"You can't be what you can't see": Community-Based Support and Representation in Diverse Cycling Communities on Instagram

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Abstract

Sports and leisure cycling offer numerous health and social benefits, yet participation remains predominantly limited to a normative male stereotype. This paper explores how underrepresented communities use Instagram to promote broadened participation. Through interviews with 12 cyclists involved in these communities, we investigate how these digital spaces address barriers to participation and provide social support. Our findings reveal how Instagram facilitates the creation of flexible, diverse 'patchwork communities' that challenge traditional narratives and provide representation for cyclists with broad, underrepresented, intersectional identities. We highlight the critical role of representation as a form of social support and discuss key tensions between platform affordances, user practices, and community dynamics, including challenges in balancing visibility and safety, and user versus platform-curated content. This research contributes to sociotechnical understandings of online community building in sports, providing implications for fostering more inclusive and sustainable digital spaces for diverse users in an ever-changing online landscape.

CCS Concepts

• **Human-centered computing** → Human computer interaction (HCI); Empirical studies in HCI.

Keywords

Inclusivity, Community, Social Media, SportsHCI, Cycling, Instagram

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1 Introduction

Cycling (for sport, leisure, utility and transport) is associated with numerous physical and mental health benefits [30, 57], can serve as a more sustainable mode of travel [4], and can have a positive social impact upon people and communities [50]. However, in the UK and elsewhere, there are many barriers to participation in cycling including socioeconomic factors, cultural norms and social expectations [60, 73]. These barriers disproportionately affect women [73], people of size [70], ethnic minorities [73], people of colour [7, 59], and LGBTQ+ people [19]. These barriers affect a range of cycling activities, from participation in professional sports [66] to everyday activities such as children riding to school [40].

The portrayal of physical activity and outdoor pursuits on social media often serves to reinforce associations of whiteness and masculinity, and often objectifies, sexualises or erases women, minorities and others [49, 51, 62]. However, as Low et al. [49] explain, social media sites including Instagram also offer opportunities for *"revealing diverse ways of being outdoors"* (p.24) and can create new associations for what it means to be an active person. Low et al. draw attention to how many women use Instagram to create active, positive portrayals of 'doing' outdoor pursuits. We focus on Instagram because it has become a widely used platform for sharing cycling-related content, and because it affords a distinct mix of visual representation, community discovery through hashtags and algorithms, and interpersonal engagement through comments and direct messages. These affordances make Instagram a critical site for understanding how representations and connections around cycling are being created and sustained. Following this, our work explores the perspectives and experiences of UK-based cyclists from underrepresented groups, examining how they use Instagram both to find and create diverse representations of cycling. The purpose of this research is to understand how Instagram can be used to support efforts to broaden participation in cycling and what opportunities and challenges this presents for inclusive community building.

Through 12 semi-structured interviews conducted between June and December 2023, we explore the views and experiences of diverse social media users and influencers. Our research uncovers how Instagram facilitates community building among diverse cyclists through the creation of flexible, visual and metaphorical 'patchwork communities'. This paper contributes insights into:

- Participants' perspectives and experiences of using Instagram to create communities and promote diversity in cycling;
- Participants' positive experiences of using Instagram, including different forms of social support;
- Participants' negative experiences and concerns regarding Instagram and social media.

The sample we use is relatively small, but each participant had actively used Instagram to represent diversity in cycling. The sample is highly diverse, with most participants sitting within complex intersectional identities. At the request of several participants, we

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do not specify these intersectionalities, or use direct examples from their social media. One of the surprises in this study was the extent to which participants found positive social support on Instagram and felt a part of alternative, grassroots cultures. Therefore, this paper focuses on social and experiential aspects of Instagram use. The key benefits we identify include different forms of social support including informational support, emotional and appraisal support, instrumental and tangible support, social companionship and network support; and crucially, representation. Key barriers identified include the effort and uncertainties involved in the production of social media content, maintaining visibility, and ethical concerns about the platform and its owners.

2 Background

Instagram is a social media platform used for sharing digital photographs and short videos. When someone posts an image or video to Instagram it can be accompanied by text, hashtags and location data. Posts on Instagram can be seen on the profile page of the person that made the post and can also appear in other people's feeds. Whether a post appears in someone's feed depends on what users often refer to as "the algorithm". Posts can also be found via search. Users can 'like' or comment upon posts made by others.

Instagram is currently one of the world's most popular social media platforms. In the UK, a study by Ofcom [55] found that 57% of adult internet users had used Instagram during 2023. The study also found women were more likely than men to use Instagram and younger adults (age 16-24) were much more likely than older adults to use it. Instagram is not as widely used in the UK as platforms such as Facebook, YouTube and WhatsApp but is still used by more than half of the UK adult population. For this paper we decided to focus on Instagram as an entry-point for studying social media and cycling.

We approach Instagram from a Human Computer Interaction (HCI) perspective. HCI has expanded in recent years to consider "SportsHCI" [25] and "CyclingHCI" [52], formalising growing research efforts at the intersection of sports and technology. Important aspects of these areas include understanding the technology needs of diverse individuals [36] and understanding accessibility issues (e.g. [65, 74, 82]).

2.1 Diverse representation of physical activity on social media

Research into a range of platforms including blog sites [3, 61], Facebook [81] and Twitter [39] has explored the ways in which online spaces and networks challenge mainstream sporting cultures and images. Social media has increased role-model diversity in sports and fitness, providing platforms for athletes who may otherwise be marginalised [38]. Online spaces have also enabled alternative constructions of identity in relation to physical activity, offering spaces in which repressive stereotypes can be challenged and reformulated to empower diverse participation [39, 72, 84]. In this way, studies have suggested that social media not only increases visibility but can also reshape the nature of participation [49].

Among this research, several studies have examined the role of Instagram specifically in participation in physical activity, including hiking [72], surfing [58], outdoor adventure [49] and fitness [79]. However, there is a notable gap in the literature regarding the use of Instagram in the context of everyday cycling.

In a study of surfing, Olive [58] found that Instagram profiles enabled 'outsiders' to actively participate in surfing spaces that were otherwise dictated by hierarchies of local and established identities; bridging online and offline surfing communities, the platform became an integral part of "everyday surfing culture representations" (p.100). Relatedly, Stanley suggests that Instagram provides a space for forms of activism that enable fat hikers to engage in "strategic, intersectional, and, above all, agentic identity work" (p.7); the curation of diverse 'hiker' identities on the platform challenges narrow and limiting images of hiking bodies and affords mobilities [72].

In relation to cycling specifically, research into Australian women cyclists' use of Facebook points to the creation of "networked counterpublics" through social media [81]. This "virtual clubhouse" acts as an inclusive space for diverse cyclists that not only enables "alternative and subversive narratives, knowledge, and cultural practices" (p.4064) but also shapes the way cyclists engage in physical cycling spaces [81].

2.2 Social support and grassroots culture

Social support theories provide a framework or understanding how online platforms can be used to support and promote inclusivity in cycling. House [41] identifies four broad types of social support: emotional support (empathy, care); appraisal support (encouragement, validation); informational support (advice, suggestions, information); and instrumental support (material and/or physical aid). Subsequent work has also recognised network support (connection, companionship) as an important aspect of social support [42]. Studies have used social support theory to explore experiences and behaviour online in a range of contexts; much of this work has focused on experiences of online health communities for support-seekers [14] as well as supporters [46]. Bridging online and offline support spaces, Harrison et al. [37] developed a system for promoting social-connections and in-person meetings between postgraduate students. Although this system was useful in supporting the creation of 'weak tie' relationships [33] it did not appear to promote any close-tie bonds. However, unlike in other social contexts where users come together more organically, this system matched participants, which may explain this difference.

