



## Article

# Exploring Images of the Future of Women Cyclists Using the Futures Triangle

Nur Anisah Abdullah<sup>1\*</sup>, Azra Naimi<sup>2</sup>

<sup>1</sup>College of Education, Tamkang University

<sup>2</sup>Graduate, Master of Arts in Design, National Cheng Kung University, Taiwan

## Abstract

*Women cyclists are an underrepresented group and initiatives taken to promote the uptake of cycling among women have been limited. This exploratory study employs the Futures Triangle as a framework in structuring a series of in-depth interviews conducted with fourteen women cyclists to capture women who cycle's images of the future. Three themes emerge from the analysis: why women don't cycle more, motivators for women encouraging them to cycle more, and the desirability of connecting with other women who do cycle. The findings of the study, further deconstructed using Causal Layered Analysis, result in a deeper understanding of the systemic causes of the issues facing women cyclists, and the worldviews held and narratives owned by society and women themselves which perpetuate those issues.*

## Keyword

Women Cyclists, Images of the Future, Futures Triangle, Causal Layered Analysis

## Introduction

Research in various locations around the world on gender differences and cycling has established that women cyclists are underrepresented and consequently miss out on the obvious health and recreational benefits derived from cycling. But this series of studies, which includes Heesch et al, 2012; Grudgings, et al., 2018; Prati, 2018; and Shaw et al, 2020; has not resulted in initiatives to promote the uptake of cycling among women (Le et al., 2019).

The objective of this study is to broaden the understanding of women's cycling experiences, looking at motivation, challenges, and influences, and exploring and documenting the images of the future of a group of women cyclists with a view to using their vision to inform the design of a more inclusive space for cycling enthusiasts.

The paper begins with a summary of the literature on the constraints reported by women cyclists. This is followed by a discussion of the futures methodologies used in (i) exploring images of the future held by individuals (in this study, women who cycle) as those images of the future in "people's mind shape their intentions and colour their decisions and actions in daily life" (Polak, 1973, p10); and (ii) deconstructing the issues facing women cyclists. This is followed by a discussion of the research methodology of the study, comprising sample selection, data collection tool design, the conduct of the interviews, and data analysis. The findings are presented and the discussion and conclusion section are structured using Causal Layered Analysis, that offers possible solutions for each specific level; namely, litany, systemic, worldview and metaphor, to facilitate the shaping of a more inclusive societal mindset for women who choose to ride bicycles.

## Why Women Don't Cycle More

Numerous studies have established that women cycle at a lower rate than men due to a variety of reasons; few studies examine the preferred futures of women cyclists and the constraints they face. The following section

\* Corresponding author.

E-mail addresses: : [chenss@tku.edu.tw](mailto:chenss@tku.edu.tw) (N. Anisah), [azranaimi@gmail.com](mailto:azranaimi@gmail.com) (A. Naimi).

summarises the existing literature on the constraints facing women cyclists, their preferences and their motivation for cycling, as emerging issues in structuring an a-priori understanding of women's cycling behaviour.

Cycling as a mode of transport or for recreation can be explained by the theory of social identity (Lois et al., 2015). For example, Parsha & Martens (2022) report from their focus group discussions, cycling as a means of transport in the centre of Tel-Aviv-Jaffa is associated with the concept of lifestyles, with women who cycle being characterised as 'getting it together, hipsters, cool women, too masculine, living a healthier lifestyle'. Elsewhere, Russell et al. (2021) showed how Maori women shy away from cycling as teenagers, identifying cycling as an embarrassing act. Others rely on (versions of) the theory of planned behaviour (Ajzen, 1985) to explain cycling levels among different socio-demographic groups, focusing on benefits, personal attitudes, and infrastructure preferences of the individual (Felix, Moura, & Clifton, 2017), while literature from the transport field indicates women choose their mode or transport based on safety and accessibility (Schindler, et al., 2000).

Studies suggest that women cycle less because of the perception of physical risk and socio-cultural concerns and if they do cycle it is more for recreation than as a commute to work or place of study. This is the case in, for example, Tokyo (Japan Ministry of Land, 2008), Queensland (Heesch, et al., 2012), England & Wales (Grudgings, et al., 2018), and Christchurch, New Zealand (Russell et al 2021). The perception of risk was found to be the main constraint on cycling among women; with the risks cited including traffic conditions, motorists's aggression and the lack of safe crossings for cyclists at intersections with heavy traffic. The general lack of provisions for cycling and the inadequacy of existing infrastructure, including the failure of articulation of disconnected pathways, or the lack of bicycle paths altogether, along with the accessibility of destinations, commuting distances and hilly terrain were further constraints reported by women cyclists (See amongst others, Heesch et al., 2012; Grudgings, et al., 2018; Le et. al., 2019; Russell, et. al., 2021). These circumstances limit the mobility of women, making them more reliant on mass transit (Root, et al., 2010). The traditional sexual division of labour inhibits women's participation in cycling as a means of transport. The wider gender inequalities in the division of time between women and men in relation to different roles assigned to them by society, such as spending time caring for and educating family members, and cooking and housework, duties that are expected to be filled by women, may prevent them from bicycle use. In addition, they more often travel with young children, which heightens the threat to safety posed by travel by bicycle (Prati, 2018; Russell et al., 2021). Women experience more ambivalent feelings (Parker, 1995) and there is a need to recognise ambivalence as it contributes to many transport decisions despite the real (political) world's continued push for simple, non-pluralistic solutions (Samuels, 1993).

The next section discusses the study of images of the future in examining desires, preferences, visions, or goals, and how those images help individuals chart their actions, and how this figures in our approach to better understand what women cyclists need and want in promoting and enriching the role of cycling in their lives.

### **The Concept of Image of the Future**

The proposition of this paper is that the images of the future that women who cycle have can be used to shape and promote a more inclusive cycling environment for them. While there are patterns of change in the social, economic, political and legal environment that shape the future of cycling, women cyclists can use their past experiences, perceptions and knowledge about what shaped society and produced its present forms and limitations in thinking about the future of cycling, and their actions and anticipation of the emerging future.

