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The 15-minute city : the influence of a sustainable neighbourhood-based proximity on subjective well-being

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Summary

At the time of COP26, the issue of Climate Change is more pressing than ever and needs to be addressed at all levels of society. In particular, the cities, whose traditional industrial development paradigm was very resources consuming, need to take actions to mitigate the environmental damages. They must embrace more sustainable development models which ought to combine both an ecological transition and a social development, improving in particular the quality of life of their residents and their opportunities to fulfil well-being.

The 15-minute city is an emerging model of sustainable urban development. Proximity-oriented, it focuses on enhancing local opportunities at the neighbourhood scale and curbing car-dependency in cities. On paper, it seems to solve the impossible equation between social and environmental development. Then, the main objective of this research is to explain whether or not proximity in the built environment have on the subjective well-being of urban dwellers, through the analysis of several dimensions of proximity such as accessibility to resources, walkability and promotion of soft active mobility modes and enhancement of social local ties at a neighbourhood level. Mediating variables about the life experiences of a resident (social life, leisure, perception of a local environment to name but a few) were introduced to better apprehend the pathways that link the physical built world to a subjective and perceived well-being.

A quantitative analysis was conducted on three case studies, corresponding to three European cities often considered as prototypes of a 15-minute city : Paris, Barcelona and Milan. To assess the drivers of well-being, two types of regression were run over the data : linear regressions to identify the relationships between potential predictors and subjective well-being dimensions, as well as, when possible, multinominal logistic regression as a verification of the linear regressions' outcomes.

Because of constraints during data collection, only conclusions from the Paris case study could be generalised. Some conclusions could be drawn from that analysis. Proximity was shown to have a direct light impact on subjective well-being through accessibility, as well as an indirect one through local social links. Proximity oriented-development can then be an enhancer of opportunities for urban dwellers, developing local potential in neighbourhoods but should simultaneously link neighbourhoods together in a polycentric system, not to become dead-ends and impede the effects of proximity over subjective well-being.

Keywords

15-minute city – subjective well-being – proximity – experience – sustainable urban development

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Abbreviations

IHS	Institute for Housing and Urban Development Studies
SWB	Subjective Well-being
15MC	15-minute city
BE	Built environment
HWB	Hedonic Well-being
LS	Life satisfaction
EWB	Eudaimonic Well-being
WB	Well-being
Eq.	equivalent
ESS9	European Social Survey – ninth edition
NP	Neighbourhood Perception

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Chapter 1: Introduction

1.1 Background information

The rise in temperature due to climate change is expected to have a tremendous impact on human settlements. In the Paris Agreement, the International Community committed to maintain below 2° the rise in temperatures at the end of this century, in comparison to the pre-industrial level, and thus, made a vow to curb their anthropogenic carbon emissions. In particular, cities are a major source of GHG emissions since they emit 70% of global emissions (UN-Habitat 2011). Thus, actions at the local level have been recognised as substantial for climate adaptation and mitigation, as stated in the article 7.2 from the Paris Agreement (2015) as well as during the Climate Summit for Local Leaders, a summit gathering 1000 of mayors worldwide and held simultaneously to the COP21.

The cities are nowadays not following a sustainable urban development path. Sustainability can be understood as a development which meets three dimensions : environmental, socio-cultural and economic. More precisely and physically, a sustainable development takes into account the impacts of the built environment on natural dynamics, including then the energy inputs and outputs (Georgescu et al. 2015). It is clear that the past models of urban development, driven by the industrial development failed to meet that definition and are now characterized by car dependency, urban sprawl, traffic congestion, residents' stress, pollution. Yet, the built environment and its features have a huge impact on people's life (Lamprecht 2016), and this very urban modernist shape had had substantial negative outcomes on both quality of life and the environment and had increased communities' vulnerability to shocks, as shown recently by the enormous impacts of the COVID19 on our lives (Moreno et al. 2021).

There is then a need to shift urban development towards the building of "safer, more resilient, sustainable and inclusive cities", according to the Sustainable Development Goal 11 of the United Nations. There are several transition models for cities being theorised and thought of, such as the low carbon city, the slow city, the circular city. However, building a sustainable city is not an easy task to achieve, given the very complex dimensions of cities (Lützkendorf and Balouktsi, 2017). One way of solving partially this complexity is to consider the urban development at the neighbourhood level, involving the local stakeholders (Lützkendorf and Balouktsi, 2017).

Considering that, a very interesting model to look at is the 15 minute city concept. This neighbourhood-based concept relies on chrono-urbanism, meaning that it plans the city according to the time that the residents spend for commuting, which should ideally be less than 15 minutes. The 15-minute city concept gained notoriety since Carlos Moreno took on the concept in 2016 and after Paris announcement to implement it within the city. According to Anne Hidalgo, the mayor of Paris, the 15 minute city is meant to be "the city where no one is left behind. It is the proximity city where all the services that are needed can be found within a 15 minute walk of one's home. This is the condition for the ecological transformation of the city." (ETI 2020)

1.2 Problem statement

The 15-minute city is often considered and presented as an example of urban sustainable development model (Lobner et al. 2021). Indeed, it relies on a lack of car dependency and a mixed land-use development, which both allows major resources' and energy savings (Moreno et al. 2021). But beyond those efficient technical solutions often attached to ecological transition's solutions such as a reform of the mobility system or of the energy system, the 15-minute city model is deeply human-oriented. Its aim is to increase the residents and the users' well-being and it relies on a the different aspects of one person's lifestyle in their daily routine (Moreno et al. 2021). Then, allegedly, the 15-minute city increases happiness and liveability in the city by providing the opportunity to residents to shift their behaviour towards more sustainable lifestyles.

This statement is particularly interesting given the difficulty that the ecological transition can represent for the people to change their behaviour. For instance, ecological transition is sometimes regarded as a regression to progress for people's life and as a barrier to happiness and achievement, as shown recently by the notorious declaration of the French President Emmanuel Macron while defending the 5G technology and calling ecologist militants "Amishes" (Domenach, 2020). In addition, climate change might cause some "eco-anxiety" (Pihkala, 2018) and some people might experiment psychological barriers to adopt a more sustainable, low-carbon behaviour, due to ignorance or mistrust in the solutions (Gifford, 2011).

Then, the 15-minute city (15MC) would have the potential to bring together social and ecological transition and to influence city dwellers to adopt greener practices in their daily life, allowing a broad, effective and systemic transition (Gollner and Yeoman 2021). This reflection is steering the focus on the relationship between the environmental transition, characterised here by the physical urban translation of the 15-minute city, and the social benefit for the people, being here the well-being aim advertised in the 15MC model, and to actually see whether that relationship is conflicting or mutually beneficial.

1.3 Relevance of the research topic

1.3.1 Academic relevance

This topic is of high academic relevance. Indeed, the 15-minute urban model is currently a new hot topic in urban literature and is increasingly investigated by researchers (Pozoukidou and Chatziyiannaki 2021). It is an important and present topic given its potential for a systemic action in climate adaptation and mitigation meanwhile cities are looking for solutions to cope their GHG emissions and to accompany their residents towards more ecological and sustainable lifestyles. In addition, given the novelty of the concept and the freshness of its implementation, there are still research gaps and more research needs to be conducted to test which characteristics of the 15-minute city are more relevant to complete its aim and achieve people's well-being (Moreno et al. 2021).

Moreover, the concept of the 15-minute city is an interesting example to study a growing field in the urban literature, which is the gap of knowledge on the bridge between well-being and environmental sustainability (Mouratidis, 2019b). The topic of subjective well-being,

itself, is gaining importance but there is still a need to study more deeply the pathways that link the physical built world to subjective well-being (Papachristou and Rosas-Casals 2019).

Ultimately, focusing on Paris, Barcelona and Milan for the case studies is strongly relevant academically because studying proximity-oriented strategy in those cities is aligned with the present scope of research in those cities and with the strategies implemented by the local authorities there.

1.3.2 Social relevance

Furthermore, the social relevance of the topic cannot be denied either. Such an urban model is indeed strongly users-oriented and replace the aim of urban development towards people and their lives. According to Moreno's words, this is a new "urban humanism" (2021). In addition, this model is currently being looked closely by several local actors in the world which are trying to find a context-based way to implement its dimensions to their place (Pozoukidou & Chatziyiannaki, 2021). Thus, this topic study benefits the urban dwellers because their individual stakes, meaning their well-being, is targeted for the implementation of an ecological solution.

