Assessing the gender gap in urban cycling through the Capability Approach

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Submission date: 02-Sep-2019 03:06PM (UTC+0100)

Submission ID: 110452706

File name:
64155_Erika_Kulpa_verdin_Assessing_the_gender_gap_in_urban_cycling_through_the_Capability_Approach_1064857_1481331434.pdf (1.06M)

Word count: 15070

Character count: 73843

UNIVERSITY COLLEGE LONDON

FACULTY OF THE BUILT ENVIRONMENT
BARTLETT SCHOOL OF PLANNING

Assessing the gender gap in urban cycling through the Capability Approach

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Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc Transport and City Planning at University College London: I declare that this dissertation is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

September 2, 2019

Word count (main body): 10,712
Word count (appendix excluding risk assessment): 778

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Acknowledgments

I want to thank all the women who shared their experiences with me and inspired me to develop this piece of work.

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Assessing the gender gap in urban cycling through the Capability Approach

Abstract

Cycling as a mode of transport is gaining popularity worldwide, not only because of its utilitarian attributes, but because of its health and environmental benefits. However, in cities where the cycling mode share is low, this mode of transport tends to exclude certain social groups, for instance, women, the subject of this dissertation.

While the gender gap in cycling has been fairly studied, the reasons behind women's behaviours and attitudes towards, or against riding a bicycle as a mode of transport, have not been deeply analysed. In this regard, the present dissertation aims to understand which aspects of a woman's life makes her prone to be a cyclist, or on the contrary, constrains her. The research was framed under Amartya Sen's 'Capability Approach', which recognises that individuals have different abilities to achieve an outcome -women's capabilities to cycle-; from this context, intersectionality played a key component throughout the analysis.

By interviewing ten women from different backgrounds in the city of London, where female cyclists only account for 1/3 of the total, the results identified several constraining or enabling factors that underpinned women's capabilities to cycle, relating to either their individual experiences or their social context. Moreover, it was found that the gender coding of a body as female, attributes women a set of respectable social behaviours and attitudes that constrain their development of bodily and attitudinal skills to cycle. This, in addition to the all white-male cycling community in London, suffocates women's propensity to cycle.

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1. Introduction

"I found from first to last that the process of acquisition exactly coincided with that which had given me everything I possessed of physical, mental and moral success, that is, skill, knowledge, character. I was learning the bicycle precisely as I learned the a-b-c."
(Women's suffragette Frances Willard, 1895, p.53)

Cycling has several positive attributes that make it a suitable option for satisfying different mobility needs while enhancing feelings of wellbeing among its users (Pucher and Buehler, 2012). However, this mode of transport is currently not accessible for all individuals; in cities where the mode share of cycling is low, it tends to exclude certain social groups (Broache, 2012), for instance, women. Women hence are excluded from the benefits that riding a bicycle brings.

Mobility from a gendered perspective has gained attention over the last years among academics, and until recently, among policymakers. It is now justly recognised that gender and mobility are intrinsically linked to each other (Hanson, 2010); however, being mobile has historically been considered a male attribute, whilst women on the contrary have been expected to be passive, slow, immobile (Law, 1999). In this sense, riding a bicycle, a highly active mode of transport, might be, or rather is, perceived as a preponderantly masculine activity.

The overrepresentation of men cyclists in cities, as in the case of London, aggregates to the (mis)conception that cycling is rooted in masculinity. The reasons behind why women tend to cycle less than men have been considerably researched, but not deeply analysed. Studies attribute the gender gap in cycling mainly to women's complex mobility patterns and their feelings of fear and risk aversion (Ravensbergen et al., 2019). However, it has rarely been explored the underlying gendered reasons that lead to women's behaviours and attitudes towards, and agains, cycling.

In this regard, under the context of London where only ⅓ of the cyclists are female (TfL, 2018), the present dissertation aims to gain a major understanding of the reasons behind the gender gap in cycling by examining what aspects of women's lives make them prone to be cyclists, or on the contrary, constrain them. The research will be based under the assumption that women's (in)abilities to cycle come from a complex set of conditionings that relate to their immediate social structure and their unique life experiences, as opposed to attributing their limitations solely to fixated factors such as resources and biological traits. Otherwise stated, it is presumed that the reasons behind the constraints are not limited to women's commodities; moreover, they are related to the abilities of women to transform their resources into the act of cycling.

There is a misconception that people have the liberty of accessing the same opportunities, to be and to do anything, when actually there are a set of attributes -such as gender- that define and constrain an individual's capacity to achieve any given objective or activity (Sen, 1984), in this case, riding a bicycle as a mode of transport. Amartya Sen framed this theory under the 'Capabilities

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Approach', which aims to unravel social inequalities of any given context (Ibrahim, 2014). This approach aligns with the focus of the present research, therefore, it will serve as the framework for assessing the social gender construction that creates and reinforces, the gap in cycling between men and women.

This dissertation will aim to answer the following question: What are the main aspects of a woman's life that constrain or enable her to ride a bicycle as a mode of transport within the context of London? It will do so by first, conducting a comprehensive research concerning relevant literature around two main pillars; being a woman and being a cyclist, and the junction between both. Then, the Capability Approach will be explained along with its relevance and its applicability for analysing women's relation to cycling. To answer the research question, qualitative interviews will be applied to two main groups which include women working on the promotion of cycling, and women who have cycled as a way of transport in London.

2. Literature review

2.1 On Being a Woman

When referring to 'women' throughout the present dissertation, the concept will elude mainly to the social construction of identity and not to the biological attributes of the body, in other words, to the notion of gender (Butler, 1990). Gender constitutes a series of social norms and regulatory practices that determine a woman's role in a specific context, along with her freedoms and limitations (Walker et al., 2012).

The way in which gender is constructed reflects on how spaces and places are experienced (Massey, 1994), and how activities are performed. 'Every human existence is defined by its situation' (Young, 1980, p3); in this sense, a woman's existence has been confined by the male-dominated context they live in, leaving her in a situation of disadvantage. However, behaviours and attributes related to gender roles are most commonly overlooked and normalised as they are rooted in long-standing repetition, generating a ripple effect in every aspect of a woman's life (Butler, 1990), for instance, mobility.

Mobility can be carried out and experienced in different ways, but it is lived and performed first and foremost with the 'body'; the immediate mobility vessel a woman possesses. Female's bodies, however, have been historically constrained to movement, especially within the public sphere; in other words, beyond the walls of their homes (Young, 1980). In addition to women being excluded from places, they are also limited to specific behaviours; Law (1999:580) stresses that the 'social coding of a body as female in our society produces a specific vulnerability associated to a set of norms of respectable and safe behaviour'. The body, hence, cannot be seen as a passive vessel, as a

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collection of parts, as the body is the expression of one-self, it is both public and private, personal and social (Pile, 1996).

However, as a woman develops, she is continuously discouraged from making use of her bodily capacities, or taking up space (Young, 1980). As the female body grows to be restricted by social constructions, riding a bicycle might represent a significant challenge as it requires the woman to place herself in a position of vulnerability, and actively push the constrained boundaries of the body's capabilities, not only in terms of mobility but of public exposure as well.

The levels of confrontation women might face when choosing to 'expose' themselves to the dynamics of the public space and partaking in the 'masculine' activity of cycling, differ significantly according to the specific case of each woman. In this sense, women must not be seen, nor treated, as a unity that shares the same characteristics (Moore, 1994), the differences within this group must be recognised, such as age, race, income, occupation, religion, sexuality and family status. By acknowledging the diversity amongst women, there is a better understanding of their needs. Intersectionality -the recognition of different characteristics that conform a social identity- (Hancock, 2007) is key for understanding a woman's propensity to cycle and for applying the capability approach, since this theoretical framework focuses on the properties of individuals and recognises the importance of subjectivity (Robeyns, 2013).

2.2 On being a cyclist

To be a cyclist comprehends a set of utilitarian and affective characteristics; it entails a series of skills and proscribed behaviours (Horton, 2007), and reflects a compound of attitudes and values that lead to the construction of a specific identity (Jensen, 2009). This identity has differentiated connotations depending on the particular urban context (Aldred, 2010); in cities where the cycling mode share is low, identifying as a cyclist tends to have a strong male denotation (Broache, 2012). As Horton (2010) mentions, women see cycling beyond just the action of propelling oneself on a bicycle; cycling is perceived as a set of prescribed characteristics and behaviours, which tend to resonate more with men than with women. Cycling, therefore, traverses the limits of merely being an activity, it becomes a reflection of the individual, which fits into the idea of self of some people but not others.

Cycling identities, apart from having an individual implication, tend to overcome the limits of the personal and spread into the collective environment. Goetzke and Rave (2009:428) state that "bicycle culture is best described as a social interaction or spillover phenomenon", meaning that the more people cycle, more people will cycle. This effect can be attributed to two proclivities, either people might enjoy cycling with others or they might succumb into positive peer pressure (idem), or by having a significant number of cyclists on the roads, the safety conditions improve and hence, confidence and numbers in cycling increase (Pucher and Buehler, 2008). Along this

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line, Anja (2016) highlights that social influence tends to be gendered, therefore women are more likely to encourage other women to cycle, generating what she calls a 'virtuous circle'; but in the context of London where women cyclists are underrepresented, the circle rather than being virtuous, is vicious.