Polak (1973) discusses the concept of a vision that guides human action, dating it back to the ancient civilisations of the Sumerians, Egyptians, Mayans, Babylonians, and Chinese, where the movements of the stars and planets, believed to be the signs of the gods, served to predict the future and to chart human action. Modern societies also seek to frame the image of an ideal future, or vision, as a manifestation of and reflection of the values of that society. Marketing and public relations have long used images that borrow from that vision to influence and manipulate consumers into buying things they didn't know they needed or that were unnecessary. For example, in the 1930s, tobacco companies used physicians and dentists' endorsements to promote smoking, because of their role in society's vision of its future. In 2017, the first-generation iPhone changed how we interact with our mobile phones with full screen views of webpages rather than the typical smartphone designs of that era: half screen, half keyboard. Powerful public images and self-images allow social influencers of this era to sell brands or ideas that resonate with

the masses.

“There are no past possibilities, and there are no future facts” (Bell and Mau, 1971,p9, quoting Robert Brumbaugh, 1966). The future has not happened but there is a future. It exists and is real, and it is open to possibilities (Bell and Mau, 1971, p10). As Dator (1998) puts it “... (the future) is the arena of dreams and of values” (p6).

In this paper, the future as an image which exists in people’s minds is used to better understand individuals and groups of women cyclists’ preferred futures. The Futures Triangle (Inayatullah, 2003) is used as a framework facilitating systematic reflective analysis in three dimensions: (i) the images of the future women cyclists envision with renewed hope (and possibly fear), that have, as Bell & Mau (1971) argue, most definitely been affected and shaped by (ii) their past cycling experiences and (iii) the adaptations they have made or that have shaped them as they cope with cycling under conditions as they presently exist.

### **Research Methodology**

This exploratory study, as part of a broader research project, aims to tease out the preferred futures envisioned by women cyclists. The research took as its basis the idea that their images of the future ideally could reduce gender differences in the cycling world, and facilitating a group of women cyclists in uncovering what they are willing and able to do could alter and prepare for the actualities of the emerging future.

The broader project was conducted in two phases, with Phase 1 having two parts, referred to in Figure 1. Phase 1:RO1 explores the perspectives of women cyclists on cycling across sport, recreation, and utility modes in terms of motivations, challenges/constraints, and influence. Phase 1:RO2 evaluates the level of desirability of some kind of community platform for sustainable cycling lifestyles among women cyclists focused on developing connectedness, advancing women, and seeking solutions in cycling. The aim of Phase 2:RO3 was the development of a community platform promoting sustainable cycling lifestyles among women cyclists. Due to the paper length restrictions of this journal, Phase 1:RO2 and Phase 2 are not discussed here but are presented in Figure 1 for completeness.

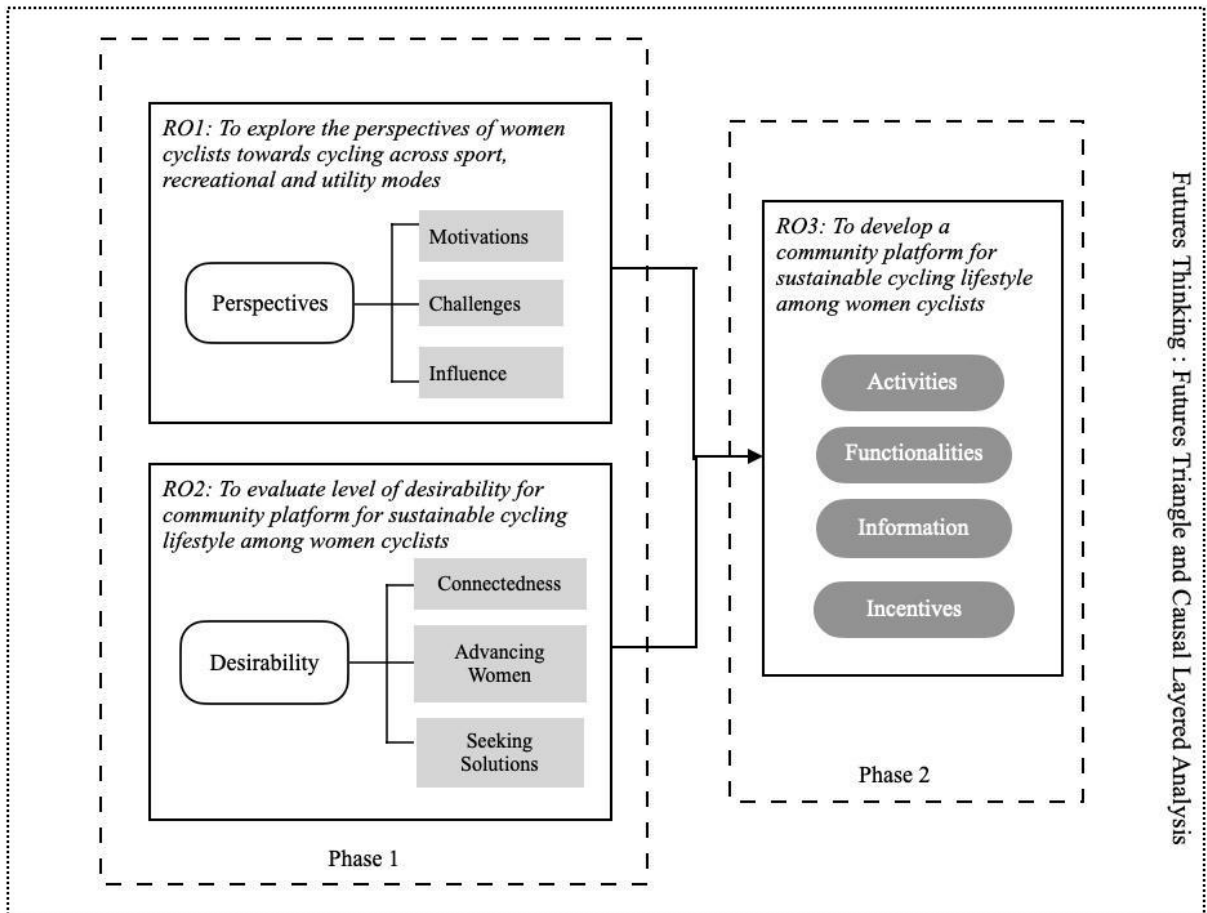


Fig 1: Research Design: Phase 1 and Phase 2

**Data Collection Tool Design**

The semi-structured interview questions for the study were developed using the Futures Triangle (Inayatullah, 2003) and led interviewees through the following steps.