1.4 Research Objectives

The objective of this research is to explain whether or not an urban development model like the 15-minute city can improve the quality of life of its residents while managing a transition in resources consumption.

Such a study can help test and identify which are the most interesting characteristics of the 15-minute city to increase urban dwellers' well-being and then, to be able to prioritize the policies during its implementation (Halpern 2010 in OECD 2013). In addition, as reported by the OECD (2013), assessing the well-being outcomes of a project or a policy enables to identify trade-offs between different outcomes (for instance here, the trade-offs between social benefits and environmental benefits) and thus improve decision-making processes.

1.5 Preliminary research question and research sub-questions

Given the problem identification and the main research objectives, a preliminary research question can be formulated as followed :

To what extent does living in a sustainable 15-minute city enhance well-being for the residents ?

A few sub-research questions can as well be formulated to answer such this question :

- Does the model of 15-minute city impact the residents or users' life, and if so how?
- To what extent does the 15-minute city contribute to the well-being of the residents and the users ?

Revised research questions were introduced at the beginning of chapter 3, after the literature review and the presentation of the conceptual framework applicable for this research.

Chapter 2: Literature review and theory

In this chapter, a review on the existing knowledge about the research topic will be conducted. In order to do so, the two main topics of interest were investigated : the **15-minute city** and **subjective well-being**.

2.1 State of the art of the concepts of the study

2.1.1 The 15-minute city

- ***Definition of the concept***

The 15-minute city (15MC) is an urban planning concept which organises the city in such a way that the residents can have access to all of their basic needs within 15 minute walking or cycling (Moreno et al. 2021).

This concept was theorised as such by Carlos Moreno in 2016 and tailored to the specific context of Paris. It became very popular and gained momentum during the Covid19 crisis in 2020 (Moreno et al. 2021 ; Camerin 2021; Simon et al. 2021). Indeed the lockdown caused by the pandemic forced a substantial number of urban dwellers to stay at home and not to cross their neighbourhood's borders. The concept became very popular among urban decision-makers, but also gained lot of attention in mainstream press (O'Sullivan, 2020). However, it is interesting to notice that the 15MC model is not new but rooted on previous theories on accessibility, chrono-urbanism or chrono-topy. Besides, a similar concept had had already been implemented in other cities such the 20-minute neighbourhoods in Portland (2012) or in Melbourne (2017) (Camerin 2021) or the 15-minute walkable neighbourhood in Shanghai (Weng, 2019). Moreover, it is important to bear in mind that the 15MC concept did not emerge due to the Covid19 pandemics, but rather as a solution for the upcoming environmental crisis.

This historical overview of the emergence of the concept is interesting because this highlights the fact that the 15MC concept is not a fixed urban planning action or plan, but rather a flexible direction to build the city, as reminded by C40 (2020), which encourages cities of its network to adopt such a planning paradigm. Carlos Moreno himself (2021) presented an adaptation of its 15MC concept, the 30-minute territory, which is more appropriate for rural areas or less compact urban forms.

Overall, the 15MC concept, in every setting or context, presents two main characteristics : urban proximity and lack of car dependency (Moreno et al. 2021).

Proximity, in particular is a very important dimension to achieve the 15MC, even a "critical" one as reminded by Moreno et al. in a recent article (2021, page 103). Indeed, the notion of proximity is interesting because it shifts the planning perspective to a more human-scale, taking more into account the user experience than traditional transportation planning (Handy, 2020). It allows local dwellers to optimise their use of public spaces and amenities infrastructure.

Besides, it can be noted that proximity is an important speech flagship for the 15MC concept, as it is commonly used by Major Hidalgo (the major of Paris) who speaks of a "Big Bang of proximity" (Moreno, 2021) or by Carlos Moreno who talks of "Hyper-proximity" (Moreno, 2021). According to Pozoukidou and Chatziyiannaki (2021) who studied and compared several different cities (Paris, Portland and Melbourne) where the concept of the 15-minute city can be applied, the notion of proximity is of tremendous importance in such a theory. Indeed, the strategy is rather oriented towards proximity rather towards accessibility and mobility.

- ***The Hyper-proximity paradigm in the 15-minute city***

Proximity can be defined as the state of being near urban functions and amenities, which are necessary to life such as amenities for work, commerce or leisure, to name but a few (Marquet and Miralles-Guasch, 2015).

More precisely, "proximity dynamics only appear in those places that gather both nearness between origins and destinations with affordable forms of accessibility for the local population" (Marquet and Miralles-Guasch, 2015, page 259). Thus, proximity can be understood as a function of both spatial and time dimensions (Marquet and Miralles-Guasch, 2015). Interestingly, this very combination of space and time can be found again in the name of the concept 15-minute city.

Proximity in a place is then characterised by short trips from residents and a high neighbourhood use of facilities (Marquet and Miralles-Guasch, 2015). According to Marquet and Miralles-Guasch (2015) though, it is often observed that proximity and short trips are more likely to happen for personal activities than for professional occasions.

In the 15MC concept, proximity is achieved because the resources and services are provided locally given that the neighbourhood ought to be "self-sufficient" (Pozoukidou and Chatziyiannaki, 2021, page 21).

In this article, the authors identified a few characteristics that are shared by the different 15-minute cities they analysed, that can be taken as a framework to analyse the levels of proximity in the 15-minute city :

- A localised city life, which relates to the ability of a neighbourhood to connect the local residents together,
- A self-sufficiency of resources, which is conditioned by the decentralisation of resources and services and a mixed land-use, allowing the residents to have all the resources and services they need within easy reach.

To those dimensions, the mean of transportation, meaning the walkability implied by proximity as well as the use of soft transportation modes, can be added, as it is a very important dimension in the proximity literature (Marquet and Miralles-Guasch, 2015).

Non-exhaustive list of common physical applications of the 15-minute city *(Moreno et al. 2021)* **:**

- Reduction of transportation and mobility : increasing of accessibility and walkability and use of soft transportation modes : walking, biking, etc.
- Accessibility to daily needs : micro markets and local shops, parks and open green areas,

health facilities, education opportunities, etc.
- Local social life : maintaining close and sustainable social links, enhancing social cohesion and interaction between people in the neighbourhood, etc.
- Residents' Participation : participation of local residents in decision making, redesign of services based on experience (UX design ..), etc.

The notion of walkability is central to the 15MC concept because it is based on a reduction of car-use and travel time to the beneficial of soft and active transportation modes such as biking or walking (Moreno et al. 2021). According to Rebecchi et al. (2019, page 3), a walkable place can be defined as "a place suitable for walking, that can be travelled, crossed, and covered by walking or cycling".

This is a very important concept because those soft modes which are walking and cycling are energy efficient and do not pollute (Marquet and Miralles-Guasch, 2015).

Another very important notion is the one of the accessibility to resources. In the very definition of the 15MC, the quality of the neighbourhood is indexed on the quality of life for the residents, given than the concept is based on accessibility of the needs of the people, so they can achieve a good life. (Moreno et al. 2021). Moreno (2021) identified six main urban functions which are needed in one district in order to achieve people's well-being :

(a) living,
(b) working,
(c) commerce,
(d) healthcare,
(e) education,
(f) entertainment

Thus, the development of soft mobility modes cannot go without a polycentric and decentralised development of urban functions. Indeed, the distribution of certain amenities in a neighbourhood, and more precisely, the absence or presence of a certain amenity in one neighbourhood shapes the patterns of mobility of the local residents (Graells-Garrido et al. 2021).

Yet, according to Capasso da Silva et al. (2019), the accessibility in the 20-minute neighbourhood (a variation of the 15MC) is of tremendous importance and can be defined as the ease of reaching opportunities and destinations. Indeed, "What matters to people is how easy it is for them to get to where they need to be, how easy it is to access the services they need or want" (Handy, 2020, page 20).

Those neighbourhoods in the 15MC can take advantage of a decentralisation of services and facilities. They are able to operate as "semi-autonomous" clusters (Pisano, 2020), in a relative "self-sufficiency" (Pozoukidou and Chatziyiannaki, 2021). Thus, it is characterised by a mixed land-use, a fairer allocation of resources and a balanced distribution of services and opportunities for all (Pozoukidou and Chatziyiannaki, 2021).