The use of digital technologies by grassroots organisations has been explored in HCI literature. For example, Ghoshal et al. [32] examined the socio-technical practices of a large-scale social movement, the Southern Movement Assembly; this work identified numerous ways in which digital technologies supported outreach and communication, but also highlighted the tensions arising between the social values of such grassroots movements and the socio-technical realities of using digital tools, echoing work in other areas (see e.g. [22]). In calling for a 'grassroots culture of technological practice', the authors engage with critical questions of power and equity in the production of these tools. Relatedly, Engelbutzeder et al. [26] explore the conflicting uses of platforms and social networking sites (Facebook and Telegram) in grassroots efforts to promote sustainable and 'fair' food sharing. This work highlights the ways in which divergent approaches to the concept of 'fairness' within the community manifested in the use of different technologies. By

applying social support theories to the context of inclusive cycling communities on Instagram, this study aims to contribute to our understanding of how social media platforms can be leveraged for grassroots efforts in sports inclusivity. It will explore how different forms of social support are facilitated or hindered by the platform's affordances, and how these dynamics shape community building and efforts to broaden participation in cycling.

HCI has a long history of research focused on social justice, inclusivity, equality, and broadening participation (e.g. feminist perspectives [5], technologies for social justice [75] and non-normative bodies [71]), as well as a large body of work focused on understanding and supporting community and social support (e.g. within particular groups such as students [37], those embarking on gender transition [35], or understanding inclusivity issues in social media for activism [86]), and considering use and appropriation of social media platforms (e.g. [48, 53]).

2.3 Inclusivity in sport and cycling

Inclusivity in sports is a critical issue that begins to manifest in childhood and becomes more pronounced during adolescence. Many girls stop taking part in sports as they move into adolescence, with as many as 64% stopping by the time they reach age 16-17 [85] – partially attributed to societal perceptions that being active and sweaty is unattractive, alongside a lack of confidence and fear of failure during puberty. As a result, many girls develop negative attitudes towards physical activity, which can persist into adulthood [68]. The disparity in sports participation is further exacerbated by gender-specific barriers. Women face numerous challenges, including safety concerns [83], societal expectations (for example around body image and beauty standards [63]), and a lack of leisure time. According to the Office for National Statistics women in the UK have five hours less leisure time per week than men, which further limits their engagement in physical activities [56]. Additionally, cultural attitudes towards women in sports often discourage participation, with traditional gender roles and stereotypes playing a significant role (for example the stigmatisation of female-identifying athletes as "masculine" in traditionally male-dominated sports [23]). These issues are not confined to women alone; various minority groups also face significant barriers to sports participation. Ethnic minorities, for instance, encounter additional challenges such as racial discrimination and cultural expectations, and direct or indirect racism, which hinder their participation in sports, even when then have interest and access [67]. There is positive news however, with initiatives and institutional efforts such as the "This Girl Can" movement beginning to address challenges, promoting inclusivity through community programs, mentorship, and advocacy [6, 78]. These efforts span from professional to leisure activities, highlighting the transformative impact of inclusivity in sports and cycling.

Cycling, historically a symbol of empowerment and freedom, particularly for women in the late 19th century, now reflects similar disparities seen in broader sports contexts [87]. Despite its potential for inclusivity, cycling remains dominated by a male stereotype, with women and minorities facing socioeconomic, cultural, and structural barriers [2]. The diversity of cycling remains low, while numbers are more promising elsewhere, in the UK where our work is situated, men made over three times as many trips by bicycle, compared to women [88]. These imbalances in gender and inclusivity, despite the historically empowering nature of cycling for women, make cycling an important case for this work.

Media representation plays a crucial role in shaping perceptions of sports, yet stereotypes continue to be perpetuated by media representations that overwhelmingly present male athletes, further alienating women and minorities. Women are still underrepresented in sports media, which both on- and offline, often focus more on sexualising their appearance, or on their maternalistic role, rather than their athletic achievements [16, 45]. Although there has been progress, such as the recent establishment of the Tour de France Femmes, which gained visibility through the #TourDeFemmes social media campaigns, large disparities remain. Social media has emerged as a powerful tool to challenge traditional narratives, providing a platform for diverse voices and fostering more inclusive sports cultures. This shift in media dynamics underscores the potential for social media to influence mainstream narratives and promote inclusivity in sports and cycling.

During the UK-wide lockdowns of the COVID-19 pandemic there was a notable increase in uptake of, and participation in, cycling – particularly for women and people of colour. The second edition of 'Diversity in Cycling' [24] also identifies the murder of George Floyd during the initial wave of the pandemic as a critical moment; in the failure of pro-cycling teams and governing bodies to engage with the global outcry *"The whiteness of cycling was exposed"* (p.5). During this period, there was also an influx of grassroots cycling communities working to increase inclusivity and participation, which originated on social media platforms. These platforms, and particularly Instagram, have enabled diverse individuals to 'take up space' in the cycling world: to share their lived experiences, connect with one another, and provide social support, which can be instrumental in encouraging more diverse participation. However, since these grassroots movements emerged, social media companies and platforms – including Instagram – have made shifts in moderation practice and commitments to EDI (equality, diversity and inclusion). In early 2025, Meta rolled back their EDI programmes and relaxed their moderation policies, including to allow previously restricted speech targeting LGBTQ+ communities – under the guise of *supporting* free speech [34, 80, 89]. These changes raise concerns about the ongoing safety and sustainability of these communities, and underscoring the need to understand how these spaces are created and maintained.

3 Method

To examine participants' perspectives and experiences of using Instagram to support broadened participation in cycling, we conducted an interview study supported by a review of Instagram content. Twelve participants took part, providing us with consent to examine their Instagram posts and participate in a semi-structured virtual interview, discussing their use and experiences of social media related to increasing diversity in cycling.

The first author is a lifelong cyclist with experience in utilitarian, leisure, sports, and fitness cycling, and has followed discussions related to inclusivity in cycling on social media, particularly during

Table 1: Study Participants

P#	Gender	Age	Industry position	Creates content aimed towards broadening participation	Followers	Following
1	Female	30	Yes, tour guide	Yes, promote opportunities and share personal experiences	5,000-10,000	1,000-2,000
2	Male	55	No	No	500-1,000	1,000-2,000
3	Female	46	Yes, cycle workshop	Yes, demystify cycling topics and gender diverse photos	500-1,000	500-1,000
4	Female	32	Yes, events	Yes, share experiences and knowledge	2,500-5,000	2,500-5,000
5	Trans non-binary	52	No	Yes, focus on trans and non-binary representation	5,000-10,000	5,000-10,000
6	Male	44	Yes, cycle instructor	Yes, mental wellbeing and minority cycling	500-1,000	500-1,000
7	Female	35	Yes, cycling media	Yes, tips and represented diverse body types	1,000 - 2,500	<500
8	Male	49	No	Yes, people of colour	1,000-2,500	1,000-2,500
9	Female	30	No	Yes, promote relaxed, non-competitive cycling	15,000+	2,500-5,000
10	Female	-	Yes, coaching	No	<500	1,000-2,500
11	Female	29	Yes, cycle workshop	Yes, showcase underrepresented cyclists	1,000-2,500	500-1,000
12	Female	38	No	Yes, highlight women's participation in rides	2,500-5,000	1,000-2,500

the COVID-19 pandemic. While this engagement was largely observational, it provided the motivation for this study and resulted in exposure to the type of content and communities explored in this paper, including some content shared by participants within this study. This prior familiarity with the topic necessitated a reflexive approach to this research, however none of the participants were personally known by any the research team prior to recruitment. The second and third authors joined this project without these prior experiences, contributed to this reflexivity and helped mitigate potential bias.

