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working paper

#02

Differential Wellbeing Outcomes of Cycling-Based Active Mobility to School Intervention on Girls and Boys: A Gender Analysis of "Al Colegio en Bici" in Bogotá, Colombia

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Project's summary

"On the Way to School" (OWS) is an implementation research study aiming at understanding how to plan, develop, and evaluate Active Mobility To -and from- School (AMTS) interventions in urban and peri-urban contexts in low- and middle-income countries (LMICs) in the Global South. OWS focuses on interventions that promote walking and cycling and evaluates their effect on children aged 8 to 16 concerning the prevention in reducing the risks of non-communicable diseases (NCDs).

This research was funded by the Medical Research Council under the Global Alliance for Chronic Diseases (GACD) life course research programme (Grant Ref: MR/Y012313/1). The GACD is a consortium of the world's largest research funding agencies. GACD initiates, facilitates, and supports research activities in low and middle-income countries, as well as in vulnerable and Indigenous communities in gih-income countries, to improve the heath of those populations. Researchers funded through GACD form an international group of researchers who actively collaborate on implementation science to move evidence-based interventions into practice and policy.

The project is led by The Bartlett Development Planning Unit in University College London in partnership with nine academic and practice organisations in Colombia, Mozambique, the United Kingdom, and the United States.

About OWS Working Papers:

The OWS Working Paper Series is a collection of preliminary research outputs of the project that are currently under consideration for an academic publication. These are preprints that have not yet been peer-reviewed and are thus subject to change.

OWS Working Papers are available at
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Working Paper abstract

Active Mobility to School (AMTS) interventions have emerged as promising strategies to address declining physical activity levels among children and adolescents. While previous research in both Global South and North contexts has shown different impacts for girls and boys, analyzes have largely remained limited to sex-disaggregated results, without interrogating how gender and societal norms surrounding mobility shape these differences.

This research addresses that gap by examining how girls and boys, as direct beneficiaries, differently perceived the wellbeing outcomes of a cycling-based AMTS intervention, using the case of Al Colegio en Bici (ACB) in Bogotá, and positioning "gender needs" as a central analytical lens. It argues that (active) mobility is gendered in practice and socially framed as a "boy's thing", which disproportionately restricts girls and consequently shapes their perception of the intervention.

Findings indicate that girls experienced more pronounced benefits in certain wellbeing components. These are attributed to gendered constraints girls faced prior to the intervention, including lower physical activity, bodily discomfort, and limited cycling competence, in contrast to boys who had already normalized cycling. Responding to these constraints, the analysis concludes that ACB, with its gender-blind design, enhanced girls' cycling independency by addressing their practical gender needs (PGNs) in mobility, yet remained limited in meeting strategic gender needs (SGNs) necessary to transform gendered practices of cycling.

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1. Introduction

This research will examine the differential wellbeing outcomes of cycling-based Active Mobility to School (AMTS) intervention, using the case of Al Colegio en Bici (ACB) in Bogotá, Colombia, on girls and boys, and its relationship to the fulfilment of gender-specific mobility needs.

This research hypothesizes that AMTS intervention, particularly cycling-based in this case, has a direct and indirect relationship with enhancing the wellbeing of children. This posits that its contributions extend not only to physical health but also to other wellbeing dimensions such as psychological, cognitive, social, and economic. Another hypothesis is, however, that these wellbeing outcomes likely differ between girls and boys, as influenced by the degree to which their gender-specific needs are fulfilled.

1.1. Research questions

- **What are the wellbeing outcomes of Bogotá's ACB intervention as perceived by girls and boys?**
- **How do the differential wellbeing outcomes of girls and boys relate to the fulfilment of practical and strategic gender mobility needs?**

1.2 Case Study: Al Colegio en Bici

Bogotá, Colombia, recognized as a model of urban transformation for both Global South and North with its progressive approach to active mobility including for children (Montero, 2017). Under the umbrella program Niñas y niños primero ("Girls and Boys First"), the city has implemented Active Mobility to School (AMTS) Intervention interventions, one of which is a cycling-based Al Colegio en Bici (Alcaldía de Bogotá, 2025).

This case is relevant because ACB's objectives extend beyond mere physical health. It aims to enhance children's connection with urban territory, improve access to education, and foster independence in road safety (Hidalgo et al., 2016), all related to broader wellbeing dimensions. However, ACB has not explicitly integrated a gender lens in its design, despite boys constituting 81% of participants (Hidalgo et al., 2016). This underlines the urgency to bring gender perspective into this discourse by examining how gender mobility needs, especially those of girls, are fulfilled or neglected, to ensure the intervention function not only as mobility solution but also as means of empowerment (Raju, 2005).

1.3 Theoretical Grounding

The literature consistently demonstrates that children's wellbeing is deeply tied to their interaction with public spaces (Hood, 2007; Casas, 2011; Rawsthorne et al., 2019; Johansson et al., 2020). Active mobility supports this interaction by enhancing children's wellbeing not only through physical activity but also through social connection and environmental engagement (Marzi, Demetriou and Reimers, 2018; Larouche, Mitra and Waygood, 2020; Westman, Friman and Olsson, 2020). Within this understanding, AMTS interventions offer a promising alternative for promoting active mobility among children and adolescents. Yet, evidence from both Global South and North reveals that they produce different outcomes for girls and boys, including boys' higher participation and girls' more pronounced cognitive benefits (Martínez-Gómez et al., 2011; Van Dijk et al., 2014; Medeiros et al., 2021; Brindley, 2023; Felez-Nobrega et al., 2023).

These outcome differences reflect the argument that "mobility is gendered" (Hanson, 2010; Chant and McIlwaine, 2015; Levy, 2015). Feminist literature indicates how gender roles, masculine cycling perceptions, parental restrictions, and intergenerational transport-related fears (i.e., mothers to

daughters) constrain girls' independent mobility compared to boys (Guliani et al., 2015; Palacios, 2019; Kawgan-Kagan, Schuppan and Petersen, 2019; Egan and Hacket, 2022; Ravensbergen, Buliung and Laliberté, 2022). Despite this, most AMTS interventions still adopt gender-blind approaches.

1.4. Knowledge Gap

- Analyzes related to outcome differences between girls and boys are **largely limited to sex-disaggregated results**, without adequately exploring how gender and societal norms systematically shape these differences.
- Despite extensive research on active mobility's association with children's and adolescents' physical health, including in Bogotá context (Segura-Jiménez, 2016; Triana et al., 2019), **other wellbeing dimensions (e.g., psychological) remain frequently overlooked**, as most research in this area focuses on working-age adults.

1.5. Working definitions

In this research, children's wellbeing is defined as multidimensional construct that encompasses physical, psychological, cognitive, social, and economic dimensions, the fulfilment of which enables children to become all they are capable of being (Bradshaw et al., 2007; Waygood et al., 2020). Gender, in turn, is a socially constructed concept of "femaleness" and "maleness" that dictates how one is expected to behave, interest, and fulfil expectations under the labels of "girl" or "boy" (Johnson, Greaves and Repta, 2009). In this context, mobility and gender interact as determinants of children's wellbeing, creating different power, opportunities, and limitations to move independently and access resources between girls and boys, thus leading to different "gender needs" (Walker, Frediani and Trani, 2013).

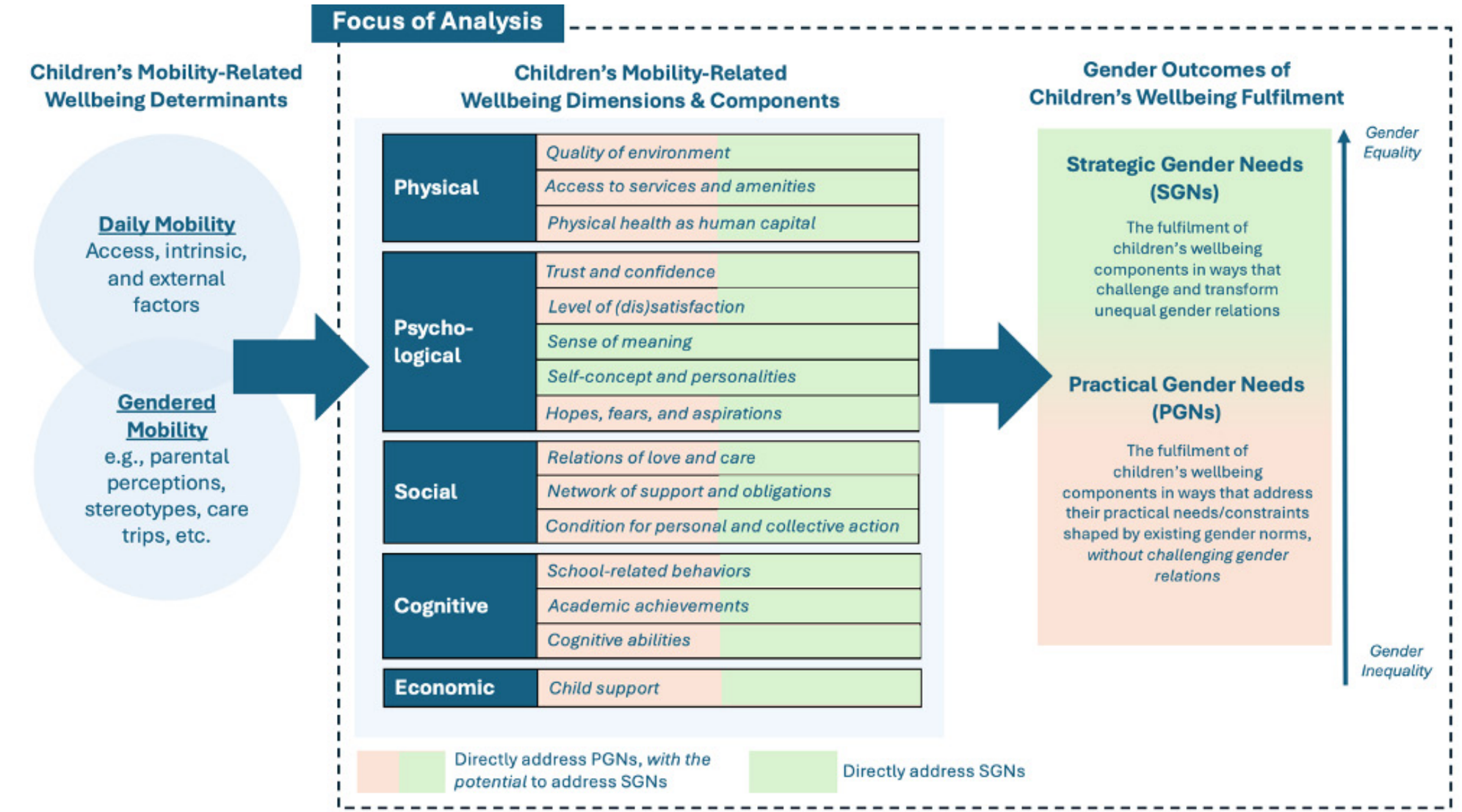
2. Conceptual framework

This research uses an integrated conceptual framework to analyze Bogotá's ACB contribution to wellbeing as perceived by girls and boys, and how these outcomes relate to the fulfilment of gender-specific needs. The framework is structured around two layers of analysis.