4. Identify the pulls of the future, in other words, the interviewee’s preferred futures, as an image of the future envisioned by the individual or a group of individuals.
5. Identify the weights of the past, historical events and/or past experiences that hinder individuals from changing or pursuing a plausible future.
6. Identify pushes of the present that compel individuals to change as, metaphorically, the ground they are standing on shifts and they have to move regardless.
7. Having considered the pulls, weights, and the pushes; individuals were asked to reflect on the decisions they would make today to take them closer to their preferred futures. Their answers in this step form their plausible futures.

**Data Collection, Sample Selection and Sampling Procedure**

The data for this study was collected through a series of fourteen in-depth interviews conducted between February and March 2022. The participants were women, above 18 years of age, cyclists of different ages, occupations, educational levels who maintained an active cycling lifestyle, and of nationalities including Taiwan, Malaysia,

Philippines, India, Germany, USA. Fluency in English was also a requirement.

The sample for this study was selected through the search function on Instagram using the hashtag “#WomenCyclists”. Then, posts with the hashtag “#WomenCyclists” were filtered through the “Recents” tab available on the mobile version of Instagram to limit the results to active users only. In addition to the hashtag “#WomenCyclists” under the “Recents” tab, the user was determined to be a cyclist on the basis of photos posted representing the user’s cycling activity. Furthermore, through the pronouns posted next to their Instagram username on their user’s profile, the user was confirmed to identify as a female. Once identified by the researcher, a direct message was sent to the user inviting them to participate in this study. Upon acceptance of the direct message and a positive response to the invitation, an interview date and time was scheduled between the researcher and the participant on Google Meet.

Addressing participants’ rights to full disclosure of the purpose of the study, before the actual interviewing process commenced the researcher described its nature and said that participants retained the right to withdraw. Participants provided their consent to participation and audio recording of the interview. Participants’ identities have been anonymised for privacy reasons.

### Participant Demographics

Table 1 below presents the backgrounds and description of participants and their relevance to the study. They were categorised as either sports cyclists, recreational cyclists, or utilitarian cyclists, and this was recorded along with cycling frequency and demographic information such as age, occupation, and education.

**Table 1:** Participant Background and Relevance to the Study

No.	Name*	Background and Description	Relevance of Participation
1	Winnie, San Francisco, USA	A recreational and utilitarian cyclist in her mid-twenties, she holds a bachelor’s degree and works as a marketing executive.	Winnie often participates in group rides with her cycling community and contributes to local causes on a bike.
2	Anna, Taipei, Taiwan	A recreational cyclist in her late twenties, holds a bachelor’s degree, is a Women’s Ride Leader at her city’s Rapha bike shop, and is in the visual advertisement industry.	Anna cycles three times weekly, mainly for socialisation purposes.
3	Bailey, Los Angeles, USA	A recreational cyclist in her late-twenties and a health practitioner, she holds a master’s degree, and is a pandemic cyclist.	Bailey’s new passion is to cycle four to five times weekly and enjoy being outdoors.
4	Fawn, Changhua, Taiwan	A recreational cyclist in her early thirties, she holds a bachelor’s degree, and works in a factory for one of the largest bicycle manufacturers in Taiwan.	Fawn takes part in community rides with her cycling group every weekend. She is the only female cyclist in her ride group.
5	Eva, Taipei, Taiwan	A recreational cyclist in her late fifties, she holds a master’s degree, is a recreational woman cyclist, and works as an investment consultant.	Eva is a mixed-mode transportation cyclist, cycling as part of her outdoor activities.
6	Jackie, Kuala Lumpur, Malaysia	A recreational cyclist in her mid-twenties, she works as a private swimming coach and indoor cycling trainer and is a professional synchronised swimmer.	Jackie picked up cycling during the pandemic and is one of the women in her community ride group.

