

DRIZZLE: a comic for covert climate action influence

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Misinformation and rhetoric in current public discourse make climate change denial a difficult viewpoint to argue against by policy and scientific arguments alone. The public is more persuaded by personal stories of influence rather than sound logic. Instead of traditional arguments, we created covert visual narratives that communicate the values espoused by climate action without framing it as an argument for climate action. Such implicit influences are designed for particular goals of climate action, such as individual responsibility, long-term vision, and collective conservation strategies, utilizing design fiction to narratively engage even antagonistic viewpoints like climate change denial. The comic tabloid *Drizzle* seeks to engage audiences visually with personal virtues that align with climate action without policy-based, overt arguments. In audience evaluations, we found that stories designed for particular psychological influence in climate action can activate the goals espoused without declaring factual knowledge about climate change. The climate comics can also lead to self-reported pro-climate actions to some extent. This espouses the use of objects designed for psychological purposes in pro-climate actions as opposed to explicit argumentative declarations.

Keywords: *design fiction; climate fiction; comics design; climate communication.*

1 Introduction

Climate change can potentially affect global populations negatively. However, people often regard climate change as distant and impersonal (Leiserowitz, 2006; Weber, 2006). Although climate awareness as an issue has been raised recently, engaging the attention of disparate populations like the non-scientifically minded and climate change skeptics remains difficult. Thus, creative forms of climate communication strategies are needed for developing long-term habits for social good, which can occur by designing narratively for specific social purposes (LC and Mizuno, 2021). We apply a socially engaged form of speculative story design (Dunne and Raby, 2013) to create a visually appealing and narratively persuasive artifact that accomplishes the goal of communicating climate change without explicitly persuading readers through prolonged arguments.

On the physical level, climate change involves a set of phenomena like over-consumption, disregard for natural resources, population increases, lack of preparation for the future, and lack of sustainability. Our work does *not* address these policy-related issues. In particular, directly imposing evidence and science on the public is not effective at behavioral change (Pawlik, 1991). Instead, this design object intends work on the human level, tackling phenomena like immediate gratification, myopia in regards to future consequences, comfort in ignorance, lack of belief in individual influence, selfishness, and desensitization of negative outcomes. Given the urgency of climate change, we decided to promote long-term behaviors that align with climate awareness using the medium of the comic, which can capture even climate skeptic's attention and promote nudging influence while avoiding the contentiousness of climate change argumentation. While previously used to enact social good such as promoting social outcomes in autism (Hutchins and Prelock, 2006) and illuminating concepts in coding (Suh *et al.*, 2020), there is yet to be work specifically targeting populations against

scientific perspectives, as we are doing in regards to climate change skeptics. Moreover, the previous approaches use design based only on the outcome desired, whereas our design is based on one of the universal story structures identified (Booker, 2004) that counters particular sub-purposes in the human level of climate action: immediate gratification, lack of individual effect, etc. Our *contribution* is this literary-based subdesign for purpose entrained to a story structure that matches the intent, utilizing the psychological power of visual storytelling to provide environmental affect as context.

2 Background

2.1 Design fiction in climate action

One way to narrate alternative futures is the use of design fiction (Blythe, 2017). When applied in narrative context, it provides social influence by showing how alternative realities collapse (Moezzi, Janda and Rotmann, 2017). Storytelling strengthens the relationship between attitude and the behavior elicited (Rhodes, Toole and Arpan, 2016), meaning that pro-climate action is strengthened in those who have pro-environmental stances. Research shows that climate fiction can lead to better understanding of climate change consequences as opposed to reading scientific research (Moser, 2016). Other evidence fails to show how much more persuasive climate storytelling is than in-person communication (Jones, 2014). This fails to recognize an intervention we propose, which is to use positive persuasion for climate-actions rather than showing negative climate change consequences.

2.2 Illustrations for visual communication

Illustrations can help illuminate complex concepts that reflect the structure underlying content (Farinella, 2018). Comics is a unique blend of visual and narrative storytelling that can convey nuances while being accessible to everyone (Darnhofer, 2018). Comics in both Eastern and Western forms support environmental storytelling based on transitions of mood and place, influencing the reader through environmental effects (McCloud, 1994). This procedure matches story structures to the target purpose, and avoids argumentation that explicitly promotes climate action publically.