This first layer of analysis is grounded in literatures that argue how mobility, as daily activity, can either support or undermine children's wellbeing. These outcomes, whether positive or negative, are determined by children' everyday mobility experiences (i.e., access, intrinsic, and external) (Waygood et al., 2020) and by gendered mobility expectations, which are argued to impose greater restrictions on girls (Hanson, 2010; Kawgan-Kagan, Schuppan, and Petersen, 2019). This layer analyzes outcomes across five wellbeing dimensions to answer the first research question.

Building on this, the second layer of analysis will address the second research question by examining how these wellbeing outcomes relate to the gender mobility needs, particularly for girls, guided by Molyneux (1985) and Moser (1993), who distinguish between PGNs and SGNs. As illustrated in Figure 1, some wellbeing components, when fulfilled, may directly address PGNs but hold the potential to contribute to SGNs over the longer term (indicated in orange and green), while others may directly address SGNs (indicated by green), depending on the manner of implementation and on how girls and boys perceive them. A holistic examination at this layer evaluates which gender-specific needs are met, or have the potential to be met, and to what extent. When intervention demonstrates the potential to address SGNs, this signifies progress toward substantive gender equality.

Fig 1. Transport well-being framework



Source: Author's elaboration (2025), adapted from Molyneux (1985), Moser (1993), Waygood et al. (2020), and Oviedo and Sabogal (2020)

Table 1. Five Wellbeing Dimensions

Dimension	Scope of analysis	Active mobility context
(1) Physical	Physical health and safety	Cycling as a means of exercise, but also poses risks like traffic danger or pollution
(2) Physcological	Emotional states and self-confidence	Impact of cycling on anxiety and life satisfaction
(3) Social	Relationships and social capital	Collective cycling as a tool for connection
(4) Cognitive	Intellectual and school performance	Knowledge of the built environment, reduction of school-related stress, and increased academic performance
(5) Economic	Parental resources and time	Reduction of transport costs and redistribution of caregiving responsibilities

Source: Waygood et al. (2020)

Table 2. Practical and Strategic Gender Needs

Gender Needs	Definition	Active mobility context
(1) Practical Gender Needs (PGNs)	Immediate needs for survival that enable women or men, boys or girls, fulfil their socially assigned roles. These needs are often linked to basic necessities (Molyneux, 1985).	PGNs may include secure routes, well-maintained environment, time-efficient commuting, adequate adult supervision, and access to bicycles that facilitate independent travel. All of these should be equally ensured for girls and boys, though their fulfilment may require gender-specific approaches.
(2) Strategic Gender Needs. (SGNs)	Needs necessary to transform women's subordinate status in society by addressing long-term political and structural change (Molyneux, 1985). Interventions that initially target PGNs may serve as entry points toward the fulfilment of SGNs in the longer term.	SGNs relate to power redistribution between girls and boys in public space, equal autonomy and opportunity, and the redefinition of gender norms that shape perceptions of who cycling and public spaces are "for" (Radford, 1992, as cited in Corradi et al., 2016; Chant and McIlwaine, 2016).

Source: Author's elaboration (2025)

3. Methodology

This research employs qualitative content analysis (QCA), a systematic method for identifying meanings from various types of texts, with the aim of making specific inferences within the context of their use, typically through the application of thematic codes (Morgan, 1993; Mayring, 2000; Krippendorff, 2019; Drisko and Maschi, 2015). In this study, deductive coding is applied, where "prior empirical research and theory are employed to derive some categories" (Drisko and Maschi, 2015, p.106). These categories/codes are derived from wellbeing dimensions proposed by Waygood et al. (2020), further specified through sub-codes from Oviedo and Sabogal (2020), and tailored to gender needs indicators based on Molyneux (1985) and Moser (1993) (see Table 4).

This research uses secondary data from translated interview transcripts processed by OWS research team, involving children and parents (see Table 3). NVivo 15 software was used to assist in organizing the data according to the codes. Informed consent and ethical approval were obtained for all interviewees , and data are presented with sensitivity and confidentiality, using unique alphanumeric code (e.g., Boy-ID120056789107) to anonymize identities.

Table 3. Interviewees characteristics by gender, enrolment status, and exposure duration

Type of data	Type of participants	Gender and age (years)	Exposure to intervention
Interview transcripts with children	ACB existing beneficiaries	**Girls (3)** 12,14,14	ranging from 2-4 years
		Boys (2) 10,14	
	ACB new beneficiaries	**Girls (2)** 10,10	ranging from 3-6 months
		Boys (3) 11,11,12	
	Students not enrolled in ACB	**Girl (1)** 15	0 month
		Boy (1) 10	
Interview transcripts with parents/guardians	Parents of ACB existing beneficiaries	**Girl (1)** n/a	4 years
		Boys (2) 15,n/a	
	Parents of ACB new beneficiaries	**Girl (1)** 10	3 months
		Boy (1) 11	
	Parents of students not enrolled in ACB	**Girl (1)** n/a	0 month
		Boy (1) 12	

Source: Author's elaboration (2025)

Table 4. Thematic coding of content analysis matrix

Main codes	Sub-codes	Sub-sub-codes (PGN's & SGNs)				
Wellbeing Dimensions (Waygood et al., 2020)	**Wellbeing Components** (Oviedo and Sabogal, 2020)	**Gender Needs Indicators** (Author's elaboration based on Molyneux (1985) and Moser (1993))		**Implementation Components** (scope of ACB intervention related to codes)	**Type of Data** (qualitative)	**Data Analysis**
		Potential direct needs addressed	**Long-term needs addressed**	**Period and scale:** 2013-present, 82 schools		
Physical	Quality of environment	**PGNs:** Ensuring safe routes, clean environments, and well-maintained infrastructure, particularly for girls, to address parental concerns and harassment.	**SGNs:** Addressing systemic spatial inequalities and gendered mobility barriers to ensure safe, equal access to education, transport, and other opportunities for all.	**a.**Infrastructure: Investment in additional bike lanes and parking spaces. **b.**Safety: Co-design of 105 "trust routes", supported by guided caravans. **c**.Operation: Encouraging cycling (2-3 km) from/to school, promoting physical activity. **d.**Operation: Provision of school-owned bikes to address affordability and accessibility barriers.	Interview transcripts **(children and parents)**	Deductive QCA **(triangulating children's and parents' perspectives)**
	Access to services and amenities	**PGNs:** Facilitating accessible school travel to enable independent mobility for all.				
	Physical health as human capital	**PGNs:** Promoting cycling as a form of exercise to improve physical activity level and health for all.	**SGNs:** Normalizing girls' participation in outdoor activities/sport and challenging societal perceptions that frame cycling as inherently masculine.			
Psychological	Trust and confidence/ Hopes, fears, and aspirations	**PGNs:** Building girls' and boys' trust, security, and self-confidence to travel on their collectively designed routes, supported by guided caravans and skills training, thereby reducing fears related to mobility.	**SGNs:** Sustained trust, satisfaction, and fulfilled aspirations will break gendered constraints that often prevent girls from entering public spaces independently, contributing to a more equitable presence of all genders in the public sphere. Furthermore, enabling all genders to express aspirations through participatory processes can help institutions (i.e., DSE/DSM) identify gender-sensitive approaches in future planning.	**a.**Pedagogy: Skills training on bike use, maintenance, and safety, as well as reframing urban environment as pedagogical space. **b.**Safety: Participatory "trust routes" planning empowers children's voices and agency, while guided caravan enhances sense of safety.		
	Level of (dis)satisfaction	**PGNs**: Improving satisfaction to influence long-term engagement with active mobility and built environment for all.				

	Sense of meaning/ Self-concept and personality	**Directly SGNs:** Active involvement in all implementation components enables children, particularly girls, to see themselves as independently mobile, autonomous, and entitled to decision-making, regardless the age or gender. This challenges the paradigm of public space as exclusively "men's (or adult's) space". AMTS intervention can also create new meaning and connection to the urban environment as a space for play and learning.		**c.**Operation: Encouraging cycling (2-3 km) from/to school to promote physical activity and reduce commute-related stress. **d.**Networking: Bike clusters and peer mentorship to improve verbal abilities, collaborative learning, and sense of belonging.	Interview transcripts **(children and parents)**	Deductive QCA **(triangulating children and parents' perspectives)**
Cognitive	School-related behaviour	**PGNs:** Improving attendance and punctuality to support academic performance for all.	SGNs: Challenging gender disparities in educational access and achievements. Over time, this supports equitable employment/market inclusion and breaks cycle of poverty for low-income families by enhancing academic performance.			
	Academic achievements	**PGNs:** Reducing commute stress to improve concentration and academic outcomes for all.				
	Cognitive abilities	**PGNs:** Stimulating cognitive growth for all through interactive elements within intervention (e.g., participatory planning, clusters, bike maintenance, skills training).				
Social	Relations of love and care	**PGNs:** Creating emotional comfort and social belonging through peer mentorship, clusters, and interaction along the route.	**SGNs:** Normalizing mixed-gender friendships to promote empathy, solidarity, and reduce gender stereotyping regarding participation in collective spaces.	**a.**Pedagogy: Older students mentor younger ones (peer learning) in bike safety classes and caravans. **b.**Networking: Collective cycling and bike clusters to strengthen shared identity and foster friendships.		
	Network of support and obligations/ Condition for personal love and collective action	**PGNs:** Cultivating shared responsibilities and peer support through collective actions within the program.				
Economic	Child support	**PGNs:** Reducing transport cost and caregiving burdens, which disproportionately affect mothers.	**SGNs:** Enabling children to internalize that caregiving is not exclusively a mother's role, and that women have equitable opportunities for personal development.	**a.**All components: Collectively, all program components have potential to foster trust with parents and reduce costs associated with caregiving for school drop-offs.		