3.1 Participants

Participants were recruited through social media posts and snowball sampling [77]. A link to a recruitment survey was shared through our own Instagram accounts, and a separate Instagram account created for specifically the project. We did not contact potential participants directly through our personal Instagram accounts, only through the project account. Our recruitment advertisement called for *"community members, organisers and influencers* [to share] *their experiences of being part of online communities that support widening participation and Equality, Diversity and Inclusion (EDI) in cycling"*, and invited potential participants to complete a sign-up form, following which we individually contacted them using their preferred means. We also approached communities and community leaders known to us, to share this recruitment information, which many did using the "stories" feature on Instagram. We targeted our advertisement on Instagram, as from our own experience this was the primary platform used by these communities. From the 24 who signed up, 12 participants took part (Table 1): eight identified as women, three as men, and one as trans non-binary. All either lived in the UK or were part of the UK-based cycling community (one participant was studying internationally at the time of the interview). This recruitment strategy aimed to ensure insights were relevant and reflective of the cycling culture within the UK, rather than influenced by varied geographic contexts. Participants' ages ranged from 29-55 (average 40), with one participant preferring not to disclose. Only two of the 12 participants were known to us in advance of the study through our following of their Instagram accounts, but neither of these participants were aware of, or followed the researcher back.

All participants stated an interest in broadening participation in cycling, hence their involvement in the study. Participants were engaged with broadening participation in cycling in a number of areas, including gender inclusivity, trans inclusivity, for people of colour, for religious groups, and for people of varying size, ability and fitness level. Over half (n=7) also had jobs related to cycling, including in cycle tourism, media, events, training/coaching, bike fitting, and workshop management. Of these, 4 founded organisations directly related to broadening participation in cycling and created and/or shared content for these organisations on social media. One participant started a community cycling group but was not employed in a cycling-related field. All but one participant frequently cycled, engaging in commuting, road, mountain, gravel, bikepacking and adventure cycling. Some raced competitively, whereas others were more interested in leisure cycling. One participant did not consider themselves to be a cyclist but had ties with the broader movement and posted related content to Instagram. All participants reported using Instagram daily, and 10 of

12 reported specifically creating content for supporting diversity in cycling. Their Instagram followers ranged from 466 – 15,400 (average 3,874), and they followed 414 – 5,360 accounts (average: 1,819).

3.2 Procedure and analysis

Data collection began with a survey focusing on demographics, specific cycling interests, and use of social media, which helped inform the direction of each interview. With consent, we reviewed the content of each participant's Instagram account. This review took place both before and during the interviews, helping us to contextualise discussions and clarify references to specific posts or situations raised by participants. We developed an interview guide which focused on: participants' cycling history; their motivations for and experiences with using social media (particularly Instagram) in relation to cycling; the types of peer support observed and provided (based on social support theory as described in the background section); strategies for broadening participation in cycling; and reflections on the role of social media in promoting diversity and inclusivity in the cycling community. Responsibility for conducting the interviews was divided between authors one and two, with both present for 10 of the 12 interviews. Interviews were conducted over 6-months, starting in June and finishing in December 2023, virtually over Zoom. They lasted approximately 1 hour (40 minutes to 1 hour 15 minutes, average 56 minutes), and were recorded for later transcription. Semi-structured interviews [9] afforded flexibility in exploring complex topics while maintaining a consistent framework, allowing us to delve into individual lived experiences while suitably adapting our questions.

The recordings were transcribed and subsequently thematically analysed by the first two authors, using the online version of Atlas.Ti. Our approach was both inductive and deductive: inductive in generating themes from the data, and deductive in attending to social support theory, which participants had been asked about directly during interviews. Our analysis followed Braun and Clarke's [8] steps, to ensure a thorough examination of the collected data. We developed an initial set of 112 codes, including for example *Activism*, *Aging*, *Social Media Fatigue*, *Local Community*, *Introversion*, *Barriers to Cycling*, and *COVID start*. These codes were iteratively refined and clustered into broader themes that captured participants' perspectives and experiences of Instagram use.

A reflexive approach was adopted to mitigate any influence of the first author's prior exposure to online cycling communities on data interpretation. This involved working closely with the second author, who brought an external perspective, to critically assess and address potential biases related to the first author's existing knowledge of the area. Our collaborative approach involved regular meetings to discuss and refine the codes, ensuring we captured participants' rich and complex experiences. To maintain the anonymity of our participants, we only provide direct quotes from interview data in the findings, when referring to social media content, we describe posts without providing direct text or images as these could potentially be re-identified.

4 Findings

This study examined participants' perspectives and experiences of how diverse cycling communities were formed and/or sustained through Instagram. Our findings highlight the complex nature of these communities; despite Instagram's limitations, cyclists have found innovative ways to create meaningful connections, foster inclusivity, and promote broader participation in cycling, all while supporting one another. The flexibility and reach of these online communities appear to address some of the limitations of traditional cycling clubs, offering new avenues for engagement and support through multiple means. Our analysis revealed that Instagram provided an important platform for informational support and the sharing of diverse images of cyclists and cycling experiences. The affordances of Instagram were tempered by the ever-changing nature of the platform, which participants experienced as increasingly demanding time, skill and strategy to sustain engagement and remain connected.

4.1 Reasons for Using Instagram to Build Cycling Communities

Many of our participants described a desire for inclusive safe spaces where they could be themselves, and support and encourage greater diversity in cycling. For many, this search for a sense of belonging was the primary motivating factor for creating their Instagram profile in the first place, or for using an existing profiles to find something new: *"What if I started like a cycling Instagram page just to like feel like I'm part of a cycling community?"* (P1). Our participants found Instagram to offer an accessible way to connect, beyond the limitations of traditional cycling clubs. The COVID-19 pandemic accelerated the formation of these online groups, underscoring the platform's flexibility and reach. Here, we detail how participants defined and built communities on Instagram, why they were drawn to the platform, and how these virtual spaces intersected with tensions around inclusivity in the cycling world.

4.1.1 Defining and building 'community' online. Participants provided varied descriptions of what an online cycling community *is* and what it means to be part of one. Most engaged with communities that were oriented towards particular intersectional experiences, aiming to broaden participation in cycling based on gender, sexuality, religion, mental health, body image and fitness, age, and race, amongst others. Communities were also formed around different cycling disciplines (e.g. gravel biking, bikepacking and ultra-distance cycling), as well as different approaches to cycling, such as those who connected through a relaxed approach to pace, or cycling for mental health.

