People believed they individually were doing it right  
78% of those people were doing it wrong  
Correct messaging didn't help

Telling people what not to recycle is more effective than telling people what to recycle.  
Have to find out what the barriers are that people have to recycle properly  
People always ask "what else" they can recycle

Only do one ask at a time, don't try and get people to do everything at once (40 min)  
Humor, aspirational messaging, rather than shaming  
Things need to be separate (cardboard package with plastic cover)

Sources:  
Jackson, Julie. Personal Interview. 6 November 2019.

# KEY FINDINGS



A Venn diagram of the points that I thought were most important from my interviews.

“

We could probably get more recycling accomplished if we got everyone to do the most common [items] correctly.

You're saying "here recycler, take my trash that you now have to use the labor to handle and you have to pay a bill to dispose of it as trash." So you basically just sent it on a really long and expensive trip to the landfill.

[on recycling contamination]

The other place that that burden is carried is by the workers in the sorting facility, who already have a very difficult and messy job, so it's not particularly kind to the people who are helping sort our materials.

- ANDREA NORRIS

“

*For our material, it could be a week before it goes... [to the recycling center], and they have to sort through it. It can be moldy by then, and it's not a good job. And those people are sorting our waste, it's not theirs. It's all of ours. We don't tend to think about the people who have to do these kind of creepy jobs.*

*[on recycling contamination]*

*We know that recycling down around campus is far more contaminated than anything else.*

*Telling people what not to recycle is more effective than telling people what to recycle.*

**- JULIE JACKSON**

## **SO PRETTY MUCH...**

Recycling contamination is a huge issue because...

- \* It ruins easily recyclable materials by making them moldy.
- \* It is unkind to the people who have to sort our materials, and makes their already dangerous jobs more dangerous.

***and... the key to success is figuring out what the real or imagined barriers are that people have to proper waste disposal.***

## ANALYSIS

The two interviews I conducted were very insightful into bigger picture issues that people have, more than just the “people put coffee cups in the recycling” that I learned through my other two methodologies. I already has an idea that recycling contamination was a huge issue, and these interviews did back that up, but also elaborated on *why* it is a such a problem.

One key point that stuck out to me from both interviews that I had not thought about before was the idea of barriers. When people don’t put their items in the proper waste receptacles, it is because there is some barrier between them and the proper knowledge about waste disposal. Both Julie and Andrea talked about barriers in a broader sense pertaining to behavior change, rather than specifically about proper recycling, but it made me realize that I need to figure out what barriers people have with waste disposal.

I learned that on campus, “on the go” receptacles are the most contaminated, which includes bins in high traffic areas outside, as well as the “all in the hall” bins in buildings. Off campus, municipal recycling near campus is much more contaminated than other areas in Corvallis. This leads me to believe that busy college students have more barriers to recycling than the average person, including a lack of knowledge about what goes in the different waste receptacles.

Another huge problem with recycling contamination is the burden it causes the people in these sorting facilities. When items aren’t clean, they get moldy, meaning someone has to deal with that mold and the other items that any liquid might have spread to. When plastic bags get put in the recycling, they get caught in the conveyor belt that the materials pass through, and someone

has to climb on heavy and dangerous machinery to remove them. I had never really considered the humans that have to deal with our recycling before, but hearing about these issues makes me more motivated to find a solution to these issues that are putting others at risk.

They also both gave me some information about labeling of waste receptacles and what is effective. The important points that stood out to me are that telling people what they can’t recycle is helpful because people always ask “what else” they can recycle, and that simple signage is most effective (duh). Andrea talked a lot about how an emphasis on the most commonly recyclable items (paper, cardboard, aluminum cans, plastic bottles) will always stay recyclable, so shifting the focus of recycling to these key items would likely lead to more recycling success, rather than giving people information about specialty recycling programs. I think that information is important as well, but if everyone would at least recycle the basic items properly (and made sure they were clean) then there would likely be less contamination. Also, everyone has to start somewhere.

# CHAPTER FOUR

## methodology three: participatory activity

### PROCESS

My final methodology was a participatory activity. I created a set of cards that I had people sort. Three cards were to represent each municipal waste receptacle in Corvallis (trash, mixed recycling, and yard waste), and eleven cards were various items that belonged in the different bins. I asked 30 people who lived off campus to sort the items into the bins as they would on a regular day. I then documented their responses and made a note of the items that they placed in the incorrect bins. After they completed this task, I showed them a printout of four different photos of waste receptacles on campus. Each photo had different labeling on the bins, and I asked my participants which labeling on the bin made the most sense to them if they were to stop and look read the labels before disposing of an items. I then recorded their choice and any additional comments they had.

