Indisposable Tales:
Visual Storytelling to Reduce Plastic Waste

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Abstract

Indisposable Tales:
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This thesis explored how visual stories might motivate people to reduce their plastic waste by changing their behavior. The aim of this project was to add to the body of work on design for storytelling and behavior change by researching and evaluating the kinds of stories that are effective in persuading people to reduce their plastic waste.

Indisposable Tales

Visual Storytelling to Reduce Plastic Waste

Clare Ortblad
Master of Design Thesis Documentation

Table of Contents

3 Introduction

4 Background

5 Research

9 Story Development

10 Research Through Prototyping

16 Design Direction

20 Reflection & Conclusion

23 Acknowledgements

24 References

Indisposable Tales

Visual Storytelling to Reduce Plastic Waste

INTRODUCTION

The U.S.' love affair with plastic began in the 1950s with the advent of disposable plastics. As plastic became a ubiquitous material for everyday products a narrative for a "throwaway culture" developed; perpetuated by storytelling through advertising.[1] Today, we are seeing plastic waste end up in our oceans and threatening about 700 different marine species, globally.[2] Entrapment, ingestion and contamination, are the main ways plastics put marine wildlife at risk.[3] At this rate, the Ellen MacArthur Foundation, a charity working to reduce plastic pollution, projects that plastic in the oceans will outweigh fish by 2050.[4] Today, scientists, environmental groups, foundations, news organizations and concerned individuals are trying to turn the tide by showing how harmful our plastic addiction has become. To my knowledge, there is little research on stories specifically about plastic pollution and how they affect behavior change. Therefore, my thesis question was: how might visual stories motivate people to reduce their plastic waste by changing their behavior? The aim of this thesis project was to add to the body of work on design for storytelling and behavior change. Specifically, I wanted to better understand and evaluate the kinds of stories that are effective in persuading people to reduce their plastic waste.

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1 "We made plastic. We depend on it. Now we're drowning in it," accessed November 3, 2018, https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/.

2 Gall, Sarah C., and Richard C. Thompson. "The impact of debris on marine life." Marine pollution bulletin 92.1-2 (2015): 170-179.

3 Law, Kara Lavender. "Plastics in the marine environment." Annual review of marine science 9 (2017): 205-229.

4 "More plastic than fish in the sea by 2050 warns Ellen MacArthur," accessed November 3, 2018, https://www.theguardian.com/business/2016/jan/19/more-plastic-than-fish-in-the-sea-by-2050-warns-ellen-macarthur.

BACKGROUND

Our Plastic Problem

Our world is facing a plastic pollution crisis. In 2015, a study from the University of Georgia estimated that between 5.3 and 14 million tons of unrecycled plastic waste ends up in our oceans from coastal regions.[5] Single-use plastics—any kind of packaging that is used once and then thrown out or recycled—make up more than a third of it. Single-use plastics account for 42% of all global plastic produced by industry.[6] Plastic can take up to 1,000 years to degrade, and even then it doesn't completely go away. Plastic degrades by breaking down into micro plastic particles over many years, and toxic chemicals latch onto these particles floating in our oceans, eventually making their way into our seafood.[7]

As of 2015, about 9% of discarded plastic was being recycled in the U.S.[8] and most of it was sent to China to be recycled, but now the U.S. is finding itself scrambling to find alternatives in the wake of China's National Sword policy.[9] The remaining 91% of all discarded plastic finds its way to landfills, washes into rivers and oceans, or is burned (about 12 percent is burned).[10]

The media, environmentalists, and scientists, among others, have already set off quite a few alarm bells about this crisis. As a result, environmentalists are emphasizing the "reduce" part of "reduce, reuse, recycle" when it comes to plastic.[11] But there is still a need for sounding this alarm and communicating the problem to the everyday consumer. If we don't do enough to change course the Ellen MacArthur Foundation projects that plastic in the oceans will outweigh fish by 2050 if things continue as they are.[12]

It's critical that the U.S. (and the rest of the world) phases out single-use plastics from everyday, disposable products. The good news in all of this is that we can help mitigate the heaps of plastics ending up in oceans—starting now. Using alternatives like reusable mugs, utensils, and tote bags can go a long way. For example, an American tosses out about 1.5 straws per day so forgoing straws for a year prevents about 548 straws from entering the U.S.' waste stream.[13]

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5 Jambeck, Jenna R., et al. "Plastic waste inputs from land into the ocean." Science 347.6223 (2015): 768-771.

6 "Plastic Production by Sector," accessed November 3, 2018, https://ourworldindata.org/grapher/plastic-production-by-sector.

7 "Why is plastic harmful," accessed November 3, 2018, https://plasticpollutioncoalition.zendesk.com/hc/en-us/articles/222813127-Why-is-plastic-harmful-.

8 "U.S. recycling rate projected to drop to 4.4% in 2018," accessed June 13, 2019, https://www.plasticpollutioncoalition.org/pft/2018/10/4/us-plastic-recycling-rate-projected-to-drop-to-44-in-2018.

9 "China has refused to recycle the wests plastic. What now," accessed November 3, 2018, https://www.npr.org/sections/goatsandsoda/2018/06/28/623972937/china-has-refused-to-recycle-the-wests-plastics-what-now.

10 "The world's recycling is in chaos. Here's what has to happen," accessed November 3, 2018, https://www.wired.com/story/the-worlds-recycling-is-in-chaos-heres-what-has-to-happen.

11 "Reduce, Reuse, Recycle. Most of all, Reduce." accessed June 13, 2019, https://www.nrdc.org/stories/reduce-reuse-recycle-most-all-reduce.

12 "More plastic than fish in the sea by 2050 warns Ellen MacArthur," accessed November 3, 2018, https://www.theguardian.com/business/2016/jan/19/more-plastic-than-fish-in-the-sea-by-2050-warns-ellen-macarthur.

13 "You Can Help Turn the Tide on Plastic. Here's How," accessed November 3, 2018, https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-solutions-waste-pollution/.

A Throwaway Mindset

Around the time that plastics were popularized in the 1950s, a "throwaway culture" was developed and perpetuated thanks to storytelling through advertising.[14] There were of course other events that factored into the widespread adoption of plastic as a material but there is clear evidence that advertising had a role to play in shifting Americans' mindsets when it came to plastic.[15] Companies such as the Dow Chemical Company, which ramped up its efforts to sell directly to consumers post World War II[16] sold products like Saran Wrap with advertisements that emphasized less clean-up and saving time.[17]

A Dow Chemical Company advertisement for Saran Wrap from 1957 (image credit: see footnote 15).