Source: Author's elaboration (2025)

4. Findings

4.1. Qualitative findings overview

The qualitative findings were interpreted using a set of predefined codes (see Table 4) to analyze interview data. These interviews included 6 girls and 3 parents of girls speaking about girls' experiences, as well as 6 boys and 4 parents of boys speaking about boys' experiences (see Table 2). In total, 119 coded references or statements were generated, capturing various aspects of children's wellbeing . As illustrated in Figure 4, the most frequently coded dimensions were physical (27%) and psychological (24%), followed by social (19%), cognitive (15%), and economic (14%). This distribution suggests that statements related to physical and psychological dimensions emerged most frequently during the interviews.

In terms of gender, the data indicate that both girls and boys expressed wellbeing-related experiences across all five dimensions, although with varying perceptions. Girls had slightly more references to components such as "child support", "access to services and amenities", and "trust and confidence/hopes, fears, and aspirations". However, this does not necessarily imply that ACB had greater outcomes on girls in these components, since their responses often conveyed both positive and negative experiences. The distribution may reflect how interview questions were framed or individuals' preferences for sharing certain types of experiences.

Similarly, "sense of meaning/self-concept and personality" did not yield any references, suggesting that this component may not sufficiently captured in the interview process.

4.2. Dimensional Findings of ACB's Wellbeing Outcomes on Girls and Boys

4.2.1. Quality

Quality of environment

In ACB, quality of environment was observed through children's cycling journey between meeting point and school. Perceptions related to this component were predominantly expressed by boys, while majority of girls, did not explicitly express concerns or preferences.

Positive experiences among boys varied. Two boys, for instance, described enjoying the outdoor environment within the cycling journey, mentioning elements such as wind, breeze, and nature. They also valued routes that passed through parks and green spaces, which they perceived as distractions from school-related stress. Another boy contrasted ACB's cycling environment with the discomfort of commuting via TransMilenio, which he described as overcrowded. However, concerns were also raised, including unpaved paths filled with puddles after rain, exhausting routes involving bridges, and negative interactions with local residents in mixed-used neighbourhoods.

Among girls, only one explicitly commented on the environment. She expressed enjoyment when the route passed through wooded areas, explaining that she liked touching flowers and picking up branches. At the same time, she disliked rocky paths due to the increasing risk of slipping.

From parental perspective, a mother of a boy specifically raised concerns about the meeting point, which had been relocated without prior consultation. She described the meeting point was dangerous not only for children, but also for parents who waited there, particularly when the cycling caravan arrived late.

Access to services and amenities

In terms of accessibility, the most frequently mentioned aspect was the duration of the school commuting journey, particularly in comparison to children's previous experiences

without ACB. Some children reported that their commute became longer with ACB, while others felt it was shorter. These views were shared across girls and boys.

Those who found the journey shorter had previously used TransMilenio, whereas those who perceived it as longer were typically dropped off by their parents. The longer duration was primarily attributed to the indirect route taken by ACB's cycling caravans, as school guides needed to pick up multiple children along the way. Reported differences in commute time ranged from 5 to 30 minutes.

Physical health as human capital

The contribution of ACB to children's physical health appears to be more significant among girls. This gender difference stems from the fact that most boys interviewed were already engaged in regular sports (e.g., football, basketball, recreational cycling in parks) before ACB. As a result, ACB did not substantially change their physical activity patterns.

In contrast, most girls reported trying new sports and increasing their activity levels after ACB. These included football, taekwondo, skating, and more frequent cycling. Several reasons were expressed for this shift. Some girls stated that they no longer became tired as easily as before, others noted that the bicycles provided by ACB were more physically suited to their body size compared to those they had at home, and some simply said they enjoyed cycling more.

While ACB did not markedly increase the frequency of physical activity among boys, some reported other health-related benefits such as improved appetite and sleep patterns. A mother of a boy also observed that ACB contributed to her son's improved breathing, as he has rhinitis.

Specific benefit was also expressed by a mother of a girl, explaining that her daughter's participation in ACB helped with weight regulation. Meanwhile, a father of two girls who were not enrolled in ACB expressed a preference for walking-based AMTS intervention, explaining that his daughters did not know how to ride a bicycle. This statement reflects the lower physical activity level and lack of cycling skills among girls who were not part of ACB.

4.2.2. Psycological

Trust and confidence/Hopes, fears, and aspirations
In this component, both girls and boys expressed similar views regarding what built their trust and self-confidence during the cycling journey, as well as what generated fear. A key factor contributing to their sense of trust was the presence of school guides who were described as attentive, protective, and proactive in ensuring safety, such as by stopping cars or helping crossing roads.

A shared psychological barrier for both girls and boys that negatively affected their self-confidence was the fear of falling off the bicycle. This fear stemmed from having either witnessed other beneficiaries fall or having experienced a fall themselves in their pasts, which they perceived as traumatic experience.

However, gender-differentiated expressions of self-confidence also emerged. Several girls described how ACB helped them become more courageous. One of them shared that the cycling journey increased her confidence by giving her an adrenaline rush, particularly when riding down bridges at speed. Another explained that collective cycling reduced her fear of encountering drunk people when she commuted alone to school via TransMilenio. In contrast, a girl who had not yet enrolled in ACB expressed her interest to participate as a way to gain her mother's trust, thereby enabling her to commute on her own.

Among boys, a boy perceived increased self-confidence differently. He linked it to a sense of being "cool" when using dedicated bike lanes. However, some boys still reported discomfort when encountering disturbing behaviour along the routes, such as witnessing men fighting with knives and receiving negative responses from local residents.

From the parents' perspective, parents of both girls and boys described ACB as a source of reassurance due to the presence of school guides, particularly when children had to commute through unsafe areas.

Level of (dis)satisfaction

Children expressed varied levels of satisfaction with ACB, with the most frequently mentioned aspect was the bicycle itself. Majority of the girls specifically valued the bike baskets, as these allowed them to place their heavy school backpacks, relieving pressure from their shoulders and improving balance. Responding this, one boy pointed out the lack of uniformity in bike features between girls and boys. He noted that although boys also needed baskets, only girls received new bicycles equipped with them. Beyond baskets, other girls expressed satisfaction with bike's colour, while boys also appreciated features such as bike stability, number plates, and bells.

Dissatisfaction related to delays and punctuality were reported across girls and boys. These were attributed to various causes, such as having to stop when other students fell, teachers' strikes, or long wait times at traffic lights.

Weather considerations and route design also emerged as sources of dissatisfaction. A boy with rhinitis explained that cycling in the rain was difficult, as the raincoat provided by ACB was too small, leaving him soaked. He also found discomfort from unpaved paths with puddles after the rain. The dissatisfaction regarding the ill-fitting raincoat was also expressed by some parents. Additionally, a girl who had been in the ACB for four years expressed boredom with the repetitive route. She also criticized the limited presence of school guides, observing that only one teacher accompanied a cycling group of 20 students.

4.2.3. Cognitive

Cognitive abilities

In cognitive dimension overall, ACB appears to primarily support the development of children's practical cognitive skills, particularly those related to independent mobility, spatial awareness, and traffic safety, rather than school-related behaviour or academic achievements.

Both girls and boys expressed enjoyment in learning about traffic safety through ACB. They equally reported gaining knowledge about road signs, how to signal when turning, and how to cross streets safely and responsibly. Additionally, many of them shared that their spatial awareness had improved. They also felt more confident navigating routes independently, including to their own homes or even friends' houses.

From the parents' perspective, cognitive benefits were also frequently mentioned and generally aligned with how children felt. Several parents further emphasized that ACB contributed to increased discipline, regardless of the child's gender.

Nonetheless, gendered differences in how cognitive benefits were perceived also emerged. One boy explained that he felt safer due to improved mechanical knowledge acquired through ACB. Similarly, a mother of a boy linked ACB's cognitive value to preparing her son for future responsibilities, which is driving car or motorbike. These specific associations with mechanical and driving skills were not mentioned by any of the girls or their parents.

In contrast, a mother of a girl emphasized how ACB contributed to her daughter's cycling independence and ability to manage daily tasks, such as knowing when to wear a raincoat, protecting her backpack, and washing the bike, skills she had not previously learned.

School-related behaviour

No child beneficiary explicitly linked ACB to changes in school attendance or punctuality. Some only reported that the cycling route made their commute shorter, while others felt it took longer, as discussed in Section 6.1.1.

In terms of classroom engagement, two boys mentioned feeling more energetic in classes, which they attributed to time-saving commute. Meanwhile, a girl expressed feeling happier in classes because she had become more sociable through ACB. From parents' perspectives, only one mother of a boy directly linked an improvement in her son's concentration, which she attributed to the cycling journey with ACB.

Academic achievements

There is only one beneficiary that mentioned a direct connection between ACB and academic performance. A girl, who had been in the program for four years, stated that her grades had declined after her first year in ACB. However, she did not elaborate on how ACB specifically contributed to this change.

4.2.4. Social

Relations of love and care

Most children, without significant gender differences, reported that ACB strengthened their friendships with other beneficiaries. The collective cycling experience provided space for conversation and, in some cases, facilitated the formation of new friendships. Individuals' experiences varied.