This is an interesting aspect of the concept because an efficient management of resources in the city is known to be an important principle for a sustainable development of cities (Luetzig et al. 2013).

Last but not least, the notion of localised city life is also of tremendous importance to assess of the level of proximity in a neighbourhood, as reminded by Pozoukidou and Chatziyiannaki (2021).

According to C40 knowledge center (2021), the 15MC is an efficient way to make places able to localise the city life and to reconnect the dwellers to their surrounding immediate neighbourhood. A localised city life is then characterised by a relatively high level of interactions between neighbourhoods, mostly for practical things such as helping, giving services, lending objects (Hoogerbrugge et al., 2021). Interestingly, neighbourhood relationship are often not considered as strong social links even though they represent up to 20% of people's individual social networks (Mollenhorst, 2015 in Hoogerbrugge et al., 2021).

- ***A double aim : achieving residents' well-being in a sustainable urban environment***

Moreno et al (2021) remind the benefits of planning according to the well-being of people, because in particular, it is a way to address major environmental issues, which is precisely climate change. Indeed, the concept of the 15-minute city, by relying on proximity and decreasing of car-uses in the urban space, results in a reduction of resources consumption. This is indeed a two-aimed concept that combined not only sustainable and low-carbon urban development but also well-being of the local residents.

2.1.2 The Subjective Well-being

- ***Definition of Subjective Well-being***

Well-being (WB) is a concept that has multiple different dimensions. It is today an increasingly popular field of study in the urban literature encompassing similarly happiness, quality of life, life satisfaction or even positive psychology and is now an important topic of study in literature (Papachristou and Rosas-Casals, 2019).

Well-being can generally be measured in an objective way or in a subjective one. In this paper, the focus will be put on subjective well-being, defined as the way people feel about their own lives and experiences (OECD, 2013).

The Subjective Well-being (SWB) is measured as the evaluation and appraisal of their own life (Diener & Oishi, 2018). Indeed, this subjective concept is based on a self-reported rate (Diener & Oishi, 2018) : it is the fact that "people themselves to think that they are living good lives" (Diener 2000, page 34 in Kent 2017, page 69)

Subjective well-being is usually decomposed in three dimensions (OECD 2013):

- The hedonic well-being, meaning the emotional state of a person at a particular moment,
- The life satisfaction, which is the assessment about their own life that someone can make,
- The eudaimonic well-being, which is the feeling of achievement and the sense of meaning about their life that a person can feel.

According to Diener and Oishi (2018), SWB is attributable to different factors. First, it is influenced by genetic factors (for 30 to 40% of the variance in the individual appraisal of SWB), but also by environmental factors for 60 to 70% of the difference in the individual rate

of SWB. Then, those are controllable factors, which means that policies and initiatives can play a role to maximise people's well-being, but also that a wrong policy could decrease the level of happiness for the citizens or residents.

- ***The influence of the build environment on subjective well-being***

Subjective Well-being is then a subjective measure, that is inner to people's feeling but with environmental determinants.

Indeed, it has been shown since a long time, by a considerable number of literature that it has physical and geographical determinants (Van Kamp et al. 2003 ; Pfeiffer and Cloutier 2016). In particular there is empirical evidence in urban scientific literature that greeneries and open natural public spaces can truly enhance resident's well-being (Kaplan 2001, in Pfeiffer and Cloutier 2016). Equally, public spaces designed to enhance social connectivity and meeting among neighbourhoods have a positive impact on how people feel and perceive their level of happiness (Leyden, 2003 in Pfeiffer and Cloutier 2016). The neighbourhood-based social capital, meaning the social ties and cohesion that are made within a local community have as well an impact on SWB (Hoogerbrugge et al. 2018). The level of accessibility to amenities in cities is also a factor of happiness for urban residents (Leyden et al. 2011). It can also be noticed that there is a whole part of literature studying the influence of commuting for residents on their well-being and happiness (Chatterjee et al. 2021).

More generally, the built environment (BE) and the way cities are planned have a great impact on people's well-being and the way they are feeling about it (so their subjective well-being). Some studies have shown that for instance, compact cities have adverse social impact on the local residents, so are not appropriate urban form to achieve residents' well-being (Morrison, 2011 in Mouratidis 2019b).

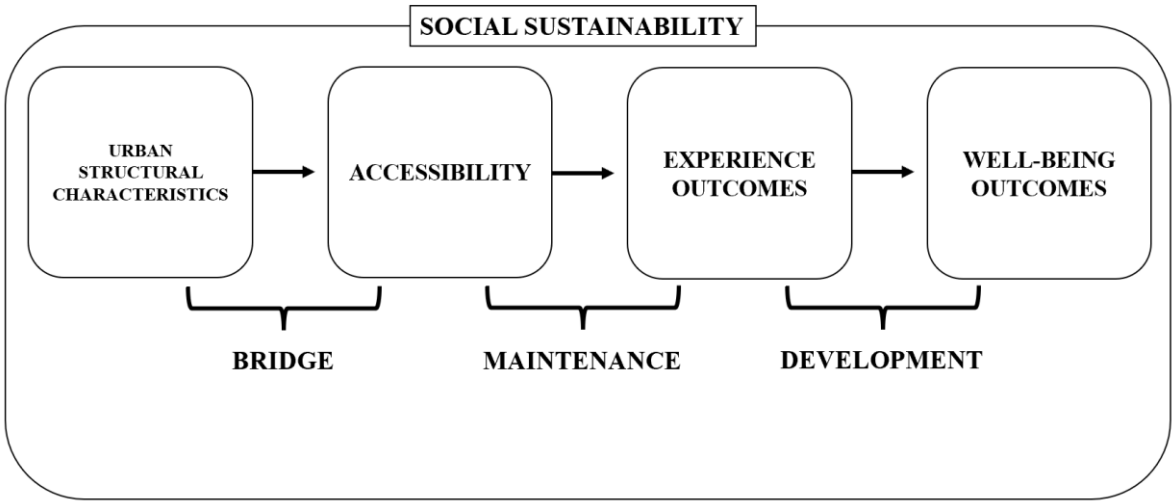
The link between BE ad SWB has been established empirically in a substantial number of academic works. However, it has also been argued that such studies sometimes lack precisions about the true drivers of the well-being, which are complex and multi-dimensional (Kent et al. 2017). A more holistic approach would be necessary to understand properly how this causal relationship works (Van Kamp et al. 2003, Mouratidis 2021).

- ***The determinants of well-being : the Experience***

An interesting element to bear is mind is the fact that the perceived environment has a stronger impact on people's well-being than the objective environment. This is confirmed by Kent et al. (2017) whose quantitative empirical research showed that the subjective well-being of local residents is actually influence in a stronger way by the perceived built environment rather (that was assessed directly by questions in a survey) than by the objective built environment (which was assessed based on objective data).

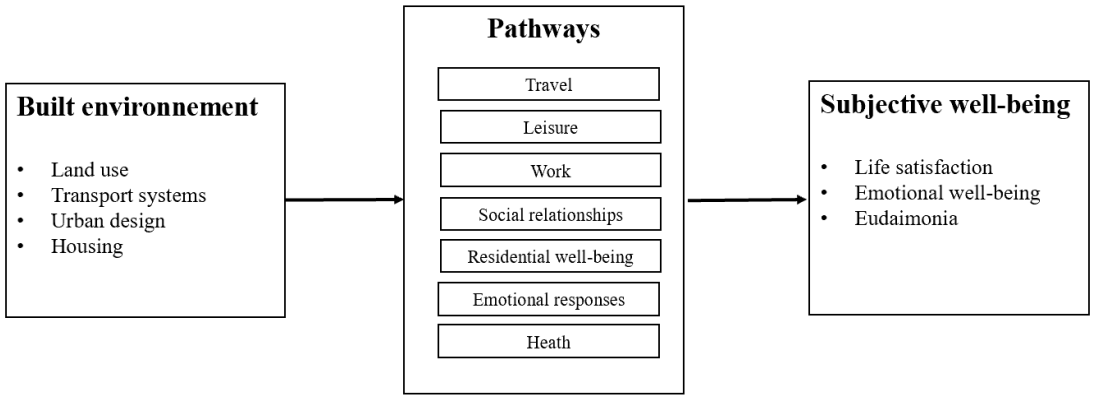
According to Kyttä et al. (2016), it is important, when it comes to measuring well-being, to also take into account some mediating factors of influence such as accessibility and the experience that the residents might have of their city.