As cycling has just started to re-emerge as a transport mode in London, cyclists tend to be seen as invaders of the streets (Aldred, 2013); hence, identifying as a cyclist might carry a negative connotation among other road users. Accordingly, women who have historically been constrained to the boundaries of the home are also seen as foreigners within the public space, therefore when a woman decides to cycle she has to deal with a double sense of exclusion and vulnerability. In this sense, it might be difficult for women to embrace the identity of cyclist, or to portray their female character as they cycle (Ravensbergen et al., 2019).

Cycling as a mode of transport is rooted in masculinity, therefore when a woman chooses to ride a bicycle she is actually challenging the social power norms (Garrard et al., 2012); the bicycle becomes a tool for changing gender relations and enabling spatial mobility. Cycling then becomes an act of rebellion, a political statement, a way of emancipation (Garrard et al., 2008). The fact that riding a bicycle is still seen as an act of bravery within society, clearly indicates that this activity is not perceived as feminine.

2.3 On cycling as a woman

The fact that women have a low representation in cycling relies on the fact that cities have been shaped mostly by men and for men (Criado-Perez, 2019). Cycling research, policies, and projects are done in a vacuum, denying the complexity and intersectionality of their users (Imrie, 2000; Levy, 2009), hence denying the necessities of women. In this regard, cities continue to reinforce an unequal social system that favours a specific body; male.

For instance, women's mobility needs differ significantly from those of men; the patriarchal scheme in which cities are rooted leaves women with the responsibility of the biological reproduction and the tasks that derive from it (Levy, 2009), this impacts directly how women move. Women in London make 8% more trips than men per weekday (Criado-Perez, 2019), which are often shorter and made in chain, women are also less likely to use a car and more likely to use public transport or walk (Tfl, 2012a). Regarding cycling, women only represent 37% of the total (Tfl, 2018a), this gap implies that it is, in fact, a gendered activity (Steinbach et al., 2011).

Cycling brings significant benefits to the city and its inhabitants; this mode of transport does not generate noise nor air pollution, it does not need non-renewable resources to function, it provides cardiovascular exercise, it is affordable for almost anyone (Pucher and Buehler, 2008; Aldred, 2012), it offers flexibility and liberty in its use -great for short door-to-door journeys or for the first

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and last mile- and it even has been linked to improvements in well-being. Even though the bicycle might gather a set of favourable conditions, women apparently are lacking the intention or capability to partake in cycling; they are hence excluded from the multiple benefits it brings.

Impediments to cycling from a gendered perspective have gained attention over the last few years. One of the main barriers has been linked to the notion of safety; research has found that women tend to be more risk-averse than men (Garrard et al. 2008, Dunckel, 2014), and cycling entails putting oneself in a position of vulnerability. Other barriers comprehend the quality of the infrastructure and the fact that usually, women tend to have tighter time and financial budgets (Bonham and Koth, 2010; Gossen and Purvis, 2005). What research has failed to explain, however, is why these barriers exist, or why they are more challenging to overcome for women than men.

Historically, transport planning tends to undermine the factors behind the decision-making process, failing to recognise that opting for a mode of transport is not a linear process. Choices are not made within full rationality (Kahneman, 2011); hence, it must not be expected that women will outright opt to cycle merely because the option exists. Levy (2013) states that when selecting a mode of transport this is not done in complete liberty, but it is, on the contrary, a result of a series of trade-offs in the context of public and private power relations. The combination of the built environment, transport modes, attitudes, behaviours, and social norms, enhances the complexity behind a woman's choice of transport (Bohte et al., 2009).

2.4 On the Capability Approach - Theoretical Framework

When addressing the gender gap in cycling, it has mainly been attributed to the lack of resources or abilities a woman has, however recent research has explored the social and geographical constraints (Garrard, 2003) that impact a woman's preferences when making decisions (Nussbaum, 2011). In this sense, it is not about a woman's resources but what she is (un)able to do with them. The economist and philosopher Amartya Sen first developed this theory as the Capability Approach claiming that 'what a person can do or can be' (1984, vii) goes beyond the individual's resources, commodities, and utilities (Robeyns, 2013). However, the weight resources have on a woman's life must not be disdained, as inequalities in resources can impact significantly the disparities in capabilities (idem). In such manner, women have access to different resources, but they also have different abilities to convert such resources into capabilities due to social, contextual, or biological factors (Sen, 1984).

The capabilities approach has been adopted by several academics to address social inequity issues, deepening into the interpretation of Sen's original approach (Ibrahim, 2014). It has been applied to evaluate social equity regarding transport accessibility in different urban contexts (Beyazit, 2011; Hickman et al., 2017; Hananel and Berechman, 2016; Mella, 2019). It has also served as the basis for assessing gender inequalities (Ibrahim, 2014; Nussbaum's (2011) and Robeyn's (2013)

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elucidation of the framework have contributed considerably to understanding of the complexities behind gender inequalities in western societies. Although the intersectionality between transport and gender has been explored through the capability approach (Kronlid, 2008), it has not been grounded to the particular case of cycling and women.

In this sense, the present dissertation is based on the recognition that cycling is a gendered activity resulting from a social construct that attributes different responsibilities and behaviour norms to men and women. It is assumed that the reasons behind a woman's ability to cycle are intertwined with the social construction of her community, the built environment, and her unique life conditions; hence, the capability approach is a suitable framework to explore the different factors that affect a woman's freedom to be a cyclist.

To determine the set of capabilities that enable or constrain a woman from carrying out the act of cycling, first, three different concepts that entail the accomplishment of the goal must be understood; these have been determined by Sen (1984) as commodities, functionings, and capabilities. Commodity can be seen as a resource to achieve a functioning, and functioning is what an individual may value doing and/or being (Sen, 1999, p. 75); whilst capabilities represent the real opportunities for people to be or to do (idem). For instance, a bicycle is a commodity, but the fact that a woman owns a bicycle does not mean she has the conditions needed -capabilities- to actually ride it, hence she fails to transform the object, the commodity - the bicycle-, into a transport mode -the functioning-, disabling her to access the potential benefits the commodity might bring. (Sen, 1984). In this sense, the resources should be detached from the person, as an object can achieve different results depending on how a person uses it.

Figure 1. Resources, capabilities, factors and impacts. Source: Frediani, 2010

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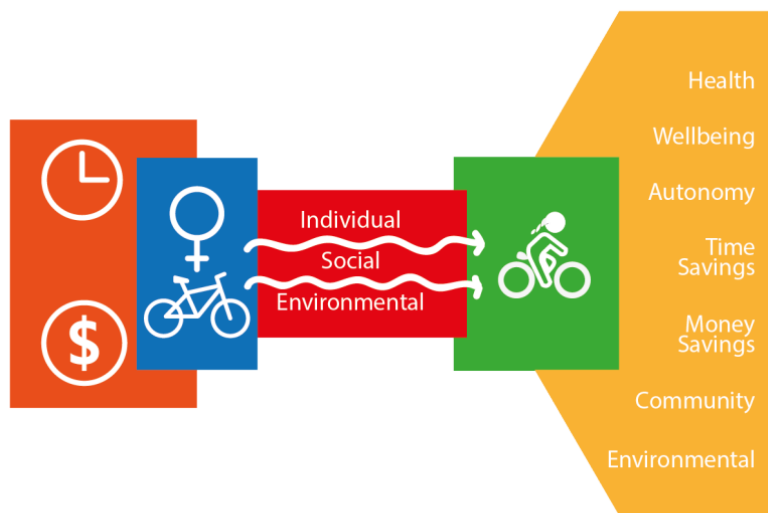
Applying the capability approach entails determining an individual's, or a social group's, relevant capabilities and their influence in the proposed goal or activity (Robyens, 2013); this is best achieved by organising and evaluating them in the form of a list, which can be either general or particular depending on the particularities of each case (idem). Also, when considering the relevant capabilities and assessing how these are formulated, developed or mitigated, conversion factors are key; these are structural and personal conditions that influence whether the individual can achieve a capability or not (Clark, 2019). In this regard, a specific list will be stipulated for assessing the gender gap in urban cycling.

Although Sen's Capability Approach has been criticised by some authors of being too individualistic (Frediani, 2010), for the purpose of this dissertation it works in favour of the research as the objective is to draw from a qualitative outlook of any given social matter as it acknowledges human diversity whilst recognising the influence of the community context. (Sen 1984, Robeyns, 2013).

This dissertation will apply the capability approach to the specific relationship between being a woman and cycling as a mode of transport. Through the research it will be recognised the impact that socioeconomic factors have on the development of women, such as age, ethnicity, occupation, and income; and thus they will serve as a strong basis for the analysis, however, the dissertation's aim is not to focus on the limitations of the resources, but rather explore how these, no matter how favourable or unfavourable, are used or unused by different women due to their particular life conditions. In other words, what are women's capabilities when considering the bicycle as a mode of transport.