If companies were able to manufacture our demand for disposable plastics through advertising and storytelling, why can't we do the reverse by manufacturing the refusal of single-use plastics? Why not change our perceptions towards disposable plastics so that we see them as a negative, wasteful symbol?

Plenty of articles and videos cast plastics in a negative light. But I was curious to know: Do these stories work to persuade viewers to change their consumption of plastic? What makes one story more effective than the other at motivating people to change? Does the visual design of a story make it more persuasive? How can the success of these stories be measured?

Therefore, my research question was: how might visual stories motivate people to reduce their plastic waste by changing their behavior? I hypothesize that visual stories motivate people to reduce their use of disposable plastics by forming negative associations with this kind of material. I chose University of Washington (UW) students as my target audience as this was the community that I spent the most time with already. The following sections show how my research, prototyping, and designs explore my research question and hypothesis.

RESEARCH

My process began with familiarizing myself with the facts and efforts surrounding plastic recycling and pollution. This included researching the UW's waste system. I found that plastic bottled beverages and containers make up a large part of UW's plastic waste.[18] The Seattle campus alone throws out about 12 million plastic bottles and containers each year.[19]

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14 "We made plastic. We depend on it. Now we're drowning in it.," accessed November 3, 2018, https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/.

15 "A Brief History of How Plastic Has Changed Our World." Youtube, uploaded by National Geographic, 22 May 2018, https://www.youtube.com/watch?v=jQdBag_p6kE.

16 "From Plastics to Bubbles: Dow's Post-World War II Consumer Push," accessed June 1, 2019, https://corporate.dow.com/en-us/about/history/vintage-chemical-advertising.

17 "Big Family, No Maid, Tight Budget! (So They Use Saran Wrap and Plenty of It!)," accessed June 1, 2019, https://digital.sciencehistory.org/works/0z708x45z.

18 "2018 UW Waste Characterization Study," accessed Jan 7, 2019, https://facilities.uw.edu/files/media/uwwcs-2018-report-final.pdf.

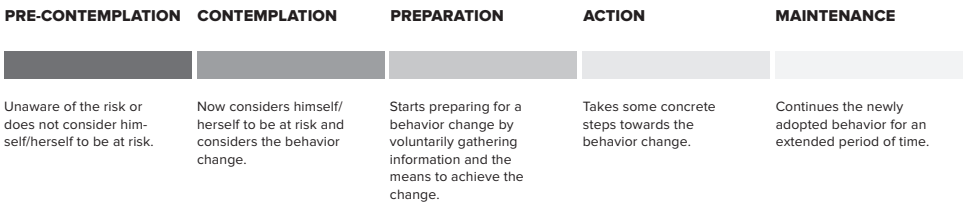
19 Estimate calculated with 248,000 pounds of PET bottles & containers tossed out each year multiplied by 50; the approx. number of bottles that weigh 1 pound.

My research also entailed reviewing literature and case studies around the following categories: behavior change models; persuasion techniques; and storytelling. It was essential for me to explore these topic areas in order to figure out what would be the right story to tell.

Behavior Change

The Transtheoretical Model (TTM) of behavior change is an established model developed by clinical psychologists James O. Prochaska and Carlo C. DiClemente. This model recognizes that individual change happens in five distinct stages: 1) precontemplation; 2) contemplation; 3) preparation; 4) action; and 5) maintenance.[20] The literature about TTM suggested that a story can be highly persuasive and provide an inciting moment to inspire someone to want to change, but it is not the right vehicle for "maintenance." An examination of weight loss programs, for example, has proven that maintenance requires regular, external forces such as support groups and monitoring schedules for forming and keeping up the new habit.[21]

The Transtheoretical Model



Research shows that stories can serve as a catalyst for taking action and trying a new behavior for the first time. For example, a study about social norms messaging to motivate environmental conservation behavior in hotel rooms found that referencing what other people do in a short anecdotal message (e.g. "the majority of guests in this room reuse their towels") with just a bathroom sign resulted in higher rates of guests reusing their towels.[22] Another example is the BBC's *Blue Planet II*, which is a nature documentary series. A recent study among 2,000 British consumers found that 88% of people who watched the television series changed their behavior as a result.[23] *Blue Planet II* has even influenced relations between the U.K. and China. British Prime Minister Theresa May gave President Xi Jinping a *Blue Planet II* DVD box set as a gift and symbolic gesture to

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20 Guttman, Nurit. Public health communication interventions. Sage, 2000.

21 "Behavior Modification and Physical Activity (Weight maintenance, Overweight, Obesity and Severe Obesity)," accessed November 3, 2018, https://www.obesityaction.org/get-educated/public-resources/brochures-guides/understanding-your-weight-loss-options-brochure/behavior-modification-overweight-obesity-and-morbid-obesity/.

22 Goldstein, Noah J., Robert B. Cialdini, and Vladas Griskevicius. "A room with a viewpoint: Using social norms to motivate environmental conservation in hotels." Journal of consumer Research 35.3 (2008): 472-482.

23 "Waitrose & Partners Food and Drink Report 2018-19," accessed June 1, 2019, https://www.waitrose.com/content/dam/waitrose/Inspiration/Waitrose%20%26%20Partners%20Food%20and%20Drink%20Report%202018.pdf.

highlight both countries' determination to stop plastic pollution.[24] Part of what made *Blue Planet II* so successful was its calibrated appeals to both the emotional and rational parts of people's brains. This is a tactic that the authors of *Switch: How to Change Things When Change Is Hard* identify as necessary to any kind of behavior change work.[25] Appealing to just one or the other won't result in as much change.

Persuasion

I gathered key insights on persuasive visual communication tactics from research on behavior change interventions and public health advertising. Much of this research concerns the use of surprising graphic images, supplemented with research about anthropomorphism and messaging strategy.