Figure 1. The social sustainability framework (Kyttä et al. 2016)



Going further, Mouratidis conducted a synthesizing work to present a relevant framework of the different pathways that link BE and SWB. Furthermore, according to Mouratidis (2018, readjusted in his paper of 2021), the link between the built environment and subjective well-being is determined by some neighbourhood factors such as personal relationships, health, leisure activity and neighbourhood impacts on the residents' mood. Then, human-oriented outcomes of the built environment should be measures and assessed prior to measuring the level of well-being. Indeed, the physical built world might have an impact on the psychological state of a person through the opportunities on their life it enables. Those mediating factors are related to the "experience" determinants introduced by Kyttä et al. in 2016. It can then be noted that, by applying his own framework, the author was able to show a positive influence on a compact built environment on subjective well-being (Mouratidis 2019b), contradicting previous knowledge.

Figure 2. The influence of built environment on subjective well-being (Mouratidis, 2021)



- ***The experiences in the cities that might increase SWB***

Social capital is considered as one of the major life domain to have an effect over subjective well-being dimensions (Mouratidis 2019b). Social capital can be defined as the "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them." (Putnam, 1995 page 19, in Hoogerbrugge et al., 2018 page 1498). Hoogerbrugge et al. (2018) report that local social capital increase the residents' life satisfaction in both an individual way (through the contacts that the residents have with each other), but also in a collective way (due to the cohesion and identity that are perceived by the residents for their neighbourhood). More precisely, the influence of neighbourhood-based social capital is stronger on life satisfaction for residents who are lonelier, or more vulnerable.

The leisure dimension is as well an important factor that contributes to residents' well-being. A recent study shows that the level of leisure for residents is influenced by the built environment, and in particular by the proximity dimensions, and the easy access to amenities such as green spaces, natural areas but also cafés or restaurants (Mouratidis 2019a). However, though already explored and tested, the effect of leisure satisfaction on subjective well-being remains unproven (Mouratidis 2019b).

Another dimension important to bear in mind is the impact of the neighbourhood on emotions and mood, or in other words, the perceived quality of the neighbourhood by its residents such as the aesthetics, the place attachment, the place reputation, the perceived safety, or the perceived cleanness (Mouratidis 2020). In particular, it has been proven that a negative perception of their neighbourhood by residents could increase their level of anxiety whereas, when a neighbourhood is considered as pleasant and free of its urban issues, it can improve the level of life satisfaction for its residents (Mouratidis 2019b).

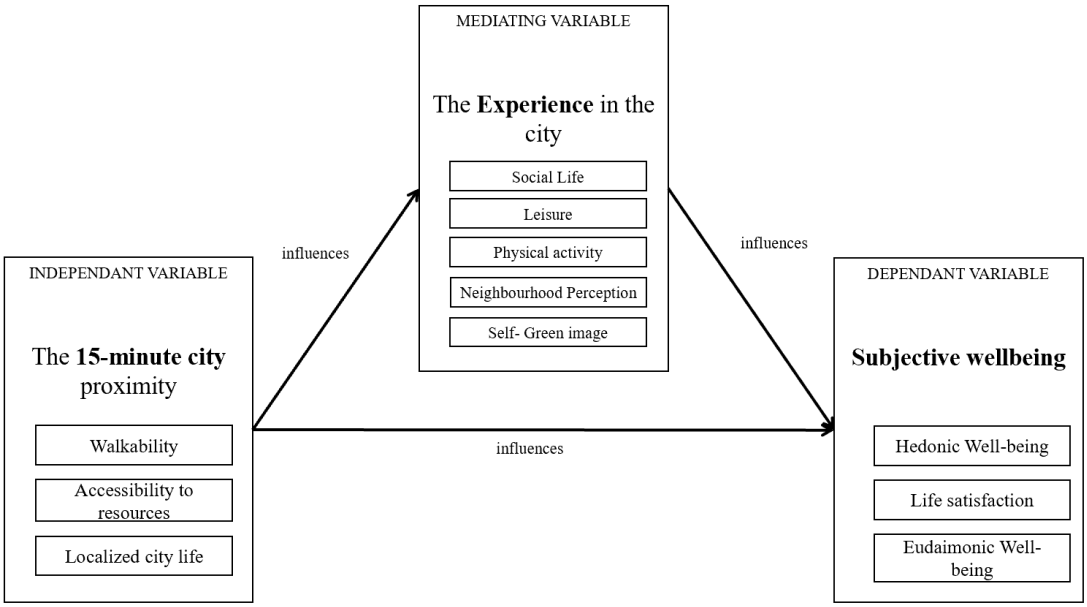
Last but not least, the impact of green behaviour, and in particular of the self-assessment of sustainable behaviour is interesting to consider, given the sustainability of the 15MC model. It has been showed that a pro-environmental or sustainable behaviour has an impact on the eudaimonic well-being, but might also be a source of stress or anxiety at a very present time (Paralkar et al. 2017). In their article, Prati et al. (2017) also argue that pro-environmental well-being influence eudaimonic well-being. In a recent article, Kasser (2017) shows the positive relationship between happiness and an ecological life, which is due in particular to psychological factors.

2.2 Conceptual framework

The following conceptual framework could be deduced from the previous review.

It is an integration of several other conceptual frameworks that helps to draw and understand the relationships between the dimension of proximity in a 15-minute city and the subjective well-being of its residents.

Figure 3. Conceptual framework



This conceptual framework relies on other conceptual frameworks that have been found in literature and which are :

- The notion of proximity, translated by some common urban features, identified by Pozoukidou and Chatziyiannaki (2021)
- The framework of the link between the built environment and well-being by Mouratidis (2021), and more precisely, some of the major determinants of well-being in a city based on the experience of the residents
- The different components of Subjective Well-being based on the OECD Guidelines report (2013).

Overall, this framework explains how an urban physical characteristic such as proximity can have an influence on people's perceived well-being and the way they are feeling about themselves. The three main dimensions of proximity that are stressed here are related to opportunities that are given to the residents : the opportunity to adopt soft and active transportation modes like cycling or walking, the opportunity to access any resources needed thanks to a better allocation of urban functions, the opportunity to have interactions with local residents and to feel part of a community.

Those opportunities are what shapes the residents' experiences of their local environment, the personal activities they might have and the feelings and perceptions they will get out of it. Those experiences are precisely determinants of Subjective Well-being in the literature (Mouratidis, 2018). Those determinants are not the only ones to influence SWB, but they are the closest related to the notion of proximity and the ones which are more likely to be shaped by the spatial opportunities related to proximity and mentioned above.

Chapter 3: Research design, methods and limitations

The previous literature review and conceptual framework leads to this revised research question :

To what extent does the level of proximity explain the subjective well-being of residents in a sustainable urban model such as the 15-minute city ?

The following sub-questions can me researched :

1. To what extent 'accessibility to resources' explain 'well-being' of the residents?
2. To what extent 'walkability' explain 'well-being' of the residents?
3. To what extent 'localized social life' explain 'well-being' of the residents?

3.1 Description of the research design

3.1.1 Data collection method : a quantitative online survey

This is an explanatory research, which aims at expounding on the level of well-being of residents in a 15-minute city neighbourhoods according to the level of proximity they can experience.

Therefore, the appropriate research method for this study is to conduct a statistical analysis based on a quantitative survey. The survey was an online self-completion questionnaire with closed-ended questions. It was designed to be short (less than 10 minutes to complete) as well as easy to understand and to fill in, but still precise enough to get interesting indicators for the analysis. Three versions of the survey were made for each city of the case study (Paris, Barcelona and Milan, cf. text of questionnaires in annexe 4).

Such a method presented several advantages for this research. First, the research, focusing on the 15-minute city development's outcomes is a new topic and there was no existing data linking people's perception on such a model. Then there was a need to collect primary data. Likewise, a survey was relevant for such a research because it enabled to collect people's perception (Van Thiel 2014), about their well-being. Furthermore, the online self-completion model may decrease the "social desirability" bias that might occur for a survey about well-being, because the interviewer is absent, so the temptation to transform reality is lowered (Bryman 2012).