The present research will draw upon previous efforts in both transport equity and gender equity, as the basis for developing the framework of the gender gap in cycling, it will mainly focus on Robeyn's (2013) and Mella's (2019) intake on the capabilities list.

3. Methodology

3.1 Case study

Research has found a close relationship between a low-cycling mode share and a low demographic diversity within cyclists (Aldred et al., 2016). This aligns with the context of London where only 2% of the total trips are made by bicycle (see Figure 2) (DfT, 2019), and of this, women represent only 37% (TfL, 2018b), which makes it a plausible case study to explore the reasons behind the gender gap in this mode of transport.

Figure 2. Transport mode share in London Source: DfT, 2019

Walk
24.0%

Car
36.0%

Cycle
2.0%

Bus (including tram)
14.0%

Motorcycle
1.0%
Taxi
1.0%
Rail
11.0%

Underground/DLR
11.0%
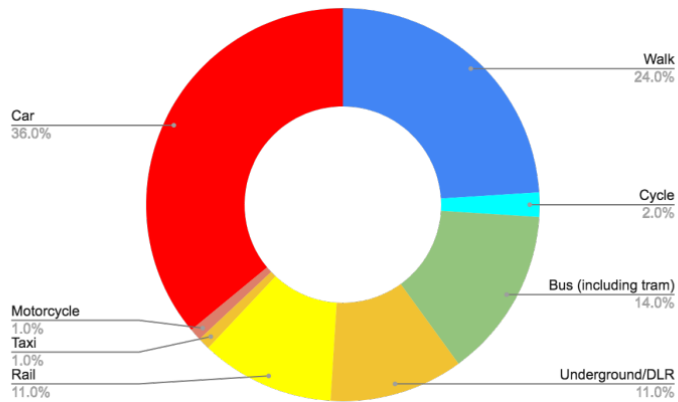
Figure 3. Cycling distribution by gender. Source: TfL, 2018b

Women
37.0%

Men
63.0%
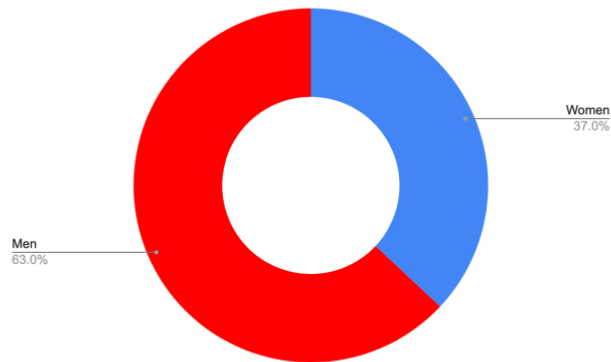
London is currently dominated by the use of private vehicles, representing 37% (see Figure 2) of the total daily trips (TfL, 2018a). However, current policies are working towards a shift in the mode share, aiming to have 80% of the trips made by sustainable transport modes by 2041, such as cycling (idem). Over the past two decades, London has worked in promoting cycling as a transport mode, and favourably has increased cycling levels by 5.8% from the year 2000 to 2017. Though the percentage of cycling has raised, the diversity of its users has not; commuter cyclists in London are more likely to be male, white and able-bodied (Transport for London [TfL]b, 2018). Cycling then, can be perceived as an exclusionary and privileged activity, evermore so as it is set in the most ethnically diverse city in the UK where only a 44.9% if its inhabitants are white British.

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Figure 3. Cycling distribution by ethnicity group. Source: TfL, 2018b

BAME
36.0%

White
64.0%
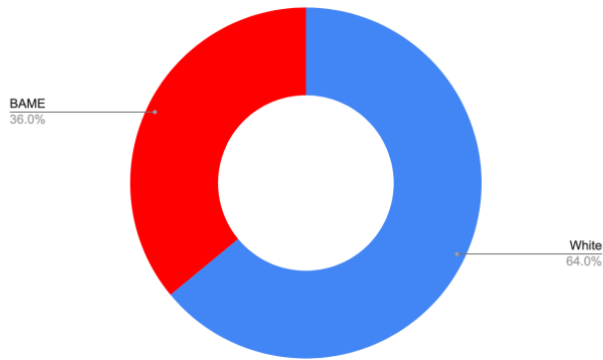
London's current Cycling Action Plan (2018b) recognises that inclusivity must be key in the promotion of transport policies, and have acknowledged that there are particular and diverse barriers when it comes to cycling for minority groups such as BAME people, older people, disabled people, and women. However, authorities are struggling to reduced the cycling gap; "Despite some welcome recent trends, such as a four per cent increase in the number of women cycling in London over the last three years, cycling does not yet reflect London's great diversity." (TfL, 2018, p.26)

In this sense, the dissertation aims to achieve a better understanding of the reasons behind the gender gap in cycling, particularly, what aspects of women's lives make them prone to be cyclists, or on the contrary, constrain them.

3.2 Research Method

Qualitative interviews were used for gathering and analysing the information in accordance with the objective of the present dissertation. This methodology provided an opportunity to access into the subject's perceptions, preferences, habits, fears, and life experiences (Tracy, 2013), generating therefore, a better understating of the circumstances that lead women into cycling as well as the challenges they had to overcome in order to do so.

The interviews were semi-structured and consisted of open questions devised to obtain in-depth information regarding a woman's conditionings that enabled her to cycle, or the particularities that constrained her. The questionnaires were designed under the concept of 'flexibility', meaning that the questions were expected to change and adapt during the interviews, allowing for unforeseen information to surface depending on the specific life story of the interviewee. The questions were

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open and avoided a 'yes' or 'no' answer in order to deepen into the subject's experiences and capture information beyond a quantitative frame. Accordingly, the questions were aligned with the literature review and intersected with the research question 'What are the main aspects of a woman's life that constrain or enable her to ride a bicycle as a mode of transport within the context of London?'.

3.2.1 Scope of the interviewees

The interviews were targeted at two different groups of women based in the city of London, consent to participate in the research was given verbally in some cases, and verbally and written in others.

The first group (A) was conformed by women who work within organisations that promote cycling with a special focus on minority groups. This allowed having an overview of the relationship between cycling and women, its challenges and its evolution over time as these actors have worked with a high number of potential female cyclists over the course of several years. In this sense, this group functioned as a window to a broader spectrum of women learning how to cycle, and at the same time, they acted as subjects themselves as they too are cyclists. Although more organisations were contacted and invited to contribute to the research, five were the ones that replied and agreed to be interviewed (see Table 1).

Table 1. Group A. Interviewees working in the promotion of cycling among women

Interviewee	Organisation	Description
E1	Council of Islington	Oversees inclusive design and promotion of cycling in the area of Islington.
E2	Wheels for Wellbeing	Promotes inclusive cycling and provides cycling opportunities for disabled people and anyone who might think cycling is not for them in South London
E3	The Bike Project	Harbours a community of refugees, cyclists, mechanics and volunteers. They take second-hand bikes, fix them up, give them to refugees and teach them how to ride.
E4	Hornbeam Joyriders	A Walthamstow based cycle club for women and families and an initiative of the Hornbeam Centre.
E5	The London Bike Kitchen	A non-profit that teaches and supports people in becoming self-sufficient and proficient in bike maintenance.
E6		

For Group B (W1, W2, W3, W4) (see Appendix 1), intersectionality played a key component when considering the interviewees, women from different backgrounds, age, family status, physical abilities, occupations, and different levels of cycling mastery, were asked to participate. The

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diversity of the interviewees allowed to deepen the understanding between the subject and the capability. Four women were interviewed in total.

In the case of Group A, the questions were catered to each of the actors in relation to the specific line of work they do, nonetheless, the questions shared the same objective (see Appendix 2); for Group B just one set of questions was designed for the different participants (see Appendix 3), as mentioned before, in some cases different questions surfaced during the course of the interviews.

3.2.3 Data analysis

To best assess the information gathered, the answers, or fragments of them, were categorised in a 'Capabilities' list, following the basis of the theoretical framework. Sen (1984) included a general list within the Capability Approach to evaluate social inequalities; however, academics have taken upon themselves to create different variations according to the specific subject they are addressing (Alkire and Black, 1997; Nussbaum, 2011; Robeyns, 2011; Mella, 2019). For the purpose of this dissertation, a new list was adapted drawing from Robeyns' proposal (2011) which addresses gender inequality, and Mella's (2019) (see Annex 1) list which measures transport equity; their inputs were intersected with the literature review of the present research. The new list aims to comprehend the capabilities and factors that relate to cycling as a woman (see table 2).

	Table 2. Relevant Capabilities for Female Cyclists. Source: Modified by Author, based on Robeyns (2011), Mella (2019)	
Code	**Capability**	**Description /Conversion Factors**
C1	Physical and mental health	Having an illness, injury or disability, or being in good physical condition, also assessing different levels of an active life; having a positive or negative attitude towards life, feeling encouraged or discouraged; having a mental illness or having healthy mind.
C2	Bodily integrity and safety	Perception of sexual and personal safety in the public space; assessing the different levels of risk; feeling confident or unconfident about the body's abilities.
C3	Sense of identity	Sense of oneself; feeling represented; having values that align with actions.
C4	Education, information and skills	Knowing how to cycle; knowing about cycling opportunities; access to information and technology; having planning skills; and physical skills.
C5	Time, financial and mobility autonomy	Having paid and/or unpaid responsibilities; being carer for other individuals; feeling/being free to use the public space.
C6	Social affiliations	Being part of a community with similar values and interests; having peers that show encouragement; being in an environment that welcomes and supports them.
C7	Environmental and political affiliation	Having concerns about the environmental agenda; feeling represented by authorities; and being involved in political matters.

