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Affective geographies of e-scooter travel: Infrastructure, emotions, and adaptive strategies

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ABSTRACT

Despite their popularity, limited attention has been given to understanding what captivates e-scooter riders and sustains their interest in the device. While surveys consistently rank e-scooters as a highly satisfying transport mode, such evaluations often reduce complex experiences to a single numeric score, leaving much unexplored. Using a video-recorded ride-along interview methodology, this study examines how infrastructure and spatial configurations influence the affective experiences of 12 e-scooter riders in Barcelona. Our observations reveal that trips encompass a wide range of emotional registers, from positive activation to negative deactivation emotions, often contingent on the quality of the infrastructure. Furthermore, by combining observational material with participants' interview narratives, we show that the intrinsic characteristics of these devices—lightness, manoeuvrability, and quiet operation—play a key role in how participants define relationships with infrastructure and the situations encountered. Across these accounts, a recurring ideal of frictionless mobility emerged, with riders expressing a strong expectation for uninterrupted travel that shaped both their behaviours and their emotional responses. By uncovering the interplay between cycling infrastructure, emotions, adaptive strategies and the pursuit of frictionless mobility, this paper shed light on the processes underpinning e-scooter satisfaction and underscores the importance of integrating affective dimensions into urban design.

1. Introduction

Introduced in 2017 and consolidated in the aftermath of the pandemic, the popularization of electric scooters (e-scooters) in cities has expanded the travel possibilities available to urban dwellers (Nello-Deakin et al., 2024; Sun and Ertz, 2022). At the same time, however, their deployment has changed the dynamics of urban mobility, introducing new levels of complexity, and posing new challenges at a city level. Especially in dense and compact urban environments, where space is a particularly finite resource, the rising number of e-scooters in circulation has caused the domains reserved for conventional transport to become blurred (Gibson et al., 2022), sparking controversy and debate among private motorized vehicle drivers, pedestrians and even cyclists. E-scooter riders often struggle to find their place, leading to disputes over urban territories which could generate undesired feelings and psychological, physical, and emotional distress to both riders and other street users. The rapid expansion of their use, coupled with the absence of planning strategies for their integration into mobility and urban planning, have led to a disconnect between policy and practice, causing discomfort both for e-scooter riders and other users of the urban space (Anderson-Hall et al., 2019; Ma et al., 2021; Zou et al., 2024). In response to these tensions, this paper argues that promoting inclusive, sustainable, and emotionally attuned forms of mobility requires greater attention to the subjective experiences of micromobility users, particularly in how they relate to infrastructure design and regulatory frameworks.

To date, micromobility research has acknowledged that e-scooter travel behaviour is influenced by environmental factors (S. Bai and Jiao, 2020; Caspi et al., 2020), and that riding experiences may potentially be conditioned by personal preferences and fears (Hardinghaus and Weschke, 2022). Additionally, previous studies have demonstrated that the use of novel innovations or products, such as e-scooters, initially elicits higher positive emotions, and that these emotions often diminish over time (Flores and Jansson, 2022). Although recent developments in emotional, affective, and sensorial geographies emphasize the importance of attending to emotions as critical components in mobility

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research and policy design (O. B. Jensen, 2010; Shaker and Ahmadi, 2022; Tironi and Palacios, 2016), the emotional dimension of e-scooter use, and the ways in which these emotions are shaped by the material, spatial and regulatory configurations of infrastructure, remains largely underexplored. These configurations include elements such as cycle lanes, sidewalks, traffic signals, surface quality, and path continuity, all of which that condition how riders navigate, interpret, and emotionally engage with urban environments.

In fact, despite their growing popularity and wide adoption, e-scooters are often evaluated through general satisfaction surveys that reduce complex, context-dependent experiences to a single score, typically on a scale from 1 to 10 (EMEF, 2023). While these instruments consistently position e-scooters as one of the most satisfying transport modes (Askari et al., 2024; Nikiforiadis et al., 2024), they tend to offer a static and decontextualised view of satisfaction, overlooking its dynamic nature. In particular, such measures fail to capture how satisfaction is shaped by the interaction between bodily sensations, infrastructural affordances, and the everyday rhythms of urban space. This simplification leaves key affective and experiential dimensions unexplored, especially when compared to other micromobility modes that have received greater qualitative attention. As previous researchers have already done in other fields (Bondi, 2005; Roy et al., 2024), there is a need to incorporate affective and emotional geographies that focus on e-scooter riders' experiences of place and space (Glenn et al., 2020; Milakis et al., 2020), closing the knowledge gap regarding the link between the urban infrastructure and the affective dimension of travel.

Drawing on insights from emotional and affective geographies, we conceptualize the built environment not only as a physical infrastructure, but also as a medium that modulates how individuals experience, interpret and respond to disruptions or affordances in space. Rather than isolating infrastructure, behaviour and emotions as separate analytical layers, this paper foregrounds their co-constitution: how spatial configurations condition embodied responses, and how these responses, in turn, inform adaptive travel strategies and affective states. By examining specific e-scooter trips through the lens of affective atmospheres and the work of emotions (Quéré, 2012), we explore how users' experiences influence their mobility practices and their relational engagement with infrastructure. These affective atmospheres are not static but constantly redefined by individuals, shaped by their available resources, perceptions, and interactions with the urban environment. This paper aims to contribute to bridging the identified knowledge gap by advancing a situated understanding of how infrastructural and spatial design conditions influence both the emotional and behavioural dimensions of e-scooter travel. In doing so, we move beyond fixed or static views of travel satisfaction and well-being, to consider it as a dynamic and evolving process. The study draws on video-recorded ride-along interviews conducted in Barcelona, Spain, and employs a dual qualitative approach combining (1) discourse analysis of participant narratives and (2) observational analysis of embodied practices captured on video.

2. Background

2.1. E-scooter and travel satisfaction

In the last few years, researchers have started to examine the travel satisfaction associated with different micromobility modes (Mouratidis et al., 2023). So far, initial findings have generally revealed high levels of satisfaction associated with e-scooter usage, primarily linking this sense of fulfilment to cognitive and functional factors (Aman et al., 2021). Based on stated preference set-ups, the literature has presented e-scooters as a practical mode of transport for daily commuting, enhancing travel independence and predictability in scheduling (Eccarius and Lu, 2018; Kopplin et al., 2021), while requiring minimal physical effort. This is in contrast to the inconveniences, slow pace, or crowdedness associated with traditional modes of transport (Hyvönen et al., 2016; Mitra and Hess, 2021). E-scooter ease of navigation and comfort while driving (Kopplin et al., 2021), along with shorter trip duration (Bielinski and Wazna, 2020; Glavic et al., 2021), and enhanced route selecting capabilities (Cubells et al., 2023), have also been cited as factors that potentially contribute to user satisfaction.

Beyond these functional factors, non-functional or sociopsychological aspects have also been found to play a significant role in users' engagement with these devices (Bretones and Marquet, 2022). One of the most frequently cited non-functional factors linked to high levels of e-scooter satisfaction, is that of environmental awareness. According to Eccarius and Lu (2020) or Mitra and Hess (2021), for instance, being environmentally conscious, and hence using an environmentally friendly mode of transport is perceived as doing a "social good", which increases the gratification associated with the modal choice. Several studies have found individual perceptions of a positive and pleasant riding experience to also serve as motivation for adopting and using e-scooters for their daily commutes (Fitt and Curl, 2020; Hyvönen et al., 2016; Sanders et al., 2020; Sellaouti et al., 2019), highlighting how important it is to experience fun and freedom as part of the ride (Will et al., 2021). Similarly, the increased potential of exposure to the natural environment as well as the perception of physical activity have also been identified as addressing the connection between e-scooter use, well-being and mental health, especially for those users replacing sedentary modes of commuting, such as the car or bus. This analysis provides a valuable starting point from which to examine the potential benefits of e-scooter use for specific populations (Grant-Muller et al., 2023).