### GOALS

From this activity I wanted to find out how people interact with the waste receptacles that they have access to and test their knowledge on the Corvallis recycling guidelines. I also wanted to find out their likes, dislikes, and frustrations with the labeling on waste receptacles around campus.



trash



mixed recycling bin



yard waste bin



plastic bags



cardboard + paper



pizza boxes



food scraps



coffee cup lids



aluminum cans



plastic jugs



bottles + cans



plastic clamshell containers



paper coffee cups



plastic coffee cups

I chose a mix of items that are easily recyclable (per Corvallis guidelines, and assuming they are clean and dry) and items that are commonly mistaken as recyclable. I also included items that can be put in the yard waste bin.





1



2



3



4

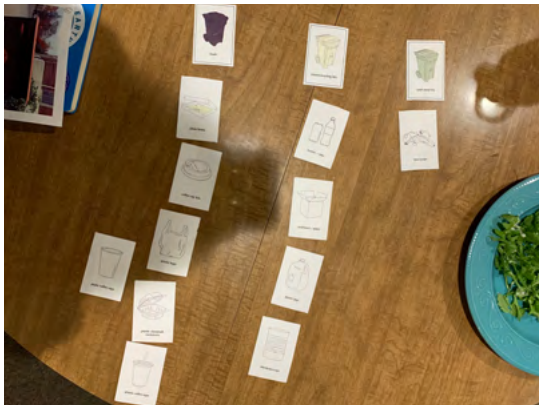
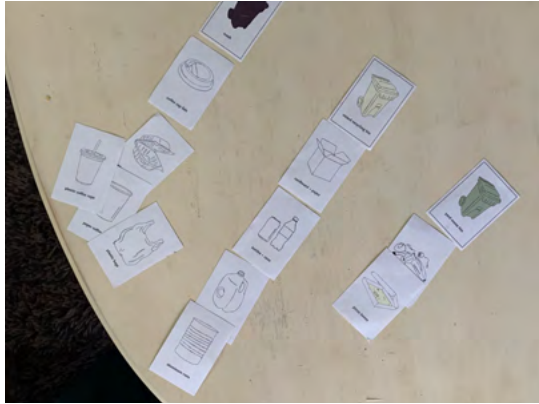
These are the photos I showed my participants after they did the sorting activity. They were arranged in this order and printed on an 11x17 piece of paper. Each photo was labeled with its corresponding number.

I asked each participant, "Which labeling makes the most sense to you, to where you would stop and read before throwing something away?"

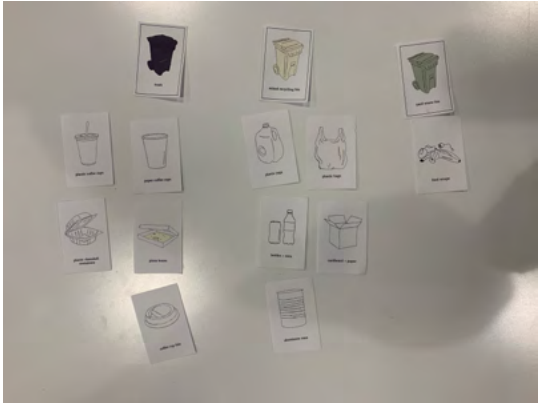
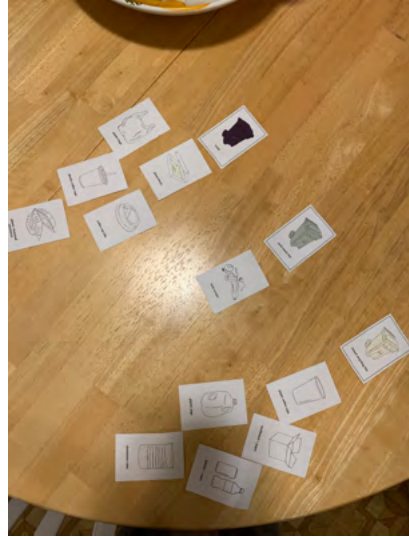
# RAW DATA