Two beneficiaries linked ACB to a reduction in feelings of loneliness compared to their previous school commutes by walk. One boy shared that walking to school with his mother often felt isolating, as she was usually preoccupied. Similarly, a girl described the streets she previously walked as "lonely" streets. ACB reduced this loneliness through collective cycling it offered.

Another girl reflected that ACB helped her become more outgoing, especially since she had previously been shy and awkward. In addition, both girls and boys mentioned feeling closer to classmates they had not spoken to much at school before. However, a few of them felt that their friendships remained unchanged by the intervention. One boy, for instance, attributed this feeling to being the only student on his route. As a primary school student, he began his commute 45 minutes earlier compared to others (i.e., elementary school students), thus offering no opportunities for peer interaction.

These findings are consistent with parental perspectives, with no negative concerns raised by them. Two parents, one of a girl and one of a boy, noted how their children were happy to cycle with friends and this contributed to reducing their fears around independent mobility.

Networks of supports and obligations/condition for personal love and collective action

Only two child beneficiaries implicitly explained how ACB creating a support network. One girl shared that she appreciated the attention she received from a friend who reminded her to wear her helmet, a gesture she liked and interpreted as care. However, she recalled feeling embarrassed when some friends made jokes about her arriving late to the meeting point.

A boy also reflected on how support networks

extend beyond fellow beneficiaries to motorized transport users. He emphasized the role of some car drivers encountered along the route who supported the cycling caravan, particularly when others expressed impatience by honking.

4.2.5. Economic

Child support

Across both girls and boys, most children reported that their mothers were primarily responsible for school drop-off and pick-up before ACB. Other caregivers mentioned included grandparents, brothers, and, in only one case, a father who dropped off his child on his way to work. Notably, the decision to enrol children in ACB was primarily initiated by the mothers.

Building on this, both girls and boys expressed satisfaction with ACB because it reduced the time their caregivers, primarily mothers, previously spent on school drop-offs. Children also noted that ACB helped save transport costs for other purposes (e.g., family trips, sports training) and made their daily routines more time-efficient.

Children's perceptions were echoed by parents in the interviews, most of whom were mothers, who described ACB as alleviating their caregiving burden, especially in terms of physical effort, time, and costs (estimated expenses ranging from 150,000-280,000 pesos/month). All parents interviewed were engaged in productive roles in either formal or informal sectors, which made school drop-off an additional burden as part of domestic responsibilities. Some parents in formal employment also relied on paid caregivers, referred to as "lady", to accompany children to school, an arrangement they perceived as expensive.

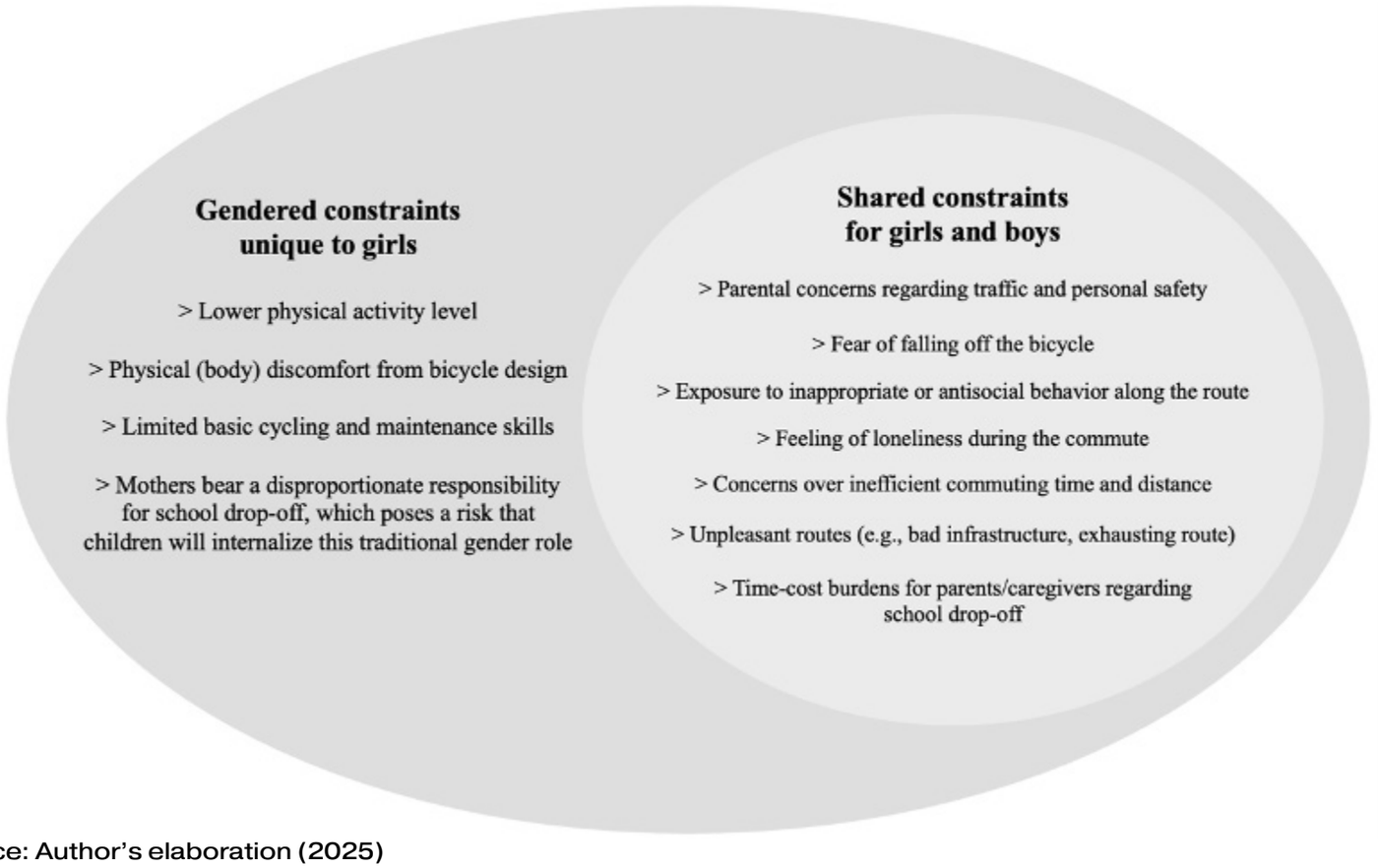
Some challenges remained. A mother of a girl who worked in informal sector acknowledged ACB's value in supporting her child, but pointed out that the distance to the meeting point was still too far. This affected her work schedule, as she lost approximately 30 minutes each day. Furthermore, a single mother whose son had not yet been enrolled in ACB expressed frustration over the lack of access to the program.

4.3. Relation to Gender Needs Fulfilment

Building on the previous section, the wellbeing dimension findings indicate that, while girls and boys perceive ACB's contribution similarly in some components, their perceptions diverge in others. These differences stem from the distinct "starting points" of girls and boys, with girls encountering additional cycling-related constraints prior to ACB that were not experienced by boys **(see Figure 5)**. These pre-existing gendered constrains, identified through the perspective of girls themselves and parents, shaped gender-specific needs for girls.

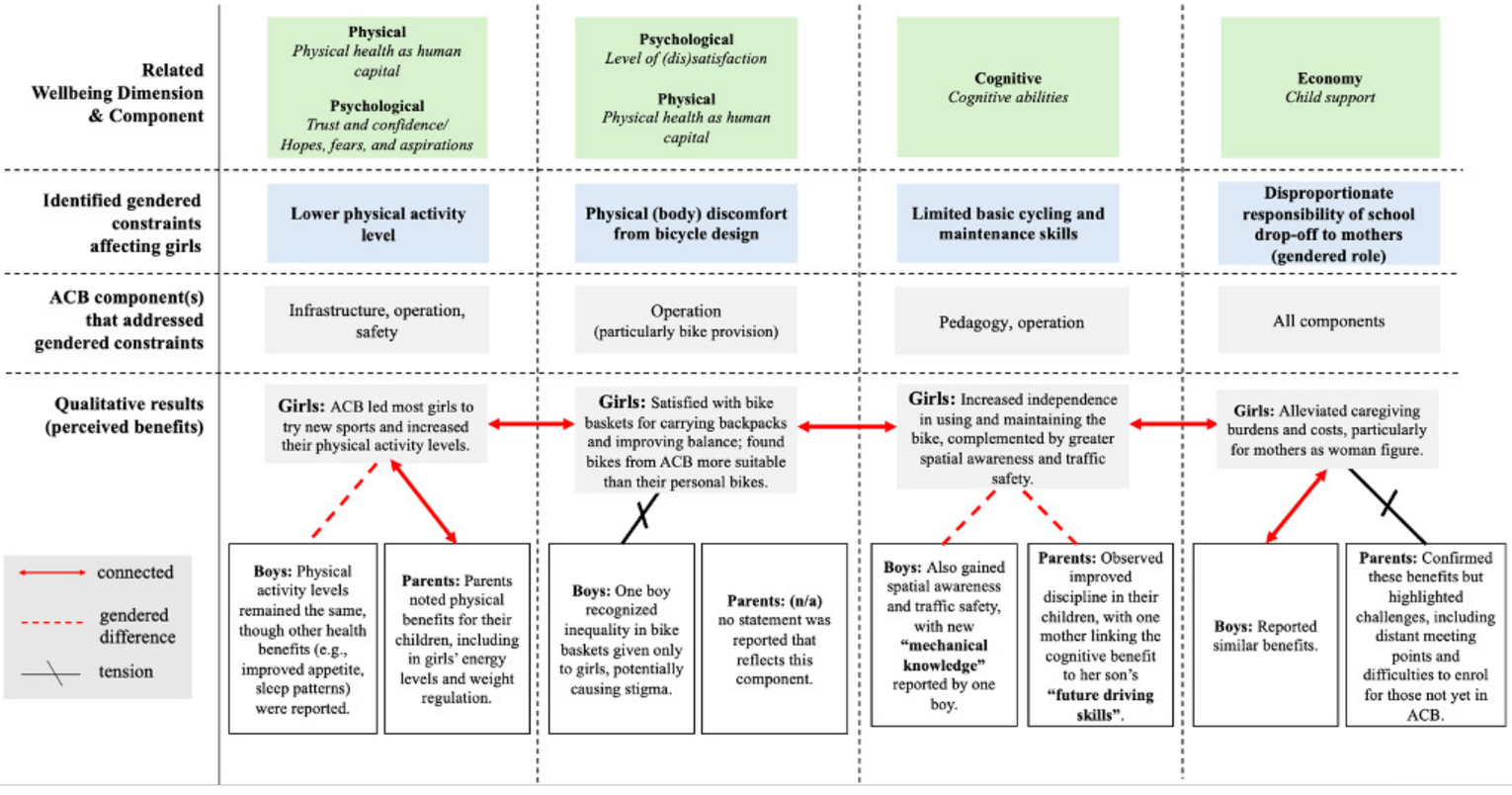
In response, ACB addressed girls' gender-specific needs, with most outcomes primarily fulfilling PGNs. However, the "gendered" benefits of ACB were not confined to girls, as boys and parents also reported positive outcomes, albeit in different forms. At the same time, certain aspects of ACB potentially created tensions that risk reinforcing gender stereotypes, illustrated in **Figure 4.**

