

Cycling as Transportation: Sociocultural Meanings from a Gender Perspective in Bogota, Colombia

María Viviana Caballero Suárez

School of Medicine Universidad de Los Andes

Catalina González-Urbe (✉ cgonzalez@uniandes.edu.co)

Universidad de los Andes-Facultad de Medicina <https://orcid.org/0000-0002-3322-5017>

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Abstract

Physical inactivity is a risk factor for chronic diseases and ischemic cardiomyopathy, which is the leading cause of death in Bogota, Colombia. Cycling is a sustainable strategy to increase levels of physical activity, especially for college students; however, fewer women than men engage in this activity due to gender roles, creating an avoidable inequity. The aim of this study was to understand the socio-cultural significance perceived by a group of medical students in women's use of bicycles as a mode of transportation in Bogotá. Qualitative research based on grounded theory was conducted. Sixteen students participated in three focus groups and four interviews from February to April 2018. We found that the meaning of the cycling experience resulted from identity construction. The cycling experience involved both sociodemographic conditions and a transitional gender model with competing notions from a traditional and a contemporary model. The traditional view on bicycling emphasised the insecurity of women based on underestimation of their capacities. This model generated perceived vulnerability and affected undermined women's self-efficacy. In the contemporary model, bicycle use facilitated well-being and served as an efficient means to commute. To increase female students' participation in urban cycling, it is essential to encourage the construction of self-efficacy. It is also necessary to improve safety in public spaces and facilitate bicycles' convenience of use. These actions could support sustainable transportation, gender equity and reduction of health risks related to physical inactivity.

Background

Physical inactivity is associated with numerous chronic non-communicable diseases and the burden of ischemic cardiopathy [1]. Heart disease is the leading cause of death in Bogotá, Colombia [2]. The average age of abandonment of physical activity has been shown to be 18 years old, which coincides with the beginning of undergraduate studies [3]. In the university environment, women and health students have high levels of sedentarism, which is worrying because physical activity during this stage is a good indicator of subsequent practice [4,5]. Moreover, for health professionals, adopting such a habit can result in better counselling and motivation for patients on this topic [6].

Transport cycling is a sustainable strategy to increase levels of physical activity because it can be integrated into daily life [7,8]. However, the prevalence of compliance with this recommendation in Bogotá is only 4.3% [9], and the rate of use is three times lower among women than men [10]. This difference persists in the university context: in Bogotá, 1.54% of female students bike to campus, but 2.88% of men bike [11]. Women's low participation in transport cycling has been related to the greater social and cultural obstacles they face. According to Mosquera et al. [12] and the Secretaría Distrital de la Mujer [13], some obstacles in Bogotá are the way in which femininity is inculcated, differences in the perceived safety of women based on objective reasons and prejudice about women's ability to ride bicycles, among others. Cycling improves health [14] and facilitates access to goods and services, such as education; therefore, inequality in cycling constitutes an inequality that predisposes women to greater health risks and negatively affects social development [15,16].

Various studies have examined bicycle use from a gender perspective. Some works have focused on how gender processes shape transportation patterns. Studies in this field have linked differences in bicycle use to factors such as the complexity of travel for women while caring for dependents, as well as urban planning, cycling infrastructure and safety, among others [17,18,19]. Other studies, mainly from feminist positions, have found that female biking experiences are diverse and can be associated with power–subordination relations between men and women and, therefore, result in unequal access and opportunities [20,21].

Despite studies on gendered cycling patterns at the local level [12], there exist gaps in the understanding of the relationships between practices and gender roles in connection to the decision to bike in the university environment, which is a strategic setting to promote this healthy habit [8]. The objective of this study, therefore, was to understand the socio-cultural significance of bicycle commuting by women in Bogotá as perceived by a group of medical students at the University of the Andes. The research focused on this population because health professionals play an important role in promoting active lifestyles [6]. The analysis adopted a perspective viewing the health–disease process as an expression of social position conflicts due to being a man or a woman, along with gender roles and identity [22]. This study drew on theoretical elements from poststructural feminism, a field that considers gender to be a subjective identity always constructed relative to the sociocultural context [23].

Methods

A qualitative methodology based on grounded theory was used [24]. Purposive sampling was conducted to recruit men and women at least 18 years old enrolled in health sciences studies at the University of the Andes, Bogotá, Colombia, regardless if they were cycling or not. Recruitment was conducted by both, institutional means like email and lectures announcements, board posters and the snowball sampling technique.