At first glance, Instagram can seem like an unlikely platform for fostering such communities, given its limited community-focused features compared to platforms such as Facebook or Reddit, both of which offer dedicated group spaces for forums and discussion, whereas Instagram has a greater focus on sharing visual content. As participant 7 highlighted: *"I think it's very hard to have a real community around an Instagram account because unless your whole thing is prompting conversation in the comments, there's not really a way for your followers to interact with each other"*. However, despite these limitations, participants instead described unique ways of

forming and maintaining online connections, describing a 'different type' of community on Instagram. These *"self-made pockets"* were formed through a *"patchwork"* of groups that were not rigidly defined: "[it's not like] *joining a community of 'x'"* (P9). These communities were formed through what one participant described as a 'snowball effect', whereby networks grew through shared online connections. Liking and sharing content across groups (*"all these little nods to each other",* P12*)* was crucial to forge and maintain the community, as well as interacting online through comments and direct messages. Across our interviews, participants reflected that it took time to 'build' or 'find' the community, as an ongoing and evolving process that could take months or even years.

The relationships made on Instagram bridged online and offline spaces, forming connections that translated into real-world relationships and events. Participant 9 shared, *"I've got a lot of longstanding friendships now, that I have built purely from Instagram. My closest friends actually come from Instagram and that's how we met and we still know each other"* – a sense of real-world connections forged through online interactions, which was echoed by numerous participants. Whereas some participants, such as P9, made connections from across the UK with whom they travelled long distances for rides and cycling events, others were more involved in local community endeavours.

Local cycling groups, small businesses, Community Interest Company (CIC, a type of social enterprise in the UK that uses profits for public benefit, rather than personal gain), and other community organisations used their Instagram presence primarily for local promotion and marketing – marking a distinction between having an online *presence* and being an online *community.* As participant 7 explained, *"our community was very much IRL and the Instagram account was really there as a promotion tool"*. As Participant 11 described, these groups tended to prioritise in-person community building, *"we don't do too much of the, like, tutorials of this is how to fix a puncture on Instagram, because we just want people to come to the class"*, underscoring how in-person gatherings remain a priority.

At the same time, participants recognised how to use their online presence to help *"set the tone"* (P12) towards a more inclusive movement, utilising visual images and captions to promote clear messaging and identify their target audience. Participant 12 also highlighted the significance of including pronouns in posts to foster inclusive rides; this reflects research in other areas that suggests social media behaviours such as the inclusion of pronouns and image descriptors contribute to the normalisation of these forms of inclusivity [72]. By showing diverse images of cycling bodies, attire, and approaches, local groups signalled that their rides were welcoming spaces, reinforcing a sense of belonging for those who might otherwise feel excluded.

4.1.2 Why Instagram? While many participants used multiple social media platforms, Instagram was the platform they associated most strongly with cycling communities. As participant 12 described, *"Instagram was definitely, like, the melting pot where everyone was kind of doing stuff that connected everyone"*. Participant 1 similarly noted that viewed Instagram as *"a big part of these conversations"* that challenged mainstream narratives of cycling, and stated that the conversations taking place in the online space played a significant role in *"helping sort of shape the future of cycling in that way"*.

Participants reflected largely positive experiences of using the platform. Instagram was seen as easy to use in terms of sharing photos and stories, and several participants stated a personal preference for Instagram over other platforms such as TikTok. *"I think the reason everyone is drawn to Instagram is because it's so easy to share photos, it's so easy to share pictures from your rides, to show, as I said before, like a variety of people, a variety of bikes, a variety of clothing" (*P7). For some participants, Instagram was the most convenient platform to operate multiple accounts oriented towards cycling from, as they also utilised Instagram for their own personal accounts. Participants also indicated that they chose Instagram because they recognised this platform had a critical mass of cycling-related content: *"these other communities that I love talking to or love what they do or people that I've connected with, they're using Instagram"* (P12).

Our study revealed limited negative experiences for participants using Instagram. Issues were occasionally raised in relation to trolling or harassment, but this was surprisingly limited. When such issues did arise, participants also experienced support from the online community. Participant 1 saw this as a strength of the online space, as *"it happens really quickly... if something's wrong, someone calls it out"*. Participant 7 also felt that the online community came to their defence when they experienced harassment, *"like everyone was sort of standing up for each other"*. Other negative experiences raised were in relation to security on the platform, including hacking and privacy breaches, although participants did not foreground these.

4.1.3 Tensions with traditional cycling clubs. The UK has a long tradition of local cycling clubs, often affiliated with British Cycling, that organise regular club rides and competitions, while fostering local community and promoting cycling for recreation and competition. However, many of our participants found these clubs to lack diversity, motivating them to seek or establish more inclusive alternative spaces online, where they felt more welcomed and represented. Speaking of her prior experiences, participant 1 explained, *"it was the classic cycling club. It's like, white middle-aged people, everyone's in their 60's, everyone's really lovely but you go out and like the conversation just doesn't, you just don't have very many things in common"* (P1), similarly Participant 4 described a *"club mentality"* centred on being *"good enough"* or *"fast enough"* that they *"really wanted to change"*. This sentiment was echoed across our interviews, with participants perceiving a lack of diversity and inclusion within local clubs, both in terms of their members and the different rides and types of activity they offered.

British Cycling's *"anti-trans movement"* (P1) had far-reaching implications; our findings revealed how cyclists, including non-transgender individuals, chose to distance themselves from British Cycling-affiliated clubs and events in response to their policies. In 2023, following a 9-month review of their policies, British Cycling made the decision to ban transgender women from the 'female' category of all its competitions [10], limiting transgender athletes to compete in the 'open' category. As participant 5 reflected, this decision at the elite level of the sport has a 'trickle-down effect, creating further barriers for transgender communities to participate

in cycling at all levels: not only are trans people not represented in competitive British Cycling races, but they are being actively marginalised through the policy. Participant 7, who also ran an inclusive cycling group explained, *"we definitely would not have had anything to do with British Cycling* [...] *we were very, very strongly against their anti-trans policy. We had trans and non-binary people as part of our group, and it would not have sat well with anyone"*. This sentiment was echoed by several participants, indicating a broader impact on inclusivity within the cycling community and pushing underrepresented groups to seek alternative, more inclusive spaces.

Finally, we observed that many traditional cycling clubs lack a strong online presence, a shortcoming which became especially problematic during the COVID-19 pandemic, when people were struggling with loneliness and social isolation. The absence of a robust online presence not only limited these clubs' ability to maintain ties with existing members during lockdown, but also fails to address the needs of cyclists with reduced leisure time – typical of under-represented populations, including women [56]. In contrast online communities offer more flexibility compared to weekly in-person rides alone, which appears to be an important factor in making cycling more accessible to diverse participants.

Our analysis indicated that the pandemic acted as a significant catalyst for the formation and growth of diverse communities on Instagram. The UK lockdowns resulted in many people losing existing social spaces, including cycling spaces, as restrictions prevented group riding and other social gatherings. Personal circumstances and other life events, such as being unable to work, moving to a new city, or having children also altered our participants relationship with cycling. As participant 7 explained, numerous inclusive cycling groups *"popped up"* during this time, contributing to a growing sense of community around broadening participation and engaging with inclusive cycling-related activity on the platform. Although such groups existed prior to COVID-19, the lockdowns accelerated their visibility, cementing Instagram as a critical tool for connection and advocacy.

4.2 Social support and representation

We talked to participants about the types of support they felt were most important in broadening participation in cycling, and how these different kinds of support manifested in the content they consumed or created. Drawing from social support theories we asked participants about *informational, instrumental, emotional* and *appraisal* support [41]. Although we did not specifically ask participants about *network* support [18] many of our interviews touched on this. Crucially, we propose representation as an additional dimension of social support in this context: while not part of the traditional framework, almost all participants described representation as integral to creating more inclusive cycling cultures, positioning it as a powerful form of community support.