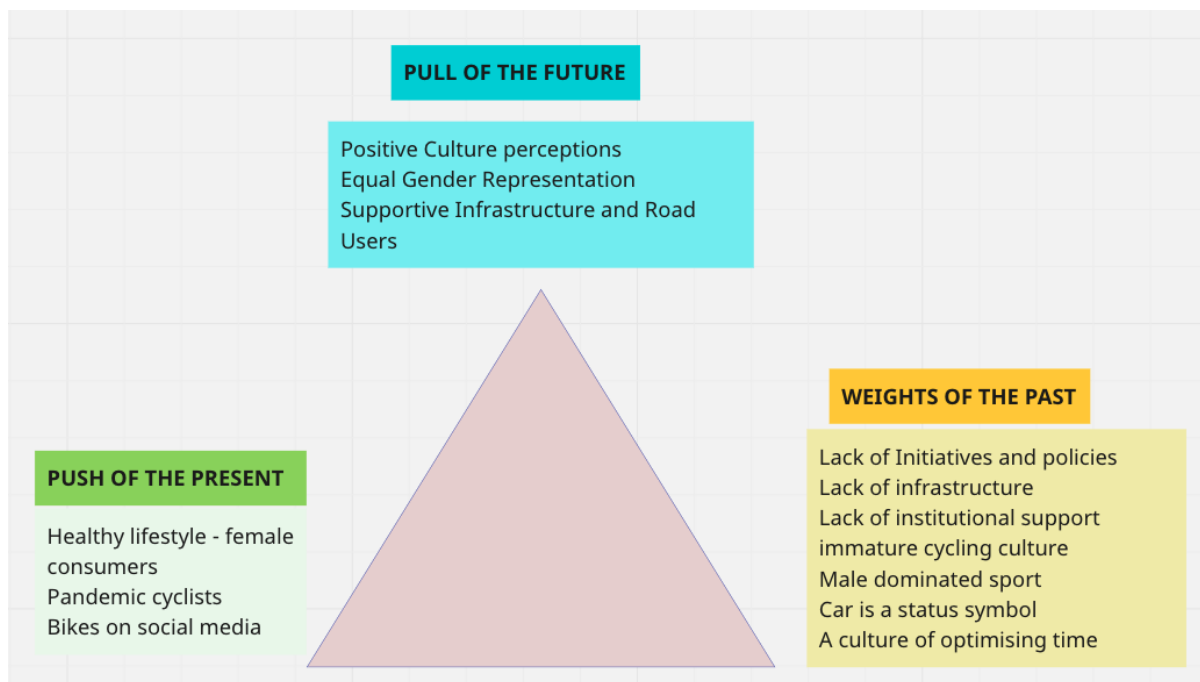
7	Mica, Cebu, Philippines	A recreational cyclist for 6 years and an ex-sports cyclist, she holds a degree, and works as a photographer.	Cycling significantly improves Mica’s life, inspiring her to continue to face challenges at work and in her personal life. She was one of the few women who cycled in Cebu when she started.
8	Nat, Kuala Lumpur, Malaysia	A recreational cyclist with a high school diploma, she works as a journalist for a cycling magazine.	Nat is an experienced cyclist and passionate about bicycles. She rides once to twice weekly, mostly during the weekends with her husband, and occasionally takes part in community rides.
9	Penny, Kolkata, India	A sport and utilitarian cyclist, she holds a bachelor’s degree and works at a local Decathlon shop in the bike section.	Penny is a road cyclist and enjoys riding for speed. She began cycling in the middle of the pandemic as a way to get out of the house.
10	Red, Los Angeles, USA	A recreational cyclist, she holds a master’s degree, and is a speech pathology graduate student.	Red cycles every day for her mental and physical health and began cycling during the pandemic.
11	Ruby, Berlin, Germany	A recreational cyclist in her late thirties, she holds a bachelor’s degree, and runs her own coffee shop.	Ruby discovered a love for cycling through her husband, and she cycles to challenge herself and set new milestones each time she cycles.
12	Sia, Los Angeles, USA	A recreational cyclist in her early forties, she holds a master’s degree, and works as a health practitioner.	Sia cycles 5 times weekly to challenge herself but to also spend time with friends. She believes in the power of advocacy and in more support for women cyclists.
13	Ying, Kuala Lumpur, Malaysia	A recreational and pandemic cyclist, in her late twenties, she holds a master’s degree.	Ying has cycled for 5 years to relieve stress from her corporate job. She is one of the few female cyclists in her group and an experienced long-distance cyclist.
14	Skye, Tennessee, USA	A utilitarian and recreational cyclist, in her late twenties, she holds a master’s degree in Urban Planning. and works as a transportation planner.	Skye’s occupation as a transportation planner inspired her to bike more and she hopes to make cities safer because of her passion for her career.

\*Names of participants have been changed for privacy reasons.

**Analysis**

The interview questions framed using the Futures Triangle unearthed the participants’ overt and hidden assumptions regarding the forces that shape the current state of women’s cycling and the enablers required to facilitate achievement of their desired futures, at the same time as it brought to mind their agency in achieving those desired futures, providing the data for the study. The data collected were clustered and analysed thematically. Three themes emerge from the analysis: motivators for women encouraging them to cycle more, why women don’t cycle more, and the desirability of connecting with other women cyclists.

A summary of interview responses is presented in Figure 2, and a detailed discussion for each the three Futures Triangle dimensions follows.



**Fig 2:** The Futures Triangle- A summary of findings

**Pulls of the future**

The women cyclists preferred a future where society views cycling as a good thing, with equal gender representation in cycling both within the actual sport and also within the industry, and where infrastructure and other road users are more supportive and accommodating.

***Positive Perception of Cycling***

The participants wished other women felt more comfortable with cycling, and that they could approach it in that frame of mind. They noted that women cyclists feel that it is dangerous to cycle, the roads are a dangerous place for cyclists, it takes too long on a bicycle to get anywhere compared to driving a car, and cycling is a difficult sport to enter, a common perception because of the elaborate attire and gear sported by many experienced cyclists. However, they also said if more women shared personal stories of how they entered cycling, and if they had the opportunity to reveal how accessible and enjoyable it is as a sport, without much mental and physical preparation required other than having a bicycle at one’s disposal, then more women would be introduced to it and would take it up. They want a future where it is easy and safe for women to get involved in cycling as a sport, where the

frequency of events promoting causes advocated by women and other gender minorities on bicycles is high, and where cycling is viewed as an approachable activity that does not require any special knowledge or excessive preparation. In this described future, women would wear normal attire, whether work or weekend, and it would be a normal part of their day and even a daily occurrence.

“Training plans are helpful but the only way to truly motivate someone is to change their frame of mind. Improving the way they think of themselves, or showing them your story and how you got into cycling, that's one thing I really like” -Winnie.

I think the first thing to change is the perception of cycling amongst females especially. I think for them they think that it is dangerous" - Ying.

### ***Equal Gender Representation***

Women cyclists want increased visibility for women in professional cycling, in order to provide women and other genders a platform for support in a predominantly male sport. With greater representation, issues important for women would be addressed and opportunities provided them to explore their preferences in cycling as a hobby. They would be able, for example, to express their individual identities with clarity through attire and equipment that have been expressly designed for them. A greater presence and an increased number of women experts on the cycling scene and in the bicycle industry would lead to more confident women on bicycles outdoors, rid of their fear of having to share the road with other vehicles and jousting with them for space.

"I think one of the ways we could, at least in the states or where I'm at, I don't know if you follow any professional women cyclists at all, if you watch them live, there is no coverage. I think there needs to be more visibility in professional sports, I think they need our support too, and I think more support would bring more attention to it" -Sia

“... the local bike shop, they were condescending to me even though I've clearly said I've biked five hundred miles in a week, I've told them, I know how to bike, I've biked for a long time, I've biked all the mountains in the area. They'd say 'you don't know anything' and it would make me less likely to go” - Winnie.