The sample consisted of 16 students, six men and 10 women, who participated in three focus groups and four semi-structured interviews from February to April 2018. One group consisted only of women, and another of only men in order to have internal homogeneity [25]. A third group comprised of both men and women to explore the phenomenon through their interactions (Table 1). The interviews were aimed at deepening students' experiences and to fully develop the categories of analysis.

A 10-item questionnaire was administered to explore what the participants thought it meant to commute by bicycle. They were asked what ideals of femininity and masculinity they identified in their social environments and what their friends and family thought about them using bicycles for transportation. In addition, the questionnaire explored how these opinions influenced their decision to use this form of mobility.

Once the focus groups and interviews were transcribed, open coding was performed using Atlas.ti. 7 software to establish the significant concepts for the analysis. Next, axial coding was carried out to group these concepts based on their common properties and dimensions, which gave rise to main categories.

This process was performed iteratively throughout the data collection. Variations in the established concepts by sociodemographic conditions, such as origin, age, and occupation, among others, were explored. Finally, selective coding integrated all the categories into one central category.

This process led to the construction of a conceptual framework of the urban cycling phenomenon describing its process and structure [24]. The process was defined as the actions and interactions of the actors involved, while the structure was understood as the conditions and consequences of these actions. The model was compared with the data to evaluate its internal consistency and was validated with two participants to reduce possible interpretation biases [24,26].

Results

Regarding the participants' sociodemographic profile, they had an age range of 18–44 years old, came from several Colombian cities and belonged to different socioeconomic strata. Except for one student, all were single and had no children. None of the women cycled to commute at the time of data collection. However, two had done so at some stage in their student life, which allowed establishing a point of comparison with those who had not. In contrast, all but one of the men rode bicycles every day (Table 2).

The open coding produced 55 codes, which were condensed through axial coding into four categories considered to be conditions for transport cycling. These categories were: perceived insecurity, use of convenience, positive meanings of bicycle users' experiences and the transitional gender model.

Perceived Insecurity

Perceived insecurity referred to the students' interpretation or judgment of a lack of safety in their environment based on their own experiences and influenced by the perceptions of their classmates, friends and family members, especially their mothers. Perceived insecurity can be classified into two subcategories: road safety, particularly traffic accidents, and street crime. The first refers to traffic accidents and the second concerns to robberies, particularly robbery and sexual aggression.

Regarding perceived road insecurity, the participants who came from outside Bogotá found traffic in the city to be more complex and aggressive than in their hometowns. Their perceptions differed according to the route they travelled, which, in turn, depended on the area of their residence and destination.

The state of the cycling infrastructure was also a determining factor in perceived road safety. Dedicated roads with proper traffic signals and connected paths were felt to be safer. A lack of such networks during whole or part of a route required sharing the road and interacting with drivers using other transportation modes. When traffic rules were not followed, interactions were considered to be disrespectful and unsafe. This behaviour by other road users was mostly reported in the southern and western parts of the city. For the students, interactions with other road actors in these circumstances required good reflexes, coordination and balance. They also felt that development of these skills depended on frequent use and practice, resulting in self-efficacy.

In general, the students who frequently commuted by bicycle rated their skills as higher, while those who did not do so considered their skills to be lower and expressed a greater fear of biking. This low sense of self-efficacy was mainly evident in women and was found to be related to gender stereotypes. Accordingly, one participant stated:

Well, I know it's not like this much anymore, but you still think that sports are for boys, and you don't see as many women in sports or biking, so these are things you think of as—no, they're more manlike. (Female participant, focus group 3, 23/03/18)

The low uptake of bicycling was associated with gendered responses to injuries conditioned in the participants by their parents during childhood. One participant mentioned this point:

If a boy falls, also because of the same cultural tendency, adults say, 'Everything is OK. Calm down'. But if a girl falls, then it is a mess, and the experience is stored as something traumatic because it is more alarming if a girl falls than if a boy falls. [...] It is because of parents' parenting. (Male participant, focus group 2, 22/02/18)

Such parental responses encouraged men to build greater self-efficacy, and consequently, motor skills were not a barrier for them. Women's fear of the road was partly related to distrust of their skills.