2.2. The influence of the environment on e-scooter travel

Research has also taken steps in understanding e-scooter to the usage and network level. Primarily employing quantitative methods, such as analysing the open-source databases of e-scooter companies or through ad-hoc surveys, existing literature provides valuable insights into, for instance, the distribution of ridership (S. Bai and Jiao, 2020; Hosseinzadeh et al., 2021), the most frequent paths (Haworth et al., 2021; Zakhem and Smith-Colin, 2021; Zhang et al., 2021), peak usage hours (Foissaud et al., 2022; Mathew et al., 2019), or the impact of external factors such as weather conditions (Kimpton et al., 2022). In general, what most of these studies have in common is the recognition of a certain typology of cycling infrastructure as a critical factor for reaching minimum user volumes (Caspi et al., 2020; Zhang et al., 2021). E-scooter users seem to consistently favour dedicated, one-way, and well-lit cycling infrastructure (Caspi et al., 2020; Yang et al., 2022; Zhang et al., 2021; Zuniga-Garcia et al., 2021), while showing aversion towards similar kinds of urban elements, such as sidewalks (Bai et al., 2017) or the presence of traffic lights (Cubells et al., 2023a; Prato et al., 2018). However, e-scooter ridership is more nuanced than these general preferences suggest, with results often being context-dependent and not conclusive. In Austin, for instance, e-scooter riders were found to take detours so as to integrate urban greenness into their rides (S. Bai and Jiao, 2020), a behaviour also observed in Calgary, Canada (Yang et al., 2022). In contrast, in Barcelona, where e-scooters are privately-owned, although riders also take longer detours than other micromobility users, they do not do so to in a quest for exposure to urban greenery (Cubells et al., 2023a). This variety in findings seems to suggest that e-scooter riding decisions are indeed influenced by factors such as urban context or city layout. At the same time, it also seems to suggest that differences in access (i.e., whether riders use sharing services or they own a personal device) should also be considered as a factor likely to influence their behaviour, which would be adding another layer of complexity in understanding e-scooter travel experiences (Roig-Costa et al., 2024a).

Some other studies have employed more experimental setups and observational techniques to delve deeper into the nuances of e-scooter use at a more micro level, examining specific aspects such as riding vibration (Cano-Moreno et al., 2021), parking habits (Brown et al., 2020; James et al., 2019), and interactions with other road users (Che et al.,

2021). Tuncer et al. (2020), for example, applied an ethnomethodological lens, using video recordings to illustrate how e-scooter riders dismounted and manoeuvred to secure the right of way, while also examining the reactions of both pedestrians and riders when confronted with the sudden presence of e-scooters. Similarly, Gibson et al. (2022) conducted in-depth interviews with e-scooter riders and pedestrians. Their thematic analysis highlighted the uneven and unfamiliar socio-spatial encounters between these groups, indicating that the presence of different transport modes with various navigation characteristics functioned as a modulator of public space users' navigation experiences.

2.3. Affects and emotions in e-scooter travel experiences

While the environment is often analysed in terms of network coverage or infrastructural quality, recent research in mobility studies and emotional geography suggests that it also functions as an affective field, generating sensory cues, symbolic meanings, and emotional affordances that shape how people move and feel in space (A. Jensen, 2011; Roy et al., 2024). Despite significant progress in identifying environmental determinants of e-scooter route choices (Cubells et al., 2023a; Zhang et al., 2021), much of the existing research lacks explanations of the rationale driving these decisions. While it is firmly established that travel behaviour is influenced by specific events experienced during travel (Ettema et al., 2011), most attempts to uncover the motivations and subjective aspects behind riders' route choices remain largely hypothetical. Surveys have occasionally complemented behavioural data with users' self-reported perceptions of comfort or experience, but affective responses are often missed, particularly when relying on quantitative approaches. Furthermore, ex-post self-reports are prone to memory biases and lack the depth required to capture the subtleties of how e-scooter riders emotionally engage with the urban environment and with other public space users.

In particular, existing methods struggle to grasp how riders navigate the city, react to interruptions or affordances and position themselves within specific socio-material contexts, all of which can significantly shape emotions experiences. In response to this gap, Zeile et al. (2016), for instance, integrated bio-physiological sensors to identify urban areas where cyclists experienced heightened stress or emotional activation. While their work focused on bicycles, it demonstrated the potential of tracking affective peaks, such as fear and anger, linked to specific spatial configurations. E-scooter riders, too, experience a range of sensory and emotional reactions, ranging from exhilaration and calm to frustration or vulnerability, which eventually shape their broader mobility decisions (Kazemzadeh and Sprei, 2022). These affective responses can also be conditioned by the social dynamics surrounding e-scooter use. For some, riding is accompanied by a "social pull", a sense of personal identification and feeling of belongingness with the micromobility community (Huang, 2021), while others report negative social feedback, such as harassment and derogatory comments, which contributes to a persistent stigma (Gibson et al., 2022; Mayer et al., 2020). These type of interactions, described by Friman (2004) as *critical incidents*, tend to evoke strong emotional reactions and can significantly shape overall satisfaction, perceived safety, and long-term behavioural patterns.

Beyond understanding how social context influences rider emotions, it is crucial to examine how users are affected by their physical surroundings and by the strategies they use to navigate them. Emotions, though internal, are shaped by external environments and emerge through spatial experience, embodied practice and interaction with the built and social world (Roy et al., 2024). This makes it essential to explore how riders feel in place and how their travel satisfaction is mediated by urban infrastructure, regulation, spatial legibility and other environmental conditions. Given the current limitations in capturing such embodied and sensory layers of experience, this study adopts a mobile qualitative perspective aimed at uncovering the emotional and affective dimensions of e-scooter travel. By observing actual behaviour in situ and analysing discourse and gesture through video-recorded mobile interviews, we offer a more textured understanding of how spatial configurations influence riders' emotional wellbeing. In doing so, we aim to move beyond a static view of satisfaction and contribute to a more nuanced perspective on micromobility's role in shaping everyday urban experience.

3. Methodology

3.1. E-scooters and Barcelona: the particularities of the study-setting

This study was conducted in Barcelona, Spain, on the northwest coast of the Mediterranean Sea. Despite recent years have seen expansions of Barcelona's cycling infrastructure (reaching 268 km in 2025), the city inherits decades of car-centric urban planning (Miralles-Guasch, 2009; Walker et al., 2023). This historical legacy continues to shape how public space is distributed and contested, often limiting the harmonious integration of emerging mobility modes such as e-scooters. In such a dense and compact city, where space is a particularly finite resource, precisely due to concerns over the occupation of public space and related dysfunctions, in 2017 the City Council of Barcelona enacted legislation prohibiting free-floating e-scooter companies (e.g., Lime or Bird) from operating within the city's administrative boundaries (Ajuntament de Barcelona, 2017). While the ban was originally framed as a pragmatic measure to protect shared urban space, it unintentionally triggered a rapid increase in the popularity of privately owned e-scooters, with trips rising by 179.6 % between 2020 and 2021 (EMEF, 2022).

At the regulatory level, privately-owned e-scooters must comply with specific municipal rules regarding both equipment and circulation. Riders are required to wear a helmet, and the vehicle must be equipped with both front and rear lights. Circulation is strictly prohibited on sidewalks and other pedestrian-only areas under any circumstance. Instead, users are allowed to travel on designated on-road cycle lanes, where they may circulate at a maximum speed of 25 km/h, although they are required to reduce their speed when approaching pedestrian crossings. When riding on sidewalk-integrated cycle lanes, the maximum permitted speed drops to 10 km/h. E-scooters are also permitted on single-platform streets, where the speed limit is capped at 20 km/h, and on pedestrian zones, where they may circulate at up to 10 km/h, but only in cases where their passage is explicitly authorized. In addition, they may circulate on zone 30 streets at a maximum of 25 km/h, and within parks, where speeds must not exceed 10 km/h (Ajuntament de Barcelona, 2024). This regulatory framework reflects an effort to integrate e-scooters into Barcelona's complex mobility landscape while ensuring safety and coexistence with other users. However, it also imposes constraints that may require riders to adjust their speed frequently and remain alert to changes in the permissibility of different spaces, contributing to a discontinuous and highly contingent riding experience.