In addition, it follows a large-scale approach (Van Thiel 2014) which is necessary to increase the external validity of a subjective measure such as well-being and to generalize the findings (Van Thiel 2014). This type of research strategy was cheap and easy to implement (Bryman 2012), and was a safer strategy to follow in a time of Covid19 while physical interactions were still not recommended.

Last but not least, this is a very commonly used and recommended collection strategy to assess subjective well-being (OECD 2013 ; Mouratidis 2019b).

3.1.2 Chrono-spatial frame of the survey

For this research, a multiple cases analysis was conducted. The choice of the three cities to focus on was made amongst a few cities that are currently considered as 15-minute city in the literature and in policy reports (C40, 2021) (see below table).

Table 1 : Potential cities for a case study

	Population (in million)	Region	Project / Policy document
Paris	2	Europe	Paris en commun (municipal campaign of major Hidalgo in March 2020)
Portland	2.2	North America	Plan action climate 2015 : 20-minute neighbourhoods
Melbourne	4.4	Oceania	Plan 2017-2050 : 20-minute neighbourhoods
Ottawa	2	North America	Plan 2019 - 2046
Milan	1.3	Europe	Milan Territorial governmental plan
Copenhagen	1.4	Europe	Neighbourhood Nordhavn (currently in development, suburban)
Barcelona	1.6	Europe	Supermanzanas

The selected cities for this research were Paris, Milan and Barcelona. The selection of Paris is motivated by the fact that the 15-minute city concept had gained momentum worldwide through this example (Moreno et al. 2021). Milan and Barcelona were selected because those two cities present similar characteristics (in terms of density, economic dynamism and European culture) which allows a comparison.

In addition, the survey was broadcast for five weeks over July and August 2021 and one week in October 2021. Regarding the covid situation and its potential bias on the outcomes on well-being in the survey, the diffusion period was relevant because it was simultaneous with the lifting of lockdown restrictions in European cities.

The survey had been diffused online through relatives of the author, social media groups for surveys' diffusion and key contacts (IHS alumni network), relying in particular on snowballing.

The questionnaires were available in English as well as in the local language : French/English for Paris, Spanish/English for Barcelona, Italian/English for Milan.

3.1.3 Description of the sample

A random sample was needed to conduct the analysis. The sample needed to be large enough to ensure the consistency of the results and to make them generalisable (Van Thiel 2014). The potential units of studies for this research are the whole population of Paris, Milan and Barcelona, so there is a need to sample the population to conduct the research (Van Thiel 2014).

The sample size n_0 had been calculated according to Cochrane's formula on sample size for a large population :

$$n_0 = \frac{Z^2 \times p \times (1-p)}{e^2}$$

with :

Z : the Z-value p : the probability of occurrence of a characteristic in the population e : the margin of error

The following table can be produced to estimate the sample size needed according to the confidence level (with a 5% margin of error, and considering p=0.5, the default value of the probability since the proportion needed is unknown) :

Table 2 : Calculations of sample sizes

Confidence level	**Z value**	**Sample size**
75%	1.15	133
80%	1.28	164
85%	1.44	208
90%	1.64	269
95%	1.96	385

The objective during data collection was to maximise the size of samples to achieve a better confidence interval and then obtain a reliable analysis. The response rate to the survey had been the following :

Table 3 : Achieved samples

	Total answers	***Valid answers***	***Unfinished answers***
Paris	241	162	79
Barcelona	56	40	16
Milan	31	21	10
Total	328	223	105

Then, a sample with 80% of confidence level was reached for Paris, and with 85% of confidence level was reached for the three cities taken together. A sufficient confidence level could not be achieved for the cities of Barcelona and Milan, which had consequences on the significance of the statistical analyses for those case studies.

There is a large number of unfinished answers (approximately 1/3 of them) because numerous people started the questionnaire (by answering to the screening question) but then, did not go further. Indeed, the questions about well-being in the beginning had been a

deterrent to a few respondents, being a bit “difficult” and long to answer, as reported by some of the participants. Nevertheless, the choice was made to keep the questionnaire with a lot of in-depth questions about SWB, in particular to have a good measurement of the different dimensions of SWB, following the recommendations of the OECD Guidelines on Measuring SWB (2013).

One remark can be made here : the initial aim for this research was to get similar sample size for the three cities. However, due to material and time constraints during data collection, this could not be achieved. The combination of an online survey and the summer period made it difficult to reach the sample size aimed. In particular, it has been difficult to reach out people in Barcelona and Milan.

3.1.4 The statistical analysis method

After the data collection, a statistical analysis was conducted on the software R.

The raw datasets had been cleaned up and a variable was attributed to each output of the questionnaire. In addition, a few latent variables were created from aggregated variables to enable the upcoming analysis. The variable table, with the questions link and the details of calculations for aggregated variables can be consulted in the annexes (Annexe 1).

First of all, a descriptive statistical analysis was conducted, in order to evaluate the levels of proximity, experience and happiness of the sample in the different cities. The data distribution of relevant indicators, as well as measures of central tendency with the mean and the standard deviation were commented.

Afterwards, a regression analysis was conducted to evaluate the potential relationships and their strength between the independent, the mediating variables and the SWB indicators of the conceptual framework. Regression are a useful statistical tool to describe a real-world complex phenomenon, though the challenge is often to find the most adequate model to run.

There are two applicable models of regression commonly used to measure subjective well-being predictors : the linear regression (Mouratidis 2019b, Hoogerbrugge and Burger 2018) and the ordinal logistic regression (Serban-Oprescu et al. 2019, Leyden et al., 2011). The latest one is often presented as more precise to catch the complexity of SWB measures because it is well suited to analyse the predictors of categorical dependent variables (Peng et al. 2003 in Serban-Oprescu et al. 2019) like SWB results, usually measured through a Linkert scale. However, this type of model, as often for categorical analysis, cannot be run with low samples. Then, in order to compare the results of all case studies, including the ones with a low sample size, the choice was made to pursue the main analyses with a multiple linear regression which offers a very straightforward method, easy to interpret. Besides it is often used in academic papers about the determinants of Subjective Well-being and was reported as equally valid than a categorical analysis to conduct an analyse (Diener and Tov, 2012 in OECD 2013).

The multiple linear regression follows this equation (Smith, 2015) :

$$Y = \beta_0 + +\beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \varepsilon$$

with :

Y : the dependant variables, here the SWB dimensions
β_0 : the intercept
βi : the coefficient of the explanatory variable Xi, holding the other variables Xj constant
Xi : the explanatory variables, here the proximity or experience variables, or the control variables
ε : the margin of error

Then, first, a multiple linear regression was lead with all of the potential predictors, including the control indicators, on each of the components of the SWB (hedonic WB, life satisfaction and eudaimonic WB). The choice was made not to apply it directly to the aggregated SWB score to run more rigorous calculations (OECD 2013). Those models were refined through a stepwise multiple linear regression, meaning that the least significant indicator was released one after the other from the model, until the model reached the maximum level of accuracy (automatically, through the R software).

Secondly, three different stepwise regressions had been carried out. The regressions were lead first on the SWB components with the proximity variables, then with the experience variables, and finally between the proximity variables and the experience variables, in order to study in more details the relationships displayed in the conceptual framework (cf. table 4).

On top of that, and because it is often advised to conduct anyways a logistic regression to ensure the reliability of the linear models (OECD 2013), a multinominal logistic regression was lead as a review of the previous outcomes, with a stepwise process.

A logistic regression estimates an unknown probability of the occurring of a dependant variable for a given linear combination of independent variables (Serban-Oprescu et al. 2019) :

$$\log\left(\frac{P(occuring)}{P(not\ occuring)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n$$

with :

$P(X)$: the probability of X, an event
β_0 : the intercept
βi : the coefficient of the explanatory variable Xi, holding the other variables Xj constant
Xi : the explanatory variables, here the proximity or experience variables, or the control variables

3.1.5 Ethics, reliability and validity

This research strategy consists of a primary data collection on, among others, sensitive personal information relatives to the health, perception and mental well-being of the respondents (OECD 2013). Thus, the ethics of this research process is a concern to be though through, and in particular the issue of informed consent and invasion of privacy (Bryman 2012). First, a particular care was taken to collect the respondents' consent by producing a transparent statement of the research purpose and of the data further utilization. Then, data minimization was applied and only strictly necessary data was collected. Data protection was ensure by an anonymisation of the data before analysis.