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	Table 2. Relevant Capabilities for Female Cyclists. Source: Modified by Author, based on Robeyns (2011), Mella (2019)	
C8	**Built environment**	Infrastructure; geographical location -origin and destination of trips-;topography; public services; parking/storage facilities; and quality of the road.

In order to optimise the analysis process, the interviews were recorded and then transcribed through NVivo which is a specialised qualitative data analysis software that allowed me to codify the answers under the Capabilities list, in other words, to classify or tag sentences or paragraphs under a specific capability or factor (Saldaña, 2012). In some cases, the same idea appeared more than once during the conversation, and hence, was coded multiple times as it reflects on the importance of the factor or capability for each individual (see Appendix 4). In this sense, it will be determined which capabilities weigh more when it comes to cycling as a woman.

4. Findings and Discussion

4.1 Findings

The following results correspond to the interview responses from ten individuals, six belonging to Group A (see Table 1), and four belonging to Group B. Nine of the interviews were conducted in person, two of them were done within the same session, and lastly, one interview was executed by telephone; they lasted between 11 minutes and 48 minutes.

The stated research question 'What are the main aspects of a woman's life that constrain or enable her to ride a bicycle as a mode of transport within the context of London?", framed under the capability approach, was successfully answered. It was asserted that all of the eight listed capabilities influence a woman's capability to cycle, however, 'Sense of identity', 'Social affiliations', and 'Bodily integrity and safety' held dominance within the matter. In the following section, the results will be further explained by addressing specific data drawn from the interviews.

The qualitative methodology allowed to capture stimulating information regarding women's personal conditions and life experience that led them to undertake cycling; the responses provided insight into the different challenges they had to overcome to become a cyclist. Additionally, by using the method of codifying to analyse the answers, I was able to quantify the qualitative data collected by linking the number of times an issue was mentioned to the categories in the capabilities list. The original proposed list (see table 2) was enriched and re-organised while the interviews were taking place since the information being gathered called for a more desegregated classification of the conversion factors within the capabilities (see table 3).

Table 3. Interview responses codified within the capabilities list

	Capability	Conversion Factor (CF)	Number of times CF mentioned	Number of interviewees referenced (out of 10)	Enabling or undeveloped capability
C1	Physical and mental health	Being active	17	7	
		Disability	10	2	
		Injury or illness	6	1	E
		Well-being	17	6	
		C1 Total	**50**	**8**	
C2	Bodily integrity and safety	Assertiveness	12	7	
		Confidence	26	7	
		Fear	13	4	
		Risk	10	5	U
		Safety	18	5	
		Sexual harassment	1	1	
		Vulnerability	11	6	
		C2 Total	**91**	**8**	
C3	Sense of identity	Aspirational	4	3	
		As a woman	10	6	
		As cyclist	78	8	U
		Cycles and wear	25	8	
		C3 Total	**117**	**10**	
C4	Education, information and skills	Cycles as a child	7	6	
		Mechanics	13	5	
		Planning	5	2	
		Research	6	2	
		Road rules	7	4	U
		Routes-maps	5	4	
		Skills	5	3	
		Speed	10	4	
		Other	15		
		C4 Total	**73**	**10**	
C5	Time, financial and mobility autonomy	Career - work	0	0	
		Family norms	1	1	U
		Unpaid responsibilities	4	4	

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	Capability	Conversion Factor (CF)	Number of times CF mentioned	Number of interviewees referenced (out of 10)	Enabling or undeveloped capability
		Resource related	12	3	
		C5 Total	**17**	**6**	
C6	Social affiliations	Cycling group	20	5	
		Friends or family	31	6	
		Leisure	19	6	
		Other road users	18	8	E
		Religion	1	1	
		Social norms	10	4	
		Other	19		
		C6 Total	**118**	**10**	
C7	Environmental and political affiliation	Environmental values	4	2	
		Political participation	4	3	E
		C4 Total	**8**	**4**	
C8	Built environment	Accessibility/inclusivity	1	1	
		Bike share system	4	3	
		Cycle lanes	6	3	
		Parking facilities	8	7	U
		Road dynamics	14	6	
		Road surface	6	1	
		General	17		
		C8 Total	**56**	**8**	

The results show that some capabilities, along with their factors, were given more weight during the interviews by the interviewees. In this regard, two capabilities were recurrently addressed when talking about overcoming challenges: 'Sense of identity' (C3) and 'Bodily integrity and safety (C2). Conversely, when talking about favourable factors that create an environment prone to cycling, the highest-ranked capability was 'Social affiliations' (C6). Also, these three capabilities were the only ones from the list (8) that were addressed by the totality of the interviewees (10). In contrast, two capabilities ranked considerably low within the list: 'Time, financial, and mobility independence' (C5) and 'Environmental and political affiliations' (C7), with the latter being referred to by only four of the interviewees (see Figure 5).

Figure 5. Undeveloped and enabling capabilities ranked. Source: Author
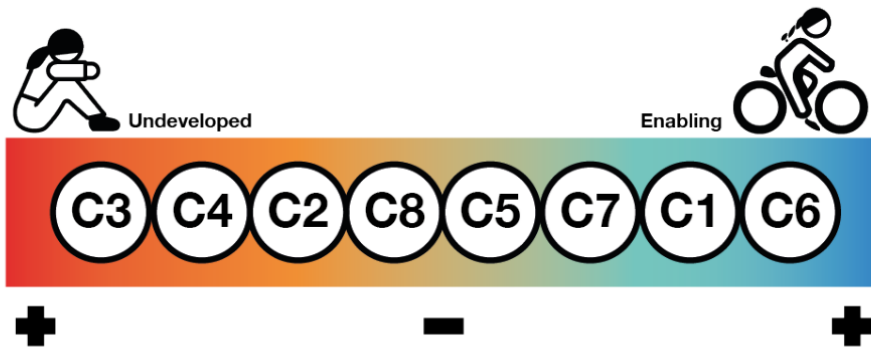
Accordingly, some capabilities, or rather lack of capabilities, have a heavier weight that inhibits women from cycling (undeveloped capability); while others gather a set of common favourable factors that facilitate the process of becoming a cyclist (enabling capabilities) (see Table 4 and Figure 5). Nevertheless, a capability can function as an enabler within a specific individual, and can be undeveloped within another, depending on the specific experience of each woman. This attests to the core of the capability approach which acknowledges human diversity while recognising the impact of a particular social context. (Sen, 1984).

Several factors came up recurrently during the interviews which can be associated to the social and environmental construct of the community, whilst other factors were linked innately to the individuals life experience, in this sense, the factors can lead to an 'extrinsic capability' or 'intrinsic capability' (Robeyns, 2003; Sen, 1984). For instance, within 'Physical and mental health' (C1), having an injury that impedes a woman to walk can lead her to consider the bicycle as a way to move within the city; the capability, hence, responds to an individual necessity. An extrinsic capability, on the other hand, would be (C8) 'Built environment', as having poor road infrastructure fails to ensure a safe trip for cycling, instigating a feeling of insecurity for different potential female cyclists.

Lastly, as expected, different factors correlated with each other, generating different scenarios, opportunities and restrictions. Having several capabilities in place increases the potential of cycling, or on the contrary, having several conditions that constrain the immediate settings can mitigate a woman's possibility to become a cyclist.

As a final remark, although the findings can be considered representative, they also call for a bigger and more in-depth investigation on the matter, since having a higher number of experiences registered will lead to a deeper understanding of women's capabilities for cycling.

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4.2 Analysis

The conversation during the interviews tended to lean to either the most undeveloped capability - Sense of identity- or the most enabling one -Social affiliations-, nevertheless significant findings regarding all of the capabilities list will be addressed in the following section.

The main arguments will be analysed through the interviewees' quotes, which subsequently will be linked to the literature review. For organisational and hierarchy purpose, the results will be analysed under each of the capabilities, beginning with 'Sense of identity' which was ranked the highest, and descending to the less referred capability, 'Environmental and political affiliations'. It should be noted, however, that although the rankings bring insight into what were the major concerns of the interviewees, or to where the conversation leaned the most, this does not necessarily mean that some of the low-ranked capabilities are not significantly important in the development of a woman as a cyclist.

4.2.1 Sense of identity (C3)

The interviewees working within the promotion of cycling have identified a common sentiment among the women learning to cycle: they do not see themselves as 'cyclists'; as indicated by Horton (2010), women do find it difficult to embrace this identity. The inability to relate with the concept of 'cyclist' can be attributed to the fact that there is an overrepresentation of men on the roads of London, or rather, there is a lack of a diversity of people cycling, as noted by Aldred (2016); this portrays the false, yet powerful idea, that women do not belong in the cycling community. Women, along with other minority groups, find it more challenging to see themselves as potential cyclists; and even when they do cycle, they fail to relate with such identity.