3 Designed Object

3.1 Theme and title design

We avoided physical resource aspects of climate change like overconsumption or resource destruction in our narratives, and instead focused on human level ideas that are the psychological cause of climate change. The subdesign involved immediate gratification, myopia, the idea that an individual's effect doesn't matter, comfort in ignorance, etc. Since we want to reach general audiences as well as those skeptical about climate change, we did not explicitly describe climate change issues. Rather, the comic can be read as a series of fiction, but with small clues like story titles of *New Revolia* (community of sharing), *Redemption Park* (attempts to fix the trash issue), and *Every Flash of Light Is the Sun of Another World* (individual responsibility), evoking rebirth, responsibility to the community, and avoiding risky behavior through learned consequences, respectively.

3.2 Story and visual design

We wrote five stories about the human level of climate change. *Sonia McDougal*, for example, uses the story structure of "Rebirth" (Booker, 2004), communicating against the prioritization of

immediate gains over future goals. In it, a business entrepreneur (Sonia) makes a decision about her company, whether to put money in a long term research agenda, or to push the product to sell widely instead. Personally, Sonia has always based her behavior on immediate gratification, never settling down with a loved one. She chooses in her professional life to maximize profit, but the business fails. From this “rebirth” moment, she realizes she should think long-term, and decides to settle down with her boyfriend. The illustration aspects use a science fiction style to show the story theme, consistent with the fictional unproduced shoe that predicts rain levels using hypothetical electronics. The style in science fiction form also betrays the intended theme of future-directed over immediate-directed motivations in the designed object in the form of the comic story.