“Bike stores don't employ a lot of women. I guess for some women it gets kind of daunting. You may not have as many women who can sort of show you the ropes. We have had women who are a bit more comfortable with it. I think there's also a lack of variety in women's specific products. We usually end up ordering things, and I don't blame them because there are more male than female cyclists. I've also experienced gender stereotyping when I bought a saddle, because it was a saddle for women, it had a grey colour with a purple line in the middle, my bike was black and red and no matter how good the saddle is, I wouldn't have bought it!” -Nat.

"I think it's quite important for women to have more knowledge about cycling. If you really want to take part in this activity, you should know more about your bike. And don't let the males underestimate you" - Anna.

"It just comes back to feeling vulnerable with sharing the road with cars basically I feel like they're weapons, like they kill people every day and we're on this tiny little instrument that we're powering with our bodies and against these huge machines, and it just takes a bit to get confident enough to be alongside them"- Skye.



### **Supportive Infrastructure and road users**

Women cyclists would prefer all road users to be more supportive of women cyclists. Whilst road safety practices by cyclists on the road are important, other users of the road such as drivers and pedestrians should also be familiar with cyclists' concerns, particularly as more and more women take up cycling with the development of supportive infrastructure. Ideally, in this narrative the urban environment would be explicitly designed and built to favour pedestrians and cyclists, prioritising slower modes of transportation over automobiles.

"The cars here aren't like in the US, I think they're very careful on the road and they share the road with scooters and drivers" - Eva.

"I think it would definitely be like providing infrastructure to make it safer. Like, if we could build our streets around people and people on bikes, versus building our streets around cars. Instead of thinking of cars and prioritising cars all the time. That would make such a difference" - Skye.

### **Weights of the Past**

In describing what held them back in cycling, the participants mentioned a lack of initiatives and policies for women in cycling and an immature bicycle culture.

### **Lack of Initiatives and Policies**

Individually, the women cyclists felt powerless to make change and were not able to address issues due to a lack of personal resources such as money and time. They went on to say that women cyclists must have the support of local councils who are better equipped with the resources to readily address the issues facing women cyclists. There was an expressed lack of concentrated efforts by organisations at both grassroots and governmental levels whereby policies and initiatives that encourage an increase in cycling and walking behaviour by pedestrians are promoted, as evidenced by the absence of physical infrastructures in place to support women cyclists. In particular, bodies such as traffic engineers, and business owners in control of properties, were important in the facilitation of these policies and initiatives.

"I think it's a lot of things. One, I think politically, you need support from people at the top that believe in biking, and that see the importance of building that infrastructure. Because without that, you wouldn't get anything approved or anything done. You need support from traffic engineers approving plans for infrastructure like that. Like you would need traffic engineers who would also be on board and see the importance of building this infrastructure." -Skye.

### **Immature Cycling Culture**

In addition to the lack of support from government and private organisations women cyclists explained that there appeared to be a lack of support from women cyclists themselves, saying that they not only must cycle, but also must make greater efforts to advocate for cyclists and then women cyclists alike, and in doing so, to voice their opinions and ask governmental bodies to take action. High rates of bicycle theft were another turn-off. When one invests in the hobby of cycling, the bicycle appreciates in value and can have a monetary worth that is equal to or more than that of a car. Additionally, the mindset of most people defaults to the use of a car or other means of transport established by the long-term existence of motor vehicles. This mindset is supported by notions of a lack of safety when travelling as an individual on a bicycle when there are no incentives to take public transportation, a common equivalent to the commute by bicycle in the eyes of many, in cases where the latter is not well structured in their immediate area or township.

"...bike theft is ridiculous right now, so I feel like that's another thing I have to worry about. I can't even leave it in my car, I've had a slew of my friends who have had their bikes stolen. You can't just leave it,

even if it's locked up, or they'll take away parts, you know what I mean?" - Sia

"It's so easy to default to the car, because we all grew up driving. It's a different mindset when you have to take public transport. You have to switch your entire frame of mind when you want to take public transportation. It's just the culture here is so different. People will think like, it's not safe, and there's homeless people. There's just like every excuse, it's not blending well with public transport." -Sia

## **Push of the Present**

What are some of the current social, economic, and technological trends that are shifting the way we live, work and behave whether we like it or not? Participants spoke of cycling as a healthy trend that women wish to pick up saying many were now potential adherents, the pandemic triggering soloist sport cycling, and social media being an important cycling promoter.

### **Women cyclists - potential consumers**

Bike shops are now more aware that women cyclists are a new group of potential customers, and they are being helpful and attentive to requests with the hope of acquiring returning customers. Such shopping experiences have been encouraging for women cyclists seeking technical support or bike maintenance. Seeing more interest, shops now carry a wider range and greater variety of women's cycling gear, among other goods.

Bike stores were also reported to be having monthly or weekly all-women rides in areas where cycling is more common, although it was noteworthy that these rides are often organized by the women themselves. Beyond traditional bike stores, participants also reported the existence of local grassroots activities such as those of smaller advocacy groups who submit plans and advocate for local action to develop bicycle-friendly cities and oppose plans that favour car-centric infrastructure development.

There's this organisation called Pasadena Safe Streets, and it's an old city that is car centric, and they have these proposals, you know they have large sidewalks, and 8 feet bike lanes with barriers, and the city would go against it. There are groups like that who fight it and like to be loud. I think that's the only way I can make a change here on a smaller scale" -Sia.

"I'm planning to have more rides in a month, to make my rides more regular. Because we know the situation is that the women's membership in Rapha, I think, all-women rides are not as regular as they can take part in. So, I think that's one small step for me to represent a regular ride" - Anna.