The outcomes of this research were reliable despite the subjective dimension of well-being. Although already numerous researches had been conducted on the reliability of subjective well-being measurement and an adequate reliability had been assessed (Diener 2011 in OECD 2013). In addition, multi-item questions were designed to assess the hedonic and eudaimonic aspects of SWB, to obtain more rigorous measures (OECD 2013).

Finally, validity of the findings was ensured, through an exhaustive literature review on subjective well-being assessment and a pilot questionnaire diffused to 5 persons, both in English and in French, in order to identify the most adequate indicators and questions formulation and address internal validity (Van Thiel 2014). The "social desirability" bias can as well be important in a well-being survey, so this aspect was monitored, by including control items for instance (Van Thiel 2014). Additionally, the happiness outcomes were compared with the official outcomes per country of the European Social Survey (ESS9), ninth round (2018) to ensure the validity of the study findings. This was allowed by the presence of a control question in the questionnaire, taken directly from the ESS9 questionnaires. The ESS9 data aims at consolidating social measures across 30 countries in Europe and is collected through rigorous collection methods in each participating country and over a random sample. It can also be noted that the Covid19 pandemics might be a situation that affects results on well-being (Schwarz and Strack, 2003 in OECD 2013), the comparison with official data was a way to counter this bias, at least partially.

3.2 Operationalization: variables, indicators

Preliminary remark : all of the data was collected through an online survey (cf. 3.1.1).

Table 4. Operationalisation table

Concept	Variable	Definition	Indicators
INDEPENDANT VARIABLE Hyper proximity in the 15-minute city	Walkability	The level to which "a place [is] suitable for walking, that can be travelled, crossed, and covered by walking or cycling" *(Rebecchi et al. 2019)*	- Share of residents using soft transportation modes (%) for daily trips - time spent commuting / in daily short trips per day (Number, in hours) *(Marquet and Miralles-Guasch, 2015)*
	Resources accessibility	This is the concept behind the very name of the 15-minute model, meaning that having all of the life functions accessible within 15-minute of one's home. Related to the 6 social functions (see literature review) *(Moreno et al. 2021)*	-Presence of food supply / services / commerce / healthcare / education / leisure infrastructures / green spaces within 15-minute of one's home *(Capasso da Silva, 2019)*
	Localised city life	This is the ability of a neighbourhood to connect residents from a same local area. *(Hoogerbrugge et al. 2018)*	-Local social capital : number of contacts with neighbourhoods per week -Local cohesion : perception on the level of trust and connection with neighbourhood *(Hoogerbrugge et al. 2018)*
MEDIATING VARIABLE Experience in the 15-minute city	Social relationships	The "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them." *(Putnam, 1995 page 19, in Hoogerbrugge et al., 2018 page 1498).*	-Social activities : frequency of meeting with friends and relatives *(Mouratidis, 2019a)*
	Leisure	"all the activities performed during time away from work, education, housekeeping, eating, and sleeping." *(Mouratidis 2018)*	-Time allocated to leisure per week -Frequency of physical, social, cultural activity -Leisure satisfaction *(Mouratidis, 2019a)*
	Impact of the city on the mood	The positive or negative emotions that can be triggered by a neighbourhood environment *(Mouratidis 2018)*	-Feeling safe in the neighbourhood -Assessment of the quality of the neighbourhood (cleanness, aesthetics) -Assessment of place attachment (*Leyden at al. 2011, Mouratidis 2020)*
	Self-assessment of green behaviour	Being conscious of adopting a behaviour virtuous for the environment *(Prati et al. 2017)*	-Self-assessment of green behaviour *(Prati et al. 2017)*

DEPENDANT VARIABLE Subjective Well-being	Hedonic Well-Being	"a person's feelings or emotional states, typically measured with reference to a particular point in time." *(OECD 2013)*	-Weekly level of happiness -Weekly level of stress *(OECD 2013)*
	Life satisfaction	"reflective assessment on a person's life or some specific aspect of it." (OECD 2013) "Life satisfaction is a way to cognitively assess one's life usually by evaluating several different domains such as personal relationships, work, income, health, and residence." (*Mouratidis 2018)*	-Overall perception of satisfaction with life *(OECD 2013)*
	Eudaimonia	"a sense of meaning and purpose in life, or good psychological functioning." *(OECD 2013)*	-Overall perception of feeling of achievement and meaning in life *(OECD 2013)*
CONTROL VARIABLES	Other determinants of SWB that are common in the literature	NB : Those variables are based on previous studies about well-being and are reported to be important to consider. They might indeed have an influence on people's answering patterns (Van Thiel 2014), this is thus a way to limit interferences.	Age, gender, marital status.. *(Layard 2005 in Hoogerbrugge et al. 2020)*

Chapter 4: Presentation of data and analysis

4.1 Description of the case studies

Previous to the statistical analysis of the data collected, a brief introduction on the case studies can be made to understand the context in those three cities.

In **Paris**, increasing the quality of life is a major goal of the municipality which deploys great efforts to tackle the urban issues impeding the residents' life such as noise, air pollution, densification or un unequal access to urban services and amenities as reported in the Plan Local d'Urbanisme, the referent planning document of the city (Conseil de Paris 2016b). A reflection has been lead about proximity since the Mayor of Paris praised the 15-minute city concept and therefore, municipal services are tailoring their actions on the neighbourhood scale.

In **Milan**, the Milan 2020 Adaptation plan (Comune du Milano 2020), adopted while the first wave of Covid19 was hitting strongly the city, reported that the city ought to adapt to new lifestyle. In particular, the rediscovery of the neighbourhood scale is mentioned and described as the area 15-minute away walking from one's home. A particular attention will be given to an provide equal accessibility to the urban amenities and services, especially for the most vulnerable and underprivileged residents.

In **Barcelona**, the Superblocks model, reshaping the urban organisation of the city into small car-free islands had been proven to have a positive impact in reducing the urban issues (noise, pollution for instance) that poison quality of life in cities and hence to be beneficial to the health (Mueller et al. 2020).

4.2 Description of the sample of the case studies

The following table displays the descriptive outcomes of the socio-demographics characteristics of the samples for each city and in total.

Table 5 : Descriptive statistics of the control variables

		PARIS		BARCELONA		MILAN		TOTAL	
Variable	**Class**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Age	*factor*	*148*		*34*		*19*		*201*	
	Under 18	1	0,7%	0	0,0%	0	0,0%	1	0,5%
	18 - 24	70	47,3%	5	14,7%	7	36,8%	82	40,8%
	25 - 34	51	34,5%	12	35,3%	9	47,4%	72	35,8%
	35 - 44	10	6,8%	1	2,9%	3	15,8%	14	7,0%
	45 - 54	4	2,7%	1	2,9%	0	0,0%	5	2,5%
	55 - 64	10	6,8%	13	38,2%	0	0,0%	23	11,4%
	65 - 74	1	0,7%	1	2,9%	0	0,0%	2	1,0%
	75 or older	1	0,7%	1	2,9%	0	0,0%	2	1,0%
Gender	*factor*	*148*		*34*		*19*		*201*	
	Female	102	68,9%	22	64,7%	11	57,9%	135	67,2%