For example, disturbing images have proven to be effective as inciting events that motivate people to change. According to a 2009 World Health Organization report,[26] in Canada, graphic labels with images of diseased lungs and mouths were particularly effective at educating people about the health risks of smoking and increased motivation to quit smoking.[27] After implementation of these new warnings, tests were conducted in countries like Thailand and Malaysia. The percentage of Thai smokers stating that the labels made them think about the health risks increased and so did the percentage of those saying the labels made them more likely to quit.[28] A survey that was conducted in Malaysia—where the text-only warning labels did not change—showed no increases.[29] Similarly, the authors of *Hidden Persuasion: 33 Psychological Influence Techniques in Advertising* note that surprising and unexpected images can help reframe people's perceptions, making viewers more likely to act on a message.[30]

The Center for Research on Environmental Decisions also recommends using vivid imagery in the form of film footage, metaphors, personal accounts, and concrete comparisons as an "experiential tool." In other words, people can relate to this content better because it visually and cognitively relates more directly to experiences one has had personally. This way the content will recall and highlight relevant personal experiences and elicit emotional responses.[31]

Another technique that informed my story's visuals is anthropomorphism. *Hidden Persuasion* explains that it brings the viewer closer to the content

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24 "Blue Planet gift from Theresa May to remind Beijing of plastic waste," accessed June 1, 2019, https://www.theguardian.com/environment/2018/jan/31/blue-planet-gift-from-theresa-may-to-remind-beijing-of-plastic-waste.

25 Heath, Chip and Dan, Switch: How to Change Things When Change Is Hard, Crown Business, 2010.

26 Fong, Geoffrey T., David Hammond, and Sara C. Hitchman. "The impact of pictures on the effectiveness of tobacco warnings." Bulletin of the World Health Organization 87 (2009): 640-643.

27 [ibid.]

28 [ibid.]

29 [ibid.]

30 Bart van Baaren, Rickert and Marc Andrews, Hidden Persuasion: 33 Psychological Influence Techniques in Advertising, BIS Publishers, 2013.

31 Center for Research on Environmental Decisions, The Psychology of Climate Change Communicaiton, Columbia University, 2009.

by empathizing with the subject (such as an animal).[32] Giving an animal or object human gestures, features or facial expressions (that communicate a specific emotion) anthropomorphizes it. I use this technique for a couple of animal characters in my story: a whale and a fish.

In addition, the authors of *Switch* advise that directives should be a relatively easy task because any kind of big change needs to start small and be incremental.[33] "It's a theme [they've] seen again and again—big changes come from a succession of small changes."[34] As a result, I edited my story's messaging to be straightforward and ask for a realistic change in behavior.

Storytelling

Scientists and storytelling professionals indicate that stories are effective at communicating information and inspiring people to act.

It turns out that our brains are hard-wired to best process information in story form, and depending on the story, neurochemical responses put us in a state where we feel motivated to do something. According to a 2015 study performed at Claremont Graduate University, a kind of "neural ballet" happens in our brains when we experience a story—and this activity releases oxytocin.[35] Oxytocin is normally produced when we are shown a kindness and it motivates cooperation with others.

Additionally, researchers found that, after taking blood draws before and after the narrative, character-driven stories with emotional arcs consistently caused oxytocin synthesis. To professional storytellers this comes as no surprise. Journalists have noticed that videos tend to go viral when they evoke intense emotional responses, especially ones that end with more positive and uplifting tones.[36] Journalists hypothesize that readers may share these stories via social media as a way to process the information, or to simply do something with the emotions they were experiencing.

Stories are effective at communicating global phenomenons because they provide audiences with an intuitive sense of the scale of the problem.[37] Not only do stories help provide understanding through context, but they also make it easier for viewers to process complex information. The Center for Research on Environmental Decisions recommends storytelling for climate change efforts to make "[issues] memorable and therefore dominant in processing."[38]

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32 Bart van Baaren, Rickert and Marc Andrews, Hidden Persuasion: 33 Psychological Influence Techniques in Advertising, BIS Publishers, 2013.

33 Heath, Chip and Dan, Switch: How to Change Things When Change Is Hard, Crown Business, 2010.

34 Heath, Chip and Dan, Switch: How to Change Things When Change Is Hard, Crown Business, 2010.

35 "Why Your Brain Loves Good Storytelling," accessed November 3, 2018, https://hbr.org/2014/10/why-your-brain-loves-good-storytelling.

36 "Why that Video Went Viral," accessed November 3, 2018, https://www.nytimes.com/2014/05/20/science/why-that-video-went-viral.html.

37 Dahlstrom, Michael F. "Using narratives and storytelling to communicate science with nonexpert audiences." Proceedings of the National Academy of Sciences 111. Supplement 4 (2014): 13614-13620.

38 Center for Research on Environmental Decisions, The Psychology of Climate Change Communicaiton, Columbia University, 2009.

Matthew Luhn, a writer and story consultant, positions storytelling differently, as a way of establishing social norms. He notes that this is because people look to the actions of others to determine their own, and this same logic applies to observing the actions of a character (both fictional and nonfictional).[39] Luhn's argument aligns with studies of social norms. In a 2018 Annual Review of Psychology study entitled "Social Mobilization," people are more likely to perform behaviors that adhere to a new social norm when these actions are observable to others (both directly and indirectly)—possibly to keep up their "reputation."[40] Most of us want to follow first adopters of a new social behavior. Whether or not we're aware of it, we tend to be moved by fads, kinship or competitiveness.

STORY DEVELOPMENT

Based on my research, I identified that a persuasive story should:

- Use the end of the story as the call-to-action (CTA) as people's minds will ideally be in a more cooperative state post oxytocin synthesis
- Have strong emotional triggers and end on an uplifting note in order to produce the cooperative state
- Use vivid imagery and shocking moments to elicit intense emotions so that the messaging is memorable
- Provide clear directives in the messaging and create a CTA that is an easy task but significant step towards the desired behavior
- Show what the desired behavior is
- Have a main human character and/or an anthropomorphic animal character affected by plastic waste in the story

Photos of my story structure brainstorming process.

I began developing my story by brainstorming multiple narratives. Through researching storytelling techniques, I found PIXAR's story spine exercise,[41] which encourages rapid, quick brainstorming using a template (example shared on the left). The story spine exercise is a series of beginning statements where you fill in the blank. For example: "Once upon a time…"; "and every day…"; then "until one day…" and so on. I combined this approach with the design post-it note method (brainstorming with and subsequently organizing them) to generate a lot of ideas and have the flexibility of modifying narrative structures easily.

While generating options for my narrative structure I was inspired by author Kurt Vonnegut's seminal work on the shapes of stories theory.[42] Vonnegut

39 Luhn, Matthew, The Best Story Wins, Morgan James Publishing, 2018.

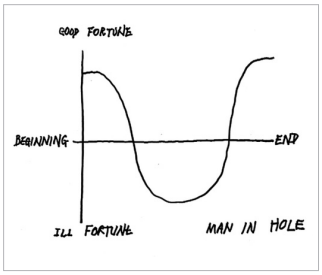
40 Rogers, Todd, Noah J. Goldstein, and Craig R. Fox. "Social mobilization." Annual Review of Psychology 69 (2018): 357-381.