A perceived lack of safety was another factor that conditioned transport cycling. The determining factors of this perception were the route, schedule and journey, understood as the distance and time to move from the origin point to the destination. A long journey was associated with greater exposure to hazards. Regarding the timetable, the students considered very early and late trips to be unsafe due to the lack of light and empty streets that could facilitate delinquent acts.

Although street crime affected both men and women, both thought that women's lower use of bicycles was associated with their perceptions of their vulnerability. One participant argued:

It is not a matter of gender that makes her vulnerable; it is more about her self-perceptions. I think that it [cycling] is not being done because there is an idea of vulnerability, and I think that this idea is badly influenced by our society. (Male participant, focus group 2, 22/02/18)

Women were considered to be easy prey, whereas men were viewed as stronger and capable of defending themselves against attacks. Although some participants related this difference to physical strength, they also linked it to women's complex roles and travel patterns. The participants associated roles with the practice of risky behaviours by men due to stereotypes of masculinity that made them feel entitled.

Another component of perceived insecurity was sexual aggression, understood in this study as harassment and rape. This concern was found exclusively in women. Although two men mentioned being victims of harassment while cycling, they considered it to be an isolated event and not a problem, so it did not generate a fear of commuting by bicycle. In contrast, some women found the attitudes and comments expressed by men along the road to be a frequent annoyance that intimidated them and

produced a negative attitude to cycling. The female students associated bullying with riding alone and wearing certain clothing.

In short, safety concerns were a major factor for many participants. However, the perceived risks to which the participants were exposed and their responses differed by place of origin, residence and gender. Insecurity presented a greater burden for women because they feared sexual assault, in addition to road fear related to their lack of self-efficacy and vulnerability to street crime. For those who manage to overcome the perception of insecurity, though, convenience of use was another important factor.

Convenience of Use

This category framed the factors that made commuting by bicycle practical or impractical, including the journey, equipment availability and weather. A long distance required more physical effort and had safety implications. Consequently, the students preferred other commuting alternatives or to live close to their most frequent destination, if possible. If their residence was very close to the latter, it was more practical for them to walk due to the logistics of bicycle use.

The students reported a need for more places to park their bicycles and for lockers and showers to prepare before work. The availability of this equipment was especially important for women, as discussed later in relation to the gender model. The insufficient availability of this equipment became a limiting factor. Variations in Bogota's weather could also make commuting inconvenient. As factors related to convenience of use influenced the decision to bike, so did positive meanings of the cycling experience.

Positive Meanings of Bicycle Users' Experience

For the students, bicycling offered a means to get around efficiently, saving time and money while exercising, improving their health and protecting the environment. These benefits resulted in a sense of well-being. According to the participants, this practice could be their best option for physical activity during the academic term due to the burden of their studies. The participants also associated this mode of transportation with a sense of control, freedom, autonomy and independence as it gave them the ability to decide when to ride, along with their speed and travel time. This empowerment was especially important for women as it increased their decision-making power and participation in public life. All these factors showed that the cycling experience was related to gender roles; the gender model of which these roles were part, therefore, was considered to structure the phenomenon.

Transitional Gender Model

The students found social constructs to be one cause of the low uptake of transport cycling among women. The students defined social constructions as social representations of how to be men and women. These representations influenced the construction of identity, so we identified them in a gender model. Within this category, three subcategories were identified: a traditional gender model, a contemporary gender model and a transitional gender model.

The last was characterised by the coexistence of notions from the first two models. Accordingly, the students found that traditional stereotypes persisted and associated the male role with being physically and emotionally strong, protective, independent and risky. In contrast, the female role was related to physical and emotional weakness, vulnerability, dependence, an impeccable personal image and dedication to caring for home and children. As mentioned by the participants, these attributes promoted risky behaviours in men and underestimation of women's capabilities. The latter was evidenced in incidents in family and academic settings that included comments devaluing women's abilities.