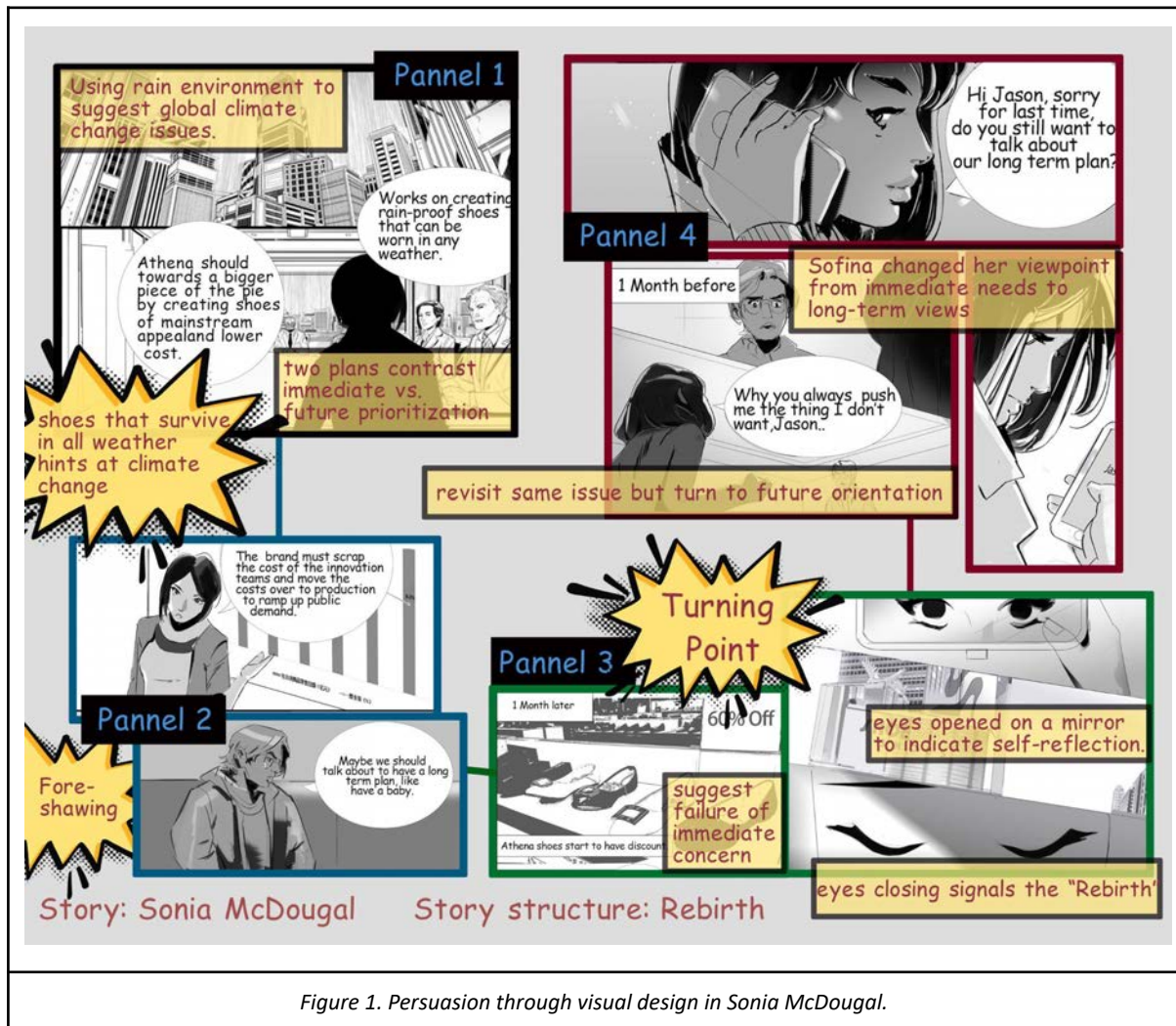


Figure 1. Persuasion through visual design in Sonia McDougal.

We used subtle clues to visually demonstrate climate change happenings in the time frame of the comic. To show the unpredictability of the weather, we used the trope of an experimental shoe that works in all weather, and used a subtle rain motif outside in scenes where a window can be seen. To show the “rebirth” moment following the business collapse, we illustrated the eyes of Sonia wide open to signal the self-reflection process. The failure of the business is indicated in a diagonal position in the visual design, while the closing of Sonia’s eyes signals the “rebirth” motif, hoping to adapt the audience point of view from immediate concerns to future-directed gains. These types of

devices establish the change experienced by the character using aspect transitions in environmental storytelling (McCloud, 1994). "Rebirth" is also emphasized by the similar arrangements of the two scenes where Sonia speaks with her boyfriend, as if the issue recurs but now runs a different course.