41 "The Story Spine: Pixar's 4Th Rule Of Storytelling," accessed November 3, 2018, https://www.aerogrammestudio.com/2013/03/22/the-story-spine-pixars-4th-rule-of-storytelling/.

42 "Kurt Vonnegut on the shapes of stories." Youtube, uploaded by David Cromberg, 30 October 2010, https://www.youtube.com/watch?v=oP3c1h8v2ZQ.

posits that the emotional ups and downs of a story can be visualized in a line graph to reveal a taxonomy of story styles.[43] He graphed several archetypal stories such as Cinderella, and the "boy meets girl" model, and this work has served as a reference for writers learning how to craft a compelling narrative. Designer and author Ellen Lupton also cites Vonnegut's work as a framework for designers mapping an "emotional journey."[44] In her view, readers (or users for products) are more likely to have a memory imprinted on them after experiencing an emotional journey.

I used Vonnegut's and PIXAR's methods to further expand and then converge to three final story options. Next, I storyboarded my three options, evaluated the strengths and weaknesses of each, and then narrowed down to two. The content of both stories was a combination of my research, ideas, and news stories with my own editorial spin on them.



A "shapes of stories" plot (image credit: A Man Without a Country, Kurt Vonnegut).

Meanwhile, I also ideated form possibilities through sketching. I settled on using video as my primary vehicle for this story for its accessibility via the web and because environmental activist groups cite its efficacy in reaching audiences in an unintimidating way that also helps break down barriers between people who perceive themselves as "enviros" and "non-enviros."[45]

RESEARCH THROUGH PROTOTYPING

Prototype 1: Case Studies & Testing

My secondary research included analyzing case studies in the form of 30-odd online, digital stories about the topic of plastic pollution and synthesizing what the most compelling narratives had in common.

I created a taxonomy of digital stories that were related to plastic pollution in order to help me find these commonalities. What I found aligned with the insights gained from my earlier research.

The most compelling narratives all had:

- A strong hook with tension built in (visual and story-wise)
- Shocking information
- Emotional highs and lows
- A character to focus on
- Some kind of inspirational quality (typically in the CTA at the end)

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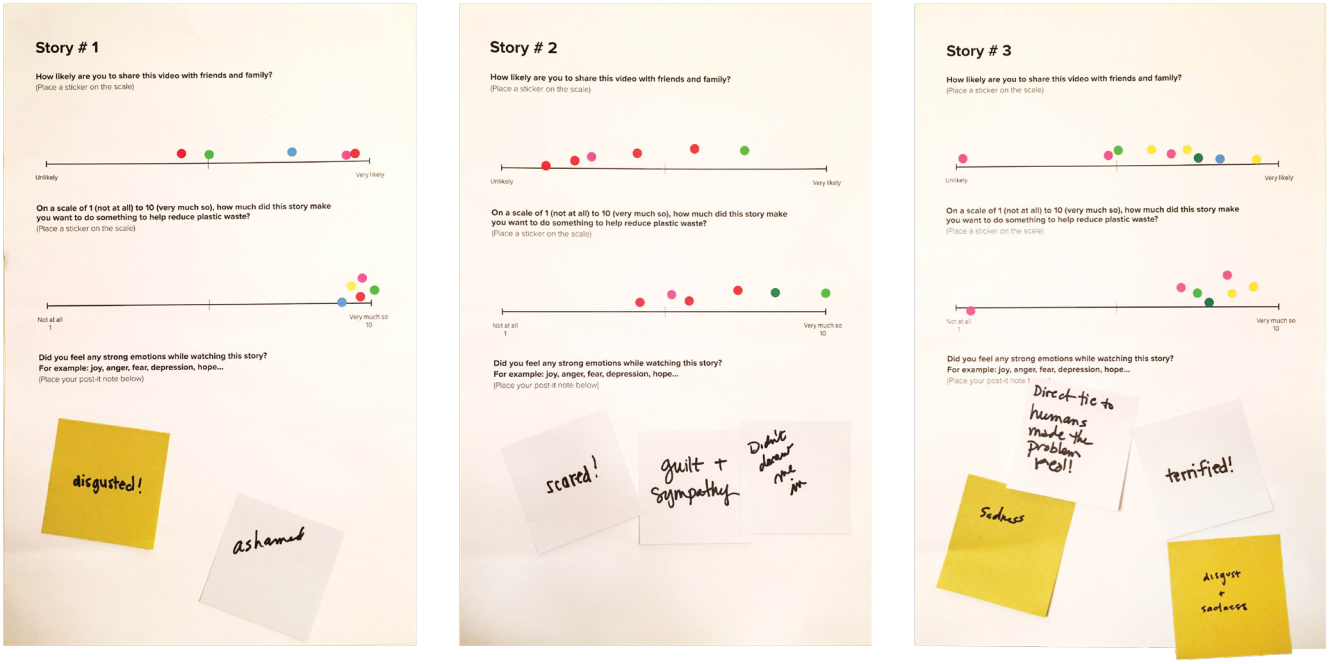
43 "Vonnegut graphed the world's most popular stories," accessed November 3, 2018, https://www.washingtonpost.com/news/wonk/wp/2015/02/09/kurt-vonnegut-graphed-the-worlds-most-popular-stories/?noredirect=on&utm_term=.9dc4c5d54051.

44 Lupton, Ellen, Design Is Storytelling, Cooper Hewitt, Smithsonian Design Museum, 2017.

45 Gallagher, Nora and Lisa Myers, Tools for Grassroots Activists, Patagonia, 2016.

Master of Design Process Show in Dec. 2018 (image credit: Yuansi Li).



A sample from the case studies survey activity for prototype 1.

I tested out these findings at the Master of Design Process poster show to get a sense of how persuasive a few select stories were from my case studies taxonomy. People's responses confirmed what I had gleaned from the case studies analysis but also showed me that the story with an animal as the main character was consistently more persuasive than the others. I conducted this activity during the same time that I was developing storyboard options. This activity helped me narrow down to character-driven stories (both animal and human) for my second prototype.

Prototype 2: Storyboard booklets

Next, I tested out two of my draft stories on 10 students (four women and six men) for my second prototype. I found my participants by approaching students at random in the Husky Union Building. I presented participants with two low-fidelity storyboard booklets and asked them to rate which of the two was more persuasive and asked follow-up questions.

During my interviews, I gained some key insights into what story elements were working to motivate them to change their behaviors.