3.2. Participants recruitment and protocol

During June and July of 2022, the first author conducted individual interviews with 12 e-scooter riders in Barcelona, all of whom had previously participated in earlier stages of the project and had agreed to be contacted in future phases of the investigation. These participants were reengaged via WhatsApp and invited to take part in a follow-up interview, with no incentives provided. According to Hennink et al. (2017), code saturation (which represents the point which no additional codes emerge from the data) is generally reached after 9 participants. After performing a preliminary coding of the 12 interviews, the research team reached a consensus that no substantially new codes were emerging, and that code saturation had been achieved. Therefore, the number of participants was considered sufficient for the study exploratory goals.

Due to the specific legal framework in Barcelona, participants in our

study were all users of privately-owned devices. This should be noted as we consider it to be by no means an insignificant detail in the study of behaviour and the relationship with the urban environment. The study was conducted in accordance with ethical research standards. Participants provided informed consent prior to participation, ensuring they were aware of the study's purpose, their voluntary involvement, and their right to withdraw at any time. The study received ethical approval from the Research Ethics Committee of the Universitat Autònoma de Barcelona (CERec, ref. 3656), ensuring that all procedures related to recruitment, informed consent, data collection, and data management complied with established ethical standards and respected participants' rights, privacy, and confidentiality.

3.3. Interviews

The data collection involved a dual approach: a mobile interview conducted during e-scooter rides and a follow-up static interview. Prior to the ride, participants completed a short survey that collected basic personal and background information (age, gender, years of e-scooter use) alongside evaluative questions about the forthcoming trip, including the Satisfaction with Travel Scale (STS) (Ettema et al., 2011) (for more details, see "Appendix A Supplementary Materials"). Administering the STS at this early stage allowed to capture participants' anticipatory evaluations of the trip, while also providing them with a more nuanced emotional vocabulary capable of triggering precise reflections during the ride-along itself (Bissell, 2010; Hein et al., 2008). Table 1 summarizes key characteristics of the participants and their trips, including gender, age and years of riding experience, information which provided important context. Information on trip characteristics and participant attitudes can also be found. During this phase of the study, the research team accumulated a total of 4 h of video and almost 9 h of interviews.

3.3.1. Mobile interviews

Ride-alongs were chosen to capture the embodied experiences of e-scootering, allowing the researcher and the participants to move through space together. This method offered a unique opportunity to explore e-scooter routes, spatial interactions, and user experiences, enabling discussions that might not otherwise arise (Wegerif, 2019). Participants were instructed to select a routine trip that they perform on a regular basis, ensuring the contextual relevance of the gathered insights. Drawing from methodology outlined in earlier research (Roig-Costa et al., 2025; Van Cauwenberg et al., 2018), and recognizing the challenges of maintaining a coherent conversation while riding an e-scooter, participants were advised against trying to engage in dialogue with the researcher. Instead, they were installed a microphone on their lapel and encouraged to share their thoughts and emotions using a think aloud method (Eccles and Arsal, 2017), without expecting a response from the researcher. To enrich participants reflections, the narrative was boosted using targeted questions posed at natural pauses such as red traffic lights or intersections.

In practical terms, this translated into a layered recording setup, capturing participants' verbalized reflections alongside their embodied movements through space. Participants verbal statements and reflections were recorded using a digital voice recorder (Sony ICDPX240. CE7). Additionally, the whole trips were video-documented with a compact camera (GoPro Max) installed on the researcher's e-scooter handlebar and simultaneously tracked using a GPS datalogger receiver (Qstarz BT-Q1000X), which logged the exact location of participants every 5 s. This approach draws inspiration from shadowing methodologies (Jirón, 2011), which emphasize the value of accompanying participants in their daily trajectories to gain insights into their embodied mobility practices and the affective and spatial dynamics of movement. By using this approach, researchers were able not only to prioritize participant safety, but also to preserve the organic nature and characteristics of the trip. All participants, without exception, travelled via e-scooters as part of their daily routines, and had been doing so for at least one year. Fig. 1 displays P01 trip. Additional specific trips for all participants in our study can be found in the Supplementary Materials.

3.3.2. Static interviews

At the end of the ride-along, the video camera was turned off, and a semi-structured interview based on the previous trip took place with each participant. This lasted approximately 25 min and involved a discussion of the attitudes, decisions and behaviours engaged by participants during the recorded trip. Together, these measures offer a nuanced understanding of participants' immediate experience of travel.

3.4. Data analyses

The analysis was structured in three distinct stages: an initial behavioural stage, a subsequent discursive stage, and an integrative phase anchoring discourse to space. All phases were conducted collaboratively by the three co-authors. To ensure analytical rigour and incorporate multiple perspectives, the initial counting and coding and classification were performed independently by two researchers, followed by consensus-building sessions. Triangulation was applied by cross-referencing video, audio, and field notes to identify recurring patterns. Additionally, peer review sessions with colleagues external to the core research team were conducted to critically discuss emerging themes and validate interpretations.

3.4.1. Behavioural and spatial interaction

The first stage of the analysis focused on observable travel behaviour and relied on two complementary sources: video footage and GPS tracking. Video recordings of the ride-along interview were downloaded to the researcher's laptop the same day the interview took place. These recordings were then reviewed to categorize user behaviour, with particular attention to how participants navigated the city, identifying patterns, deviations and responses to street infrastructure. In parallel,

Table 1
Participants and trips characteristics.

Code	Gender	Age	Riding experience (years)	Trip reason	Trip distance (km)	Trip duration (min)	Riding time (min)	Walking time (min)	Av. speed (km/h)	Max. speed (km/h)	Helmet
P01	Woman	37	4	Work	1,5	10	6	4	9,93	25,02	Yes
P02	Man	38	3	Leisure	2,6	5	5	0	12,08	22,15	No
P03	Man	36	3	Work	6,7	32	26	6	9,40	31,78	Yes
P04	Man	40	1	Work	2,6	12	11	1	8,56	24,42	No
P05	Man	25	3	Work	5,4	24	24	0	14,82	30,45	Yes
P06	Woman	32	4	Work	3,8	20	19	1	8,51	26,48	Yes
P07	Woman	57	6	Work	4,2	28	16	12	8,09	28,06	Yes
P08	Man	51	4	Work	3,9	27	25	2	10,49	20,87	Yes
P09	Woman	54	2	Work	4,5	19	19	0	11,16	27,40	Yes
P10	Man	38	2	Work	3,6	20	19	1	9,25	25,08	Yes
P11	Woman	48	3	Work	1,9	11	10	1	7,49	20,16	Yes
P12	Man	19	2	Leisure	2,6	11	11	0	12,59	27,07	No