> "If you don't see people like yourself doing it, maybe you think you should not be doing it." (E4)

> "Imagining yourself as a cyclist is quite a huge barrier, it works for women, it works for people of colour, it works for disabled people […] We need to be seen, we need to be part of the cycling culture, the cycling environment, the cycling world." (E3)

> "I don't know, I mean I like to cycle a lot, every time I can do it, I do it, but I know that I don't do it on a regular basis, so I don't think it is fair that I take that title from people who actually cycle and try to fit myself in it". (W4)

The fact that minorities are underrepresented on the road reinforces Levy's (2013) conception that streets are a stage for power relations. It this sense, it can be recognised that cycling in London is a gendered activity that reflects the power of men over women, of the privileged over the unprivileged.

"Like it is quite a big opportunity for people if they want to, to show off and hold power over women, and I am just not down with that all." (E5)

The perception of gendered power relations due to the underrepresentation of women in cycling was not limited to the context of the road; some interviewees experienced the sensation of exclusion in other spaces and through other objects related to this activity. For instance, in some cases, the cycles and accessories did not resonate with the subject's taste, since products are mainly catered for men, or in a general sense, do not recognise the diversity of their (potential) customers.

"As a disabled woman, I found the cycles that are on the market are often really off-putting" (E3).

"I don't like wearing a helmet because it feels very uncomfortable, it doesn't fit properly with my hijab." (W1).

In this regard, where the identity of being a 'cyclist' plays a heavy role in the inclusion of women in cycling, the cycle itself represents an important vessel for achieving this goal, not only because of its obvious utilitarian purpose, but because of its affective qualities. The rigid idea of a 'bicycle' needs to be deconstructed in order to give space to a greater variety of vehicles that cater to a wider spectrum of users, such as cargo bikes, tricycles, handcycles, and more. As Aldred (2013) indicates, a cycle is seen as an extension of the person, it reflects and identity, it comprehends a set of personal attributes, it holds a public message from the owner to the world; consequently, if a woman does not relate to the cycle, it is highly difficult for her to relate to the activity and embrace it as an identity.

4.2.2 Social affiliations (C6)

This capability was prone to be high as half of the interviews involved women working within cycling groups, where the community is placed at the core of the promotion of cycling. However, the findings reinforced the importance of having a support network in order to start cycling, and also demonstrated that Anja's (2016) 'virtuous circle' does in fact exist.

"It's a women-only group, taught by all-female instructors, that is very important, so we create a very strong and supportive environment, people are able to establish friendships through that group." (E4)

Also, for some of the interviewees, the reason to attempt cycling related to the possibility of having an activity in common with one of their loved ones; others were encouraged by their friends to do so. This alludes to Goetzke's and Rave's (2009) hypothesis that people cycle because they succumb into positive peer pressure, or merely because it is an enjoyable activity to do among acquaintances. As a cycling instructor, the interviewee E2 has seen this trend among several of her students:

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> "She said to me, "you know, I wanted to cancel this morning, but then my son really pushed me to come". You know, it is often the children who push them to come, they really want to do activities with their moms." (E2)

> "Once the mom cycles, the rest of the family starts, you know, when the mom sees that is actually not that dangerous, because they are also the moms who are more protective than the dads." (E2)

In this sense, cycling can arise from strong family or friendship links, and in return, cycling can enable new relationships, confirming that this activity is a 'spillover phenomenon' as denominated by Goetzke and Rave (2009).

Conversely, the majority of the interviewees expressed that the white-male cyclist community made them feel like intruders on the road, as unskillful, slow cyclists, or what Aldred (2013) would refer as, not 'proper' cyclists. Women hence, deal with a double sense of social inadequacy and exclusion, from other road users, and from other cyclists.

> "I know that I am slow cyclist and people would get frustrated but I don't care [...] this happened to me quite a lot of times, being told off about other cyclists because they are angry because I am quite slow and they want to overtake me." (E1)

4.2.3 Bodily integrity and safety (C2)

> "You have to fight for your right to use the space, I have to always be alert, it is very stressful." (W1)

During the interviews, women referred significantly to feeling unconfident, unassertive, and fearful on the roads while cycling. This feeds into the established theory that women and cycling strongly correlate to fear and confidence, which becomes one of the main barriers keeping women from using the bicycle as a mode of transport (Garrard et al., 2008). In addition to reinforcing this statement, the present findings shed some light on where the lack of confidence originates from. As Law (1999) has addressed, it can mainly be attributed to the social construct of the society, where women have to align to certain behaviours and rules that eventually affect their notion of what they are (un)able to do. Similarly, when talking about confidence, interviewees that mentioned being active as a child, and continued to be in their adult life, did not relate cycling with fear or vulnerability; it can then be inferred that practicing sports in the development years of a girl can reflect on the bodily confidence as a woman (Young, 1980).

> "Men, in general, are socialised to be more assertive, and so they would in general, be more confident to overtake vehicles, while women tend to stay in the left-hand space." (E1)

> "Society expects women to be quiet and not take up space, to stay out of the way, the funny thing is that society expects cyclists to be that way as well, "you are in my way, get out of the road!"" (E6)

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As pointed out by interviewee E6, not only do women are expected to minimise their presence within the public sphere, but as cyclists too, hence women are faced with the challenge of breaking, not only one, but two stigmatised social identities (Hanson, 2010; Aldred, 2013). Being able to overcome social barriers becomes even more complicated when other aspects of their backgrounds intersect.

> "You would see less women cycling, specifically for minority backgrounds, you see, British women, they are different, I've trained a lot of them, and they are more confident although they didn't learn how to cycle as a child, or don't know how to behave on the road as well." (E2)

Clearly, confidence and fear are a social construct which correlates with gender, ethnicity and women's immediate context, being able to overcome these feelings which are rooted in the woman's identity represents a complex challenge that needs to be addressed by deconstructing gendered roles.

4.2.4. Information, education and skills (C4)

A lot of the interviewees had specific concerns regarding the technicalities of riding a bicycle, but even more about the skills needed to navigate through traffic and negotiate space with other road users. If women tend to feel more unskillful on the road than men, is because, as Young (1980) states, women were not encouraged to make use of their full bodily capacities as children.

> I don't know when you learned to ride a bike, but for most people it was when they were a child and learning to something like riding a bike when you are an adult is so much more complicated, everything is, is not just getting on a bike and getting to pedal, is your brain having to think in a different way, your body moving in a different way, there is a risk of falling, and that risk is a lot scarier as an adult than as a child who probably falls over and gets back on a lot more often, […] trying to learn how to bike as an adult is very challenging." (E4).

One of the most common concerns regarding the interviewees was speed. Keeping up with the flow of more experienced cyclists is particularly challenging for women using other types of cycles apart from a standard bicycle, such as a cargo bike or a handcycle. The current cycling dynamics on the road portray the idea that circulating must be done at the highest speed; this actively excludes women from cycling.

> "To be able to shoot out of the way at the lights… hand cycling is great but if you start from zero it takes a long time to crank up the energy. Then I thought 'I need the assist', once I get the assist I can keep off the way," (E3)

Some of the women thought that riding a bicycle requires an extra effort in comparison to other transport modes, as well as a more complex set of skills (Horton, 2007). The act of preparing the trip, lifting the feet, finding balance and finding assertiveness, means that cycling is not an accessible/easy activity for all.

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> "The preparation was an extra effort, and I think it is because I was so used to having a car where you can just keep your stuff, I am a person who is always with something, my food, my umbrella, my books, and everything, so just preparing that, and having no place to store it, I had to put everything in my backpack, it was sort of tricky, it represented an extra effort, but I wanted to do it, I mean I liked it." (W4)

> "Women are more like "oh no, my boyfriend always does that for me" I hear that a lot and I also hear them say "My boyfriend used to do it for me all the time, but we broke up, and now I can't do it, so I need to learn."" (E6) When referring to fixing up a bike.

Once again, cycling and its activities related to it, reflect the rooted masculine connotation where women, unlike men, are not encourage to develop mechanical skills as children (Young, 1980).

On another note, cycling as leisure can be a huge stepping stone into cycling as a mode of transport, as women can come in contact with the activity in a less imposing way which can lead into building the abilities needed to evolve into a transport mode.

> "Female cycling groups are safe spaces where no man will look at you or judge you" (E2)

> "If you just use it for leisure, I think you will only go to a park, or maybe these Sundays that the Mexican government organises and they close the streets, so I think it is different. I think you do need more skills if you are going to use it as a mode of transport" (W3)

4.2.5 Built environment (C8)

The built environment is an extrinsic capability that reflects, harbours and enables the concerning soft (social) aspects of cycling expressed by the women interviewed. As Criado-Perez (2019) observes, the way a city has been designed, favours or disfavours certain groups of people, in the case of London, men over women, motor vehicles over active modes, and fast cyclists over slow cyclists. The car-oriented culture in which London is rooted translates into the exclusion of cyclists from the roads due to the lack of infrastructure which transforms the daily commute into a daily battle of space and mobility. This greatly discourages women from cycling as it entails having to be more assertive, confident and fast, which, as mentioned before, are attributes difficult to develop as a woman due to the gendered performance of the body (Young, 1980).