In this context, bicycling was associated with attributes regarded as masculine, such as strength, independence and risk taking. Accordingly, women considered the sweating and blushing caused by physical exertion when bicycling to be inconvenient because they felt that it affected their femininity. One participant stated:

I feel that it is welcomed when a man arrives on a bicycle, like, 'What a sportsman. He is sweating! Oh, yes!' But it is different for women, and it should not be like that. [...] I feel that like going to the street on a bicycle or jogging, right, to her work, and things like that, like it does not fit the image that we have of a woman. It should not be like that, I say, but it is the way it is. (Female participant, focus group 2, 23/03/18)

In addition, cycling made the women visible in public spaces, considered to be inadequate and unsafe for women late in the evening. Consequently, they were afraid to use public roads, where they might suffer aggression. One participant commented:

The fact that you ride a bicycle is as if it makes you seen by more people sometimes because you go alone. [...] It is frowned upon or something like that or dangerous for a woman to be alone on a bicycle at around 10 o'clock at night any day in Bogotá. For my family, not specifically for me, but for them. (Female participant, focus group 1, 08/02/18)

Even as the students identified traditional gender constructs, elements of the contemporary model were also found. In this model, the female ideal was associated with a professional, economically independent, strong woman. Due to this image and the socio-economic context in which the female students were embedded, care for their personal image was very important, representing credibility and professional respect. The above connected to the idea of the impeccably presented woman, a symbol of femininity in the traditional model. In this scenario, blushing and sweating were again inconvenient, requiring logistics and equipment to counteract them. Although the students recognised the persistence of stereotypes that affected the meaning of the cycling experience, they aspired to an egalitarian model that broke schemes imposing gendered ways of acting. However, they thought that this model was changing slowly and required alterations in structural conditions.

Finally, the relationships of the transitional gender model, as a central category, with the three preceding categories were established. From the established relationships, emerged our conceptual framework of the socio-cultural significance of cycling for health sciences students at the University of the Andes.

Discussion

Based on the results discussed in the previous section, we propose the theoretical model in Figure 1, which shows the relationships among the conditions, actions, interactions and consequences of the phenomenon. In this scheme, the meaning of the use of the bicycle for students results from the construction of identity, which is influenced by sociodemographic conditions such as residence, gender model and place of origin. Other studies have also found that identity is a socially constructed factor that shapes the cycling experience and varies according to sociodemographic characteristics [20,21,27]. Rurality, for instance, has been associated with higher prevalence of active transportation [28]. This suggests that elements of the urban context, such as traveling distance and traffic congestion, among others, create differences in cycling behaviour.

In the transitional gender model with which the students identified, ideals of the traditional and contemporary models coexist. The former is based on a social organisation in which unequal power relations create dichotomous female and male roles based on attributes such as passivity and weakness in women. According to Velasco [22], the traditional model demands that a man demonstrate the ability to maintain ownership over a woman, who, in turn, must show signs of scarcity. This context generates a pattern, understood as repeated actions in response to certain situations [24], that, in this case, underestimates women's capabilities. This pattern is learned and reinforced through social interactions that take place at levels close to the individual, such as the family and academic environments.

Consequently, women develop a perception of vulnerability, which undermines their self-efficacy, defined as confidence in one's ability to successfully carry out an action and overcome barriers [29]. Other studies have also found such relationships between different role expectations and the preconceptions associated with women's ability to cycle [12,27]. All of these factors give the cycling experience a meaning of insecurity, which this and other studies have found is the main reason why women do not adopt this form of mobility [30]. Moreover, bicycle use, associated with attributes and activities considered to be masculine, may represent a transgression of femininity, partly as public spaces historically have been conceived as masculine territories while women have been associated with private spaces [22,31,32]. The spaces women's bodies inhabit and how they inhabit those spaces have been restricted [33], and therefore, women's access to space and attributes assigned to male others, therefore, is considered to be a risk for transgressing their identity [22].

Female students also associated the time when they biked or the way they dressed to potential for street harassment and risk of sexual assault. Other authors have found that these manifestations of power by some men are frequently blamed on women due to their dress or presence in public [33]. Such situations are attributed to women's departure from the traditional structure [34].

However, positive meanings of cycling such as well-being, commuting opportunities and empowerment coexist with and can rival the above. These meanings are related to the transition to a contemporary model characterised by incorporation of women into public life, education and work [22]. In this context, maintaining the ideal of femininity posed by the traditional model conflicts with the autonomy, freedom

and independence of women in the contemporary model. According to Velasco [22], these conflicts are characteristic of the transitional model.

Finally, the meaning of the cycling experience determines attitudes in relation to the use and, consequently, decisions of whether to adopt this behaviour. Consequently, adverse attitudes towards transport cycling are likely to be developed by women who identify with the ideals of the traditional model, who have had fewer opportunities to build self-efficacy in riding bicycles and whose place of origin and residence view bicycle use as insecure and transgressive of the ideal of femininity. In contrast, for women who mainly identify with the contemporary model and have had more chances to build self-efficacy, insecurity presents a smaller barrier, and the positive meanings associated with the experience acquire greater relevance. If cycling is also convenient, the behaviour is more likely to be adopted, as other authors have also found [35].