My key insights included:

- People appreciated receiving clear directives in the story's messaging; being told what they can do versus what not to do
- The story that began with a whale as the central character was more emotionally triggering and generally more persuasive
- A bit of humor helped the audience connect with the story more
- An online, hashtag-related activity* proposed as the CTA—in order to create a negative association with plastic—made people feel uncomfortable. Participants seemed to feel that this action would be too attached to their online identity

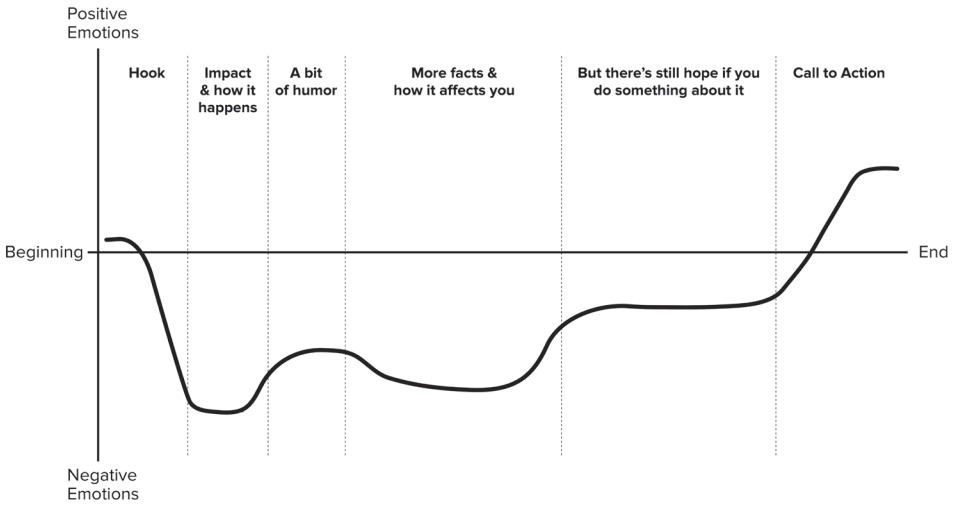
*The call to action was to take photos of single-use plastic packaging and then tag it with #stupidplastic on social media.

While this testing round was helpful in selecting the right story structure to move forward with, I found myself with a dilemma. What should the ending of my story be? Students' responses to the hashtag activity was lukewarm at best and it didn't seem to generate a feeling of excitement. Plus I couldn't simply end with the directives about creating your own reusable containers kit. That simply wasn't engaging or exciting enough.

After more ideating and a lot of head-scratching, I decided that the CTA would have to fulfill the following criteria: be exciting and/or inspiring; be out of the ordinary (or disruptive to grab attention); and create a negative association with plastic. Inspired by the likes of artists Shepard Fairey[46] and Candy Chang,[47] I found that a guerrilla sticker activity could fulfill these three criteria. Its illicit nature was exciting and unexpected. And it literally

Shepard Fairey's "Obey" sticker (top) and Candy Chang's "I wish this was" sticker project.

46 "Sticker art," accessed March 3, 2019, https://obeygiant.com/essays/sticker-art/.
47 "I wish this was," accessed March 3, 2019, http://candychang.com/work/i-wish-this-was/.



Convenience at a Cost's story structure plotted.

created a negative association to plastic by attaching the story's message to the material itself.

In the end, it didn't matter whether or not thousands of stickers appeared on campus. What was more important was that students felt inspired by this idea and finished the story on a note of excitement and inspiration. I used this CTA idea as a device to energize students to want to take action and walk away from this story on a more uplifting note. If even a few people felt motivated, and a dozen or so stickers appeared, that was a success for me.

Prototype 3: Testing out the video

My third prototype entailed testing out a near-final version of my video using a Knowledge, Attitudes, and Practice (KAP) survey. Health researchers often use this survey type to collect information on what is known, believed and done in relation to a particular topic.[48]

I went with a KAP survey instead of a test screening (as the film and advertising industry does) because it was the most effective option for measuring behavior change. Test screenings tend to collect responses about what audience members liked or purchased[49] rather than how it changed them. In addition, Professor Tania Busch Isaksen, a lecturer from the UW Department of Environmental & Occupational Health Sciences and my collaborator for testing my video on a UW class, recommended the KAP survey.

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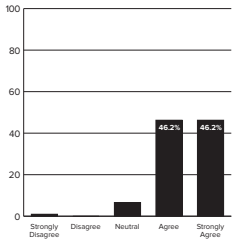
48 "The KAP survey model (Knowledge, Attitudes, and Practices)," accessed June 13, 2019, https://www.spring-nutrition.org/publications/tool-summaries/kap-survey-model-knowledge-attitudes-and-practices.

49 "Advertising testing," accessed June 3, 2019, http://www.dobney.com/Research/ad_testing.htm.

Professor Tania Busch Isaksen's environmental health class on April 19, 2019.

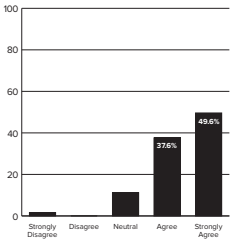
Statement Type: Practice

I may be willing to change my daily habits to reduce the amount of plastic waste I produce.



PRE

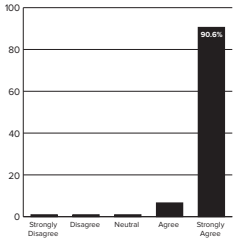
I will change my daily habits to reduce the amount of plastic waste I produce.



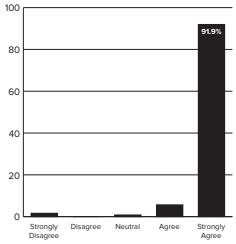
POST

Statement Type: Knowledge

Plastic waste in the ocean affects sea life.



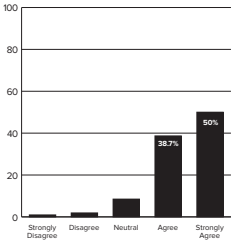
PRE



POST

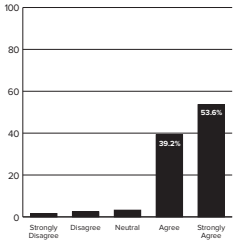
Statement Type: Attitude

I feel concerned about the amount of plastic waste I create.



PRE

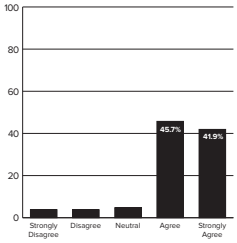
I will be aware of the amount of plastic waste I create.