4.2.1 Informational support. Participants consistently highlighted informational support, which involves providing advice, suggestions and information [18] as having a positive impact on broadening participation. Participants were particularly drawn to profiles that shared a range of informational support: *"the things and the accounts that I'm attracted to are the ones that give you some information"* (P2) and similarly made attempts to share information with the aim of broadening participation in cycling through their own accounts.

Participants reported being exposed to different cycling disciplines, such as track or endurance cycling, through Instagram: *"I just didn't even know these things existed... until I went on social media"* (P1). Similarly, information about different cycling events shared via Instagram helped facilitate participation. Shared lived experiences about what to expect in various events also helped – for example, participant 2 explained how they gained an understanding of group cycling through information shared on Instagram, providing insight into the dynamics of events that they would not otherwise have had.

The complexity, or perceived complexity, of cycling knowledge was identified as a barrier by our participants, particularly given the male-dominated culture of cycling, and bicycle workshops. This was particularly related to aspects such as mechanical jargon and expectations about specialised equipment, which participant 3 described as *"intimidating"* and keeping the sport *"shrouded in mystery"*. Images and information shared on Instagram helped reduce these barriers, challenging mainstream expectations about kit and clothing, and demystifying aspects of cycling that could be intimidating. Noteworthy was the emphasis on sharing mechanical knowledge and repair skills, already outlined as a barrier for underrepresented groups to take part. Participants viewed this type of informational support as vital for broadening participation, as it directly addressed confidence issues that deter potential cyclists. As participant 3 stated, *"the more people know about their bikes and are confident in being able to fix them, the more they're going to go cycling"*.

By sharing information about common technical issues such as punctures, participants aimed to create a more realistic and approachable image of cycling. Participants noted how mainstream images and stories of cycling tend to 'edit out' mishaps and problems, whereas social media can be used to normalise these challenges, as participant 3 articulated: *"if nobody ever posts about their flat tires when they're posting about their adventures then it's not normalized that they're fixable"*. Creating confidence through informational support was viewed as an important form of empowerment, which social media could contribute to:

> *"I think it's more important that I can, like, help build communities and help empower people to kind of take cycling back* [...] *I think shifting that and giving people the tools, like the literal and the metaphorical tools to be able to be self-sufficient in those spaces. I think it's really empowering and I think that's really important"* (P5).

4.2.2 Emotional and appraisal support. Given the importance of informational support for confidence, we anticipated that emotional and appraisal support would play a key role in broadening participation, but our participants did not suggest this. Emotional support refers to empathy and care, whereas appraisal includes feedback that can aid self-evaluation and validation [15, 41]. Despite their potential importance, these types of support were less central to how our participants approached broadening participation – online, at least.

Participants often highlighted the value of sharing personal stories and lived experiences through social media, but this was largely discussed in terms of creating *authentic content* rather than providing or receiving emotional support. As participant 11 noted, emotional support was instead more prevalent during in-person interactions, such as group rides: "*The emotional support would probably only happen during the session and that does happen a lot, me and* [name] *call it 'bike therapy'. People share stuff when they're riding bikes, which is good because you've created a space that people feel comfortable to talk in".*

Despite the general lack of emotional and appraisal support on Instagram, the comments section and personal messages offered moments of validation and encouragement. Participant 1, who took part in competitive races, mentioned receiving supportive messages: *"There was a lot of encouragement and people being like, yeah, just understanding and providing that social emotional support was really big"*. However, this support was typically linked to specific experiences, such as overcoming a mechanical issue during a race, rather than contributing to broader participation.

4.2.3 Instrumental and tangible support. Instrumental support [41] refers to providing material aid, support, or physical items. As expected, this was limited within our findings, given the online focus of our research. In cycling networks more generally, this kind of support might include borrowing or providing kit or equipment, which given the significant expense of cycling equipment is important within the context of broadening participation in cycling. Many of the groups or organisations our participants were involved in provided this form of support to communities, but orchestrated offline. Such support included bike repair and mechanical support on guided rides or cycling events, taught sessions on bike maintenance and repair, and classes to help adults learn to ride.

Interestingly, only one participant reported experiencing instrumental support directly through Instagram. Participant 1, who had an extensive network with many followers, described using Instagram *"like a library"* for seeking help, borrowing equipment, or finding solutions to cycling-related problems. However, this appeared to be an exception rather than the norm. More often, Instagram was utilised as a tool to market and promote in-person sessions and events where instrumental support would be provided offline. This suggests that while social media platforms can facilitate connections that may lead to instrumental support, the actual provision of such support typically occurs in face-to-face settings.

4.2.4 Social companionship and network support. Social companionship [15] and network support [18] refer to the connections that foster a sense of belonging and provide access to new social contacts, respectively. These forms of support emerged as crucial components within online cycling communities, facilitating meaningful connections between members, particularly benefitting those who felt underrepresented or excluded from traditional cycling communities and stereotypes. Participants described how discovering local rides and meetups through Instagram could lead to new friendships offline, which was *"really encouraging"* (P9) for continuing participation. These connections helped foster a sense of belonging among diverse cyclists and often extended well beyond the digital realm. P1 recalled, *"when I found this online community it was like, oh, there's people around my age and women and people of colour* [...] *it was quite a nice community"*, underscoring how Instagram helped her locate others she related to more closely.

Not all experiences were positive, however. Participant 9 noted that some groups could feel "cliquey," making it difficult for newcomers to integrate, even if a group was nominally inclusive. Hence, while network support was generally beneficial, certain online or offline dynamics could still pose barriers to those trying to join a new group. Overall, though, these network connections, both virtual and face-to-face, were widely seen as essential in motivating participants, reinforcing their sense of belonging, and encouraging ongoing involvement in cycling.

4.2.5 Representation. While not part of traditional social support frameworks so far focused on in this section, representation arose repeatedly as participants discussed how Instagram fosters inclusivity. This extends conventional understandings of social support, highlighting the role that social media, and particularly Instagram, plays in fostering inclusivity. Beyond simply showing different faces or body types, many participants actively curated and shared diverse imagery to support others in the community. This was a deliberate, outward-facing act: if more people see cyclists who look or identify like them, they feel invited to participate. As participant 5 succinctly put it, *"you can't be what you can't see"*.

Throughout the interviews, participants noted that cycling remains dominated by the image of a white, male cyclist, and the lack of representation for marginalised groups has long been a barrier to broader participation. Participants reflected on the significant role social media, and particularly Instagram, had to play in challenging mainstream images. In the online space, alternative images of cyclists with a range of body-types, abilities and intersectional identities proliferated. Participants consistently stated the significant impact that diverse representation on social media had on their cycling journeys, as participant 1 reflected:

> *"It seems like a simple thing, like the whole, you know, 'see it to be it', whatever, but it's not stuff I really believed in very much... But it's funny how it did affect me when I did start to see people through accounts that I found on social media of some professional women, black cyclists out there doing this stuff that I hadn't even considered".*

Several participants made the link between the pandemic and an influx of diverse images of cyclists on Instagram. During this period, participants identified a move towards expanding the content they were consuming online, consciously broadening the range of accounts they followed. This movement towards what participant 7 described as *"diversifying the feed"* during the pandemic contributed to a growing sense of connection for participants online. Participant 1 articulated that, during this time, *"there was definitely a feeling of community and a group of people who were committed to helping elevate and share and promote other lesser-known cyclists who didn't fit that mould*". These reflections suggest that representation online was not only personally meaningful, but also a deliberate strategy used to support others — a point we return to in the discussion.