> "And the fact that we provide opportunities to try cycling and practice cycling away from the roads is great, but it also reinforces this misconception that you need all of this huge environment to cycle, and also that for disabled people, cycling is out of sight out of mind, and it continues with this myth that disabled people don't cycle, because nobody sees many disabled cyclists." (E3)

Previous research (Garrard et al., 2012) has already determined that women have a high preference for segregated cycleways, but as Aldred (2016) rightly stipulates, the mere promotion of cycling,

does not mean more diversity in cycling, this includes infrastructure projects. For instance, the Cycle Superhighways are a perfect example that it is not sufficient to solely look at the 'problem', but also at the 'cause'; although this infrastructure complies with the objective of keeping cycle traffic separated from motor traffic, it harbours other attitudinal issues that continue to reinforce the exclusion of women in cycling.

> "In terms of attitudes, they are terrible because they are so straight that it encourages people to go very fast and they get very frustrated, this is why I don't like using them. So I use quieter ways, but then they are not that well protected."(E1)

Storage or parking facilities for cycles also played a key role when considering cycling. When choosing to own a bicycle, previous thought has to go into where it will be kept, and where it will be parked. For someone who is a regular cyclist, such as interviewee W2, storage was a strong concern when choosing where to live.

> "My life is really around my bike, and what brings me happiness is to be on my saddle, having a place where to keep it becomes a priority." (W2)

In the case of interviewee W1, who got her bicycle stolen in the past, finding a good parking spot for it has become a major concern.

> "I feel very close to my bicycle, it is my home on wheels, I don't want it to get stolen again. So every time I am going someplace new I have to go into google earth to see where I am going to park my bicycle." (W1).

4.2.6 Physical and mental health (C1)

Physical and mental health is mostly characterised for being an intrinsic capability. In the case of interviewee W2, having a knee injury, served as an enabler to use the bicycle as a mode of transport during her university years; her inability to walk left her with little options of mobility. As a child, interviewee W2, used to cycle often with her parents but stopped as a teenager, however, she continued to be physically active; she practiced gymnastics and ran regularly. Her proneness towards physical activity might have made the transition into cycling as a mode of transport easy.

> "I'd say by the fourth year, I cycled like daily, because then I had a feet issue and I couldn't walk, I could cycle, but not walk." (W2)

Cycling as a way of physical activity (Pucher and Buehler, 2008) contributed to the decision to keep on cycling among some interviewees, especially for those that have a tight schedule and cannot find any other time of the day to exercise due to their social role of the domestic responsible (Bonham and Koth, 2010; Gossen and Purvis, 2005). In this sense, being physically active can be seen as one of their motivations.

Having poor mental health was not found to be a constraint or an enabler for trying out cycling within the interviewees of the present research; however, the sense of wellbeing they get from the activity (Lehner-Lierz, 2003) was a significant factor for continuing the practice. The participants considered improvements in mental health as one of the significant positive impacts of using the bicycle, particularly more by women from minority backgrounds.

> "[…]but it is also an act of empowering and also a kind of rebellion for women who often had come through significant trauma and got to the point where they are here seeking asylum in the UK; and being able to put their energy into something positive like cycling, to reconnect with their bodies, start to feel, that kind of sense of freedom, that is probably the biggest thing that we get told by women." (E4)

4.2.7 Time and mobility autonomy (C5)

Although factors related to this capability were not referred recurrently within the interviews, its significance must not be undermined, especially among women from minority backgrounds.

4.2.8. Environmental and political affiliation (C7)

Only two of the interviewees alluded to this capability, particularly to the environmental factor; cycling aligned with some of their lifestyle values, such as sustainability. As Jensen (2009) points out, cycling, unlike other transport modes, functions not only as a vessel to get around but it holds different connotations which in some cases makes it attractive for people with specific values or lifestyles.

For instance, currently the discourse of climate change is getting louder, and the need for changing global habits towards a more sustainable way of life is growing eminent; in this regard, the bicycle represents a symbol of environmentalism, either from a policy perspective or from an individual point of view.

> "And there is also the conditions of climate emergency, health reasons; walking and cycling are in policy at the full front of the agenda." (E1)

> "But she does prefer cycling to being in the car because she is an environmentalist [...] I think she is because I am a little bit too, and cycling is a better way of transport,[...]she is very conscious about these things" (E2 talking about her daughter)

Although historically the bicycle has been linked to female political statements, such as women suffragists or feminists (Garrard et al., 2008), the interviewees from the present research did not allude to this value, except for one when referring to women with disabilities.

> "Another reason to encourage more people to fight the barriers of cycling and get out there is also a political sort of statement, kind of, we need to be seen, we need to be part of the cycling culture, the cycling environment, the cycling world". (E3)

Additional remarks

In addition to assessing women's capabilities, the impacts related to cycling were recurrently addressed during the interviews.

As previous research has already stated (Pucher and Buehler, 2008; Aldred, 2012; Lehner-Lierz, 2003), the benefits of cycling are several, but these are usually unknown by potential cyclists and are only learned when experienced. In this regard, the biggest challenge yet is getting women through the door, into that first ride. All-female cycling groups are helping to close the gap, it has, however, not been easy.

> "It was always volunteer-run, you didn't have to have any experience with bikes, you just had to have an interest, and that worked very well because you reduced the barrier of entry and it was always intended to be a stepping stone into the bike workshop." (E6)

Once women have broken this first barrier, and have experienced first hand the benefits of cycling, they are hence driven to continue doing it.

> "Once you've got the taste of cycling, you've discovered it, once you've realised how enabling it is, how exciting it is… I think that is not the disability, but it is the experience of cycling as a disabled person, I think it gives you a huge sort of incentive, a new context in which to think about becoming a cyclist or whatever, because it brings so many advantages." (E3)

Within the more experienced interviewees, cycling evolved and merged into other aspects of their lives outside the mobility purpose. For instance, when referring to assertiveness while cycling, interviewee E6 added:

> "I think I start to see the effect it had on me, when I first started doing maintenance, my confidence in general, like riding a bike made me confident, because I had to assert my self in a public space, so it is almost like practicing confidence, is like "no, I am allowed to be here, I have to be firm with this car or this driver and be clear that I am allowed to be here" if I am yelling at cars I am finding my voice in a way (E6)

In this line of thought, the meaning of bicycles as an object, as a sole vessel for getting places, evolves into an element of intrinsic importance for a woman's life, were affectionate links are created between the owner and the cycle.

> "Your life depends on your bike, so when I am injured I can't have my normal life, because I do lots of things in the evening and without my bike I am not able to do that, my life is really around my bike, and what brings me happiness is to be on my saddle." (E3)

Conclusions

The present dissertation aimed to answer the following question: What are the main aspects of a woman's life that constrain or enable her to ride a bicycle as a mode of transport within the context of London? In accordance with this objective, ten cyclist women with different backgrounds were interviewed taking Sen's Capability Approach as the foundation of the research since this framework recognises people's different conditionings and abilities to achieve any given functioning. The research question was answered by linking the results to eight capabilities concerned with cycling and gender, which in turn, underpinned three main conditions that constrain women from cycling in the city London. First, the gendered social construction that defines what a woman is, and does; second, the social road dynamics that determine how a cyclist should look, and act; and third, the underdeveloped bodily and attitudinal skills need to partake in set road dynamics.

In this regard, the promotion of cycling among women relates mainly with issues of social and gender coding, rather than with technicalities of transport planning; nevertheless, both matters continuously, and intrinsically, influence each other. While cycling projects and policies must be specifically targeted to the necessities and attitudes of women, a considerable shift won't happen

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unless the constraints of gender, and its related attributes, are deconstructed. In this sense, the results of this dissertation call for a deeper analysis on how gender is shaped and how it affects behaviours that consequently limit women's freedom to be, and peculiarly to this case, to move.

Accordingly, the concept of women as a whole demands to be desegregated. As stated in the literature research, and supported by the capability approach principles, intersectionality played a key component when assessing cycling through a gendered lens. Recognition of the broad spectrum of identities within women is imperative for the promotion of cycling, and for every other aspect of a woman's life. By acknowledging intersectionality within the present research, the weight of the capabilities and their propensity to be developed shifted considerably depending on the different characteristics of each of the interviewees. If cycling research, policies, and projects continue to deny the complexity and intersectionality of women, London will continue to consolidate a sole cyclist identity.

To be a cyclist in London is to be white, middle-aged, and bodily able; in this sense women don't see themselves represented on the roads, and hence they don't see themselves as cyclists. The three sectors, private, public and non-profit must combine efforts to make women visible on and off the roads. The private sector, companies and marketing, hold great power in how the landscape of cycling is perceived, therefore they have a responsibility to portray the diversity of identities, stating that cycling is an activity that can be done by anyone regardless of their looks or level of expertise. To keep reinforcing the idea that cycling concerns only men through media and products, is to ignore the fact that society has evolved; furthermore, restricting the identity of cyclists to one exclusionary ideal goes against the essence of London, one of the most socially diverse cities in the world.