## **Pandemic Cyclists**

"Pandemic cyclist" is a name given to cyclists who took up cycling during and have continued since the COVID-19 Pandemic, when social distancing was encouraged in order to curb the spread of the highly contagious virus. A handful of the participants in this study identified as "Pandemic cyclists" and a few noted their significant others were cyclists prior to the pandemic, and had invited them to join them in rides. As a result, and beyond the peak periods of the virus, the participants developed a newfound passion for cycling and even surpassed their significant others in terms of their enthusiasm and the time they put into the hobby. Participants who were cycling prior to the pandemic were happy to see that their co-workers had also taken up the hobby. They expressed satisfaction in being a trusted source of help and of advice for pandemic cyclists, both men but especially women. They had noticed significant increases in the number of women cyclists, and they were conscious of their responsibility within the cycling community to extend a warm welcome to other women.

I think it's really great to see a lot of people getting into cycling during the pandemic. It made me happy to see random co-workers biking more and they were asking me where I can find a used bike, I really enjoyed that"- Winnie.

## **Bikes on Social Media**

The representation of women on bicycles on social media platforms, notably Instagram, increased before, during and after the COVID-19 Pandemic. The groups of cyclists that formed online communities on social media platforms ranged across the various bike types, such as road cycling, gravel biking, and mountain biking, and with their activity encouraged and promoted the taking up of cycling by women through the sharing of updates, progress, outfits, and accomplishments. There were women who cycled mainly for self-promotion on social media, and this brought about more awareness of female cyclists. Some who maintained an active social media presence where they shared their posts on bicycles were conscious of the impression they made upon their female friends, among their followers who were interested in starting to ride bikes and asked them important beginners' questions. While the participants found themselves to be the only or among a handful of women cyclists in their vicinity, they were pleasantly surprised at the number of women cyclists they found online through communities, and supportive communities existed on Reddit, Facebook and Instagram, although many were not women-only platforms.

"I'm trying not to pressure them into doing anything, but I'm always so excited when my friends start biking with me and are asking more questions. So, I have a lot of hope that I'll see more. People that I don't know have reached out to me and said that your posts are the reason I'm thinking about biking. It makes it so much better; I love that. It's so cool to see that my little posts are inspiring other women" - Skye.

"Whether they just cycled for social media, it did get them cycling. I feel like it has improved a little bit. If I wasn't working for the magazine, there would be a decent amount of influence because I ran a website, and social media did reach a number of people" - Nat.

"I don't feel my network amongst cyclists is very big. It's just within my group of friends" - Ying.

## **Findings**

Three themes emerged from the analysis: motivators for women encouraging them to cycle more, why women don't cycle more, and the desirability of connecting with other women cyclists.

## **Factors for Women to Cycle More**

### **Nature of the bicycle**

The bicycle was valued due to its reliability as a machine and availability. It was frequently compared with other modes of transportation and the participants agreed that in comparison to the automobile and public transportation, it was better because it allowed more control over one's schedule. The bicycle was considered to be an economical form of transportation and was suited to people across all demographics and in particular across all socio-economic levels. Additionally, the bicycle was often described as an encourager of exploration and escapism and of use in multi-modal recreational activities, as well as a means to access locations and achieve travel goals. It was also reported that travelling by bicycle allowed participants to escape their typical urban surroundings and to leisurely appreciate rural and natural scenery.

### **Mental health**

The second predominant theme was the mental and physical benefits that accompanied cycling. The women cyclists agreed that while cycling allowed them to keep fit, they also said they appreciated the way in which cycling allowed them time to be alone with their thoughts, and to be revived not only physically, but also refreshed mentally. Participants agreed that in the time when cycling and away from work and the challenges they faced in their daily lives, these challenges appeared to lighten and feelings about them become less of a burden. Participants expressed

the idea that being in nature had a sort of healing effect, rejuvenating them and restoring balance to their minds, under threat from life's stressors, one of the most important of which was the shift to the world of online work as the COVID-19 pandemic hit in 2020, two years prior to this study, forcing the participants to work from home and presenting them fewer opportunities to get out of the house.

### **Self-discovery**

Another theme was self-discovery and the ways in which cycling had revealed to the cyclists that their bodies were capable of achieving more than they had thought or even imagined they could previously. The women cyclists acknowledged that they had received physical benefits associated with cycling. However, they valued the ways in which they could accomplish new goals and set extended limits for themselves each time they embarked on a ride. Participants also commented on how they surprised themselves at their progress as they continued to cycle, and how although it was not an easy experience, they would return to tackle more challenging rides.

### **Socialising**

An important motivator for the participants of this study was cycling with peers. They highlighted the idea that cycling also meant community, and that this was an aspect of cycling that they felt they were drawn to. They described their cycling peers as either a family or a close-knit circle of friends with whom they would spend long hours on a bicycle. Besides those who appreciated being members of a regular circle, there were also cyclists who liked that cycling groups and events gave them the opportunity to meet new people, in particular business people from different fields. Therefore, there was a strong sense that building networks and community for women cyclists is associated with cycling.

## **Why Don't Women Cycle More?**

### **Lack of institutional support**

A main constraint reported was the lack of support by the bicycle industry itself. In particular, a common concern was the lack of female representation there, as a result of which female cyclists feel less welcome and lose confidence in their efforts to learn more about bicycles. This representation also took the form of limited options in the way of bicycle product purchase choices, with fewer products being produced, advertised, and made immediately available to them, forcing them to have to work harder than their male counterparts to get what they wanted so they could participate on an equal footing in cycling with men. A common theme of disappointment and annoyance was the attitudes taken at bike stores to women customers, and complaints were made of "mansplaining" where women would apparently be given information about bike products in a condescending tone by bike experts who were usually of the male gender.

The second constraint was the lack of courtesy shown by car drivers with whom women cyclists share the road, manifested in the form of catcalls, harassment and bullying by male car drivers, which had led to feelings of insecurity when cycling. It is noteworthy that many of the participants dwelled in car-centric cities.

### **Lack of social support**

The difficulty in finding the right female partners to cycle with as a group was a common complaint. The participants noted that cycling is a very individualised experience and this is so when searching for partners to cycle with too. It was further stated by participants that the lack of women cyclists around them also made it difficult for them to have conversations with other cyclists who could relate to their experience, particularly about those experiences which only women have. They noted that beginners could decide cycling was not for them without good cycling partners who could show them the basics. On top of the complexities of being a cyclist, there were also the biological challenges of being a woman, such as managing pre-menstrual and menstrual symptoms, and low energy and energy surges during those periods; women's low-center anatomy affects how they cycle.