4.3 Barriers to sustained engagement

While Instagram appeared as a useful space for connection and community, participants also described tensions and challenges associated with maintaining their use and engagement over time –

particularly when creating and sharing content. Here we present the complex relationship between users, content, and the platform: how participants worked with and against the algorithm; the cost of trying to remain visible and relevant on the platform; and the impact this had on people's interactions with Instagram – causing some to reevaluate their use of the platform, or withdraw altogether.

4.3.1 Feeding the algorithm. All our participants were aware that the content they consumed and produced was impacted by Instagram's algorithm, and we discussed their perceptions of how this influenced online engagement and community. The extent to which participants understood the machinations of the algorithm varied, as did the conscious efforts they made to adapt their content as a result.

Many participants had a sense of the kind of content favoured by the algorithm, whether this was in relation to video or still image formats, image content, or the tone of content. Several participants stated that images that included faces tended to gain more traction. Some participants also felt that emotionally 'positive' content was likely to be less successful within the algorithm than content that had negative associations. Others articulated a more detailed understanding of the intricacies of the platform, and how views and impressions impact on what content the algorithm picks up. The use of trending audio in video content, as well as frequent and regular posting were also noted by participants as being important.

Participants' awareness of the algorithm was often linked to a sense of their social media *"strategy"* (P3), and many participants recognised that creating successful content required a specific skill set and had *"become an expert job"* (P4). Some participants had gleaned knowledge about how platforms worked from documentaries and news reports, whereas others sought out courses or webinars to develop their skills. Participants who had professional expertise in social media and marketing, had more automatic behaviours due to training and experience; as participant 12 stated, *"there's loads of stuff that I don't even think about, that I just do, I guess"*. Participants that did not have this background had a range of responses. For example, participant 3 expressed making a conscious effort to develop their approach online: *"I've kind of made it my goal that I'll get the stupid Instagram strategy thing sorted"*. Participant 4 set limitations around their response, stating: *"I'll keep an eye on it.... I will do what I can but I'm not going on a proper treasure hunt"*. And participant 8 was resolute: *"I don't try to play with the algorithms or anything. I haven't got time for that"*. The majority of our participants expressed some ambivalence towards the algorithm, often describing a tension between being aware of the importance of adapting to the algorithm to create successful content, and lacking the capacity or motivation to make these adaptations. Along with this tension, participants reflected both positive and negative aspects of the perceived changes to the platform, including the algorithm.

For several participants, the way the algorithm altered the content they saw on their feeds had negatively affected their sense of being part of an online community. As participant 1 explained, *"when they just rolled it* [new changes] *out like I felt just disconnected to people again. I wasn't able to see content I wanted to see of the people that I was following that inspired me, that I wanted to share things with, it just wasn't there"*. Participants were also aware that the algorithm may be limiting the reach of their own content, which compounded a sense of the online community as a *"bubble"* (P3) or *"echo chamber"* (P4). As a counter to this, one participant reflected that the curbs of the algorithm may have some benefits, particularly in relation to communities that face a lot of harassment online, such as the trans community. As participant 5 articulated, *"I guess there's good and bad things that come out of having an algorithm that's running things and like it does reduce kind of crossover. And therefore... for the most part, it kind of means that the space is quite safe"*.

The question of authenticity was also raised in relation to the algorithm, and to content creation and consumption more broadly. Adaptions to suit the algorithm altered participants' sense of the authenticity of what they saw online: *"for me, it's become a little less organic and raw and honest because we all feel like we're just, like, yeah, we're just doing things for the algorithm"* (P1). 'Rawness' has been linked to socially productive forms of intimacy on Instagram, nurturing trust within digital fitness communities [64]. The algorithm's influence also impacted on participants' sense of their own authenticity, as they compromised their content to meet the demands of an ever-changing platform. For some, this infiltrated real-life cycling experiences in a negative way: *"It's hard not to sometimes see what you're doing through the lens of Instagram... you start just seeing things through, like, a content lens, which can be really sad in a way"* (P11).

4.3.2 The labour of visibility. The ongoing effort to create and share content comes with a cost. Participants described frustration, guilt, fatigue and increased stress associated with trying to maintain relevance on the platform. Others reported experiencing a sense of burnout: *"I just got tired of trying to figure it out or trying to keep up with it" (*P1). For participant 4, the constant machinations of the algorithm left them feeling *"played"* and limited their enjoyment and capacity on Instagram: *"Why do they need to change it at all?.... Why is it so hard? Why does it have to be a game? It's not a fun game, and I don't have time for the game"*.

For some, this translated into feelings of inadequacy. Participant 5 felt pressure to *"feed the cycle"*, and said *"I always feel like I'm not doing enough"*. Similarly, participant 7 stated: *"I kept stressing myself out, this idea of if I don't post consistently, then I'm going to lose traction, and then I'm going to lose that following and then it's all going to be for nothing"*. They went on to explain how the pressures around content creation resulted in them stopping enjoying cycling as an activity in and of itself: *"it felt like, rather than just being like, it' a nice day, I'm going to go and ride my bike, it became about it's a nice day, I really should be out of the bike so that I can get content. And it just made me not want to do it anymore"*. This constant effort – of tracking engagement, adapting to change, and trying to stay visible, was a labour in itself. For many, this was at odds with the inclusive, supportive, environment that had originally drawn them to these communities.

4.3.3 Futures and fading engagement. Despite the pressures and frustrations, participants agreed that social media remained the dominant platform for online cycling communities. As participant 1 reflected, *"what it will evolve to eventually, I don't know. But it's really an exciting time in social media. And... even with Instagram*

messing with algorithms and things like that, it's still like, Instagram's still the place to be to connect with and find out about these communities". However, others described a change in their own engagement — either through conscious withdrawal, or a shift in motivation. Participant 7 described feeling like their voice was no longer needed, and a sense that the wave of online activity that came out of the Covid-19 pandemic may have peaked: *"the landscape's moved on without me and I don't feel like I'm needed anymore. I feel like there are so many really amazing voices out there, that I'm quite happy to just sit back and enjoy it, and just be someone who rides my bike".*

These reflections reveal the ongoing effort required to remain visible on a platform that continually evolves, and the toll this can take over time. While Instagram continues to offer important spaces for connection and visibility, sustaining this engagement was, for many, far from simple.

5 Discussion

Our findings highlight the opportunities and challenges of using Instagram as a platform for supporting inclusive cycling communities, and supporting broadened participation in cycling. While Instagram helped individuals and groups come together to challenge narratives in cycling and provide support to others, it also burdens users, who must navigate algorithmic shifts, visibility pressures, and a platform not designed with grassroots communities in mind. Our participants reported positive experiences and meaningful engagements on the platform, resulting in information sharing, new friendships, and a perception of supporting broadened diversity in cycling. However, their use of Instagram was not without challenges. This discussion draws together three contributions: (1) the concept of 'patchwork communities' for inclusive cycling; (2) recognition of online representation as a form of social support; and (3) the need to reimagine platform sustainability for grassroots, inclusive movements.