Fig 3. Venn diagram illustrating gendered and shared constraints related to cycling before ACB



Source: Author's elaboration (2025)

Fig 4. Girls' practical gender needs addressed by ACB in comparison with boys and parents



Source: Author's elaboration (2025)

4.3.1. Practical Gender Needs

In its current design, ACB contributes to fulfil girls' practical needs by directly addressing immediate, gender-specific constraints to cycling to school. The most prominent constraint was girls' lower engagement in physical activity, including sports, before the program. Evidence reflects a gendered pattern in which cycling and other forms of exercise were perceived as routine for boys, but remained less encouraged for girls. By integrating cycling into girls' school commute, supported by infrastructure and safety measures, ACB enabled girls to participate more regularly in physical activity, helping to improve health and self-confidence in a context where such opportunities had been limited. As one girl explained:

"I practiced football [after ACB]. I used to get very tired on the road, and now I don't get as tired" (Girl-ID220030702332, existing beneficiary).

Another girl described a shift in how she valued cycling:

"I started to feel like riding a bike was cool, and that riding a bike is better for the environment than driving a car" (Girl-ID220030602325, existing beneficiary).

A mother also observed these changes:

"We [parents] realize that cycling has been really good for her in terms of endurance and speed. Being on a bike has improved her skating performance" (Parent-02, new beneficiary).

A further barrier specific to girls was the unsuitability of bicycles they previously owned due to their large size. As a girl expressed:

"…I didn't use it much…the bike was too big, so we had to store it somewhere else and we never found it" (Girl-ID210020501202, new beneficiary).

Therefore, ACB fulfilled this practical need by providing bikes that were suitable for girls' bodily comfort, along with baskets for carrying school bags.

"I like it because it's [the bike] very soft and has a basket" (Girl-ID220030602325, existing beneficiary).

However, this provision also created tension. A boy, who identified basket as a practical need, expressed dissatisfaction about unequal treatment between boys and girls:

"I think the basket [needs to be provided], because some girls were given a new bike and it had a basket" (Boy-ID210020504205, new beneficiary).

ACB also responded to the practical need for basic cycling and maintenance skills, which girls had fewer opportunities to develop before the program. A mother explained:

"Her behavior has been to lead a more independent and disciplined life with regard to issues related to the bike, keeping it clean, organizing the raincoat, and luggage cover" (Parent-02, new beneficiary).

Finally, ACB addressed mothers' PGNs by reducing the time and opportunity costs involved in escorting children to school. This benefit indirectly supported children's wellbeing while also beginning to challenge the assumption that caregiving responsibilities should fall primarily on mothers. One girl linked her interest in ACB to easing her mother's concern, rather than those of other possible caregivers (e.g., father, grandparents):

"It [ACB] would change things because it would be little calmer for my mom. She's always very worried about what might happen to me" (Girl-ID200060901604, not enrolled).

Collectively, these fulfilled PGNs are interconnected in ways that enhance girls' independent mobility within previously gendered constraints and, over time, have potential to narrow the gap in cycling prevalence between girls and boy.

4.3.2. Strategic Gender Needs

There is currently no conclusive evidence that ACB has fulfilled strategic gender needs. This limitation may be due to the relatively short participation period (3 months-4 years) and interview questions that were not designed to capture long-term social change.

Nevertheless, in line with the conceptual framework, the PGNs fulfilled through ACB provide a foundation for achieving SGNs over time. By increasing girls' cycling competence, comfort, and engagement in physical activity, ACB has the potential to normalize girls' presence in outdoor settings and, more broadly, challenge persistent gender norms that frame cycling as a "boy's activity." Moreover, the skills acquired (e.g., spatial awareness, route safety, cycling competence, independence) could extend girls' independent mobility beyond school commutes to other daily activities, including visiting parks and training facilities without adult supervision. In the long term, this may contribute to greater gender parity in the use of public space, social participation, and access to economic opportunities.

However, the realization of these outcomes depends on ACB's long-term sustainability and its ability to integrate more gender-sensitive practices. For instance, unequal equipment provision (e.g., bike baskets) and association of cognitive benefits with skills like "future motorbike driving" or "mechanics", raised only by boys and their parents, risks reinforcing symbolic distinctions between "girls" and "boys" if replicated at scale.

Similarly, lack of institutional support for program enrolment could pose the risk of disproportionate unpaid care being reproduced in the next generation. This challenge was expressed by one single mother, despite having visited DSE's office:

"I'm the head of the family, it was a luxury to get the money to pay for it [paid caregiver]. However, it was really hard for me, and nothing, they [DSE] didn't accept my letter, or give me the [ACB] benefit until now" (Parent-06, not enrolled).

Addressing such gendered issues, starting at the practical level, is critical if ACB is to move beyond meeting PGNs toward advancing SGNs.

5. Discussion

The findings from ACB implementation illustrate how the intersection of "gender" and "active mobility" produces differential wellbeing outcomes as perceived by girls and boys. Two arguments emerged. First, ACB generally enhanced children's wellbeing, with girls and boys reporting shared perceptions in majority of wellbeing components. Second, certain outcomes appeared more pronounced for girls, while for boys, the outcomes largely reflected continuity with their regular cycling practices. This research is the first to examine ACB explicitly through gender lens, drawing on beneficiaries' perspectives across implementation window from 3 months to 4 years.

Shared outcomes

As AMTS intervention, ACB contributed positively to children's wellbeing by strengthening friendships, improving health, building confidence, and enhancing spatial awareness. However, children also identified barriers, including punctuality issues, dissatisfaction with route choice, and fears of falling off the bicycles. No significant differences reported between short- and

medium-term beneficiaries.

Although physical and psychological dimensions generated the highest number of coded references, these did not consistently reflect positive experiences. Instead, two themes most frequently emerged as positive influences on children's wellbeing were social interactions

during the collective cycling and sense of trust and self-confidence, irrespective of gender. This aligns with previous studies that identifies social support as crucial determinant of children's and adolescents' active mobility (Hohepa et al., 2007; Prezza and Pacilli, 2007; Mikkelsen and Christensen, 2009; Simons et al., 2013).

Children perceived school guides as particularly important in fostering trust and self-confidence in cycling. While children's independent mobility is commonly defined as travel without adult supervision (Jones et al., 2012; Marzi, Demetriou and Reimers, 2018; Westman, Friman and Olsson, 2020), evidence from ACB suggests that "limited" adult supervision can function as a transitional stage toward independence. Guides not only reassured parents but also enabled children to gradually develop autonomy and overcome fears, particularly among those with limited cycling and traffic knowledge.

Gendered outcomes

In several components, ACB outcomes appeared more pronounced for girls, consistent with findings in other contexts (Martínez-Gómez et al., 2011; Van Dijk et al., 2014). This disparity reflects gendered constraints girls faced prior to joining ACB, including lower engagement in physical activity, bodily discomfort with unsuitable bicycles, and limited cycling competence. Boys, by contrast, had already normalized cycling as both commuting mode and recreational practice (Twaddle, Hall and Bracic, 2010; Kawgan-Kagan, Schuppan and Petersen, 2019).

The interview data, however, did not capture how societal and familial norms produced these unequal starting points. Feminist scholarship offers possible explanations. Young (2005) and Ravensbergen, Builing and Laliberte (2022) argue that patriarchal norms condition girls to embody "femininity" through immobility, bodily restraint, and attachment to domestic sphere. Conversely, cycling is constructed as "masculine" practice associated with exploration, athleticism, and risk-taking (Egan and Hacket, 2022). Practical barriers, such as school uniforms requiring skirts, may further exacerbate these disparities (Higgins and Ahern, 2023). Therefore, future studies are imperative to examine how these gendered expectations mediate girls' engagement with cycling and active mobility.

Interestingly, contrary to literature suggesting that parental restrictions disproportionately constrain girls' mobility (Hanson, 2010; Guliani et al., 2015; Palacios, 2019), this study found such concerns were expressed equally by parents of boys and girls.

Gendered constraints before ACB were also related with "trip-chaining" pattern, where mothers escorted children to school while balancing productive roles (Saegert, 1980; Hanson, 2010; Chant and McIlwaine, 2015). While this practice does not directly undermine children's wellbeing, it risks reinforcing gendered division of labour by normalizing women's double burden of paid and unpaid (care) work. This, in turn, may shape children's perceptions of traditional gender roles, particularly among daughters. This is especially relevant in Bogotá, where low-income women constitute the largest group of unpaid caregivers (Guevara-Aladino, et al., 2024), and where interviewed beneficiaries were from lower socio-economic neighbourhoods.

Responding these constraints, ACB fulfilled

PGNs through its operational (daily cycling and bike provision including baskets), infrastructural (bike lanes), safety (school guides and "trust routes"), networkin (collective cycling), and pedagogical (training and spatial learning) components. These measures enabled girls to increase participation in physical activity, improve cycling independence, and benefit from physically-suited bike designs, while also alleviating mothers' caregiving burdens. All relate primarily to daily functioning.