participant	items sorted into trash	items sorted into mixed recycling	items sorted into yard waste	bin labeling preference	comments about bin preference
1	pizza boxes, plastic coffee cups, paper coffee cups, plastic bags	plastic jugs, aluminum cans, cardboard + paper, coffee cup lids, bottles + cans, plastic clamshells	food scraps	1	wants 3 at home
2	coffee cup lids, plastic clamshells, plastic coffee cups, plastic bags, cardboard + paper	plastic jugs, bottles + cans, paper coffee cups, aluminum cans, pizza boxes	food scraps	1	catches eye, fonts + colors
3	coffee cup lids, plastic bags, plastic clamshells, plastic coffee cups, pizza boxes	bottles + cans, cardboard + paper, plastic jugs, paper coffee cups, aluminum cans	food scraps	3	nice to have rules for each city in front of you
4	coffee cup lids, plastic bags, paper coffee cups, plastic clamshells, plastic coffee cups, pizza boxes	plastic jugs, cardboard + paper, bottles + cans, aluminum cans	food scraps	1	the icons are nice, #3 is too small
5	pizza boxes, plastic clamshells, aluminum cans, coffee cup lids, plastic coffee cups	bottles + cans, cardboard + paper, plastic bags, paper coffee cups, plastic jugs	food scraps	3	clearly labeled
6	pizza boxes, plastic clamshells, coffee cup lids, paper coffee cups, plastic coffee cups	cardboard + paper, plastic bags, plastic jugs, bottles + cans, aluminum cans	food scraps	1	

participant	items sorted into trash	items sorted into mixed recycling	items sorted into yard waste	bin labeling preference	comments about bin preference
7	food scraps, coffee cup lids, pizza boxes, paper coffee cups, plastic coffee cups, plastic bags, plastic clamshells	cardboard + paper, plastic jugs, bottles + cans, aluminum cans		1	
8	paper coffee cups, plastic coffee cups, plastic clamshells, pizza boxes, coffee cup lids, plastic bags	cardboard + paper, aluminum cans, bottles + cans, plastic jugs	food scraps	1	
9	plastic clamshells, plastic bags, pizza boxes, coffee cup lids, aluminum cans	plastic jugs, plastic coffee cups, cardboard + paper, bottles + cans, paper coffee cups	food scraps	3	1 is pretty, eye catching
10	plastic bags, plastic coffee cups, coffee cup lids, pizza boxes, food scraps, paper coffee cups	plastic clamshells, aluminum cans, bottles + cans, cardboard + paper, plastic jugs		1	
11	plastic bags, paper coffee cups, coffee cup lids, plastic clamshells, plastic coffee cups, pizza boxes	bottles + cans, aluminum cans, plastic jugs, cardboard + paper	food scraps	1	but 3 is informational
12	pizza boxes, plastic clamshells, coffee cup lids, plastic bags, plastic coffee cups	aluminum cans, cardboard + paper, plastic jugs, paper coffee cups, bottles + cans	food scraps	3	
13	pizza boxes, coffee cup lids, plastic bags, paper coffee cups, plastic clamshells, plastic coffee cups	bottles + cans, cardboard + paper, plastic jugs, aluminum cans	food scraps	1	