Given these findings, the best approach to encourage participation in urban cycling is to make it safe and convenient [36]. To this end, action must be taken at the structural level to improve objective safety in public spaces. Likewise, at the individual level, imaginaries about women's vulnerability must be modified, and their self-efficacy for transport cycling should be promoted. The latter is essential as it has been shown that interventions aimed solely at improving infrastructure cannot change behaviour to the desired extent, especially among women [19,37]

It is important to note that the biking phenomenon is dynamic, feeding back into and can be modified from the structural level to the individual level and vice versa, as represented by the arrows in Figure 1. According to the participants' statements, changes in the social structure and constructs can affect individuals' perceptions at the closest socialization levels and encourage bicycle use. In the same way, the adoption of cycling by women can increase their self-efficacy, change the negative perceptions of cycling of family, friends and classmates and, finally, transform existing social stereotypes about women's spheres of action and ways of commuting.

Conclusions

In this study, we have built a conceptual framework that accounts for gender processes related to the construction of identity and thus the meaning of bicycle commuting for a group of university students. This cycling experience involves sociodemographic conditions and the transitional gender model with competing notions from the traditional and contemporary models. In our conceptual framework, self-efficacy is a central construct in explaining cycling behaviour and the differences between men and women. Based on the foregoing, this research contributes to the public policy debate favouring gender equity and sustainable transportation and to efforts to reduce health risks of physical inactivity. Subsequent studies can study the phenomenon in a broader range of conditions to enrich the scope and explanatory power of the proposed conceptual framework.

Declarations

Ethics approval and consent to participate

This research was classified as having minimal risk and was approved by the Ethics Committee of the School of Government of the University of the Andes at a meeting on 13 December 2017. Before data collection, the researchers explained the purpose and scope of the study to the participants, who signed informed consent forms.

Availability of data and material

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of Interest Statement

The authors declare that they have no competing interests.

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Authors' contributions

MVCS collected, analysed, interpreted data, and wrote the manuscript.

CGU analysed, interpreted data and suggested relevant literature and methodological analysis, read, edited and approved the final manuscript.

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Authors' Information

Maria Viviana Caballero Suarez is an Assistant Professor in Physiotherapy at Universidad Manuela Beltran in Bogota, Colombia. She did her BSc in Physiotherapy at Universidad Nacional de Colombia and her MPH at Universidad de Los Andes, where she is also a researcher. Her research interests cover topics on the empowerment of women through physical activity, equity, and health challenges in Colombia border areas.

Catalina González Uribe is an Associate Professor of public health at the School of Medicine at Universidad de Los Andes and conducts research on social inequalities in sexual health, reproductive health and vector transmitted diseases. She is passionate about interdisciplinary work, the development of social indicators and mixed methods research and currently leads the Public Health Research Group

SEP at the School of Medicine. Catalina studied anthropology, psychology and did her masters studies in Anthropology at Universidad de los Andes; MSc in Social Epidemiology and her Doctorate studies in Epidemiology and Public Health at University College London.

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Tables

Table 1

Data collection technique and study participants

Technics	Sex		
	Men	Women	Total
Focus group 1	0	4	4
Focus group 2	4	0	4
Focus group 3	2	2	4
Total focus groups	6	6	12
Interviews	0	4	4
Total	6	10	16
Male/female ratio	0.6		