Yet, as Molyneux (1985) and Moser (1993) argue, meeting PGNs alone does not equate to gender transformation, though it can serve as an entry point. Raju (2005) similarly warns that merely facilitate access to practical resources (e.g., education, safe commute) without redefining social structures can be counterproductive or disabling. Evidence from ACB illustrates this risk (i.e., unequal bike provision, difficulties faced by single mother in enrolling children, gendered interpretations of cognitive outcomes). One mother, for instance, perceived ACB as preparation for her son's future driving, and one boy highlighted mechanical knowledge gained, skills associated with masculinity. Such perceptions, absent among girls, suggest that without deliberate attention, ACB may reproduce gendered stereotypes.

To progress toward fulfilling SGNs and gender equality, ACB must move beyond gender-blind approaches. Intervention should not only ensure girls' (and boys', where relevant) practical access but also contest and reshape social meanings around cycling and mobility, beginning within families, friends, schools, and intervention itself, even if this requires differentiated strategies for girls and boys (Marzi et al., 2020). Failure to do so risks undermining girls' wellbeing and negatively influencing their engagement with physical activity in adulthood (Malina, 1996; Cleland, Dwyer and Venn, 2012; Chant and McIlwaine, 2015).

Overall, the findings from this research challenge dominant discourses that situate the value of AMTS primarily within physical health outcomes, as done by previous studies (Chillón et al., 2010; Segura-Jiménez, 2016; Triana et al., 2019; García and Kim, 2020).

While health remain significant, the prominence of social, psychological, cognitive, and economic dimensions in children's perceptions underscores the multidimensionality of wellbeing and the ways in which these dimensions influence one another (Waygood et al., 2020). This also indicates the importance of centring children's voices in designing and evaluating AMTS.

Limitations

This research has several limitations, and findings should be interpreted with caution. First, it was limited by small sample size (12 children, 7 parents) from similar life-stage (10-15 years) and socio-economic backgrounds (i.e., lower socio-economic status). Second, the dataset lacked temporal details regarding specific provisions (e.g., training, bike distribution), limiting analysis of how outcomes evolved over time in relation to particular inputs. Third, interview questions were not framed in gender-sensitive manner, which may have limited how beneficiaries articulated their gendered experiences. Fourth, ACB's participatory elements (e.g., social cartography, peer learning, clusters) were not explored in interview questions, though these may influence gendered outcomes.

Future research should consider these limitations and engage with diverse beneficiaries with intersecting identities, as the interplay of gender with age, ethnicity, physical ability, sexuality, and socio-economic produces varying degrees of opportunities and barriers in public spaces (Ortiz et al., 2025). Comparisons between socio-economic strata

could also be valuable, for example contrasting children's perspectives from higher socio-economic groups, who benefit from better access to bike lanes and urban resources, with lower socio-economic groups. Spatial factors, such as proximity to sports facilities and parks, also warrant attention, as lower physical or cycling activity may result from distance and spatial inequality rather than gender alone, as observed by Parra et al. (2018). Finally, data collection in future studies should explicitly designed with gender-sensitive and intersectional questions to capture how children perceive gender norms and other forms of marginalizations in shaping their lived experiences and connection with active mobility.

6 . Conclusion

This research examined the differential wellbeing outcomes of cycling-based AMTS intervention on girls and boys, and its relationship to the fulfilment of gender-specific mobility needs, using the case of Al Colegio en Bici (ACB) in Bogotá. While earlier studies of AMTS interventions in Bogotá and other global contexts have primarily focused on physical health, this research expanded the analysis to broader wellbeing dimensions, positioning gender as central analytical lens. The conceptual framework integrated children's mobility-related wellbeing (Waygood et al., 2020; Oviedo and Sabogal, 2020) with gender analysis (Molyneux, 1985; Moser, 1993).

As an intervention whose objectives extended beyond health to include strengthening connection to urban territory, improving access to education, and fostering cycling independence, ACB was generally perceived by children and parents as contributing not only to physical wellbeing but also to psychological, social, cognitive, and economic aspects of their everyday life. Social interactions and school guides emerged as particularly significant in shaping children's mobility-related wellbeing, regardless of gender.

This research also reinforced the argument that "mobility is gendered". Prior to ACB, girls (and mothers) experienced disproportionate barriers, including lower cycling competence, bodily discomfort, limited physical activity, and unbalanced escort responsibilities assumed by mothers.

ACB mitigated these constraints by fulfilling PGNs, enabling girls to develop positive relationships with cycling. For boys, some outcomes merely reflected continuity with regular cycling practices. However, ACB's contribution to meeting SGNs, which involve transforming gendered meanings and norms of cycling, remain limited but holds future potential.

As an early-stage intervention, ACB model shows promise and could be replicated in other contexts, particularly in urban-peripheries of the Global South, where its affordability and practicality could improve educational access and address transport barriers (Felez-Nobrega et al., 2023). Yet, if AMTS interventions are to function not only as mobility solutions but also as means of empowerment, policymakers must move beyond gender-blind approaches that risk reproducing inequalities. Only by meaningfully engaging with the voices of girls and boys, while paying particular attention to gendered constraints faced by girls, can AMTS achieve equitable wellbeing outcomes and contribute to gender equality over the long-term.

7. Bibliography

- Alcaldía de Bogotá (2014) "Inició en forma y en vía la estrategia 'Al colegio en bici.'" Available at: https://bogota.gov.co/mi-ciudad/movilidad/inicio-en-forma-y-en-la-estrategia-al-colegio-en-bici (Accessed: July 1, 2025).

- Alcaldía de Bogotá (2022) “Al colegio en Bici” beneficia a cerca de 80 colegios en Bogotá ¡Te contamos! Available at: https://bogota.gov.co/mi-ciudad/educacion/colegios-en-bogota-que-cuentan-con-la-iniciativa-al-colegio-en-bici (Accessed: July 1, 2025).
- Alcaldía de Bogotá (2025) Al Colegio en Bici llegará a 13 mil niños y niñas en Bogotá en marzo de 2025. Available at: https://bogota.gov.co/mi-ciudad/movilidad/al-colegio-en-bici-en-bogota-2025-llegara-13-mil-ninos-y-ninas (Accessed: July 1, 2025).
- Alingo, P. and Abdulmelik, N. (2017) From rhetoric to action: delivering for young women in africa. Available at: https://issafrica.org/research/policy-brief/from-rhetoric-to-action-delivering-for-young-women-in-africa (Accessed: August 27, 2025).
- Ben-Arieh, A. (2008) “The Child Indicators Movement: Past, Present, and Future,” Child Indicators Research, 1(1), pp. 3–16. Available at: https://doi.org/10.1007/s12187-007-9003-1.
- Bradshaw, J., Hoelscher, P. and Richardson, D. (2007) “An index of child well-being in the European Union,” Social Indicators Research, 80(1), pp. 133–177. Available at: https://doi.org/10.1007/s11205-006-9024-z.
- Brindley, C. et al. (2023) “Gender-specific social and environmental correlates of active travel to school in four European countries: the HBSC Study,” Frontiers in Public Health, 11. Available at: https://doi.org/10.3389/fpubh.2023.1190045.
- Bungum, T.J., Clark, S. and Aguilar, B. (2014) “The Effect of an Active Transport to School Intervention at a Suburban Elementary School,” American Journal of Health Education, 45(4), pp. 205–209. Available at: https://doi.org/10.1080/19325037.2014.916635.
- Camfield, L., Streuli, N. and Woodhead, M. (2009) “What’s the use of ‘well-being’ in contexts of child poverty? approaches to research, monitoring and children’s participation,” International Journal of Children’s Rights, 17(1), pp. 65–109. Available at: https://doi.org/10.1163/157181808X357330.
- Casas, F. (2011) “Subjective social indicators and child and adolescent well-being,” Child Indicators Research, 4(4), pp. 555–575. Available at: https://doi.org/10.1007/s12187-010-9093-z.
- Cervero, R.B. (2013) “Linking urban transport and land use in developing countries,” Journal of Transport and Land Use, 6(1), pp. 7–24. Available at: https://doi.org/10.5198/jtlu.v6i1.425.
- Chant, S. and Gutmann, M.C. (2002) “‘Men-streaming’ gender? Questions for gender and development policy in the twenty-first century,” Progress in Development Studies, 2(4), pp. 269–282. Available at: https://doi.org/10.1191/1464993402ps041ra.
- Chant, S. and McIlwaine, C. (2015) Cities, Slums and Gender in the Global South. Routledge. Available at: https://doi.org/10.4324/9781315862996.
- Chillón, P. et al. (2010) “Active commuting to school in children and adolescents: An opportunity to increase physical activity and fitness,” Scandinavian Journal of Public Health, 38(8), pp. 873–879. Available at: https://doi.org/10.1177/1403494810384427.
- Cleland, V., Dwyer, T. and Venn, A. (2012) “Which domains of childhood physical activity predict physical activity in adulthood? A 20-year prospective tracking study,” British Journal of Sports Medicine, 46(8), pp. 595–602. Available at: https://doi.org/10.1136/bjsports-2011-090508.
- Connell, R.W. (1988) “Gender and Power: Society, the Person, and Sexual Politics,” Bulletin of Science, Technology & Society, 8(4), pp. 445–445. Available at: https://doi.org/10.1177/027046768800800490.