5.1 'Patchwork communities' as an inclusive alternative

Despite its limitations as a community-building platform, Instagram served as a useful tool for our participants to create flexible, self-selected, and intersectional networks: what we describe as *'patchwork communities'*. These grassroots community networks were not defined by formal membership, geographic proximity or rigid organisational structures, but instead from overlapping digital interactions, shared values and reciprocal recognition. Informally constructed through a combination of followed accounts, shared hashtags, mutual engagements, and algorithmic suggestions, our participants 'stitched' together their own personalised social 'patchwork' of connections shaped by lived experiences, and common identities and values. These were not formalised groups, but fluid and emergent constellations that offered familiarity, validation, and solidarity. Participants described assembling these 'patchworks' by following accounts aligned with shared identities and values, using and browsing hashtags, exchanging comments and direct messages, and relying on algorithmic recommendations; over time, these lightweight ties crystallised into more durable connections and, in some cases, offline friendships.

These communities provide an alternative to traditional cycling clubs, which our participants found lacked diversity and representation, characterising them as homogeneous, male-dominated, unwelcoming to diverse participants, and constrained by location. Participants reflected that local clubs often failed to reflect the diverse identities and experiences of cyclists, or to foster inclusive spaces where all cyclists felt they could belong. In contrast, Instagram enabled participants to curate spaces that reflect their interests, identities, and values. The term grassroots has been used to describe digital organising around shared values, including in HCI contexts [22, 26], our notion of 'patchwork communities' builds on this, highlighting a decentralised, person-centred, and value-driven organic formation, avoiding formal memberships, or shared offline infrastructure. These patchworks fostered a broader approach to community, supporting a larger number of 'weak tie' social connections [33, 43], and offering exposure to other cyclists with diverse intersectional characteristics. Participants described gradually building up a sense of community through interacting with like-minded individuals and organisations, often beginning through visibility and mutual recognition, before evolving into closer relationships and in some cases, offline friendships.

This form of community contrasts not only with traditional clubs but also with more bounded and centralised digital communities, such Facebook Groups, sub-Reddit threads, or forums, where users *"join a community of X"* and are typically governed by moderators and fixed boundaries. In contrast, Instagram afforded what participants described as "self-made pockets" of belonging, enabled through more organic and fluid forms of connection. This resonates with existing work on digital counterpublics, where marginalised communities make use of digital platforms to share alternative narratives [44]. This includes Trott's [81] study of women's cycling groups, which describes Facebook communities functioning as "virtual clubhouses" and digital counterpublics – spaces for women and gender-diverse cyclists to connect, share knowledge, and push back against the male-dominated landscape of competitive and recreational cycling. In our participants' accounts, patchwork communities extend this framing by emphasising flexibility: rather than cohering around a single cause or identity, they often encompassed overlapping experiences across gender, race, size, mental health, and more. They were stitched together not through formal calls to action, but through ambient engagement: everyday acts of following, liking, messaging, and mutual care. The platform's visual nature further supported this, as users could share images representing diverse body types, abilities, and cycling styles, challenging mainstream narratives of what a 'cyclist' looks like. Our findings align with broader HCI and CSCW work on intersectionality and identity on digital platforms, which emphasises the expression of complex, multifaceted identities [11, 28], but it also requires effort and intentionality, and leads to a level of precarity as the *patchwork* is reliant on an ever-changing platform.

5.2 Representation as a form of social support: balancing visibility and safety in online communities

Traditional models of social support emphasise informational, emotional, appraisal and instrumental support [41, 42]. Our findings

highlight how *representation* on social media, particularly the visual representation of diverse identities, can be considered a distinct and important form of social support. Unlike companionship or network support, representation does not require a direct relationship between content producers and consumers yet still plays a crucial role in creating a sense of belonging. Participants repeatedly stressed the importance of seeing diverse bodies and identities in a cycling context. This visibility fostered feelings of inclusion and belonging within their communities, encouraging them to participate in ways that felt authentic and welcoming. Several participants reflected on how encountering representation had shaped their involvement in cycling, and in turn, how they felt motivated to share content with others who might benefit. As participant 5 succinctly told us, *"you can't be what you can't see"*.

This increased visibility of diverse cyclists not only supported individual participation but also acted as a mechanism for challenging social norms. By recognising representation as a form of social support, our research extends traditional social support theories [41, 42] and highlights important ways in which social media can be leveraged to foster inclusivity through *visual representation* in sport and beyond, not just interpersonal connections. However, this also raises questions about the reach of content beyond the community 'bubble', showing a clear tension between balancing visibility of content, and the protective, safety, effect of staying within the 'bubble'. This aligns with literature on traditional sports media [16] and leisure [7], which suggests that modelling, through visible and relatable role models, can have broader implications for participation. Our work builds on this by arguing that modelling, or digital self-representation can itself be a deliberate, outward-facing act. When our participants posted photos of themselves cycling, our participants were not only documenting experiences, but also sharing inclusive representations with others in mind.

This is particularly interesting in the context of Instagram, a platform often designed around the performance of self and personal brand [64]. While this logic encourages the curation of idealised, aestheticised images, our participants intentionally subverted this: choosing instead to share images of real-world diversity, from body types and fitness levels to kit, location, and cycling style, with the goal of helping others feel included. In some cases, these acts were described as political: conscious efforts to "take up space" in a sport where many of them had previously felt unwelcome.

A recent report [1] detailed findings from an analysis of 100 'family cycling' images from UK web searches and found that almost all depicted white, able-bodied, slim people in conventional family structures, concluding that such representations narrow the public imagination of who cycles, where, and how. The content shared by our participants on Instagram is stark in contrast: inclusive, intersectional, embodied, and situated in real-world experiences, offering an alternative representations of what cyclists, and cycling, can look like. This work resonates with Low et al. [49], who analysed over 1,000 Instagram posts shared by women participating in outdoor activities. They found that while mainstream portrayals of adventure reinforce masculine and elite narratives, user-generated content created a "DigiPlace" where women reshaped their own visibility and norms around participation. Similarly, our participants engaged in a form of visual counter-narrative building, helping to expand who is seen, and what is normalised, in cycling culture.

Instagram's algorithm reinforces content "bubbles" or "echo chambers", by prioritising familiarity and past engagement. While this can help create a "safe space", aiding user preservation [20] and protecting users from negative messaging and potential bullying, by primarily sharing with those who have previously interacted with similar posts [47], it also limits reach. Our participants almost universally reported Instagram as a supportive and friendly platform, curating content that aligned with their interests and values, while exposing them to little abuse or harassment. This contrasts with experiences on other platforms such as TikTok, where the 'For You' page can present diverse but potentially harmful content, leading to a 'runaway train' effect where users are exposed to a wide range of interactions [53] – an experience which would likely ruin the friendly curated community our participants reflected to us, and lead to users leaving the platform.

However, this protective bubble also presents challenges for increasing diversity and representation in cycling, potentially limiting content's reach and impact Our Participants expressed frustration that their efforts to share diverse content might receive limited visibility outside of their immediate networks. While representation can challenge social norms and foster inclusivity, its impact relies on visibility of said content, creating a tension between visibility and protection: sharing widely increases risk, but staying safe may limit broader influence. This dilemma echoes broader concerns about social media's role in reinforcing existing beliefs and limiting exposure to diverse perspectives [31]. Social representation theory [54] suggests that increased visibility of diverse cyclists could potentially make the sport more inclusive by challenging cultural norms. This takes on particular significance in the context of efforts to increase diversity in sports and leisure activities, where representation plays a crucial role in shaping perceptions and encouraging participation – helping potential cyclists feel that cycling is 'for them' [7].