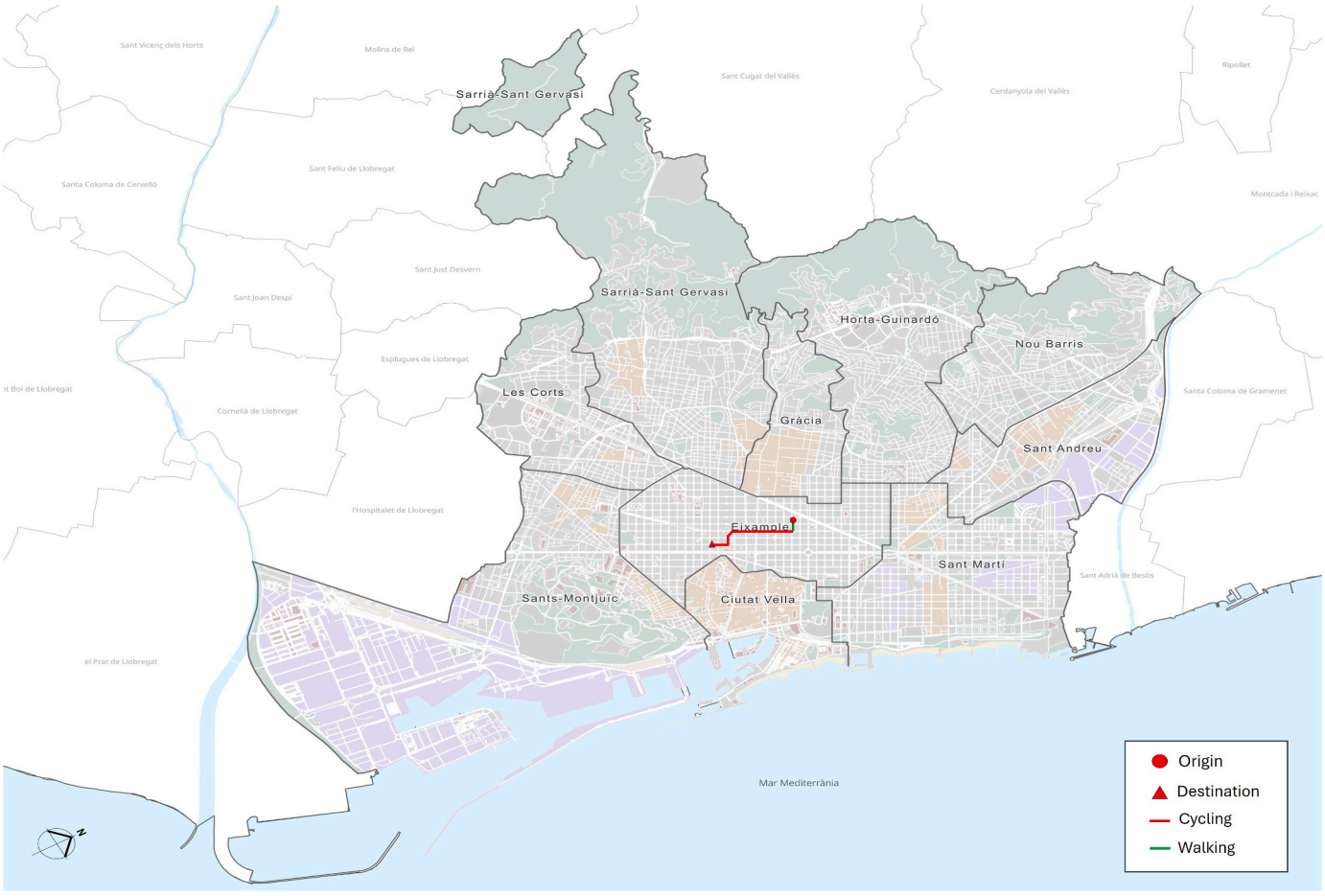

Fig. 1. P01 trip (source: own elaboration).

GPS spatial data was processed using the Human Activity Behavior Identification Tool and data Unification System (HABITUS) software, supporting a geolocated reconstruction of movement that enriched the behavioural assessment. Behavioural indicators, such as speed changes, manoeuvring tactics, and adaptation to environmental cues were audited to capture recurring actions or anomalies, as detailed in "Appendix B Supplementary Material". Participant photographs derived from the recorded videos are included to further illustrate the findings.

3.4.2. *Discursive content*

In the second stage, the thematic analysis of participants' discourses took place. The transcription process involved both the mobile (during the trip) and static interviews, and was initiated within hours of each interview and completed within a week to ensure the accuracy and retention of nuances. The thematic analysis was conducted systematically, with codes and themes generated inductively from the data and guided by the research objectives. The "open coding" process, supported by Atlas.ti software, facilitated the organisation, tagging and systematic management of large volumes of qualitative data. Following the approach outlined by Sandelowski (2001) and Van Cauwenberg et al. (2018), qualitative data was then integrated with quantitative counts of participants who discussed specific infrastructural elements to support the description of our findings. Prevalence of these elements was represented as follows: "few" for elements mentioned by less than 25 %, "some" for 25–50 %, "a lot of" (sometimes "many" for readability purposes) for 50–75 %, and "almost all" for over 75 %. Participant quotes derived from the recorded interviews were included to further illustrate the findings.

3.4.3. *Anchoring discourse within the spatial dimension*

The final stage of analysis integrated the discursive and behavioural layers by synchronising participants' verbal expressions with specific spatial contexts observed during the ride-along. This temporal alignment allowed the researchers to interpret spoken reflections not as isolated narratives but as situated responses to real-time experiences of movement and urban form. By anchoring discourse in its spatial and embodied context, this approach deepened the interpretive richness of the thematic analysis and revealed affective patterns that might otherwise remain undetected.

4. Findings

This section presents the results of the inductive qualitative analysis combining direct observation, thematic coding, and the interpretive integration of both. Among the patterns that emerged, *satisfaction* stood out as the most consistent and conceptually central theme across participants' accounts. *Cycling infrastructure* and *adaptive strategies* appeared as key elements shaping, reinforcing, or challenging this satisfaction in different urban settings. Drawing on the framework of the Satisfaction with Travel Scale (STS) (Ettema et al., 2011), satisfaction is here understood as a multidimensional construct that includes both cognitive and affective components. Cognitive evaluations refer to users' assessments of the general quality, convenience, and efficiency of the travel experience. In parallel, affective components are based on the two-dimensional model of emotional response proposed by Russell (1980, 2003), which distinguishes emotions according to their valence (pleasant–unpleasant) and level of activation (high–low).

4.1. E-scooter ridership: when functionality fuels satisfaction

As already mentioned, a highly recurring theme during the interviews was the satisfaction associated with e-scooter use, observation that aligns with previous reports and research on privately-owned e-scooters (Boo et al., 2023; EMEF, 2022; Nikiforiadis et al., 2024; Roig-Costa et al., 2024b). In almost all cases, and especially during the static part of the interviews, these observations were justified with functional factors, such as *"the convenience of door-to-door travel"* (P09) (Mitra and Hess, 2021), *"the minimal amount of physical exertion required during transportation"* (P10) (Eccarius and Lu, 2020; Sanders et al., 2020), or *"the time savings compared to other modes of transportation"* (P01) (Carroll, 2022; Glavic et al., 2021). Each of these factors contributed to a perceived high standard of trip quality and a cognitive assessment that e-scooter travel *"worked well"* and was the *"best"* transport option they could think of. Expressions such as *"You see, it is fantastic"* (P01, P09) or *"It is the best decision that I have taken"* (P05) were recorded during the rides, revealing general feelings of gratification. This connection between travel satisfaction and practical benefits confirms the significance of the functional aspects in shaping the satisfaction associated with e-scooter travel (Aman et al., 2021).

4.2. The affective dimension of e-scooter ridership: cycling infrastructure as a modulator

Rather than treating emotions as fixed responses or satisfaction as a final outcome, this section explores how the embodied act of riding an e-scooter gives rise to a dynamic range of affective states, states which are entangled with the material and spatial conditions encountered during the trip. These emotions do not emerge in a vacuum; instead, they unfold through the interaction between users' personal dispositions, infrastructural settings, and the contingencies of the ride. In this sense, affect is not simply felt, but produced, shaped by the rhythm of movement, the negotiation of speed, and the presence or absence of separation from other vehicles, for instance. In what follows, we draw from participants situated accounts to trace how emotions manifest through the ride. The analysis is structured around three types of infrastructural configurations and the affective atmospheres they tend to generate: those associated with positive engagement, those marked by ambivalence, and those that give rise to tension and alertness.

4.2.1. Infrastructural configurations supporting positive affective states

A key finding emerging from the ride-along interviews is that certain infrastructural configurations, particularly those involving spatial segregation, unidirectional flow, and sufficient width, were consistently associated with positive emotional states among e-scooter users. While these elements are often discussed separately in planning literature, our analysis suggests that it is their co-presence that enables a sense of ease, confidence, and fluency in micromobility travel.

"I prefer the one that is purely segregated". P07' clear words summarize the strong preference that almost all participants expressed for spatial segregation. In line with prior research (Cloud et al., 2022; Fonseca--Cabrera et al., 2021; Glavic et al., 2021), a lot of participants in our study described segregated bike lanes as safer spaces that reduced the constant sense of fear of collisions or close calls. Additionally, our observations suggest that navigating these environments tends to elicit positive deactivation emotions. In this sense, many participants associated segregation with feelings of "calmness" or "relaxedness", emotional states commonly used in standardised and multidimensional constructs to conceptualize satisfaction (Bergstad et al., 2011; Ettema et al., 2011; Olsson et al., 2012). As P02 noted, *"The type of bike lane that makes me feel more comfortable is the one that is segregated, clearly. Either unidirectional or bidirectional but segregated. […] I feel more calmed*". These responses point to the role of the cycling infrastructure not only in shaping perceived safety, but also in producing emotionally supportive travel environments that contribute to the overall satisfaction of e-scooter users.