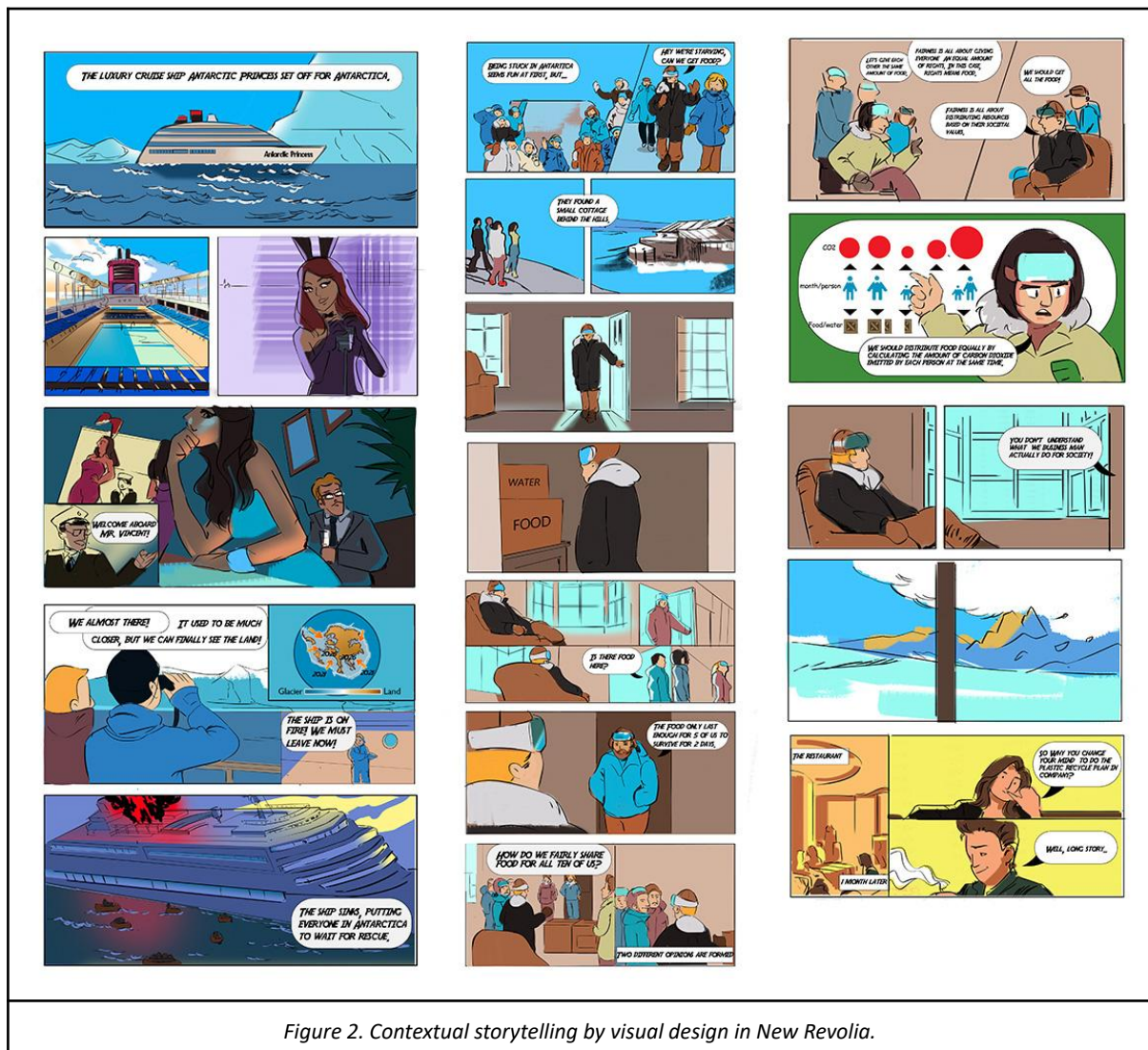


Figure 2. Contextual storytelling by visual design in New Revolia.

3.3 Magazine layout

Drizzle is purposely presented as a magazine-style tabloid to be accessible to climate change skeptic audiences. The form of this intervention allows us to use sensational news-style media to narrate stories which are paradoxically about pro-climate action from a psychological perspective. The comic is printed on A5 size (148mm×210mm) newsprint in full-page layout. It is 20 pages long, with stories including *Sonia McDougal*, *Redemption Park*, *VO*, *Every Flash of Light Is the Sun of Another World*, and *New Revolia*. We use comic-style drawing that differ between each story. To aid in following the flow of the story, we used the "Z-path" layout from left to right and down, preferred by most public readers (Cohn, 2013). The different visual devices like layout and panels are designed to enhance the drama of the story. Character closeup moments in each story is used to establish specific story structure that underlies the target pro-climate mindset goal espoused in the particular story.