	Male	46	31,1%	12	35,3%	8	42,1%	66	32,8%
	Other	0	0,0%	0	0,0%	0	0,0%	0	0,0%
Partner	*factor*	*148*		*34*		*19*		*201*	
	Yes	80	54,1%	27	79,4%	8	42,1%	115	57,2%
	No	68	45,9%	7	20,6%	11	57,9%	86	42,8%
Children	*factor*	*148*		*34*		*19*		*201*	
	Yes	26	17,6%	14	41,2%	1	5,3%	41	20,4%
	No	122	82,4%	20	58,8%	18	94,7%	160	79,6%
Education	*factor*	*148*		*34*		*19*		*201*	
	No diploma	2	1,4%	0	0,0%	0	0,0%	2	1,0%
	Less than High school	2	1,4%	3	8,8%	0	0,0%	5	2,5%
	High School graduate	7	4,7%	3	8,8%	1	5,3%	11	5,5%
	Bachelor or equivalent	15	10,1%	12	35,3%	2	10,5%	29	14,4%
	Master or equivalent	108	73,0%	15	44,1%	15	78,9%	138	68,7%
	Doctorate or equivalent	14	9,5%	1	2,9%	1	5,3%	16	8,0%
Employment status	*factor*	*148*		*34*		*19*		*201*	
	Employed	85	57,4%	21	61,8%	11	57,9%	117	58,2%
	Unemployed or looking for work	2	1,4%	3	8,8%	0	0,0%	5	2,5%
	Retired	3	2,0%	5	14,7%	0	0,0%	8	4,0%
	Student	55	37,2%	4	11,8%	8	42,1%	67	33,3%
	Other	3	2,0%	1	2,9%	0	0,0%	4	2,0%
Income	*factor*	*142*		*32*		*18*		*192*	
	Difficult	11	7,7%	2	6,3%	3	16,7%	16	8,3%
	Coping	50	35,2%	14	43,8%	11	61,1%	75	39,1%
	Confortable	81	57,0%	16	50,0%	4	22,2%	101	52,6%
Health	*factor*	*146*		*34*		*18*		*198*	
	Yes a lot	1	0,7%	1	2,9%	0	0,0%	2	1,0%
	Yes to some extent	12	8,2%	10	29,4%	3	16,7%	25	12,6%
	No	133	91,1%	23	67,6%	15	83,3%	171	86,4%

It can be noticed that the sample size at 95% of confidence level had not been reached for any city. In particular, the cities of Barcelona and Milan did not reached a very important sample size.

The samples are not very representative of the population on some dimensions : for instance, there is a high proportion of women (67% of the overall sample), of young people (77% of the overall sample is between 18 and 34) and of people with a high level of education (91% of the overall sample has a university degree).

4. 3 The Paris case study

4.3.1 Descriptive analysis of the outcomes

The main information held in the collected data has been structured, aggregated and summarised in the following tables. The details of the questions for data collection can be consulted in Annexe 1.

4.3.1.1 The Subjective Well-being measures

Table 6: Descriptive statistics of SWB variables in the Paris sample

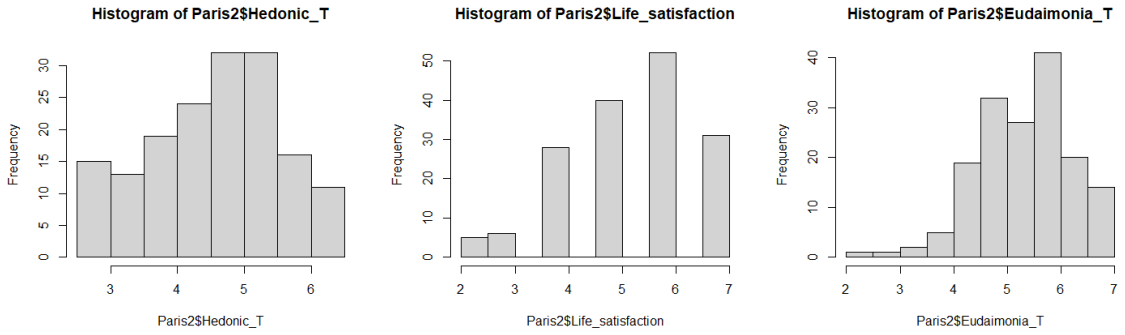
Variable	Class	N	Min/Max	Mean	SD
SWB variables (dependent variables)					
SWB_Total	numeric	162	1/7	5.12	0.84
Hedonic_T	numeric	162	1/7	4.62	1.01
Life_satisfaction	numeric	162	1/7	5.36	1.25
Eudaimonia_T	numeric	162	1/7	5.39	0.87
Happiness_ESS	factor	162	1/7	5.88	1.15
ESS_France	*factor*	*2001*	*0/10*	*7.24*	*2*

The *Hedonic Well-being* score, which describes the emotional state of a person at a particular moment, is the aggregation of the outcomes of several questions about the emotional state (feeling happy, relaxed or stressed for instance) of the respondents on the day before they filled up the questionnaire. It has a rather high average in the Paris sample (4.62 over 1/7) and has a gathered distribution, comparatively to the other WB dimensions.

Life *Satisfaction* collected data from the question "*How satisfied are you with your life nowadays ?*" on a scale from 1 to 7 and ended up with a high mean (5.36), meaning that overall, the respondents from the Paris sample are generally quite satisfied with their life.

Eudaimonic Well-being is the aggregation of outcomes from questions apprehending the feeling of achievement of the respondents (for instance the feeling to be true to their values, to be optimistic and skilled). This dimension has a very high average as well of around 5.39 on a continuous scale 1 to 7.

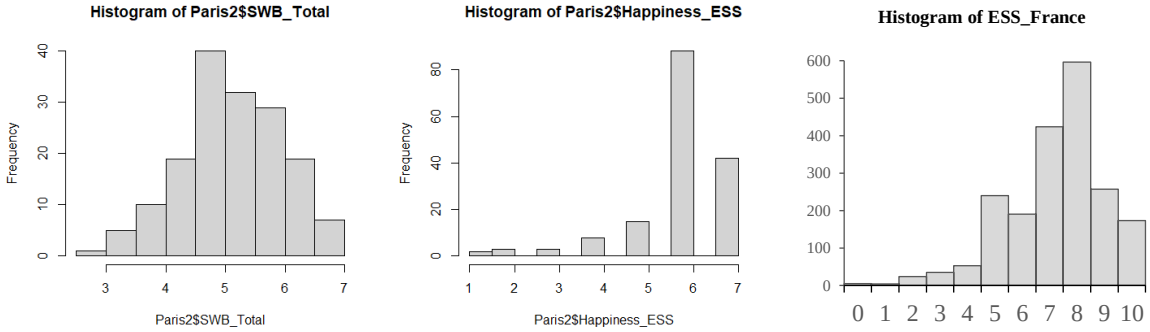
Figure 4: Histograms of SWB dimensions in Paris



Those three previous dimensions had been aggregated into an overall indicator, the *Subjective Well-being_Total* indicator which displays a mean of 5.12 on a continuous scale of 1 to 7. Moreover, the distribution of the data is right-skewed and the standard deviation value (0.84) is rather low, which suggests that most of the Paris sample's respondents have a general high level of well-being.

In order to assess the reliability of the data collected, an addition question taken directly from the ESS9 (2018) was asked to the respondents "*Taking all things together, how happy would you say you are?*" for comparison purposes. It was calculated under the *Happiness_ESS* variables, while the official data from the ESS9 for France can be read under the *ESS_France* indicator. Here, the *Happiness_ESS* average score is almost 0.8 point higher that the average *Subjective Well-being* score, strengthening the literature findings that an aggregated score is be a more precise measurement than an univariate question (OECD 2013). Likewise, the distributions of the indicators *Subjective Well-being* and *ESS_France* are rather similar, and the mean of *ESS_France*, reported on a scale of 1 to 7 is of 5.06, so closer to *Subjective Well-being* than to *Happiness_ESS*.

Figure 5:Histograms of SWB total scores in Paris



4.3.1.2 The Proximity measures

Table 7: Descriptive statistics of Proximity variables in the Paris sample

Variable	Class	N	Min/Max	Mean	SD
Proximity variables (independant variables)					
Soft Mode score	factor	150	0/5	1.71	1.12
Walking Locally	factor	152	1/7	5.74	1.42
Accessibility	numeric	152	1/7	5.96	0.79
Social capital	numeric	152	1/4	1.80	0.58
Social cohesion	numeric	150	1/7	3.61	0.94

The *Soft_Mode* variable is meant to give a measure to the Walkability variable presented in the conceptual framework. It is an aggregated score calculated by adding up one point when respondents reported that they went either walking or biking to their main life occupations (such as work or groceries). Then, this measure of the tendency to use soft mode in the daily life has a low score in average (1.71 on an ordinal scale 0 to 5). This means that respondents did not report to use soft active modes as a transportation mean for the majority of their activity.

The *Walking Locally* score is the outcome of the question "*How often do you walk (or bike) somewhere for less than 15 minutes from your home ?*" and is measured on an ordinal scale from 1 to 7. This indicator, nourishing as well the Walkability variable, counterbalances the previous score of soft mode because its average is very high (5.74). However, its standard deviation is rather higher (1.42), suggesting that there is a difference in the walking habits of the respondents.