- Corradi, C. et al. (2016) "Theories of femicide and their significance for social research," Current Sociology, 64(7), pp. 975–995. Available at: https://doi.org/10.1177/0011392115622256.
- Cresswell, T. (2010) "Towards a Politics of Mobility," Environment and Planning D: Society and Space, 28(1), pp. 17–31. Available at: https://doi.org/10.1068/d11407.
- Denzin, N.K. (2009) "The elephant in the living room: or extending the conversation about the politics of evidence," Qualitative Research, 9(2), pp. 139–160. Available at: https://doi.org/10.1177/1468794108098034.
- Drisko, J.W. and Maschi, T. (2015) "Qualitative Content Analysis," in Content Analysis. Oxford University Press, pp. 81–120. Available at: https://doi.org/10.1093/acprof:oso/9780190215491.003.0004.
- Dunckel-Graglia, A. (2013) "Women-Only Transportation: How 'Pink' Public Transportation Changes Public Perception of Women's Mobility," Journal of Public Transportation, 16(2), pp. 85–105. Available at: https://doi.org/10.5038/2375-0901.16.2.5.
- Egan, R. and Hackett, J. (2022) "The Social Practice and Regulation of Cycling as 'A Boy's Thing' in Irish Secondary Schools," Active Travel Studies, 2(1). Available at: https://doi.org/10.16997/ats.1121.
- Erickson-Schroth, L. and Davis, B. (2021) Gender: What Everyone Needs to Know. New York: Oxford University Press. Available at: https://search-ebscohost-com.libproxy.ucl.ac.uk/login.aspx?direct=true&AuthType=ip,shib&db=nlebk&AN=2691749&site=ehost-live&scope=site (Accessed: July 14, 2025).
- Felez-Nobrega, M. et al. (2023) "Active school commuting in adolescents from 28 countries across Africa, the Americas, and Asia: a temporal trends study," International Journal of Behavioral Nutrition and Physical Activity, 20(1), p. 1. Available at: https://doi.org/10.1186/s12966-022-01404-y.
- Freeman, C. and Tranter, P. (2012) Children and their Urban Environment. Routledge. Available at: https://doi.org/10.4324/9781849775359.
- Fyhri, A. et al. (2011) "Children's active travel and independent mobility in four countries: Development, social contributing trends and measures," Transport Policy, 18(5), pp. 703–710. Available at: https://doi.org/10.1016/j.tranpol.2011.01.005.
- García, I. and Kim, K. (2020) "Active Commute to School, Physical Activity and Health of Hispanic High School Students in the United States," in, pp. 149–168. Available at: https://doi.org/10.1108/S2044-994120200000012011.
- German Marshall Fund (no date) Mobilizing communities around safe school commutes: It Begins With a Bicycle. Available at: https://www.gmfus.org/download/article/21412 (Accessed: July 28, 2025).
- Gilbert, M.R. (1998) "'Race,' Space, and Power: The Survival Strategies of Working Poor Women," Annals of the Association of American Geographers, 88(4), pp. 595–621. Available at: https://doi.org/10.1111/0004-5608.00114.
- Gomez, L.F. et al. (2015) "Urban environment interventions linked to the promotion of physical activity: A mixed methods study applied to the urban context of Latin America," Social Science & Medicine, 131, pp. 18–30. Available at: https://doi.org/10.1016/j.socscimed.2015.02.042.
- Guevara-Aladino, P. et al. (2024) "Urban Care for Unpaid Caregivers: Community Voices in the Care Block Program, in Bogotá, Colombia," Journal of Urban Health, 101(6), pp. 1113–1127. Available at: https://doi.org/10.1007/s11524-024-00899-z.
- Guliani, A. et al. (2015) "Gender-based differences in school travel mode choice behaviour: Examining the relationship between the neighbourhood environment and perceived traffic safety," Journal of Transport & Health, 2(4), pp. 502–511. Available at: https://doi.org/10.1016/j.jth.2015.08.008.

- Kern, L. (2005) “In Place and At Home in the City: Connecting privilege, safety and belonging for women in Toronto,” Gender, Place & Culture, 12(3), pp. 357–377. Available at: https://doi.org/10.1080/09663690500202590
- Krippendorff, K. (2019) Content Analysis: An Introduction to Its Methodology. 2455 Teller Road, Thousand Oaks California 91320 : SAGE Publications, Inc. Available at: https://doi.org/10.4135/9781071878781.
- Larouche, R., Mitra, R. and Waygood, E.O.D. (2020) “Transport and physical wellbeing,” in Transportation and Children’s Well-Being. Elsevier, pp. 21–39. Available at: https://doi.org/10.1016/B978-0-12-814694-1.00002-6.
- Levy, C. (2013) “Travel choice reframed: ‘deep distribution’ and gender in urban transport,” Environment and Urbanization, 25(1), pp. 47–63. Available at: https://doi.org/10.1177/0956247813477810.
- Levy, C. (2015) Gender, Asset Accumulation and Just Cities. Edited by C.O.N. Moser. Routledge. Available at: https://doi.org/10.4324/9781315776118.
- Levy, C. (2019) “Travel Choice Reframed: ‘Deep Distribution’ and Gender in Urban Transport,” in Integrating Gender into Transport Planning. Cham: Springer International Publishing, pp. 43–65. Available at: https://doi.org/10.1007/978-3-030-05042-9_3.
- Ludantia Bienal Internacional (2017) Al Colegio en Bici. Available at: https://ludantia.wixsite.com/bienal-internacional/al-colegio-en-bici (Accessed: July 1, 2025).
- Malina, R.M. (1996) “Tracking of Physical Activity and Physical Fitness across the Lifespan,” Research Quarterly for Exercise and Sport, 67(sup3), p. S-48-S-57. Available at: https://doi.org/10.1080/02701367.1996.10608853.
- Martínez-Gómez, D. et al. (2011) “Active Commuting to School and Cognitive Performance in Adolescents,” Archives of Pediatrics & Adolescent Medicine, 165(4), p. 300. Available at: https://doi.org/10.1001/archpediatrics.2010.244.
- Marzi, I. et al. (2020) “Interventions Aiming to Promote Active Commuting in Children and Adolescents: An Evaluation From a Sex/Gender Perspective,” Frontiers in Sports and Active Living, 2. Available at: https://doi.org/10.3389/fspor.2020.590857.
- Marzi, I., Demetriou, Y. and Reimers, A.K. (2018) “Social and physical environmental correlates of independent mobility in children: A systematic review taking sex/gender differences into account,” International Journal of Health Geographics. BioMed Central Ltd. Available at: https://doi.org/10.1186/s12942-018-0145-9.
- Mayring, P. (2000) “Qualitative Content Analysis,” Forum: Qualitative Social Research, 1(2). Available at: https://www.qualitative-research.net/index.php/fqs/article/view/1089/2385 (Accessed: July 8, 2025).
- Medeiros, A. et al. (2021) “Review of gender, socioeconomic status, and ethnic background considerations reported in active school travel intervention studies,” Journal of Transport & Health, 21, p. 101035. Available at: https://doi.org/10.1016/j.jth.2021.101035.
- Mikkelsen, M.R. and Christensen, P. (2009) “Is Children’s Independent Mobility Really Independent? A Study of Children’s Mobility Combining Ethnography and GPS/Mobile Phone Technologies1,” Mobilities, 4(1), pp. 37–58. Available at: https://doi.org/10.1080/17450100802657954.
- Molyneux, M. (1985) “Mobilization without Emancipation? Women’s Interests, the State, and Revolution in Nicaragua,” Feminist Studies, 11(2), pp. 227–254. Available at: https://doi.org/10.2307/3177922.

- Montero, S. (2017) “Worlding Bogotá’s Ciclovía,” Latin American Perspectives, 44(2), pp. 111–131. Available at: https://doi.org/10.1177/0094582X16668310.
- Morgan, D.L. (1993) “Qualitative Content Analysis: A Guide to Paths not Taken,” Qualitative Health Research, 3(1), pp. 112–121. Available at: https://doi.org/10.1177/104973239300300107.
- Moser, C.O.N. (1993) “Practical and strategic gender needs and the role of the state,” in Gender Planning and Development. 1st edn. Routledge, pp. 37–54.
- Ortiz, C. et al. (2025) “Spatialising intersectionality: An approach to public space design in self-built neighbourhoods in Cali, Colombia,” URBAN DESIGN International [Preprint]. Available at: https://doi.org/10.1057/s41289-024-00267-y.
- Ovalle Clavijo, E.F. (2019) Por una ciudad al alcance de los niños: sistematización de “Al colegio en Bici” en la localidad de Kennedy. Available at: https://www.proquest.com/dissertations-theses/por-una-ciudad-al-alcance-de-los-niños/docview/3108453656/se-2 (Accessed: July 1, 2025).
- Oviedo, D., Levy, C. and Dávila, J.D. (2017) “Constructing wellbeing, deconstructing urban (im)mobilities in Abuja, Nigeria,” in Urban Mobilities in the Global South. Routledge, pp. 173–194. Available at: https://doi.org/10.4324/9781315265094-10.
- Oviedo, D. and Sabogal, O. (2020) “Unpacking the connections between transport and well-being in socially disadvantaged communities: Structural equations approach to low-income neighbourhoods in Nigeria,” Journal of Transport & Health, 19, p. 100966. Available at: https://doi.org/10.1016/j.jth.2020.100966.
- Oviedo, D. and Titheridge, H. (2016) “Mobilities of the periphery: Informality, access and social exclusion in the urban fringe in Colombia,” Journal of Transport Geography, 55, pp. 152–164. Available at: https://doi.org/10.1016/j.jtrangeo.2015.12.004.
- OWS Research Project (2024) “Interview Transcripts: Children and Parents in the Al Colegio en Bici Program [Unpublished interview data].” Bogotá: Faculty of Medicine, Universidad de los Andes.
- Palacios, A. (2019) Transport Connectivity: A Gender Perspective. Available at: https://www.itf-oecd.org/sites/default/files/docs/transport-connectivity-gender-perspective.pdf (Accessed: August 27, 2025).
- Parra, D.C. et al. (2018) “Equity in cycle lane networks: examination of the distribution of the cycle lane network by socioeconomic index in Bogotá, Colombia,” Cities & Health, 2(1), pp. 60–68. Available at: https://doi.org/10.1080/23748834.2018.1507068.
- Prezza, M. et al. (2001) “The influence of psychosocial and environmental factors on children’s independent mobility and relationship to peer frequentation,” Journal of Community & Applied Social Psychology, 11(6), pp. 435–450. Available at: https://doi.org/10.1002/casp.643.
- Raju, S. (2005) “Gender and Empowerment: Creating ‘Thus Far and no Further’ Supportive Structures. A Case from India,” in A Companion to Feminist Geography. Wiley, pp. 194–207. Available at: https://doi.org/10.1002/9780470996898.ch14
- Rathgeber, E.M. (1990) WID, WAD, GAD: Trends in Research and Practice, Source: The Journal of Developing Areas. Available at: https://www.jstor.org/stable/4191904 (Accessed: June 6, 2025).
- Ravensbergen, L., Buliung, R. and Laliberté, N. (2019) “Toward feminist geographies of cycling,” Geography Compass, 13(7). Available at: https://doi.org/10.1111/gec3.12461.
- Rawsthorne, M. et al. (2019) “Young person’s well-being: Exploring material, subjective and relational factors,” Children Australia, 44(01), pp. 13–22. Available at: https://doi.org/10.1017/cha.2018.53.