Source: data collected in this study

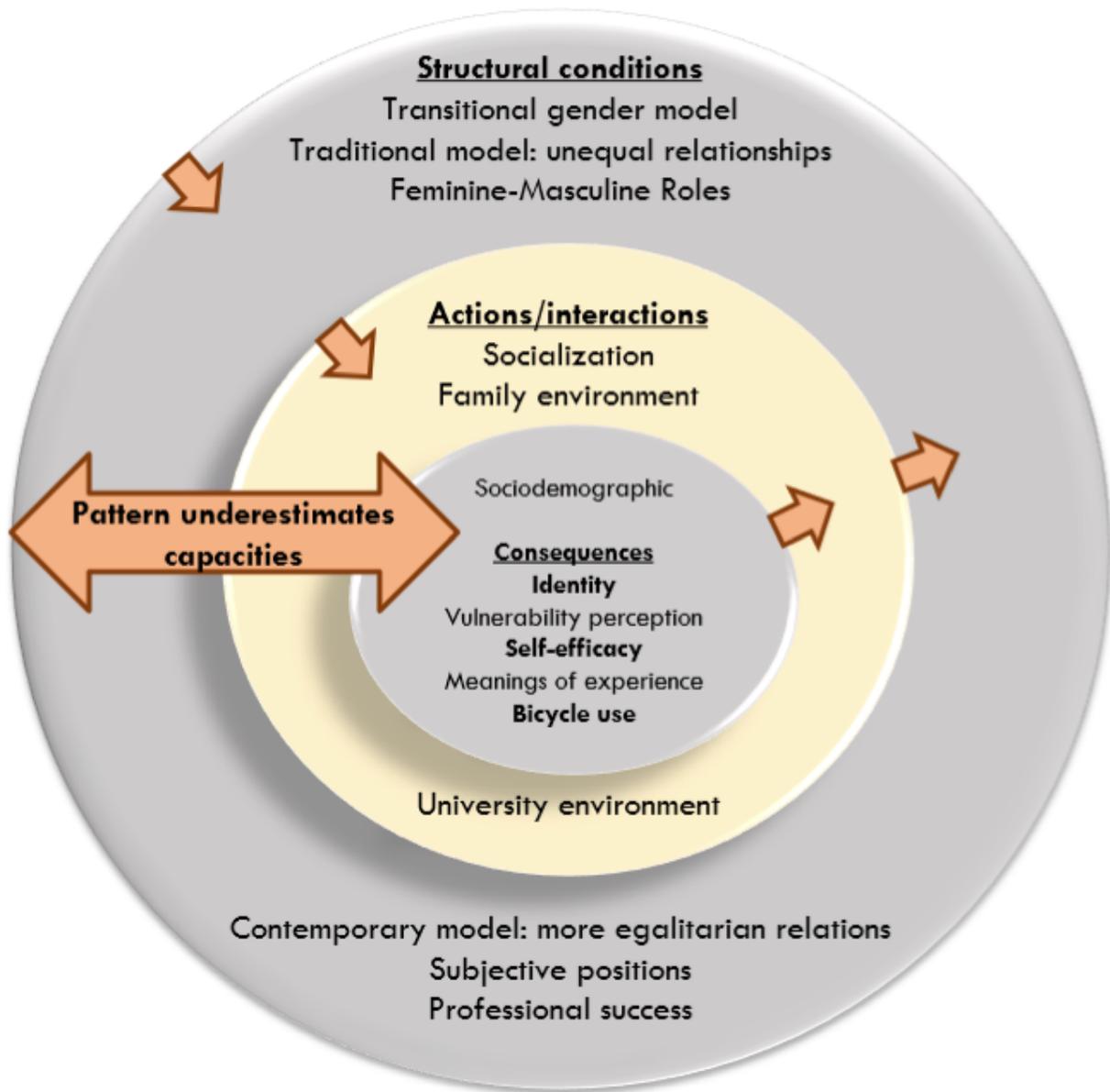
Table 2

Sociodemographic information and bicycle use in the participating population

Sociodemographic variables	Men n (%)	Women n (%)
Total	6 (37.5)	10 (62.5)
Age		
18-22	3 (50)	5 (50)
23-26	2 (33.3)	4 (40)
>26	1 (16.6)	1 (10)
Marital status		
Single	5 (83.3)	10 (100)
Common-law relationship	1 (16.6)	0
City of origin		
Bogotá	3 (50)	5 (50)
Outside Bogota	3 (50)	5 (50)
Socio-economic stratum		
1 y 2	0	3 (30)
3 y 4	4 (66.6)	6 (60)
5 y 6	2 (33.3)	1 (10)
Term enrolment		
1-4	1 (16.6)	0
5-8	3 (50)	6 (60)
9-12	1 (16.6)	3 (30)
Postgraduate	1 (16.6)	1 (10)
Bicycle transport		
Yes	5 (83.3)	0
No	1 (16.6)	10 (100)

Source: data collected in this study

Figures



Source: data collected in this study

Figure 1

Theoretical model about the sociocultural meanings associated with the use of the bicycle