Following this line of thought, diversity first and foremost should be reflected on the roads; to achieve this, an intersectional gender perspective must be included in the promotion of cycling policies. In regard to infrastructure, interviewees did express a preference towards segregated bikeways, mainly because it eases the aggressive and stressful traffic dynamics (TfL; Steer, 2012), in this sense, authorities in London should continue the implementation of protected cycling ways. However, these measures must be accompanied by social programmes that promote the development of skills; embodied knowledge, learning by doing, has proven to be successful in encouraging women to cycle through all female learning groups and bike rides. "An ounce of practice is worth a ton of theory" (Willard, 1895, p. 39). In this regard, female bodily capabilities, should be encouraged to be fully developed from an early age, meaning that sports and other active performances should stop segregating boys and girls.

Although London has been working in reducing the gender gap in cycling through combined efforts of non-profit organisations and government public policies, deep gendered dynamics have still to be addressed in order to tackle the underrepresentation of women cycling. Research such as the present dissertation is essential to enhance awareness about the implications -mostly adverse- of gender roles in the general aspects of a woman's life, such as mobility; and shed some light of how

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the coding of the body as female affects bodily capabilities that limit the performance of certain activities, like cycling. As a final thought, increasing the number of female cyclists will not only bring intrinsic positive impacts to women, but will contribute to improve the social environment of London.

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Appendix 1- Characteristics of interviews

Characteristics of the interviews

INTERVIEW GROUP	INTERVIEWEE CODE	DATE OF INTERVIEW	LENGTH
KEY ACTORS	E1	Jun 27, 19	42m 55s
	E2	Jul 29, 19	48m 29s
	E3	Aug 2, 19	47m 18s
	E4	Aug 5, 19	34m 48s
	E5	Aug 10, 19	11m 12s
	E6	Aug 10, 19	28m 33s
CYCLISTS	W1	Jul 29, 19	49m 54s
	W2	Aug 4, 19	27m 27s
	W3	Aug 5, 19	21m 9s
	W4	Aug 5, 19	21m 1s

Appendix 2 -Targeted questionnaires

Islington Council

1. In what ways do women tackle learning to cycle?

2. What do you think women find most difficult when learning to cycle?

3. Are women's attitudes towards cycling different from men's?

4. What do you think are women's main motivations for learning to cycle? Does it come out of necessity or curiosity?

5. What do you think mainly keeps women with disabilities from cycling?

6. How would you describe the experience of cycling in London?

7. How do women with disabilities benefit from cycling?

Wheels for Wellbeing

Wheels for Wellbeing promotes inclusive cycling and provides cycling opportunities for disabled people and anyone who might think cycling is not for them in South London.

8. What motivates a woman with disabilities to learn how to cyle?

9. From what you have observed, do you think men and women tackle learning to cycle in different ways?

10. What are women's attitudes towards cycling?

11. What do you think they find most difficult when learning to cycle?

12. What do you think mainly keeps women with disabilities from cycling?

13. Do you think women with disabilities would have learned to cycle if they hadn't gone to the cycle hubs?

14. How do women with disabilities benefit from cycling?

The Bike Project

The Bike Project is a community of refugees, cyclists, mechanics and volunteers. They take second-hand bikes, fix them up in their workshop and give them to refugees, and teach them how to cycle.

1. Do you think in general cycling is exclusionary for women, and even more so for minorities?

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2. What are women's main motivations for learning to cycle?

3. What do you think was keeping them from learning before?

4. What do you think women find most difficult when learning to cycle?

5. Women usually feel some sort of fear of cycling, where do you think this fear comes from?

6. Do you think refugee women would have learned to cycle if they hadn't come to your programme? What is the value of having a solely refugee women cycle group?

7. What impact do you think cycling has had on refugee women's lives?

Hornbeam JoyRiders

JoyRiders is a Walthamstow based cycle club for women and families and an initiative of the Hornbeam Centre.

1. Do you think in general cycling is exclusionary for women? End even more so for BANES?

2. What do you think are women's motivations for learning to cycle? What do you think was keeping them from learning before?

3. What do you think women find most difficult when learning to cycle?

4. Women usually feel some fear of cycling, where do you think this fear comes from?

5. What impact do you think cycling has had in their lives?

6. What difference does it make to have an all-female cycling group, instead of a mixed one?

London Bike Kitchen

The London Bike Kitchen is a non-profit that teaches and supports people in becoming self-sufficient and proficient in bike maintenance.

1. What is the concept behind Women and Gender-Variant nights?

2. Why is it important to have all-female spaces within the cycling community?

3. What do you think motivates women to come here?

4. What benefits do women get from learning how to fix their own bicycles?

5. Do you think London is exclusionary to cyclist women ?

6. What needs to change in order to get more women cycling?

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Appendix 3 - Cyclist's questionnaire

Age
Occupation
Level of education
Do you have a family of your own?
How often do you use the bicycle? (times a week, how long do you bike for?)
How long have you been cycling for?
Do you consider yourself a cyclist? What does it mean to you to be a 'cyclist'?
Do you own a bicycle? Does your bicycle have a name?
What encouraged you to try out cycling?
How was the experience of cycling for the first time? What drove you to keep on doing it?
Why hadn't you tried it before?
What is keeping you from using the bicycle for other kinds of trips?
What do you think would make cycling easier?
Did you use to ride a bicycle as a kid? Did you go riding with your parents or friends?
Did you play any sports or did any other kind of out door activities?
More or less at what age were you allowed to go out by yourself?
What do you think has changed about yourself or your life since you started cycling?

Appendix 4 - Coding data

Answers Data

Nodes	E1	E2	E3	E4	E5	E6-1	E6-2	E6-3	W1	W2	W3	W4	Total
A-Motivations	0	0	3	1	1	0	0	0	0	1	0	0	6
Cycle	0	1	2	3	0	0	0	0	0	2	1	1	10
Money	0	0	2	3	0	1	0	0	0	1	0	2	9
Other transport modes	0	1	4	0	0	0	0	0	0	3	1	0	9
Physical activity	0	0	2	0	0	0	0	0	0	1	0	1	4
Time	0	1	0	1	0	1	0	0	0	1	0	1	5
Wellbeing	0	0	0	1	0	0	0	0	0	0	0	2	3
B-Barriers	0	1	8	3	0	0	0	0	0	1	0	0	13
C1 Physical and Mental Health	2	0	10	7	0	0	0	1	4	10	2	7	43
Being active	1	0	2	3	0	0	0	0	3	1	2	5	17
Disability	1	0	9	0	0	0	0	0	0	0	0	0	10
Injury or illness	0	0	0	0	0	0	0	0	0	6	0	0	6
Wellbeing	0	0	2	5	0	0	0	1	2	4	0	3	17
C2 Bodily Integrity	8	16	9	10	0	0	0	4	2	0	7	4	60
Assertiveness	3	1	4	1	0	0	0	1	1	0	1	0	12
Condifence	4	6	3	6	0	0	0	3	1	0	3	0	26
Fear	2	5	0	3	0	0	0	0	0	0	3	0	13
Risk	1	5	0	1	0	0	0	0	1	0	2	0	10
Safety	6	4	3	2	0	0	0	0	0	0	0	3	18
Sexual harassment	0	1	0	0	0	0	0	0	0	0	0	0	1
Vulnerability	3	1	4	0	0	0	0	1	0	0	1	1	11
C3 Sense of Identity	22	17	23	8	4	8	3	3	5	5	1	4	103
As a woman	0	2	0	2	0	0	0	2	2	1	1	0	10
As cyclist	19	15	15	6	4	6	3	2	0	5	0	2	77
Cool	0	1	2	1	0	0	0	0	0	0	0	0	4
Cycles and wear	5	2	8	1	0	2	0	0	4	1	0	2	25
C4 Education, Information and Skil	8	6	14	9	2	5	3	3	1	1	8	6	66
Cycled as a child	0	2	0	1	0	0	0	0	1	1	1	1	7
Mechanics	0	0	0	1	2	1	3	3	0	0	2	1	13
Planning	0	0	2	0	0	0	0	0	0	0	0	3	5
Research	0	0	5	0	0	0	0	0	0	0	0	1	6