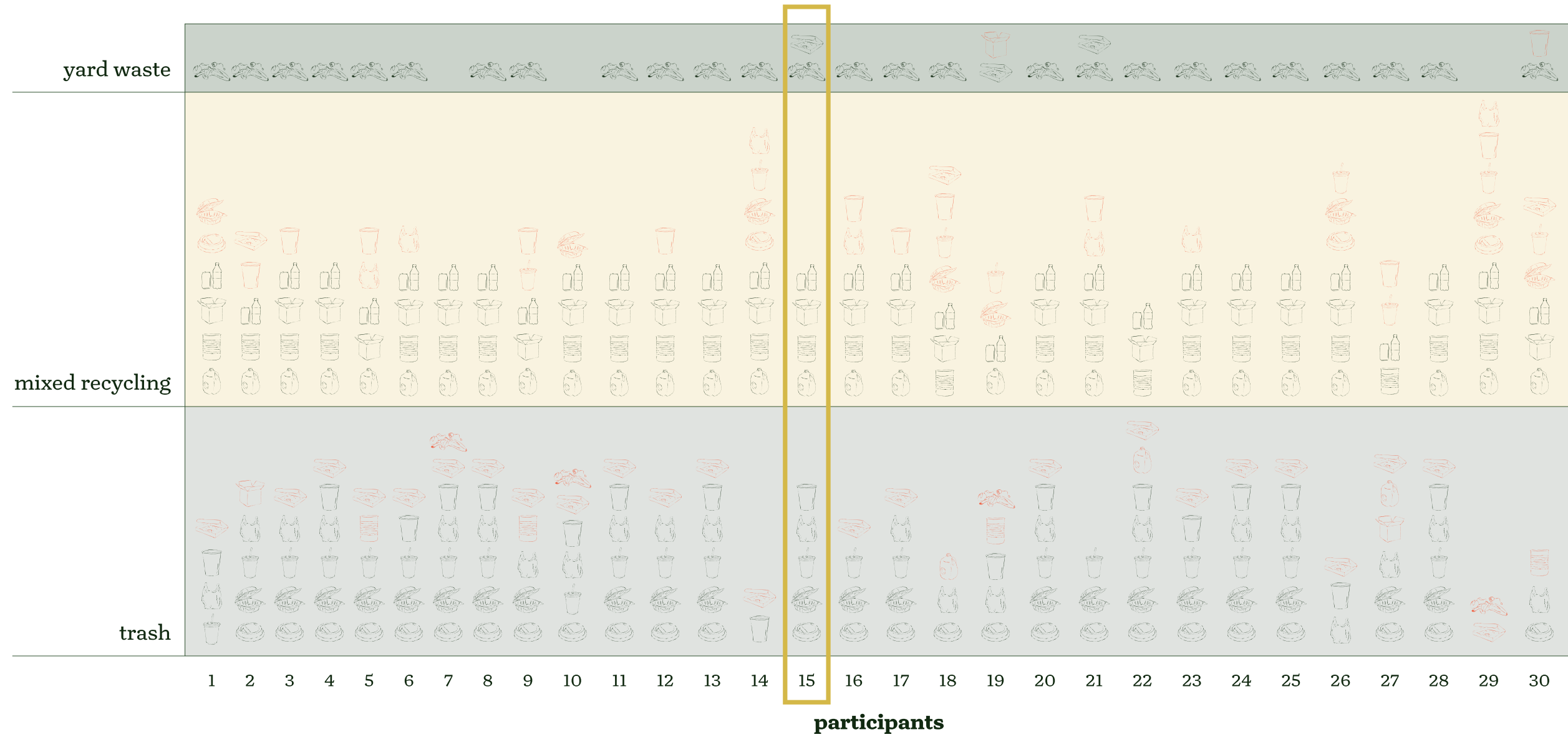
participant	items sorted into trash	items sorted into mixed recycling	items sorted into yard waste	bin labeling preference	comments about bin preference
14	pizza boxes, paper coffee cups	plastic bags, cardboard + paper, plastic clamshells, plastic jugs, bottles + cans, plastic coffee cups, coffee cup lids, aluminum cans	food scraps	3	comprehensive, specific
15	coffee cup lids, plastic clamshells, plastic coffee cups, plastic bags, paper coffee cups	cardboard + paper, plastic jugs, bottles + cans, aluminum cans	food scraps, pizza boxes	1	it's in your face, color is easily recognizable, nice that the info/icons take up a bigger space
16	coffee cup lids, plastic coffee cups, pizza boxes, plastic clamshells	aluminum cans, bottles + cans, plastic jugs, cardboard + paper, plastic bags, paper coffee cups	food scraps	1	it's bold and straightforward, color
17	plastic bags, plastic coffee cups, coffee cup lids, pizza boxes, plastic clamshells	paper coffee cups, cardboard + paper, plastic jugs, aluminum cans, bottles + cans	food scraps	1	big, color
18	plastic bags, plastic jugs, coffee cup lids	bottles + cans, cardboard + paper, paper coffee cups, plastic clamshells, plastic coffee cups, aluminum cans, pizza boxes	food scraps	1	when there's too much stuff people get overwhelmed
19	food scraps, coffee cup lids, plastic bags, paper coffee cups, aluminum cans	plastic coffee cups, bottles + cans, plastic clamshells, plastic jugs	pizza boxes, cardboard + paper	1	

participant	items sorted into trash	items sorted into mixed recycling	items sorted into yard waste	bin labeling preference	comments about bin preference
20	coffee cup lids, pizza boxes, plastic clamshells, plastic coffee cups, paper coffee cups, plastic bags	cardboard + paper, plastic jugs, bottles + cans, aluminum cans	food scraps	1	easy to see from far away what it is, openings are always so small
21	coffee cup lids, plastic clamshells, plastic coffee cups	bottles + cans, paper coffee cups, plastic bags, aluminum cans, plastic jugs, cardboard + paper	food scraps, pizza boxes	1	3 is too much, no one reads it; what does "containers" mean?
22	paper coffee cups, plastic coffee cups, plastic clamshells, pizza boxes, coffee cup lids, plastic bags, plastic jugs	bottles + cans, aluminum cans, cardboard + paper	food scraps	1	
23	plastic coffee cups, paper coffee cups, plastic clamshells, pizza boxes, coffee cup lids	plastic jugs, plastic bags, bottles + cans, cardboard + paper, aluminum cans	food scraps	1	
24	coffee cup lids, plastic clamshells, plastic coffee cups, pizza boxes, paper coffee cups, plastic bags	cardboard + paper, bottles + cans, aluminum cans, plastic jugs	food scraps	3	it's clear what belongs where
25	coffee cup lids, plastic coffee cups, pizza boxes, plastic clamshells, paper coffee cups, plastic bags	bottles + cans, aluminum cans, plastic jugs, cardboard + paper	food scraps	3	nice to have labels