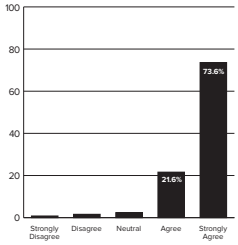
POST

Statement Type: Knowledge

Plastic waste disposed of in the U.S. ends up in our Oceans.



PRE



POST

The KAP survey results.

The survey was administered both before and after the video was shown to measure whether or not a shift happened in all three areas (knowledge, attitude, and practice). Students responded to statements by either agreeing or disagreeing with it on a 5-point scale (strongly disagree, disagree, neutral, agree, strongly agree).

My primary aim was to measure how effective my video was at motivating students to change their practices (habits) when it comes to using single-use plastics. My secondary aims were to see how effective my video was at shifting attitudes and filling knowledge gaps.

Trial Run

I conducted a trial run on a group of eight students (from a design course where I was the teaching assistant) to get some qualitative information and feedback on my video from my target audience (university students). Based on my interactions with them post survey, I found that most of these students already had basic knowledge about plastic pollution but were surprised by specific pieces of information in the story (e.g. the amount of plastic produced since the 1950s). Based on my recorded post-survey interviews, I observed that more than half of the students (six) were intrigued and excited by the sticker CTA in the story.

The Real Deal

The real test happened on April 19, 2019, right before Earth Day—the day when I would distribute hundreds of stickers so that it got to as many students as possible. I shared my video with Professor Busch Isaken's introductory environmental health class of about 120 students.

Overall, the results of this test were promising. I found that the general trend for all three areas showed a shift towards "strongly agree." The most significant result was a 32% increase for "strongly agree" in response to the Knowledge statement: plastic waste disposed of in the U.S. ends up in our oceans. According to a p-value statistical analysis, this particular question/statement result shows that my video increased knowledge for these students at a statistically significant level (p value<.001).

For Attitude and Practice, there was a slight shift: a 4% increase in each case. The Attitude statement (being aware of the amount of plastic waste I create) also seemed to nudge more people from a neutral state to a position of "agree."

For the Practice statement (willing to change daily habits) I saw a less significant shift. There was a shift from "agree" to "strongly agree" of 4%, but there was also an increase of 3% for a neutral state; signifying that perhaps more students weren't sure of what they would do after they watched the video.

One of the limitations of this survey was that I could not know what every student's Practice baseline was. It was possible that this crowd was already fully informed about this problem and therefore happy with their

Bottle Count Experiment: To supplement the survey data collection, I also did a counting experiment to see if there was any change in behavior when it came to bringing in single-use plastics. I attended the class without students knowing I was silently observing them and counted every single-use plastic item I saw: coffee cups (hot or cold) and bottled drinks.

There was a decrease in the number of drinks that I counted based on two separate counts; before and after the video test. Between each count there was a 78% decrease in the number of bottled waters I counted and 44% decrease for hot or cold coffee cups.

To have valid quantitative results, this test should be repeated multiple times. There are a number of variables at play here that influenced these students so it's likely that my video alone didn't make this change.

behaviors around using single-use plastics. I also don't know what exactly prompted such a large Knowledge increase other than it was related to the U.S.' contribution of plastic waste. I surmise that students were surprised to learn how much of their personal waste goes towards impacting the larger problem of plastic in our oceans, and that this pollution crisis isn't a far-away problem that only developing countries contribute to. Other minor limitations of this survey were that about 20 students did not fill out the first portion of the survey and the settings for displaying this video were not ideal.

In short, the results are a positive step in the right direction. I was not surprised that this video only motivated a few of the 120 odd students to change their behaviors, but perhaps these few will be the "first adopters" and help push for more change. The most promising result of course was the jump in Knowledge, which seemed to raise greater awareness and perhaps reframed people's perspectives on how their own actions affect the environment. This shift is also a critical first step in creating behavior change.

DESIGN DIRECTION

Over time, my video evolved to become a campaign—*Convenience at a Cost**—and therefore my visual direction expanded to a website and guerrilla sticker bombing† activity. This campaign advocates for reducing single-use plastic consumption and waste to help mitigate our plastic pollution problem. It also aims to raise awareness at the UW Seattle campus. My video evolved into a campaign because it needed a platform that would both host the video and provide context for why this video exists. I also discovered through sharing this campaign with students that it provided another benefit: creating the identity and sense of a movement (and not just a standalone video).

*To see this campaign's final deliverables, see pages 19 to 22.

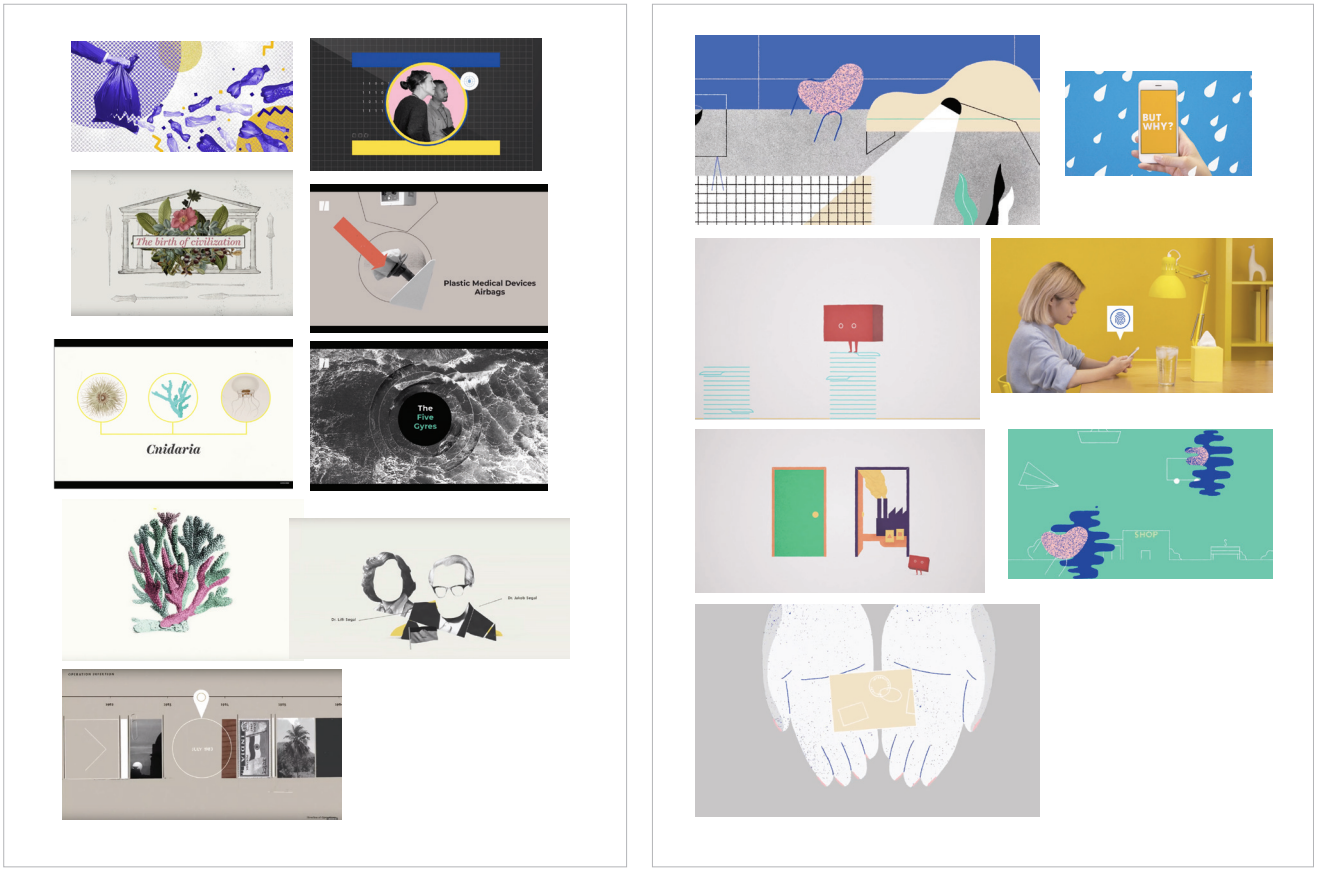
†Sticker bombing is a form of street art where an image or message is publicly displayed using stickers.