- Razavi, S. and Miller, C. (1995) From WID to GAD: Conceptual Shifts in the Women and Development Discourse. Geneva. Available at: https://www.files.ethz.ch/isn/38688/OP%20001c.pdf (Accessed: June 6, 2025).
Rosas-Satizábal, D. and Rodriguez-Valencia, A. (2019) "Factors and policies explaining the emergence of the bicycle commuter in Bogotá," Case Studies on Transport Policy, 7(1), pp. 138–149. Available at: https://doi.org/10.1016/j.cstp.2018.12.007.
- Rutberg, S. et al. (2025) "My Way to School Through a Camera Lens: Involving Children to Inform a Policy Recommendation on Active School Travel," Health Promotion Practice, 26(3), pp. 437–445. Available at: https://doi.org/10.1177/15248399241255376.
- Saegert, S. (1980) "Masculine Cities and Feminine Suburbs: Polarized Ideas, Contradictory Realities," Signs: Journal of Women in Culture and Society, 5(S3), pp. S96–S111. Available at: https://doi.org/10.1086/495713.
- Salon, D. and Gulyani, S. (2010) "Mobility, Poverty, and Gender: Travel 'Choices' of Slum Residents in Nairobi, Kenya," Transport Reviews, 30(5), pp. 641–657. Available at: https://doi.org/10.1080/01441640903298998.
- Schönbach, D.M.I. et al. (2020) "Strategies and effects of school-based interventions to promote active school transportation by bicycle among children and adolescents: a systematic review," International Journal of Behavioral Nutrition and Physical Activity, 17(1), p. 138. Available at: https://doi.org/10.1186/s12966-020-01035-1.
- Schreier, M. (2012) Qualitative Content Analysis in Practice. 1 Oliver's Yard, 55 City Road London EC1Y 1SP : SAGE Publications Ltd. Available at: https://doi.org/10.4135/9781529682571.
- Segura-Jiménez, V. et al. (2016) "Physical fitness as a mediator between objectively measured physical activity and clustered metabolic syndrome in children and adolescents: The UP&DOWN study," Nutrition, Metabolism and Cardiovascular Diseases, 26(11), pp. 1011–1019. Available at: https://doi.org/10.1016/j.numecd.2016.07.001
- Sibilski, L.J. and Targa, F. (2019) Latin America's suburban cycling craze, World Economic Forum. Available at: https://www.weforum.org/stories/2019/11/latin-america-urban-cycling-culture/ (Accessed: July 1, 2025).
- Simons, D. et al. (2013) "Factors influencing mode of transport in older adolescents: a qualitative study," BMC Public Health, 13(1), p. 323. Available at: https://doi.org/10.1186/1471-2458-13-323.
- Smith, M. et al. (2017) "Systematic literature review of built environment effects on physical activity and active transport – an update and new findings on health equity," International Journal of Behavioral Nutrition and Physical Activity, 14(1), p. 158. Available at: https://doi.org/10.1186/s12966-017-0613-9.
- Triana, C.A. et al. (2019) "Active streets for children: The case of the Bogotá Ciclovía," PLOS ONE, 14(5), p. e0207791. Available at: https://doi.org/10.1371/journal.pone.0207791.
- Twaddle, H., Hall, F. and Bracic, B. (2010) "Latent Bicycle Commuting Demand and Effects of Gender on Commuter Cycling and Accident Rates," Transportation Research Record: Journal of the Transportation Research Board, 2190(1), pp. 28–36. Available at: https://doi.org/10.3141/2190-04.
- UNICEF (2025) Child Well-Being in an Unpredictable World. Available at: https://www.unicef.org/innocenti/media/11111/file/UNICEF-Innocenti-Report-Card-19-Child-Wellbeing-Unpredictable-World-2025.pdf (Accessed: July 14, 2025).
- Uteng, T.P. and Lucas, K. (2017) "The trajectories of urban mobilities in the Global South," in Urban Mobilities in the Global South. Routledge, pp. 1–18. Available at: https://doi.org/10.4324/9781315265094-1.
- Van Dijk, M.L. et al. (2014) "Active commuting to school, cognitive performance, and academic achievement: an observational study in Dutch adolescents using accelerometers," BMC Public Health, 14(1), p. 799. Available at: https://doi.org/10.1186/1471-2458-14-799.

• Walker, J., Frediani, A.A. and Trani, J.-F. (2013) “Gender, difference and urban change: implications for the promotion of well-being?,” Environment and Urbanization, 25(1), pp. 111–124. Available at: https://doi.org/10.1177/0956247812468996.
• Waygood, E.O.D. et al. (2020) “Introduction to transport and children’s wellbeing,” in Transportation and Children’s Well-Being. Elsevier, pp. 1–17. Available at: https://doi.org/10.1016/B978-0-12-814694-1.00001-4.
• Westman, J., Friman, M. and Olsson, L.E. (2020) “Travel and child wellbeing: The psychological and cognitive domains,” in Transportation and Children’s Well-Being. Elsevier, pp. 41–59. Available at: https://doi.org/10.1016/B978-0-12-814694-1.00003-8.
• White, S.C. (2010) “Analysing wellbeing: A framework for development practice,” Development in Practice, 20(2), pp. 158–172. Available at: https://doi.org/10.1080/09614520903564199.
World Health Organization (WHO) (2020) WHO Guidelines on Physical Activity and Sedentary Behaviour. Geneva. Available at: https://iris.who.int/bitstream/handle/10665/336657/9789240015111-eng.pdf (Accessed: July 14, 2025).
• Young, I.M. (2005) On Female Body Experience. Oxford University PressNew York. Available at: https://doi.org/10.1093/0195161920.001.0001

9. Footnotes

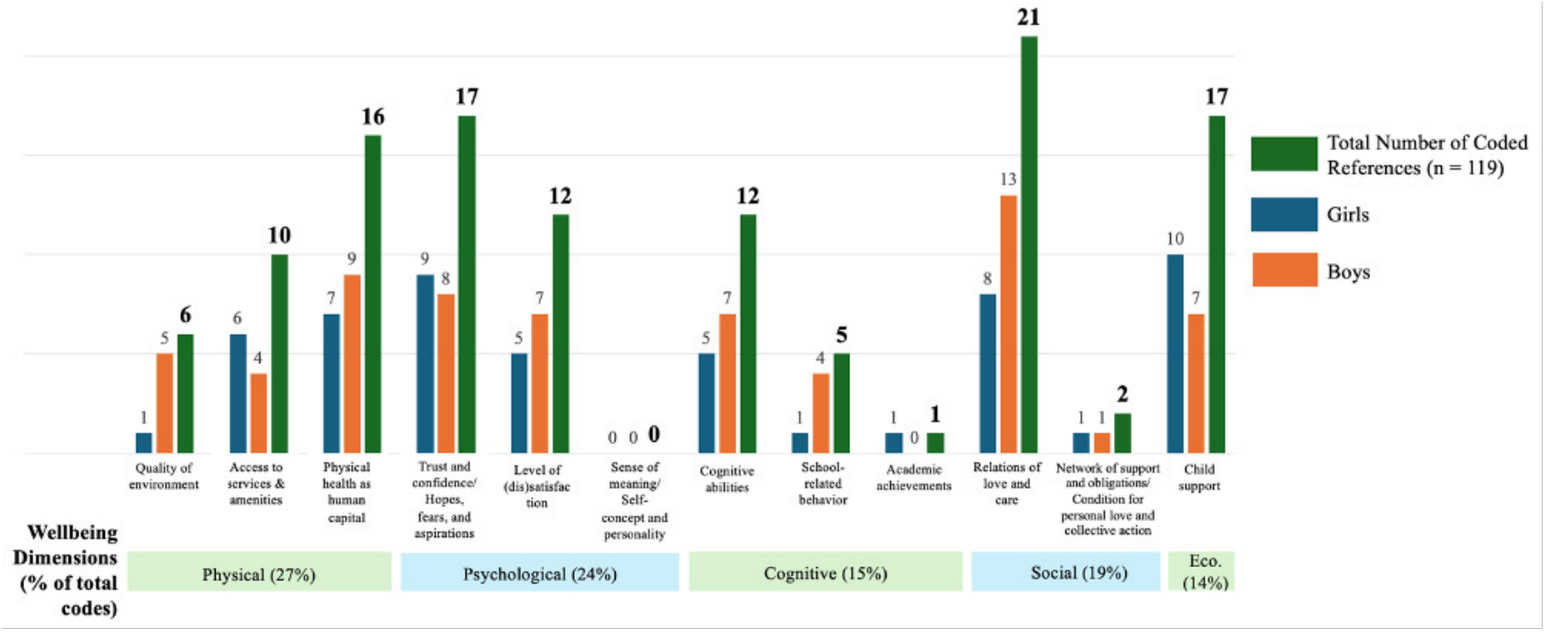
[1] As this research is part of the On the Way to School (OWS) research fellowship project, consent and ethical procedures for the interview were obtained by the team beforehand as a direct interviewer. In addition, author has also signed a data sharing and confidentiality agreement.

[2] An interview statement can be assigned multiple codes when it reflects more than one wellbeing component.

9. Anexxes

Annexe 1. Data sources: Interview summary

Fig 2. Distribution of coded references by gender across wellbeing dimensions



Source: Author's elaboration using NVivo (2025)

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