Platform designers and researchers have an opportunity to support this work by developing infrastructure that amplifies diverse content without exposing users to harm. This could include smarter visibility tools, targeted reach options, or more responsive moderation systems. Representation, in this sense, is not just a personal act of expression, but a collective infrastructure for social support. But without platform support, its reach and sustainability remain limited. This is particularly important given recent changes to content moderation practices on social media platforms [89].

5.3 Platform pressures and the sustainability of grassroots communities

Building on the importance of visibility for representation, our findings highlight how Instagram's ongoing 'algorithmic' changes to how content is prioritised and displayed, increases pressure on creators to remain relevant and visible on the platform: shaping what is seen, by whom, and at what cost. While Instagram enabled our participants to assemble inclusive and supportive spaces, the ongoing evolution of the platform created notable tensions, particularly as changes to the content display algorithm increasingly shaped what content was seen, and by whom. This highlights concerns for the longer-term sustainability of such communities.

As Instagram shifted to prioritise reels, video content, and algorithmically-curated feeds, our participants expressed a growing awareness of needing to *'feed the algorithm'* in order for their content to remain visible. These changes gave rise to what DeVito and others have described as folk theories [20, 27]: informal, user-developed beliefs about how the algorithm functions, and the types of content it prioritises displaying to users. For example, participants noted a shift towards video content, believing that the algorithm prioritised videos over photos. The opaque nature of Instagram's algorithmic 'black box', contributed to a sense of loss of control, and folk theories influenced posting behaviour, from using trending audio, to deliberately structuring content for better engagement. Participants described how producing content had become "an expert job" (P4), and several noted frustration, fatigue, or burnout from attempts to keep up with the shifting priorities of the platform.

Some participants described how changes in the feed disrupted their ability to stay connected with their networks, or made their posts less visible to others in the community. At the time of our data collection, Instagram's self-curated communities contrasted with platforms like TikTok, where the algorithm predominantly dictates content visibility through the 'For You' page, potentially limiting the diversity of content seen by users and presenting unwanted or negative content [53]. Instead, Instagram content was largely presented based on followed accounts and previous engagements, shaping community dynamics. However, participants noted changes in Instagram's content display, with an increasing emphasis on algorithmically-curated content similar to TikTok's 'For You' feed. Participants were concerned that this shift could undermine the networks they created, potentially undermining the 'patchwork communities' our participants carefully curated, as the display of algorithmically-curated content increasingly overshadowed community posts. Where once Instagram allowed them to build meaningful relationships based on shared values and identity, the growing emphasis on algorithmic curation risked making these communities less visible and less cohesive.

The ever-evolving nature of social media platforms, particularly Instagram, creates challenges for the sustainability of online communities. Our findings show how platform changes can have a significant impact on community dynamics and user engagement, and that some users feel pressured to adapt, leading to further disengagement and fatigue.

These concerns relate to a broader shift in platform dynamics, where human-centred community-building is increasingly mediated by automated systems. This creates a tension between authenticity and algorithmic performance: users must navigate content creation not just as personal expression, but as a strategic negotiation with the platform. The emotional impact of this labour, and the pressure to produce algorithm-friendly content, can detract from the enjoyment of cycling itself, as participants reported feeling stressed and overwhelmed by the demands of content creation. This aligns with work on the algorithmic imaginary [12, 69], which explores how creators' perceptions of algorithmic systems shape their identities and practices, and echoing findings elsewhere (e.g.[17]), our participants were concerned about the effort required to keep up with these changes. These pressures can alter community interactions, moving from fostering supportive, authentic communities, to a focus on maintaining visibility. Furthermore, these pressures could raise wellbeing issues, as the impact of algorithmic demands on mental health is a potential concern [13].

Compounding these challenges is the issue of platform lock-in [29]: despite frustrations with Instagram's changes, many participants felt unable to move to alternative platforms because of critical mass of community-members on Instagram, and the fact that technologies can only support activist movements if enough people use them [26]. As van Dijck et al. note, the commercialisation of digital life has created a "platform society" [21], in which community dynamics are increasingly governed by proprietary infrastructures. In this context, participants described being "stuck" on Instagram: while the platform no longer fully served their needs, the cost of leaving was simply too high, raising questions about long-term sustainability in an environment of constant change.

These tensions speak to a deeper misalignment between the social values of digital communities and the design of commercial platforms. Our participants used Instagram to foster inclusive spaces, but this often conflicted with platform priorities around engagement, reach, and ultimately monetisation. Representation centring marginalised people is in tension with an opaque algorithm; echoing other work that points to the tensions between the social values of grassroots movements and those imposed by widely available technologies [32]. If social media platforms are to support the long-term sustainability of grassroots communities like those in our study, they must offer greater flexibility, transparency, and control. This could involve tools to better personalise algorithmic curation, metrics that value meaningful interaction over attention time, or mechanisms that allow users to foreground community relationships. Designing for sustainable participation means acknowledging the emotional and logistical labour of visibility, and building systems that support those efforts.

6 Limitations and future work

Our relatively small sample of 12 participants provided a diverse range of perspectives from across the inclusive cycling community. Although a larger sample would have likely led to more varied responses in terms of participants' lived experience and intersectional characteristics, we believe that findings related to the broader community and its tensions with the platform would be similar. Each of our participants were interested in broadening participation in cycling, as was intentional in our recruitment strategy, which relied on self-selected participants, most of whom were actively creating content and contributing to discussion. Our sample did not include cyclists uninterested in broadening participation, those at the start of their cycling journey, or 'lurkers' who make up a significant portion of online community traffic and who may have good reasons for not participating in online communities [76]. As such, our research does not represent the broader cycling community on Instagram, and our sample undoubtedly included participants who were highly motivated and passionate about inclusivity.

We also focused solely on Instagram. While this decision reflected our participants' own emphasis on the platform, and its particular affordances for visual representation and community-building, this does limit transferability of insights to other platforms such as Strava, TikTok, or Facebook, which play different roles in

cycling culture. In addition, our work was not designed to evaluate whether participants' efforts on Instagram directly increased cycling participation or diversity; instead, we focused on participants' perspectives and experiences of using the platform.

Future research should expand to consider other platforms, include non-users, allies, and members of overrepresented groups, and look beyond the UK to provide a more comprehensive understanding of community dynamics. Further work is also needed to examine how online representations translate into actual participation and retention in cycling, and how platform design might better support inclusive, grassroots communities over time.

7 Conclusions

This paper explores how diverse cyclists use Instagram to facilitate the creation of inclusive and intersectional 'patchwork communities'. Rather than evaluating outcomes in terms of increased participation, our study examined participants' perspectives and experiences of using Instagram to support broadened diversity in cycling through shared experiences, information, and representation. We highlight the complex relationship between platform affordances and user needs, showing how changes to the platform and algorithm affect community dynamics. Our findings contribute to understanding how social media can both support and challenge efforts to foster inclusivity in sports communities. We provide insights into the benefits and challenges of using social media platforms for inclusive community building, offering implications for platform designers, communities themselves, and HCI researchers. These contributions provide a foundation for future research into community support, representation, and the sustainability of diverse online communities in an ever-changing online landscape.

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