Despite P02's ambivalence regarding directionality, almost all participants expressed a clear preference for unidirectional bike lanes, compared with two-way or mixed-traffic environments, aligning with prior studies highlighting their benefits in terms of clarity and reduced conflict (Caspi et al., 2020; Zhang et al., 2021; Zuniga-Garcia et al., 2021). P04 and P06, for instance, described one-way lanes as more "predictable", while P08 defined them as "ecosystems with potential to reduce conflict". Interestingly, these perceptions contrast with recent findings by Nello-Deakin (2025), who, using injury data from Barcelona, reported slightly higher injury rates on one-way bike lanes compared to two-way ones. In our study, however, unidirectional cycling infrastructure was frequently associated with positive affective responses, particularly among women, such as feelings of "confidence" and "calm". These emotions were not only verbalized during the interviews but also observed through participants' body positioning and riding behaviour, adopting more central lane use or displaying more relaxed postures (see Fig. 2). Such embodied responses suggest that the perception of safety and emotional comfort does not necessarily align with objective measures of risk.

Bike lane width emerged as another factor shaping emotional responses during e-scooter travel. Almost all participants expressed a strong preference for wide cycle lanes, associating them with "comfort", "freedom of movement", and a general "sense of ease". Wide lanes allowed riders to maintain a steady pace without feeling constrained, fostering a relaxed and fluid riding experience. This was especially evident during overtaking situations (moments that, in narrower lanes, were described by some participants as "tense" or "anxiety-inducing"). Within wider lanes, participants reported feeling "at ease" when overtaking slower users or being overtaken themselves, as the additional space reduced the likelihood of friction or abrupt manoeuvres. A few participants also mentioned that wide lanes promoted a sense of shared responsibility and mutual respect, as there was "space for everyone to move" (P06). In contrast, narrow sections were frequently associated with verbalized or visible signs of irritation, hesitation, or body tensing, as noted in P08's words *"Here the lane narrows, usually there is few space for two to fit. I know that most people here don't overtake. You see, occasionally someone does, like now that one, but then frictions happen."* The comparison between both settings revealed that width is not just a functional attribute but a modulator of emotional states, with wider paths often enabling calmer, more cooperative interactions among micromobility users. As P01 noted, summing up a widely shared view: *"Wide lanes are marvellous"*.

The combined presence of segregation, unidirectionality and lane width, as earlier mentioned in this section, was particularly appreciated by participants, especially in high-traffic areas, as it created a protective buffer from motor vehicles (see Fig. 2). These features consistently fostered emotional states linked to positive deactivation, such as "calm" and "confidence", evident not only in participants' verbal accounts and body language, but also in spontaneous behaviours like whistling or humming, actions often interpreted as markers of heightened emotional engagement or enthusiasm (Berger and Motl, 2000; Buhrmester, 2013). Some participants described these segments as moments of peace or minor daily pleasures, often mentioning sensations such as "the wind in my face" (P09) or expressing that these stretches were their "favourite part of the ride" (P11). Enjoyment here took on an almost meditative or restorative quality, what could be termed light or everyday fun, emerging not from thrill-seeking but from a sense of ease and fluidity in the urban environment.

Yet, enjoyment was not always passive or tranquil. In some cases, few participants associated fun with speed, agility, and playful negotiation of space. This more active and sometimes transgressive form of fun, closer to excitement or euphoria, was especially present among younger riders, for whom the e-scooter ride was sometimes described as an "escape" or "game." One participant reflected: *"I love riding an e-scooter. I mean, I really like the e-scooter. I really have a good time. […] I*

Fig. 2. P01 riding through a dedicated, unidirectional, and wide bike lane.

really like going a little like that … if I see something, dodging it. Not playing, because deep down [the e-scooter] is a vehicle, but almost [playing]. I have a good time. Of the vehicles I've used, the e-scooter is the one that I've enjoyed the most". This playful dimension, while emotionally positive, also hinted at behaviours that challenged formal or expected norms of circulation, particularly when cycling infrastructure permitted greater freedom of movement.

While these reactions suggest that infrastructural conditions can help generate emotionally supportive environments for e-scooter travel, they also reveal a potential paradox: in some cases, these same conditions appeared to foster overconfidence, particularly among specific user profiles. Increased speeds or riskier manoeuvres, for instance, were more frequently reported and observed across younger male participants, indicating that positive affective states, especially those involving excitement or euphoria, can lead to behavioural excesses. In this sense, cycling infrastructure not only shapes emotional geographies by reducing stress, but can also produce forms of positive activation that translate into unsafe riding practices (see also Cubells et al., 2023b; Gioldasis et al., 2021).

4.2.2. *Infrastructures of ambivalence: when design elicits divergent emotional responses*

Although segregated cycling infrastructure is often perceived as the most effective and widely requested design solution, its implementation becomes particularly challenging in compact cities like Barcelona, where planners navigate constraints related to limited public space (Nikitas et al., 2021; Tzamourani et al., 2022). In such spatially restricted environments, urban planners frequently turn to space-sharing strategies, which not only offer a pragmatic response to spatial limitations but also support the multifunctional role of streets as places of social interaction (Diemer et al., 2018; Tsigdinos and Vlastos, 2021). A representative example of this approach is the implementation of bicycle sharrows: maximum 30 km/h one-way streets where bicycles (and e-scooters) and motor vehicles share the same lane. According to Tzouras et al. (2024), these designs function as compromise solutions aimed at balancing the needs of different users. By enabling their coexistence within the same space, such configurations are believed to promote more uniform travel speeds and smoother interactions among users (Kaparias and Wang, 2020; Karndacharuk et al., 2013).

However, the everyday experience of riding in a dense city suggests that the benefits highlighted by Tzouras et al. (2024) are not shared equally among all users and should therefore be interpreted with caution. Supporting this, research by Cubells et al. (2023b) observed that while men are more likely to use mixed or shared spaces, women riding e-scooters tend to favour routes with dedicated cycling infrastructure. Aligning with these findings, our ride-along interviews offered further insight into how shared infrastructures are differently inhabited across all e-scooter users. In particular, notable gendered differences emerged in how such environments are perceived and navigated. While almost all male participants displayed confidence and assertiveness in their use of shared lanes, often positioning themselves centrally as a way of maintaining control over interactions with motor vehicles (Fig. 3), some female participants tended to adopt more cautious strategies. This bodily positioning was, most of the time, the result of a deliberate and conscious process, as illustrated in the following statement by a male participant:

> *"Let him wait [in reference to a car approaching from behind]. I'm doing fine, I'm going at the right speed. I place myself in the centre so that he doesn't overtake me, I'm riding at 25km/h in a street of 30, let him wait. This way I don't give him any option to overtake me."* (P03).

In contrast, as also observed in Fig. 3, women were more likely to keep to the right edge of the lane, seemingly in search of a perceived buffer zone that might offer protection from passing motorized vehicles. Some of them accompanied this spatial behaviour with expressions of "discomfort", "fear", or "stress", emotional states consistent with what can be described as negative activation, the opposite of satisfaction. While these differences in travel behaviour have traditionally been attributed to women's greater risk aversion (Graystone et al., 2022; Prati et al., 2019), recent studies argue that social constructs of gender and power dynamics at the bodily level provide a more nuanced explanation (Ravensbergen et al., 2019). From the perspective of performativity and embodiment theories, men draw on internalised norms of entitlement and confidence that legitimise their presence on the road, whereas women's more cautious positioning reflects a need to minimise exposure and maintain a sense of personal safety (Cubells et al., 2023b; Heim LaFrombois, 2019). Echoing findings by Sersli et al. (2022) on cycling and women in Vancouver, Canada, several female participants in our study reported "feeling in the way", a sentiment that reflects how public spaces have long been constructed as masculine and purpose-driven domains, leading women, through socialisation processes, to internalise the idea that their presence in such spaces is illegitimate or should be discreet and unobtrusive (Heim LaFrombois, 2019; Sayagh and Dusong, 2022). Our observations suggest that designs perceived as safe by male e-scooter riders might not necessarily be experienced as such by female riders, an asymmetry also noted by Xie and Spinney (2018) in the

Fig. 3. Tendencies when riding in a 30 km/h bike sharrow. Above, females. Below, males.

context of urban cycling. The perception of space-sharing strategies as neutral or inclusive must therefore be critically re-evaluated in light of these embodied and emotional differences in user experience.