participant	items sorted into trash	items sorted into mixed recycling	items sorted into yard waste	bin labeling preference	comments about bin preference
26	pizza boxes, paper coffee cups, plastic bags	aluminum cans, cardboard + paper, plastic jugs, plastic coffee cups, bottles + cans, plastic clamshells, coffee cup lids	food scraps	4	won't read labels
27	coffee cup lids, plastic jugs, plastic clamshells, pizza boxes, cardboard + paper, plastic bags	plastic coffee cups, bottles + cans, paper coffee cups, aluminum cans	food scraps	3	pictures are helpful
28	paper coffee cups, plastic clamshells, pizza boxes, plastic bags, coffee cup lids, plastic coffee cups	bottles + cans, plastic jugs, cardboard + paper, aluminum cans	food scraps	1	
29	food scraps, pizza boxes	plastic jugs, bottles + cans, coffee cup lids, plastic coffee cups, plastic clamshells, paper coffee cups, plastic bags, aluminum cans, cardboard + paper		3	labels are helpful
30	aluminum cans, coffee cup lids, plastic bags	plastic jugs, plastic clamshells, plastic coffee cups, pizza boxes, cardboard + paper, bottles + cans	paper coffee cups, food scraps	4	simple

Sources:  
Newcomer, Libby. Participatory Activity. 4 November 2019.

## KEY FINDINGS





63%



0%



30%



7%



A majority of people preferred the labeling on bins in the first photo. Almost everyone agreed that it was nice to have some form of picture or label about what belongs in each bin. The first photo stood out to people because they could easily see from farther away what belong in each bin, or enough to know they needed to get closer to be able to dispose of their their item. There was some

disagreement between the level of detail that participants wanted, some liked the simpler icons while others preferred that the labels in photo 3 had more specific information about what belongs in each bin. Some participants also noted the inconsistencies and confusion between the labeling of each bin, specifically the phrase “containers.”

# ANALYSIS

This methodology confirmed my assumption that people do not know their local waste management guidelines. Out of the 30 participants that I had for my activity, only one person put everything in the right place. She was one of my roommates, and I have more or less trained them to properly dispose of their items. The majority of my participants seemed unsure about a lot of items and went back and forth between bins for a lot of the items before settling on a choice, whether that was correct or not. Even for the people who put most of the items in the correct bin, or at least only put correct items in the recycling, this shows that people are unsure of guidelines, even if they are good at guessing.

I am also not surprised that most people preferred the labeling of bins in the first photo. The design and use of color on the bins stands out so much more than any of the other options. This is also a very strong grouping of bins, having trash, eco2go, and mixed recycling all next to each other. However, the mixed recycling bin labeling is a little vague, and based on the feedback I received, the best solution is something in between the first photo and the third photo. The best solution to labeling of bins will allow for no confusion about what belongs in each bin.

# CHAPTER FIVE

## conclusions

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The biggest triangulation I had through my research was the issue of recycling contamination. It was repeated throughout my interviews that it is very problematic, and was confirmed that it is prevalent through my survey and participatory activity. I had definitely suspected that it was an issue going into this class, but my methodologies made me realize that it is the most important problem related to how people dispose of their things, and that something needs to be done to try and help the problem.

A point that came up in both my survey and my participatory activity was that the labels on recycling and trash bins are not working well. This was discovered through my survey findings that people read labels but continue to put items in the wrong bins, and my activity supported it when I asked people about the different labelings of bins on campus. While most people liked the labeling in the first photo, it was still somewhat vague, but the third photo was too detailed.

The idea of barriers came up throughout my research as well. Both of the people I interviewed discussed needing to figure out what barriers people have to disposing of their items properly. Once it was phrased like this I realized I needed to focus on figuring out what issues people have with waste disposal, which I found out more about through my survey and activity.

So pretty much, I learned that contamination is a huge issue, people do not know where to access the information they need to know what is supposed to go where, and current labeling on bins is not working well.

I will be addressing these issues by creating a platform where users can access all of this information they need related to waste management guidelines in Corvallis. This will entail a website that provides information for residential waste disposal as well as information for on campus. I will also have a few print deliverables. The final component will be mockups for new labeling of waste receptacles on campus.