As this campaign was of a subversive nature, the tone and visual language of my video reflected this as well. I developed a visual direction by first creating mood boards. This helped me with making the decision to incorporate vivid imagery through photography to connect the content to real-world references. For example, I incorporated a photo of a dead albatross with its stomach sliced open, revealing chunks of plastic inside.

I was careful to not overwhelm viewers with too many graphic and upsetting images because I didn't want them to only experience feelings of disgust and shock. I needed to draw viewers into the story with a combination of disgust, shock, sadness, sympathy, and then eventually, hope. As a result, I used a mix of photography and graphic illustrations to invoke my desired emotional journey.

I also represented vivid imagery through motion graphics—such as the scene where a pilot whale vomits plastic bags—to dramatize the scene and allow viewers to feel like they were with the pilot whale in the moment. In this case, the photographic evidence of these plastic bags didn't visualize the tragedy of this moment, whereas illustrating this scene myself

One of the three storyboards I created.



Mood board samples.

afforded an intense, emotional moment where I could emphasize the horror and sadness of a pilot whale vomiting plastic bags. For moments like these, I picked up the pace of the story and punctuated climactic moments with higher color saturation and faster motion to reflect a more edgy and exciting tone. Color choices included electric pinks and purples to communicate the artificial and sometimes toxic quality of plastic.

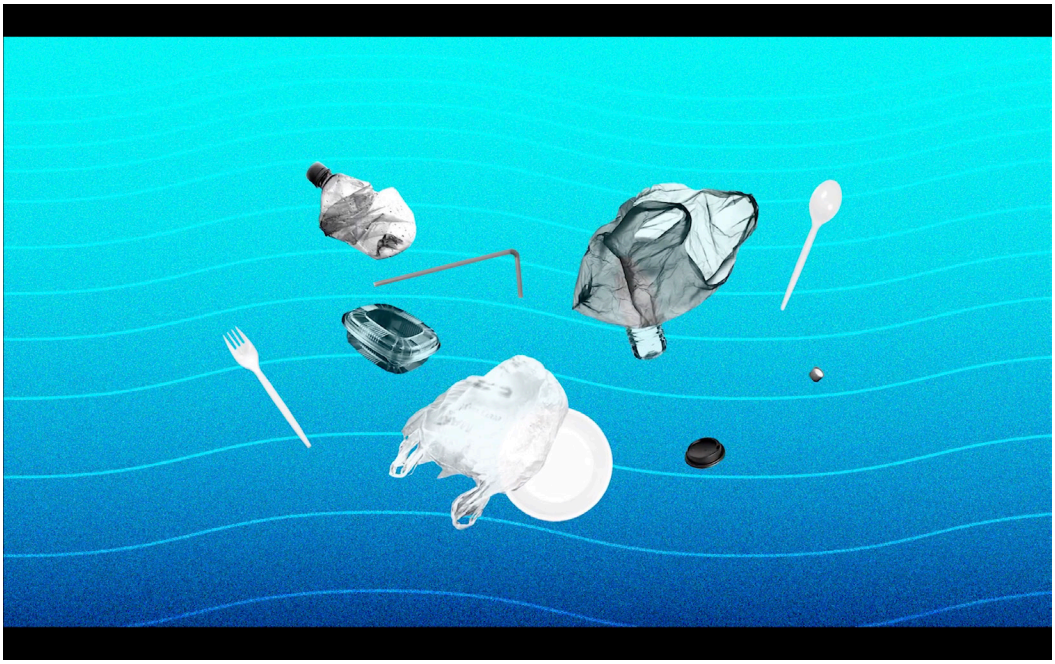
As for the audio components of this video, I selected music tracks that aligned with the emotional journey: one for a somber beginning about marine animals affected by plastic; a track that picked up the pace yet was still serious for the facts-and-figures-driven segment; and finally a track that was energetic and uplifting for the ending scenes.

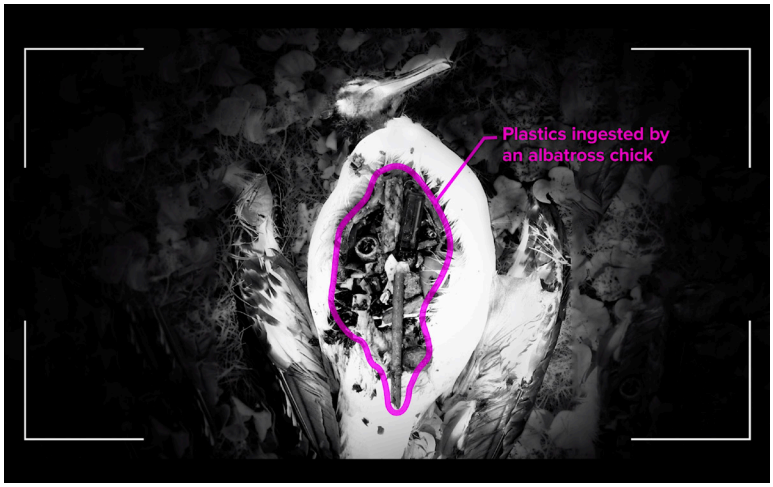
I also worked with a local actress and friend, Britt Hobson, for the video's narration. Thanks to her skills and ability to take direction, she narrated the story in a way that cues shifts in the story's emotional journey as well as points of dramatic emphasis.