### **Connecting with Other Women Cyclists**

The women cyclists preferred a platform that provided a safe space to share, grieve and support one another in times when they felt challenged or unsure as a woman cyclist, seeing that as women they were more exposed when expressing ambivalent feelings. It was also noted that the environment of an all-women space on social media was very different from that in a mixed space. Reasons such as the absence of trolling, the more serious topics under discussion, and the less-judgemental attitudes of participants were cited. They also shared that they were interested in listening to others' stories and how they had come to discover cycling. An event scheduling feature on their platforms where women cyclists could organise, schedule and share ride details with other women cyclists online was seen as desirable and as a way to grow a community with a larger following. It was said that when group rides were organised, there must be full-disclosure of the nature of the rides due to the varying goals, expectations, capabilities and confidence of individual women cyclists. Some participants expressed their discontent when joining rides with a certain expectation only to be disappointed when they realised they had been misled.

### **Offline cycling groups**

It was common for women cyclists to meet other cyclists through encounters with informal cycling groups. These cycling groups met in places such as bicycle stores, coffee shops, triathlon training locations, and travel group settings, or were brought together by larger, global cycling chain stores such as Rapha. Women cyclists were invited to participate in rides by these groups either through knowing the owner or employees, or through mutual acquaintances. Typically bike stores would organise group rides, and these would not be advertised on any form of social media, but rather participants would learn about them face-to-face. This indicates that women cyclists had to frequent a bike store or a coffee shop often enough in order to become acquainted with the organisers and to be invited to join the group ride.

### **Online cycling groups**

Women cyclists would also meet on online platforms and participate in group rides organised on these networks or share information there. The most referenced social media networks were Facebook, WhatsApp, Strava, and Instagram. Although it was noted that peers who connected online would usually only be present for support and could not cycle with each other, activity was considered worthwhile there. Strava for example, was used to share routes, Instagram was used to find and share content with other women cyclists, and Facebook was for discussing training or organising fun or event-based rides. It appears that each social media site serves different purposes with different types of cycling information being shared on different platforms. Cyclists sharing their content with others made them feel seen, supported, and encouraged to continue cycling and to produce more content. Activity on other social media networks such as Youtube was also cited as a way to learn more about the bicycle and how to do maintenance, and fix flat tyres, for example.

### **Discussion**

To contextualise and further unpack the preferred futures of women in cycling, the findings were deconstructed using Causal Layered Analysis (Inayatullah, 2003).

### **Litany: The headlines on women in cycling**

At the Litany level, women cyclists were conscious of their isolation in terms of numbers in their engagement with cycling, and of a lack of support provided by industry experts and cycling peers. In their encounters with male cyclists, women cyclists noted the disrespectful approach of the men when the latter shared knowledge with them and reported even outright dismissals of their enquiries. Women cyclists were often frustrated with the lack of acknowledgement that professional women cyclists were also in the limelight because their frequent marginalisation and limited exposure meant there was reduced opportunity for non-professional women cyclists to learn what was

happening in professional cycling and become engaged with the scene there. Road-rage directed at cyclists in general and the disrespect shown by male car drivers to women cyclists when they subjected them to catcalling, and displays of power led to feelings of fear, insecurity and anger. The participants visualised a future where there were equal numbers of women and male cyclists alike, and where the roads were safe and a cyclist-friendly space readily accessible by women cyclists. Education and infrastructure were often cited as key drivers to achieving women cyclists’ desired futures, as this would encourage more women to take up cycling. Furthermore, the immediate availability to women of bike equipment and gear that was not discriminatory was also considered in their desired futures. Table 2 summarises the headlines on women cyclists with a list of solutions suggested by participant.

**Table 2:** Litany Level: Headlines on Women Cyclists

Current Reality	Transformative Future: Cycling for All
<p>One woman alone in a group of male cyclists.</p> <p>Zero to low numbers of female bike experts in the industry. Lack of coverage and interest in professional women cyclists.</p> <p>Little inclusivity in women’s bike equipment and gear in cycling stores in contrast to male bike equipment and gear abundance</p> <p>Aggressive car drivers on the with no respect for cyclists, seen as a nuisance or road hazard.</p> <p>Male cyclists who mansplain when talking to women cyclists.</p>	<p>Equal numbers of women and male cyclists</p> <p>More inclusivity in attention paid to professional cycling.</p> <p>Greater variety, availability and inclusivity of women’s bike equipment and gear.</p> <p>More bike lanes on main roads in cities, cycling the only mode for short distance commuting.</p> <p>More education, equal treatment of cyclists on the road with fewer shows of power, and respect for all forms of transportation.</p> <p>Men who share their knowledge with women cyclists in a respectful, inclusive manner.</p>

**Systemic Causes: Why Women Don’t Cycle More**

It was implied that stakeholders such as politicians and governing bodies as agents had power in Current Reality and would continue to do so in cycling futures. Urban planners, governments and private concerns show little interest in the complexities of how women weigh decisions about mobility and accessibility (Root, et. al., 2000) or in the complexities of claims upon women’s time, many of which can’t be read out from socio-economic class distinctions (Prati, 2008). What are the weights that reflect women’s needs?

More roads for cars do not solve traffic congestion or bring either freedom or mobility to city residents (Hymel, 2018; Weingart, 2023). In Current Reality, there must be advocates of cycling infrastructure being built in place at all levels, but participants noted that there is little to no advocacy of bicycles by privately-owned concerns, and even fewer initiatives for women to take up cycling. There were instances described of proposals being sent to governments by local organisations for the provision of better infrastructure, where these proposals were rejected by higher authorities, representatives of the predominantly car-oriented culture in the cities where the participants dwelled. They believed in the power of technology to have the voice of women cyclists be heard by relevant stakeholders, the urgency of measures to halt environmental decline, and the enforcing of pedestrians and cyclists’ rights to roads in cities. They saw these principles as strong forces of change for the future. They supported initiatives to educate and create room for women leaders to be representatives to both the government and bike industry and weigh in on women cyclists’ needs, and women’s transportation needs in general. A city designed for women is a city designed for all with care as a core value of transport policies (EU Horizon, 2020). Table 3 summarises the

systemic causes explaining why women don't cycle more, with a list of suggestions for necessary changes at the systemic level.