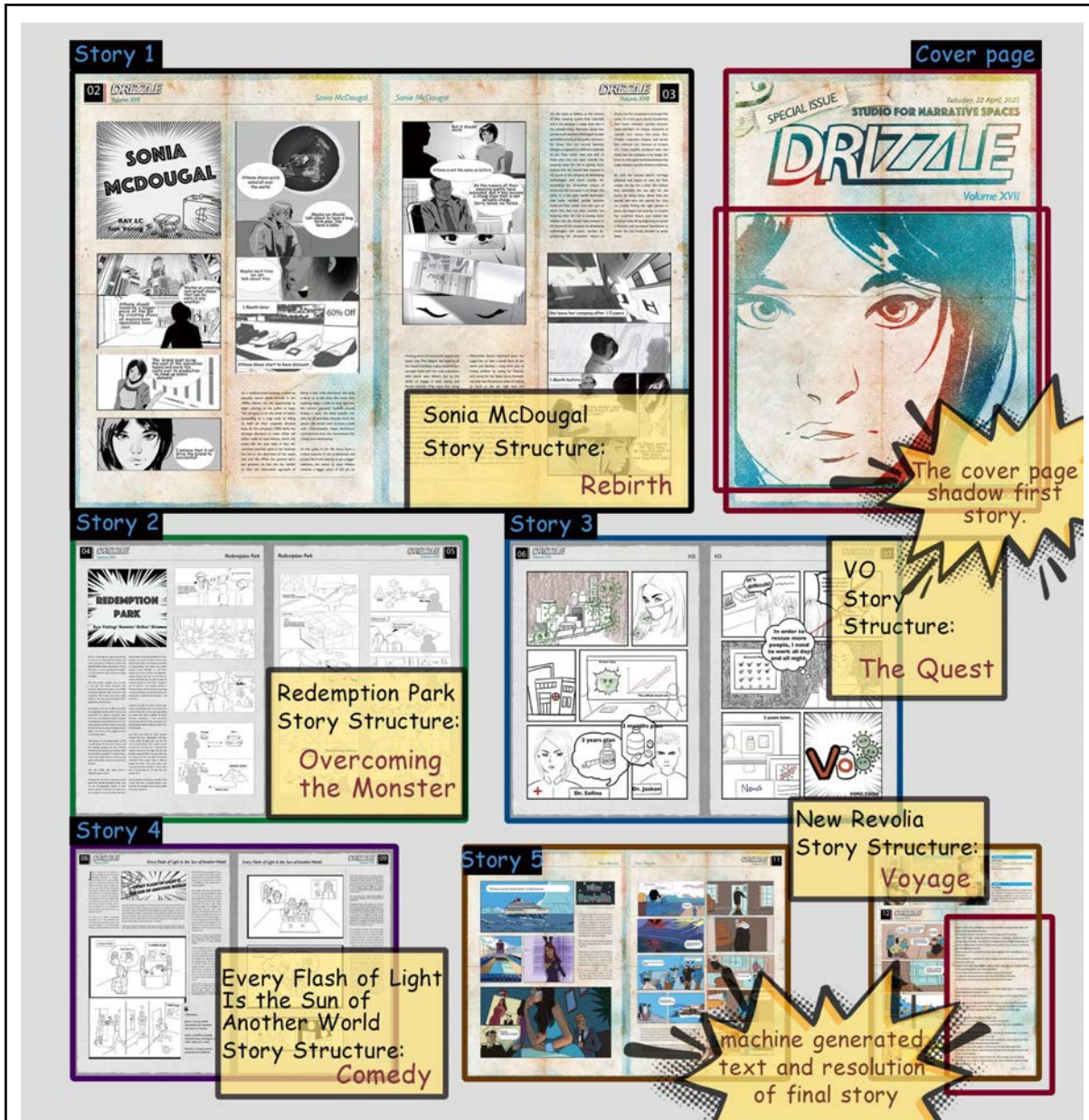


Figure 3. Layout of Drizzle and design purpose for each story.

3.4 Exhibition

In addition to being presented as a magazine-formatted tabloid, the comic can also be exhibited for wall viewing with potential for augmented reality-based mobile device viewing. For the wall view, it's also possible to present the work either as paper print or as a projection. Along with the title page, 7 panels can be printed on newspaper at 1.1x0.8m size and mounted on two walls. The spreads can be printed in situ and mounted without glass on white backing, and lit with diffuse lighting. If space is limited, an alternative strategy involves display of the spread on a table on A5 size newspaper.



Figure 4. Exhibition Plan Strategies. (Top) Printed book for dissemination on a podium. (Bottom) Exhibit for wall viewing.

4 Methods

To evaluate the effect of our design and its possible influence on climate attitude, we conducted a study using online questionnaires and individual interviews. The sample is recruited and paid through the online research platform Prolific (n=22, 10 female, 12 male). The participants spent about 15 minutes reading the four stories in *Drizzle* and completed questionnaires based on their reactions, covering their interpretation of the story, the impact on their climate attitude, and what they would do for climate action in real life (online here: <https://forms.gle/2SyunymTwAdpH4iU8>). Nothing about the story other than its content was disclosed to readers before the study. We analyzed the survey results in R Studio, and conducted semi-structured interviews with a separate set of visitors (n=6, approx 20 min each) to gain in depth insight about the effect of our intervention. All studies were conducted anonymously under procedures approved by the university Institutional Review Board, with the purpose of the comic material and study fully disclosed after the studies.