The Sticker Campaign

For the guerrilla sticker campaign on Earth Day 2019, I coordinated with UW student-run sustainability groups SEED and Precious Plastic to publicize the Convenience at a Cost campaign. Students in both groups, as well as a few of my fellow graduate students in the Master of Design program, helped disseminate stickers for sticker bombing on and around Earth Day. This campaign consisted of a video, stickers, a website, and Henry Art Gallery installation.

The most exciting development from this activity was seeing the handiwork of other students pop up in unexpected places and even days after Earth Day. For example, I found stickers at the District Market (a location that I had not recommended going to) and at Parnassus Cafe three days after Earth Day. I also observed that products with stickers on them were often left on shelves for days, which indicated to me that people were avoiding these items.





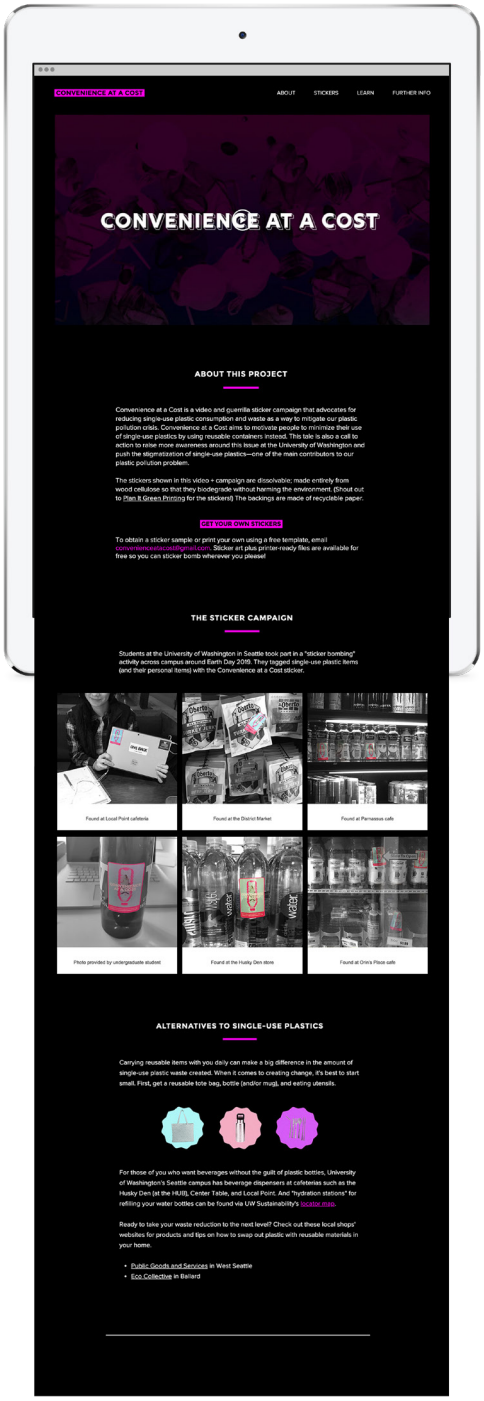
Stills from the Convenience at a Cost video.

REFLECTION & CONCLUSION

My thesis journey began with an inquiry into how visual stories might motivate people to reduce their plastic waste by changing their behavior. Based on preliminary research, my hypothesis was that visual stories can motivate people to reduce their use of disposable plastics by forming negative associations with this kind of material.

What I can conclude from my research and prototyping is that my hypothesis was partially right. Visual storytelling may motivate people to reduce their single-use plastic waste by forming negative associations with this material, but it cannot guarantee it. Nor can storytelling guarantee behavior change. Visual storytelling can foster motivation and act as a catalyst for changing behavior but I was not able to determine whether or not it creates lasting change on the individual level. Based on my testing and results, it seems that visual stories can motivate a small percentage of a group.

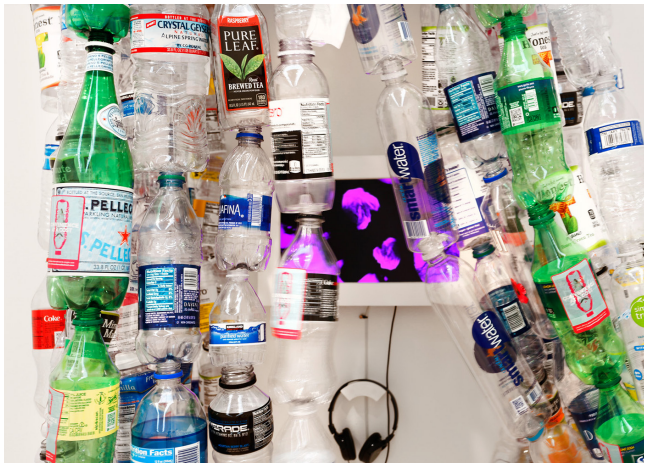
Changing behavior is a difficult and ambitious goal. I was aware of this but I think that this was a good “north star” to reach for. I am proud of what I was able to learn and achieve in pursuit of this “north star.” There were a lot of steps that I could have done better had I more time (and a team of helpers). For example, the survey test could have had a lot more controls on them and/or been conducted multiple times to further validate the results. Had I conducted this test multiple times, I could have also tried a diverse mix of audiences, such as business school or fine arts students. I recommend to those who pursue similar endeavors to design a more controlled test of their stories, to conduct this test a few times, and follow up with interviews to gauge how long new habits and attitudes lasted. This test should also include an expanded version of my bottle count experiment. I recommend doing multiple counts across a greater length of time (a few weeks) before and after the video survey test.



Convenience at a Cost website homepage, www.convenienceatacost.com.

Convenience at a Cost stickers found at Parnassus Cafe (top) and at District Market (bottom).

Convenience at a Cost sticker.



My Henry Art Gallery installation (image credit: Mark Woods for top and left photos).

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Karen Cheng
Annabelle Gould

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