Road rules	2	2	2	1	0	0	0	0	0	0	0	0	7
Routes-maps	1	0	2	1	0	0	0	0	0	0	1	0	5
Skills	1	0	0	2	0	0	0	0	0	0	2	0	5
Speed	4	0	4	1	0	0	0	0	0	0	1	0	10
C5 Time and Mobility Autonomy	2	4	0	4	2	1	0	0	2	0	0	0	15
Career - work	0	0	0	0	0	0	0	0	0	0	0	0	0
Family norms	0	2	0	0	0	0	0	0	0	0	0	0	2
Unpaid resposibilities	2	3	0	1	0	0	0	0	2	0	0	0	8
C6 Social Affiliations and Alienation	15	27	10	17	5	8	2	4	2	6	10	6	112
Cycling group	0	4	4	9	1	2	0	0	0	0	0	0	20
Friends or family	0	12	2	5	0	0	2	0	0	5	5	0	31
Leisure	5	4	0	1	0	2	0	0	0	0	3	4	19
Other road users	6	3	4	0	0	0	0	1	1	1	1	1	18
Religion	0	1	0	0	0	0	0	0	0	0	0	0	1
Social norms	1	5	0	0	0	0	1	2	0	0	1	0	10
C7 Environmental and Political Values	3	4	1	1	0	1	0	0	0	0	0	0	10
Environmental values	2	2	0	0	0	0	0	0	0	0	0	0	4
Political participation	0	2	1	0	0	1	0	0	0	0	0	0	4
C8 Built Environment	10	8	11	2	0	0	0	0	3	4	11	4	53
Accessibility-inclusiveness	1	0	0	0	0	0	0	0	0	0	0	0	1
Bike share sytem	0	0	0	0	0	0	0	0	0	1	1	2	4
Cycle lanes	1	3	0	0	0	0	0	0	0	0	2	0	6
Parking facilities	1	0	1	1	0	0	0	0	1	1	2	1	8
Road dynamics	0	3	2	1	0	0	0	0	2	1	5	0	14
Road surface	0	0	6	0	0	0	0	0	0	0	0	0	6
X- Impacts	1	3	6	15	1	0	0	5	3	7	2	1	44
Total	143	180	192	141	22	39	17	36	43	71	83	69	1036

# Annex 1 - Foundations of the capabilities list

1. Mella's Capabilities list (2019)

Table 1 Categories of the survey considering transferability of concepts from the central human capabilities list

1. Basic socioeconomic and sociodemographic data, as well as factors of self-assessed physical and mental integrity	For example, commune of residence; gender, age, disabilities, level of education; current occupation, income; main and secondary transport mode for commuting; levels of stress, levels of air pollution; crowdedness
2. Associations between primary transport mode and emotive/instrumental concepts while commuting (or performing main activity)	For example, freedom, insecurity, functionality, enjoyment, affordability, poverty, safety, value of time, unpunctuality, congestion, efficiency, luxury, environmental care, health, social interaction, comfort, happiness, status
3. Reasoning and planning for commuting and/or regular trips	For example, assessment of access to job opportunities; reliance on public transport for commuting; frequency; activities; access to transportation and life quality
4. Social interaction with other people while commuting or doing regular trips	For example, assessment of the level of interaction; importance of other people while traveling; feelings of discrimination
5. Nature and sustainability	For example, variability depending on weather; access to sustainable transport modes; willingness to pay for more access to sustainable modes
6. Information	For example, access to information and modal interchanges; waiting, transfers and travel times; difficulties when transferring; access to technological online tools
7. Built environment	For example, considering transport infrastructure for private vehicles, public transport and cycling infrastructure
8. Productive activities and commuting	For example, questions related to commuting and productive trips; possibilities of getting a good employment; assessment of current available opportunities; satisfaction with job; travel times and expenditure

2. Robeyns' Capabilities list

1 Life and physical health: being able to be physically healthy and enjoy a life of normal length.

2 Mental well-being: being able to be mentally healthy.

3 Bodily integrity and safety: being able to be protected from violence of any sort.

4 Social relations: being able to be part of social networks and to give and receive social support.

5 Political empowerment: being able to participate in and have a fair share of influence on political decision-making.

6 Education and knowledge: being able to be educated and to use and produce knowledge.

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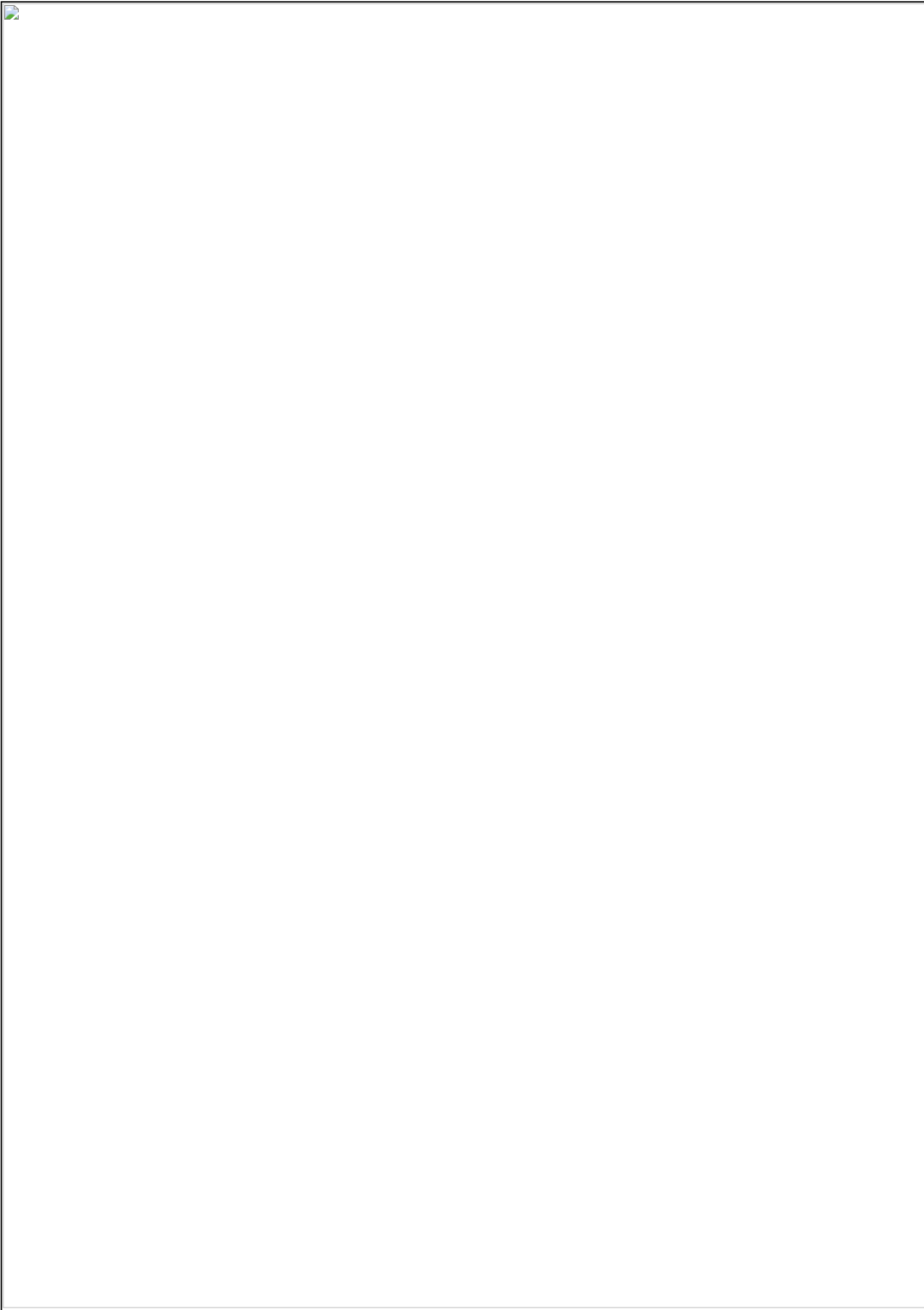
Risk assessment

**RISK ASSESSMENT FORM
FIELD / LOCATION WORK**

≜UCL

The Approved Code of Practice - Management of Fieldwork should be referred to when completing this form

http://www.ucl.ac.uk/estates/safetynet/guidance/fieldwork/acop.pdf

**DEPARTMENT/SECTION
LOCATION(S)   ON-LINE
PERSONS COVERED BY THE RISK ASSESSMENT**

BRIEF DESCRIPTION OF FIELDWORK

Consider, in turn, each hazard (white on black). If **NO** hazard exists select **NO** and move to next hazard section.
If a hazard does exist select **YES** and assess the risks that could arise from that hazard in the risk assessment box.
Where risks are identified that are not adequately controlled they must be brought to the attention of your Departmental Management who should put temporary control measures in place or stop the work. Detail such risks in the final section.

ENVIRONMENT	**The environment always represents a safety hazard. Use space below to identify and assess any risks associated with this hazard**
e.g. location, climate, terrain, neighbourhood, in outside organizations, pollution, animals.	Examples of risk: adverse weather, illness, hypothermia, assault, getting lost. Is the risk high / medium / low ?

CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**

	work abroad incorporates Foreign Office advice
	participants have been trained and given all necessary information
	only accredited centres are used for rural field work
	participants will wear appropriate clothing and footwear for the specified environment
	trained leaders accompany the trip
	refuge is available
	work in outside organisations is subject to their having satisfactory H&S procedures in place
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EMERGENCIES	Where emergencies may arise use space below to identify and assess any risks
e.g. fire, accidents	Examples of risk: loss of property, loss of life

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk

	participants have registered with LOCATE at http://www.fco.gov.uk/en/travel-and-living-abroad/
	fire fighting equipment is carried on the trip and participants know how to use it
	contact numbers for emergency services are known to all participants
	participants have means of contacting emergency services
	participants have been trained and given all necessary information
	a plan for rescue has been formulated, all parties understand the procedure
	the plan for rescue /emergency has a reciprocal element
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

FIELDWORK   1   May 2010

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