**Table 3:** Systemic Causes Explaining Why Women Don't Cycle More

Current Reality	Transformative Future: Cycling for All
<b>Cities built for cars not for people</b>	<b>Cities for mobile communities</b>
Residents and governments do not promote the bicycle as a mode of transportation or its rights to roads in cities, in a vicious circle of automobile dependency.	Traffic planners, urban planners and private organisations recognise more roads for cars will not solve traffic problems or result in freedom or mobility.
Governmental bodies and politicians don't care about sustainable transport or alternatives to automobiles.	The rights of pedestrians and cyclists on roads are recognised and cycling is encouraged as accessible, safe and a major means of transport.
Urban planners, governments and private organisations do not care for the complexities of how women weigh decisions about mobility and accessibility, or the complexities of claims upon their time, many of which can't be read out from socio-economic distinctions.	Road safety education for all road users inclusive of cyclists and car drivers on how to behave and respect all users of the road.
Small to medium sized organisations such as bike shops don't have initiatives to support women on bikes, such as all-women's rides	Initiatives to educate and create room for women leaders to represent cyclists to both the government and bike industry for recognition of women cyclists' needs, and women's transportation needs in general. A city designed for women is a city for all. Care is a core value in transport policy.
Technology such as apps can be a powerful tool to promote women's cycling	Social media empowers women cyclists' voices and advocates for them and other minorities on the road

## Worldviews on Cycling

### What are our values attached to cycling in general and for women cyclists in particular?

The automobile has dominated our thinking about transportation since Ford started mass producing cars in 1908 making them an affordable means of transport. The National Travel Survey UK 2021 reports for all distance bands, even of the minimum trip length of between one and five miles, the car is the most frequent mode of travel. Governments continue to commit to road expansion with more roads and road widening as their transportation solutions for many cities (Weingart, 2023). Research has shown how such solutions are often short-lived as there is an ever-increasing number of cars on the road (Hymel, 2018). The car as status symbol and social asset has long been a feature embedded into many cultures (Poiani, et.al., 2018). Our culture promotes optimising time and people feel rushed and pressed for time (King, et al., 2018) leaving much less time for leisure. In some cultures, women who cycle are labelled as rough or not lady-like as researchers in Tel-Aviv have found; or cycling is embarrassing, as for Maori women.

It is timely to reconsider how we value life. The participants of the study spoke of how they desire more time to enjoy nature and recreation, more time away from work and the stress of making a living, and more time to promote their health. Serious consideration is being given to the benefits of slowing down the pace of life (Parkins and Graig, 2006). Making cities walkable, cycling seen as the option of choice for short trips, and reclaiming living space from

roads for cars are all part of a broader agenda for more active mobility practices and the making of mobility meaningful to people in their communities. This broader agenda is compatible with that of slow living. Table 4 presents the worldviews of cycling that society has with suggestions how it can embrace slow living and a better work-life balance.

**Table 4:** Worldviews on Cycling

<b>Current Reality</b>	<b>Transformative Future: Cycling for All</b>
<b>Cycling is slow and not a status symbol</b>	<b>Cycling as the mobility option of choice</b>
Cycling is slow, driving is much faster — a culture optimising the use of time.	Health as symbol of prosperity, promoting slow living. Cycling is cool and great for health.
Immature cycling culture	Cycling reduces traffic, removes congestion, and allows for better mobility.
I have the means to own a car, and it befits my social status.	Reclaiming car parks and roads as living spaces Pedestrian- and cyclist-friendly cities promote freedom and active mobility in their communities, making mobility meaningful to people.
I have a car and I personally want and need to drive.	
Cars equal freedom.	
More roads and car parks seen as essential for access and mobility	

**Metaphors for Women Cyclists**

The participants felt that they had to move mountains in order to drive change while being just a minority within the minority group of women cyclists. They were the rose among the thorns. They felt powerless. They were battling the naysayers.

The metaphors that were used to describe Current Reality as experienced by women cyclists show a great yearning for justice and are an exemplar of a hidden but valuable strength in women cyclists that waits to be uncovered. The women cyclists desire connections and support offered with sensibility and sensitivity by their own kind. Their metaphors are an indication of the greater strength required from numbers of women in cycling, hence the authors’ use of the metaphor, “starlings in a murmuration” as their interpretation of the information gathered from the participants as they addressed the constraints they continue to battle to achieve a desired future of ”equality on wheels” that affords them freedom and justice.

Table 5 presents the metaphors for Current Reality and for a more transformative future.

**Table 5:** Metaphors for Women Cyclists

<b>Metaphors</b>		
<b>Transformative Future: Cycling for All</b>		
<b>Current Reality</b>	<b>Medium Term</b>	<b>Desired Future</b>
Rose among thorns	Starlings in a murmuration	Equality on wheels
Battling the naysayers		



## Conclusion

Using the Futures Triangle, the participants produced hopeful, more inclusive, positive images of the future they envisioned for women cyclists. The participants enjoyed the interview process. They felt thinking about the future had been educational as they shared their personal experiences on and off the bicycle prior to the study, especially when describing the constraints they faced. Though they were challenged by the request to describe their preferred future, they welcomed the opportunity to reflect, as it led to recollections of how they had started cycling and why they were passionate about it. They also realised they had agency and could effect change at least at the personal level, a shift in the self-concept of the woman cyclist from powerlessness to empowerment. The deconstruction of the findings using Causal Layered Analysis revealed the layers of issues involved along with the various levels of cause of those issues, establishing the basis for a more systematic, structured approach in drafting possible solutions.

A limitation of the study might be that it did not attempt a comprehensive intersectionality analysis because of the limited number of participants but kept its focus on an exploration of the images of the future of women cyclists.

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