5 Findings and discussion

5.1 Quantitative findings

Survey evaluation following reading of the comics show that each story affects the physical understanding and conceptual understanding of the intended climate action purpose differently. Overall, the narrative goal (long-term planning, egalitarian distribution, individual responsibility, and limitation of technology) were understood better than the physical effect of climate change in each story, with significance in the New Revolia (egalitarian distribution) and Every Flash of Light is the Sun

of Another World (individual responsibility) stories (Wilcoxon ranked sum, $p=0.0149$, $p=1.34e-6$). In terms of behavior adaptation, there's also a trend in the data towards adopting the viewpoint espoused in the story over simply physical resource-dependent behavioral change, but none of the trends are significant (Fig. 5). This shows that particular story designs best activated the particular purpose for climate action, perhaps due to the efficacy of its design, but that in all cases, audiences recognized the mental layer of affective change over the physical effects of climate change that was not explicitly declared. This shows that our work has been working at the implicit level to thematically influence how participants process the story without necessarily affecting their conscious understanding about climate change.

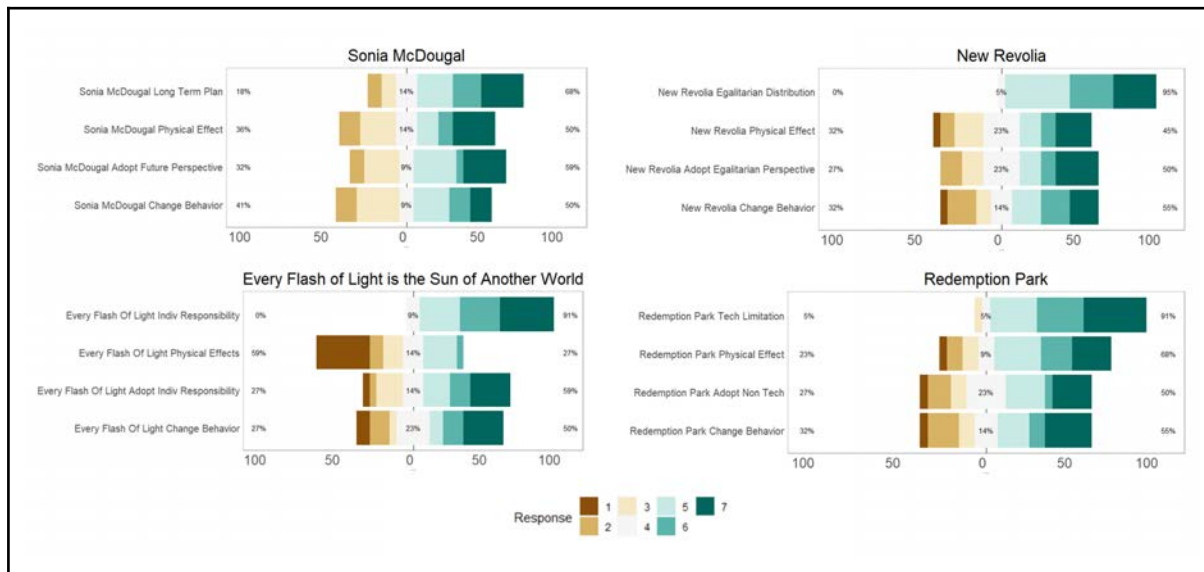


Figure 5. Participant survey results on stories from Drizzle by Likert scale rating ($n=22$). **Sonia McDougal**: Q1. Long Term Plan: How strongly does the Sonia McDougal story contribute to an understanding of prioritizing long term planning? Q2. Physical Effect: How strongly does the Sonia McDougal story indicate the physical effects of climate change? Q3. Adopt Future Perspective: How willing are you to adopt a more future-looking perspective in your own life based on what you experienced in the Sonia McDougal story? Q4. Change Behavior: How likely are you to change your personal behaviors in consideration of what you experienced in the Sonia McDougal story?; **New Revolia**: Q1. Egalitarian Distribution: How strongly does the New Revolia story contribute to an understanding of egalitarian distribution of limited resources? Q2. Physical Effect: How strongly does the New Revolia story indicate the physical effects of climate change? Q3. Adopt Egalitarian Perspective: How willing are you to adopt a more socially egalitarian perspective in your own