Bidirectionality within bike lanes, which allows bicycles and e-scooters to flow in both directions on a single side of the road, emerged as another design feature where men and women shared different concerns. In scenarios such as those illustrated in Fig. 4, where direct encounters with other actors were more likely to occur, it was observed that some women tended to slow their pace or to lean right more often. Indeed, a lot of female participants expressed a need to pay "increased attention" when using two-way lanes, concern only expressed by a few men. Emotional responses such as "alertness" and "stress" were more likely to co-occur in these settings, particularly among female participants, who often described two-way lanes as requiring "heightened attention" or "caution". As P09 summarised: *"I'm a little bit afraid that it's two-way, but it's practical"*.

This discomfort may be partly explained by the presence of fast-moving or risk-taking riders in these environments, behaviours that tend to disproportionately affect those travelling at moderate speeds, often women (Balkmar, 2018; Sersli et al., 2022). Observational data from the ride-alongs reinforce this interpretation: across the video material, overtaking manoeuvres were predominantly performed by male riders or directed at female riders, revealing contrasting dynamics in confidence, space negotiation, and pacing (see "Appendix B Supplementary Materials" for more details). This pattern resonates with findings by Cubells et al. (2023b) and Arellano & Fang (2019), who noted that male e-scooter riders not only travel at higher speeds than any other group using cycling infrastructure, but also tend to exhibit more careless attitudes. Once again, these gendered contrasts in behaviour and emotional response appear to be shaped by broader social norms, cultural expectations, and systemic privilege, which collectively grant men greater ease and entitlement in public space. Worrisomely, these forms of careless masculinity, embodied through speed and disregard for others, can actively dissuade potential users from sharing the space, thus undermining the inclusive potential of micromobility and its contribution to more sustainable urban mobility futures.

Fig. 4. Female participants leaning to the right side of a bidirectional lane when crossing with another cycle lane user.

4.2.3. Infrastructural disruptions and the production of negative affect

Finally, we observed that certain design elements consistently triggered negative emotional responses among participants. One of the most frequently mentioned (almost by all participants) was the placement of bike lanes on sidewalks. Participants such as P07 and P09 reported issues like "lower surface quality" and "increased frequency of vibrations", which undermined perceived comfort and safety. These discomforts were partly attributable to the smaller wheel diameter of e-scooter (Ma et al., 2021; Tzouras et al., 2023). However, most concerns stemmed from interactions with pedestrians, described by P03 as *"chaotic and confusing"*. In that sense, almost all participants verbalized difficulties in making their trajectories predictable, which hindered effective cooperation with pedestrians (Tuncer et al., 2020). The slower, stop-start riding pattern required in these settings disrupted the flow of movement (Fig. 5), with few participants even describing these lanes as "suicidal" (P05), opting instead to share roads with cars despite the increased risk. These anxieties were most often tied to fears of harming pedestrians in narrow, contested spaces. Indeed, existing evidence shows that pedestrians involved in e-scooter collisions face disproportionately severe consequences, including higher rates of head, face, and neck injuries, traumatic brain injuries and prolonged hospitalisations than riders themselves (Siman-Tov et al., 2017).

Another significant design issue pointed by almost all participants was the lack of continuity within the cycling network. During our interviews, nearly all participants highlighted examples where dedicated cycling infrastructure was either absent or ended abruptly, resulting in fragmented and inconsistent riding experiences. Similar concerns have been raised in urban cycling research, which shows that discontinuous infrastructure not only disrupts physical flow but also produces stress and uncertainty among riders (Aldred and Jungnickel, 2014; Van Duppen and Spierings, 2013). These sudden interruptions and disconnections among cycle lanes sometimes forced participants to dismount and walk long distances alongside their e-scooters, triggering most of the time negative emotional states such as frustration or a sense of being fed up (Fig. 6). This aligns with broader findings suggesting that network coherence is essential for creating a sense of safety, predictability, and trust in the system (Forsyth and Krizek, 2011; Pucher and Buehler, 2012). This frustration was vividly illustrated by P07, who vehemently described an example where a cycle lane suddenly ended: *"You see, here? There is a piece of bike lane and suddenly it disappears. It is brutal. There is no continuity. No continuity! What am I supposed to do?"*.

Finally, the lack of coordination between traffic signals also emerged as a prominent factor negatively impacting participants emotions during e-scooter rides. This issue has previously been documented in the context of motorcycles and red-light running (Shinar et al., 2004). In our study, some participants pointed to instances where traffic signals were poorly timed in relation to e-scooter speeds, fragmenting the flow of movement and prompting frustration due to repeated stops. As P09 remarked: *"Traffic lights in this section are a bit of a mess. […] They are not synchronized"*. Such observations were particularly common in areas affected by construction works, where signal coordination tended to deteriorate even further. While motorcycles and e-scooters differ in terms of legal status, speed capacity, and safety requirements, the parallels observed in relation to traffic light-related frustration lend empirical support to existing hypotheses that certain behavioural dynamics associated with motorcycle may also emerge, albeit in more subtle or context-dependent ways, among e-scooter users (Roig-Costa et al., 2024a; Useche et al., 2022). These affinities warrant further investigation, especially given the growing presence of light personal vehicles that challenge conventional modal classifications.

Altogether, these verbalized and embodied reactions highlights the importance that almost all participants place on having a continuous and uninterrupted ride, an aspect previously noted not only among e-scooter users (Gibson et al., 2022), but also in the case of urban cyclists (Delaney, 2016). Such reactions reflect a broader reconfiguration of travel expectations, shaped in part by technological innovations that promote fast, frictionless mobility as the standard. Walking, in this context, is increasingly perceived as an inadequate for meeting the time constraints of everyday life (Solnit, 2001). This reconfiguration of travel norms becomes particularly salient in the case of e-scooters, which are culturally and functionally framed as fast, fluid and efficient. As such, the need to dismount and walk is experienced as particularly frustrating, directly contradicting the very imagery of the e-scooter as a fast and effortless mode. In line with Solnit's critique of how mechanised mobility redefines walking as inefficient or even obsolete, e-scooter users appear to embody a similar sense of temporal urgency, whereby any forced deceleration directly undermines the core appeal of the mode. Several participants expressed visible frustration when confronted with such disruptions, suggesting that the imaginary of seamless movement is not merely symbolic, but deeply internalised. A comparable pattern was observed in response to poorly synchronized traffic signals, which generated feelings of "*confusion*" and "*vulnerability*" and, in some cases, led participants to reconfigure their routes in search of smoother, less interrupted trips. As P01 explained: *"I used to come along Consell de Cent, but I discovered that the traffic lights are not so correlative. […] In Valencia Street I go all green-green-green while in Consell de Cent I had to stop all the time."* (P01). These observations echo earlier findings that e-scooter users tend to favour routes with minimal interruptions, such as stops or traffic lights (Cubells et al., 2023a; Prato et al., 2018).

4.3. Adaptive strategies and the pursuit of satisfaction beyond infrastructure

Despite frequent encounters with infrastructural shortcomings, most participants reported consistently high satisfaction with their e-scooter use. This paradox can be understood through the lens of adaptation:

Fig. 5. Participants foot positioning.

Fig. 6. Participants "walking the e-scooter" facing lane discontinuity.

rather than simply enduring deficiencies, many riders dynamically responded to spatial constraints using a repertoire of flexible and, at times, informal or illegal tactics. These strategies, ranging from minor rule-breaking to legal status-switching, often produced affective states such as confidence, relief, or even playful satisfaction, suggesting that positive emotional experiences are not always infrastructure-enabled but sometimes tactically produced through situational responses to constraint.

4.3.1. Illegally engaging in minor infractions

Analysis of video footages revealed that actions such as sidewalk incursions, counterflow riding, or red-light skipping were recurrent informal strategies across most participants (see Figs. 7 and 8). However, these acts were not merely expressions of frustration with infrastructure (as in Buehler et al., 2021), but also moments of recalibration, instances where riders sought to restore flow and regain affective control over their trips. As P02 casually remarked while steering onto a sidewalk, *"And here we go again up on the sidewalk to avoid this bus lane. Whoops!"*, the act was both transgressive and routine, a spatial negotiation shaped by convenience and time pressure. Importantly, most riders demonstrated awareness of their positionality within contested spaces, moderating speeds on sidewalks and doing efforts to avoid pedestrians disruption, aligning with Mayer's et al. (2020) findings on risk mitigation. In fact, this awareness did not always translate into guilt; rather, participants framed these infractions as necessary adaptations to an inflexible system. Resonating with Prato et al. (2018), red-light running, for example, was described by few participants as a logic of efficiency *"I skip this one because there's no one here. I feel stupid stopping in the middle of nowhere"* (P04). Here, minor infractions emerge not simply as acts of individual risk-taking, but as embodied responses to infrastructural misalignment with user expectations and mobilities.

Rather than interpreting such actions solely through the lens of non-

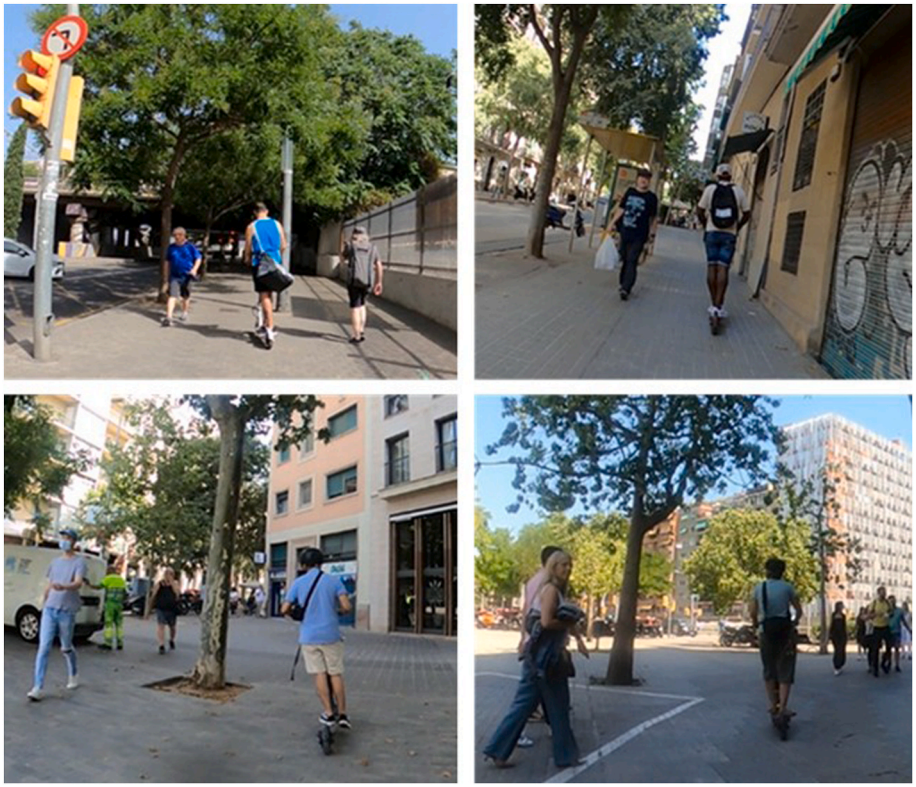

Fig. 7. Participants illegally riding the sidewalk.

Fig. 8. Up: participants riding counterflow; Down: participants running a red traffic light.

compliance or safety risk—as common in micromobility studies focused on deviant behaviour (Boua et al., 2022; Useche et al., 2022)—we approach them as tactical responses to constraint. Drawing from de Certeau's (1984) concept of "tactics", these behaviours can be seen as everyday acts of spatial improvisation, through which users temporarily subvert the logics of the city design and governance. While strategies, in de Certeau's terms, reflect the institutional production of space (through maps, plans, and regulatory frameworks), tactics represent how individuals rework these structures from within, carving out temporary routes of continuity, control, and affective coherence in a fragmented landscape. This tactical dimension is deeply entangled with emotion: satisfaction, relief, and playful pleasure arise not in spite of the infraction, but through it. In line with Anderson (2014) and Matteis (2020), such affective geographies of movement are not confined to smooth infrastructure but emerge dynamically from users' capacity to adapt and navigate around constraints. While previous studies have documented similar behaviours (Lind et al., 2021; Ma et al., 2021; Tuncer et al., 2020), our findings offer a distinct contribution by situating these practices within the affective and experiential dimensions of travel. Drawing on video-recorded ride-alongs, we show how minor rule-breaking operates as a practical strategy to recalibrate disrupted journeys, revealing how adaptive behaviour becomes key source of user satisfaction under constrained conditions.

Such tactical infractions can be read as acts of spatial reappropriation, momentary subversions of the logics inscribed into the city by institutional power through design, regulation, and control. What stands out here is not only the behaviour itself, but the emotional narrative attached to it: the sense of agency and control together with the emotional reward of restored flow. The frictions of the city are not merely endured but reinterpreted as challenges to be overcome, with satisfaction arising precisely from the act of negotiating and momentarily reshaping these spatial prescriptions. Yet this sense of control sometimes tipped into a perceived legitimacy to bypass norms, particularly among a few younger male riders, as P05's words exemplify: *"Why have I bought an e-scooter for? I have deserved my right to commit certain irregularities. Also, I have the control."* This notion of entitled mobility resonates with findings from Boua et al. (2022) and Gioldasis et al. (2021), who associate overconfidence and heightened perceptions of control with increased risk-taking.

4.3.2. Legally changing status

In addition, some participants demonstrated e-scooter's ability to quickly switch between pedestrian and vehicle status, giving them the flexibility to adapt to changing conditions and optimise their travel experience. This chameleon-like nature enabled riders to select the most convenient infrastructure (whether pedestrian or bike-oriented) at any given moment, increasing their options and enhancing the likelihood of finding a route that suited their needs. Fig. 9 illustrates a common practice: participants dismounting to cross a zebra crossing and walking on the pavement as a temporary pedestrian. In such cases, situations, participants would slow as they approached a red light, dismount at the front of the queue, and join the pedestrian flow at walking pace, avoiding disruption. Once on the pavement, they typically continued walking until they locate a bike lane, at which point they remounted and resumed riding. These small adjustments allowed riders to maintain momentum and avoid complete stops, as summarised by P07:

> " […] *to win time. The e-scooter is practical, I don't need to … I can get off, keep on walking, get back on it*" (P07).

Interestingly, and also observed by Tuncer et al. (2020), most riders employing these behaviours did not feel a need to justify their reasons for doing so, unlike in the case of skipping traffic lights. Nonetheless, many made conscious effort to minimise disruption to others. Most participants were generally keen to avoid being perceived as intrusive, dismissive of rules, or negligent, as demonstrated by their deliberate attempts not to cut across or disturb pedestrians while passing through pedestrian crossings. By transitioning between pedestrian and vehicle status, riders expressed a sense of agility and control that aligned with shifting urban conditions. This situational responsiveness appeared to reinforce their confidence in arriving on time, while also producing affective states such as enthusiasm and engagement. Enthusiasm often stemmed from the ability to bypass congestion or navigate crowded areas, while engagement was linked to the psychological aspect of maintaining a harmonious relationship with other road users and pedestrians. Riders who succeeded in managing their presence and movements (ensuring they did not disturb others or were perceived as

Fig. 9. Participant dismounting to cross as a temporary pedestrian.

rule-breaking) more often described a sense of satisfaction rooted in mutual respect and spatial awareness:

> *"The e-scooter is very versatile. It's much better, you've seen that I immediately get off and get on it … And I don't bother anyone, I have it very internalized. […] It is so easy […]"* (P01).