life based on what you experienced in the New Revolia story? Q4. Change Behavior: How likely are you to change your personal behaviors in consideration of what you experienced in the New Revolia story?; **Every Flash of Light Is the Sun of Another World**: Q1. Indiv Responsibility: How strongly does the Every Flash of Light Is the Sun of Another World story contribute to an understanding of individual responsibility? Q2. Physical Effect: How strongly does the Every Flash of Light Is the Sun of Another World story indicate the physical effects of climate change? Q3. Adopt Indiv Perspective: How willing are you to adopt greater individual responsibility in your own life based on what you experienced in the Every Flash of Light Is the Sun of Another World story? Q4. Change Behavior: How likely are you to change your personal behaviors in consideration of what you experienced in the Every Flash of Light Is the Sun of Another World story?; **Redemption Park**: Q1. Tech Limitation: How strongly does the Redemption Park story contribute to an understanding of technological limitations in climate action? Q2. Physical Effect: How strongly does the Redemption Park story indicate the physical effects of climate change? Q3. Adopt Non Tech: How willing are you to adopt a non-technological approach to helping the environment in your own life based on what you experienced in the Redemption Park story? Q4. Change Behavior: How likely are you to change your personal behaviors in consideration of what you experienced in the Redemption Park story?

If audiences indeed were influenced by the purpose espoused in the comic, would they actually take action to better the situation in the world? In the next set of questions we found that climate change

awareness was high after reading the story even though climate change was not explicitly mentioned. In general, simpler personal habit goals were rated as more likely after reading the comics. For example, they self-reported a lot more likely than before to take public transportation and use recycled materials after experiencing the comic. However due to the self-report nature of the survey we cannot be sure how much these changes are due to the attractiveness of becoming for climate action as opposed to actual intended behavioral changes on the part of the participants. Indeed there appears to be minimal change in self-reported likelihood to engage in campaigning against climate change before and after reading the comics (Fig. 6).