However, our findings also suggest that such adaptive behaviours, while often oriented to avoid trip inconsistencies and infrastructural shortcomings, inadvertently reinforce the broader 'monopolization of space' by cars (Horton et al., 2007). In Barcelona, where private motorized vehicles still dominate a disproportionate share of urban space, the growing popularity of e-scooters has not yet been met with proportional and targeted expansion of cycling infrastructure. As a result, congestion has increased in the already limited spaces allocate to active modes. Within this constrained landscape, the adaptations and coping strategies adopted by riders become particularly visible. Our video recordings reveal that when confronted with infrastructural gaps or obstructions, e-scooter users are often compelled to resort to pedestrian spaces, further intensifying the imbalances between active travel modes and motorized vehicles, and exacerbating tensions within active users, a pattern that ultimately reflects the persistence of automobility frames in urban infrastructure and planning (Glaser et al., 2020).

5. Concluding remarks

This paper contributes to the affective geographies of micromobility by examining the lived mobility experiences of 12 e-scooters riders navigating the dense and compact urban setting of Barcelona. Through in-depth (mobile) interviews and video analyses, we show how different elements of cycling infrastructure modulate emotional states and, in turn, influence the range and frequency of opportunistic strategies employed during travel. Our findings suggest the existence of a feedback loop, whereby the successful implementation of such strategies—particularly in response to infrastructural shortcomings—enables users to avoid disruptions, leading to a shift in affective atmosphere from frustration or anxiety to a sense of relief, control, or even accomplishment. By enabling users to approximate an ideal of frictionless mobility, we argue that these adaptive behaviours help users avoid disruptions and reach their destinations efficiently. In doing so, they not only reinforce the perception of e-scooters as a convenient and agile travel option but also contribute to the broader imaginary of the e-scooter as a mode of transport associated with autonomy, emotional reward, and everyday satisfaction (Fig. 10).

Beyond efficiency, our results suggest that a trip is not merely a spatial transition, but also involves the construction and deconstruction of emotions shaped by the spaces traversed. The act of moving is inseparable from the experience of encountering and interacting with one's surroundings. Deficiencies in infrastructure not only shape behaviour, but also give rise to complex affective responses. These insights highlight the need for more nuanced transport policies that consider emotional dynamics as intrinsic to travel. However, policy alone is insufficient to drive meaningful change. Public awareness and culturally sensitive engagement, particularly around how individual agency and identity mediate mobility experiences, are equally essential. For instance, might the semi-illicit or transgressive status of e-scooters particularly enhance satisfaction for certain users, such as younger men? To what extent could rule-bending be an affectively charged practice that partly explains their appeal? These questions suggest the value of future research into the intersections of age, gender, and geography in shaping emotional landscapes of micromobility. These reflections also underscore the need for more tailored educational and infrastructural strategies aimed at addressing risks associated with youthful exuberance, overconfidence, and emotionally driven behaviours. Within this broader context, we argue that micromobility research must pay greater attention to the role of affect, not as a static or uniform, but as dynamic, fluctuating and influential for both short-term behaviours and shape long-term mobility patterns.

This research is not without limitations. One important consideration is the potential influence of the Hawthorne effect (i.e., where individuals modify an aspect of their behaviour in response to their awareness of being observed). Since the analysis draws on situated behaviours, the researcher's presence may have affected riders' decisions or emotional expressions. As one participant noted during a ride, "*Normally I would have skipped this one*," referring to a red traffic light, some degree of self-censorship may have occurred. Participants might have been more inclined to demonstrate law-abiding behaviour, potentially influencing their overall experience and self-evaluations. While efforts were made to minimise reactivity, such as maintaining a non-intrusive presence and only intervening at rest points, this limitation remains inherent to observational and mobile methodologies. Future studies may consider additional strategies to further mitigate observer effects when exploring affective and embodied aspects of travel in real time. Additionally, the

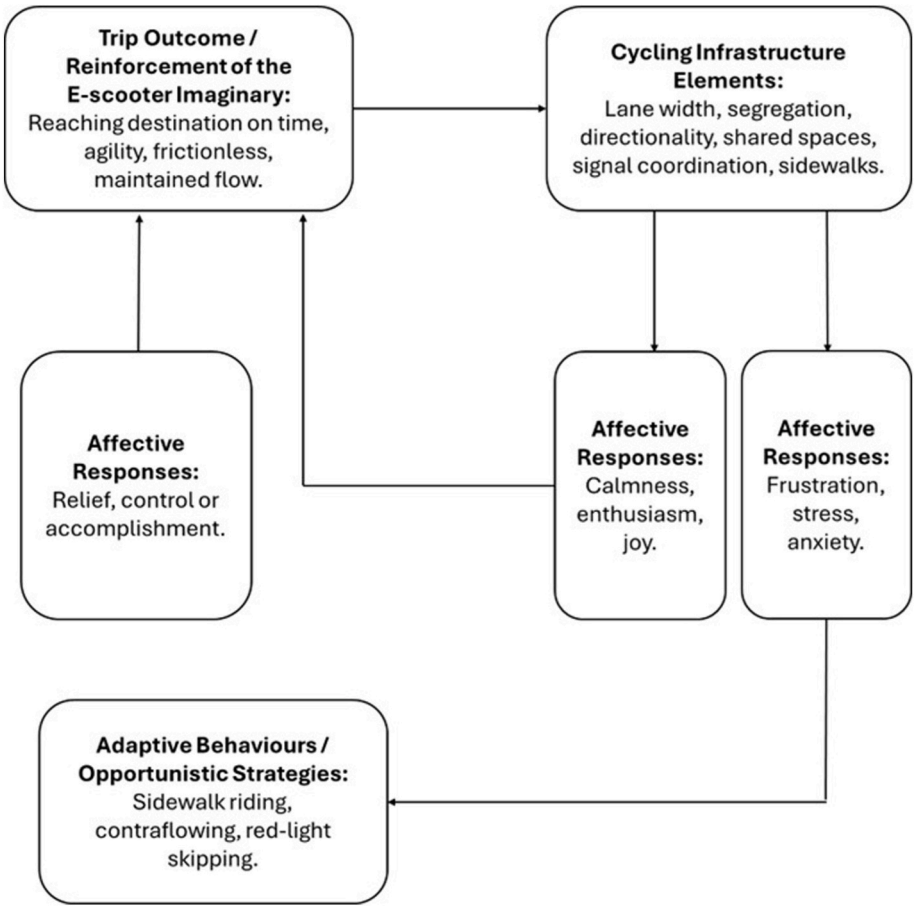

Fig. 10. Affective feedback loop of e-scooter travel experience in urban environments.

modest sample size of the study limits the generalisability of our findings. Although the study provides rich, in-depth insights into the affective dimensions of micromobility, further research is needed to better capture the nuanced and intersectional dynamics of infrastructure use across different social groups and urban contexts. Future studies should consider diverse sampling strategies to explore how factors such as gender, age, class, or racialisation intersect with infrastructure availability, emotional experience, and behavioural adaptation.

Finally, these findings also point to a broader imperative for policy makers and urban planners: to read these minor or tactical behaviours not simply as deviations from the norm, but as affectively charged responses to infrastructural shortcomings and spatial inequality. Rather than treating them solely as issues of enforcement or regulation, they could be interpreted as everyday performances that expose the inadequate and uneven distribution of public space. From this perspective, e-scooter users' adaptive practices become an opportunity to critically reassess how urban environments are structured, and to design mobility policies that respond more equitably to the needs, rhythms, and emotions of all users.

CRediT authorship contribution statement

Oriol Roig-Costa: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Carme Miralles-Guasch:** Writing – review & editing, Validation, Resources, Project administration, Funding acquisition. **Oriol Marquet:** Writing – review & editing, Validation, Supervision, Formal analysis, Conceptualization.

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Declaration of competing interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.emospa.2025.101124.

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