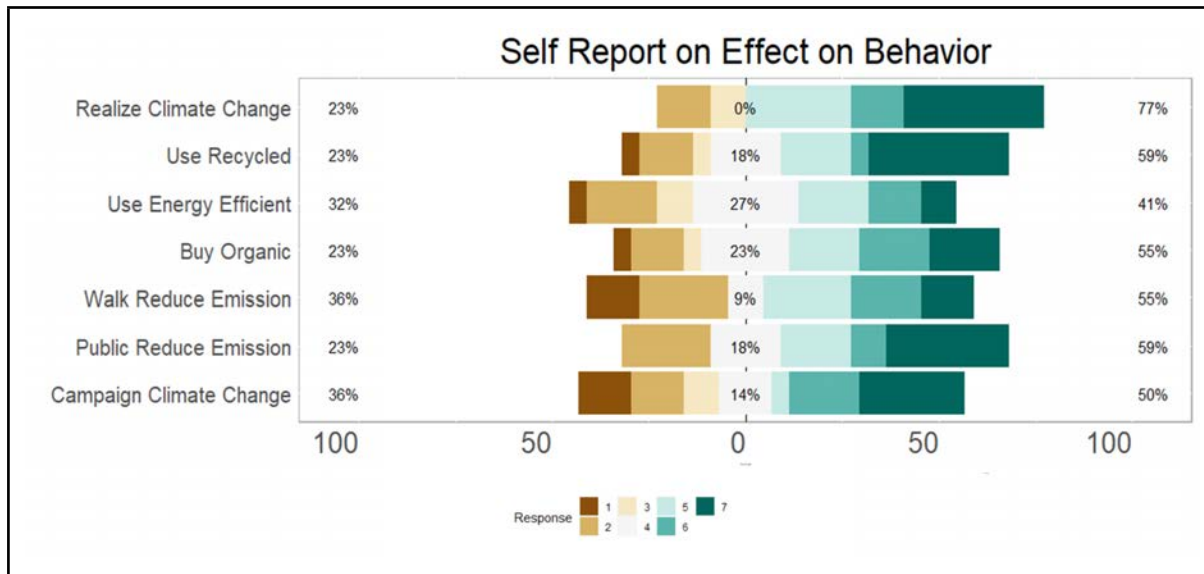


Figure 6. Self reported effect of Drizzle on climate change-related behavior. Q1. How much do you think the comic stories help you realize the urgent situation of climate change? Q2. How much more likely are you to make sure you use recycled items like recycled paper and glass in your daily life after reading the comics? Q3. How much more likely are you to use energy-efficient appliances like hybrid vehicles despite the higher cost, after reading the comics? Q4. How much more likely are you to buy sustainably grown organic foods after reading the comics? Q5. How much more likely are you to walk or cycle to work to avoid carbon emissions after reading the comics? Q6. How much more likely are you to use public transport to reduce carbon emissions despite the inconvenience after reading the comics? Q7. How much more likely are you to take part in a campaign about a climate-related issue after reading the comics?

5.2 Qualitative results

Positive impacts on an individual's mental and physical level: When asking about participants' feelings of the comics, they showed understanding corresponding to our desired purpose, especially in the story *New Revolia* and *Every Flash of Light Is the Sun of Another World*. (*New Revolia* - P9: "It is about social values and how to manage limited resources. Also, it's about climate change and its effects."; P11: "It's about selfishness about distribution of resources."; *Every Flash of Light Is the Sun of Another World* - P18: "A scientist who is going to mars to do some research about an illness, but he has trouble keeping balance of his job and his family."; P8: "I think the story is about priorities and responsibilities.") The majority of participants indicated that they will take pro-climate actions after reading the comics despite not encountering climate change explicitly in the story. (P6: "Every little contribution counts."; P10: "It highlighted my need to make small changes in how we do things in our environment."; P15: "I have decided that I will go and buy a bicycle and use public transport in order to decrease my carbon footprint."; P18: "I will do more in my daily life to make a positive impact in

the climate change crisis.") To some extent, the designed object for climate change actions have achieved self-reported positive influences on the individual's long term behaviors.

Limited impacts of climate information in comics: In comparison to other designed objects in climate communication, participants mentioned the benefits of applying narratives and visual design to climate change issues, providing rationales why such a subtle strategy may be more effective:

"I would see it through the storyline..."- P7

"It is a different and more relaxed way to see the perspective of the world we live in and be aware of the problems that surround us."- P9

However, some participants responded negatively since climate change info in the comics have not provided clear new insight about climate issues, despite having an overall effect on their self-report.

"These are short, but not as straightforward. I prefer documentaries which show real footage and explain things in detail."- P3

"I've always viewed climate change as a real thing that was slowly but surely affecting the planet. So the comics just further cemented what I have always known."- P15

However this declaration of lack of explicit effect doesn't mean they are not affected implicitly, as assessed by the quantitative measures (Fig. 5). The further development of the comics for climate change actions should explore opportunities to collaborate with other related fields. For instance, the design of narrative comic posters and advertisements for social purpose can mimic the use of these media by corporations to show their own positive image, such as in advertisements of luxury goods in movies. However, instead of promoting brands, we instead use pro-climate action as the "brand" itself, to provide a type of "public branding" that leverages human psychology to show the positivity of the goals of future-thinking, individual responsibility, and collective sharing (Doyle, Farrell and Goodman, 2020). Indeed, the methods of marketing may provide a template for how to make traditionally academic topics like climate action appear "cool" and "in with the times."

6 Conclusions

We have presented a design object intended as a work of implicit influence to change the minds of climate change skeptics and deniers without using explicit arguments regarding policy and governance. We design for the human psychology of climate change denial, leveraging the ability for nudging to affect change in the mindset of the reader, producing an environmentally driven storytelling approach using easy-to-comprehend visual metaphors accessible to the general public. Showing this work in exhibition form allows us to further investigate whether these design fiction strategies can affect behavioral change of public audiences.

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