The *Accessibility* total mean score is very good, with a mean of 5.96 (on a scale from 1 to 7) and a low standard deviation (0.79). It is itself measured by aggregating the scores of the perceived accessibility to the urban facilities (culture, green areas, restaurants, etc) by the respondents, which means that most of the respondents consider to have a good accessibility in their neighbourhood.

Last but not least, the Localised Social Life in the neighbourhood is measured through two indicators. First, *Social Capital*, that aggregated results of questions about the residents' local acquaintances and which has a rather low mean of 1.80, over a continuous scale from 1 to 4. Then, *Social Cohesion*, which is measured through the aggregation of questions relative to the perception of the social atmosphere in the respondents' neighbourhood (thrust, values and sense of belonging for instance with neighbours) and has a mean score of 3.61. Here the social proximity reported is a bit lower comparatively to the scores of the accessibility and walkability variables.

4.3.1.3 The Experience measures

Table 8: Descriptive statistics of Experience variables in the Paris sample

Variable	Class	N	Min/Max	Mean	SD
Experience variables (mediating variables)					
Social Life	factor	149	1/7	4.26	1.40
Leisure	factor	148	1/7	4.57	1.70
Physical Activity	factor	149	1/7	3.55	1.64
Neighbourhood perception	numeric	149	1/7	4.49	0.96
Green image	numeric	149	1/7	5.56	0.96

Social Life measures the answer to the question "*How often do you meet your friends and relatives ?"* on an ordinal scale of 1 to 7 and has here an average score of 4.26.

Leisure gathers the perception of respondents about their time allocation to their leisure, on an ordinal scale of 1 to 7, with a mean score here of 4.57.

Physical activity measures the weekly frequency of exercise of the respondents on an ordinal scale of 1 to 7. Its average score of 3.54 and standard deviation of 1.67 means that there is a relatively important difference in the perception of the exercise habits of the respondents

Neighbourhood Perception is the aggregated score calculated on the respondents' perception about the quality, safety and cleanliness of their neighbourhood. With a mean of 4.49, over a continuous scale of 1 to 7, the respondents from the Paris sample have a general positive perception of their neighbourhood environment.

Green Image is the aggregation of two questions related to the self-perception of awareness and commitment by the respondents regarding Climate Change. Interestingly, it has a high

average of 5.56 over 1 to 7, meaning that the respondents usually consider themselves as environmentally sensitive and respectful in their behaviour.

4.3.2 Inferential analysis of the outcomes

In the conceptual framework (cf. table 4) and based on the literature review, it was assumed that the level of proximity of a city has an impact on the subjective well-being of the urban dwellers. More precisely, three sub-questions were formulated to verify this relationship. The following regression models are meant to verify the relationships between the proximity indicators, the experience indicators and the subjective well-being indicators.

Prior to running the linear regressions, the data was tested to meet the regression conditions (Smith 2015):

- The independent variables are approaching a normal distribution (cf. Figure 5), so they meet the hypotheses of independence, linearity and of homogeneity of the variance.
- No perfect multicollinearity was found between the different variables (cf. table of Pearson's correlation and comments in Annexe 2)

4.3.2.1 Linear regression on the overall model

The first regression model presented bellow was found after conducting a stepwise backward linear regression between all of the independent and mediating indicators with each SWB dimension indicator.

The stepwise regression enabled to refine the model in order to keep only the more significant indicators, in order to maximise the accuracy of the model and its explanatory power on a real-world phenomenon.

Table 9: Stepwise linear regressions with all predictors in the Paris sample

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Proximity indicators			
Accessibility	0.186578.	0.30332*	0.18203*
Walking Locally	-0.079800/		
Soft mode			
Social Capital			
Social Cohesion		-0.15489/	
Experience indicators			
Social Life	0.092403/	0.19617*	0.15558**
Leisure	0.086108.	0.11126.	0.10489*
Physical Activity			
Neighbourhood Perception			
Green Image	0.199695*		0.11655/
Socio-demographics indicators			

Age squared	0.034937***		
Female			-0.26730.
Partner		0.56897**	
Children		0.82350**	0.71572.
College degree	0.797010**		
Unemployed			
Low Income	-0.351304*		
Health Problem			

Summary statistics			
N	128	130	130
Adjusted R-squared	0.2529	0.1812	0.214

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

This first regression models on the dimensions of SWB deliver an overall picture of the main empirical determinants for each of SWB's components in the sample of Paris. To be noted, the cells left blank in the table represent indicators that were not significant enough to be kept in the final models.

From the model applied on Hedonic Well-being (HWB), the following equation can be deduced :

$$Y_{HWB} = 1.19 + 0.18X_{accessibility} - 0.08X_{walking\ locally} + 0.09X_{social\ life} + 0.08X_{leisure} + 0.2X_{green\ image} + 0.03X_{age\ squared} + 0.8X_{degree} - 0.35X_{low\ income}$$

This means that the main predictors of the Hedonic Well-being in our sample are Accessibility, Walking Locally, Social Life, Leisure, Green Image, the Squared Age, the Level of Education and the Perception of income.

This model though explains only around 25% of the HWB score according to the adjusted R-squared value. According to Diener and Oichi (2018), environmental factors are accountable for around 50% or 60% of a SWB score but the explanatory powers or this model is much weaker. This means that there might be a few omitted environment predictors that are missing in our model. However, the value of the adjusted R-squared is rather close to the ones in similar models that can be found in literature (Mouratidis 2019b). Then, despite a quite weak explanatory power of the model on subjective well-being, the findings are reliable and valid.

From the model applied on Life Satisfaction (LS), the following equation can be deduced :

$$Y_{LS} = 2.34 + 0.3X_{accessibility} - 0.15X_{social\ cohesion} + 0.19X_{social\ life} + 0.11X_{leisure} + 0.57X_{partner} + 0.82X_{children}$$

In this model, the main contributors to life satisfaction are accessibility, social cohesion, social life, leisure score as well as having a partner and having children. The model, having an adjusted R-squared of 0.18, does not have a strong explanatory power on life satisfaction neither.

From the model applied on Eudaimonic Well-being (EWB), the following equation can be deduced :

$$Y_{EWB} = 2.53 + 0.18X_{accessibility} + 0.15X_{social\ life} + 0.10X_{leisure} + 0.12X_{green\ image} - 0.27X_{female} + 0.71X_{children}$$

In the sample, Eudaimonic WB is explained mainly by the level of accessibility of the neighbourhood, the score on social life and leisure, the self-green image of respondents, the gender of the respondents and whether they have children or not. Similarly to the other components of SWB, EWB is only explained by this model by approximately 21%.

The following steps of the analysis provide the readers with more details about the associations between those predictors and the SWB indicators.

4.3.2.2 Regressions on the relationship of Proximity variables on Subjective Well-being

Table 10: Regression of Proximity indicators over SWB dimensions in the Paris sample

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Proximity indicators			
Accessibility	0.2923**	0.3749**	0.23214*
Walking Locally			0.07765/
Soft mode			
Social Capital			
Social Cohesion			
Summary statistics			
N	135	135	134
Adjusted R-squared	0.0457	0.05037	0.05565

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

In Paris, *Accessibility* is the only indicator held in the models after the stepwise regression for *HWB* and *LS* and is also the most important contributor to *EWB*. It can be noticed thought that it has an overall explanatory power rather low over SWB's dimensions (its adjusted R-squared being around 5%), so its influence is quite low despite the coefficient value and the strong significance of this indicator.

For instance, for *Hedonic WB*, the regression coefficient is around 0.3 with a p-value lower than 0.01 so with a high significance. This means that for every rise of 1 point in the overall *Accessibility* score, the *Hedonic WB* score will rise of 0.3 point. On *LS*, the influence of *Accessibility* quite equivalent ($\beta = 0.37$, $p<0.01$).

It can be observed as well that the *Walking locally* variable has a low positive and marginally significant relationship with the *Eudaimonic WB*, meaning that walking locally might increase lightly the level of eudaimonic well-being.

4.3.2.3 Regressions on the relationship of Experience variables on Subjective Well-being

Table 11: Regression of Experience indicators over SWB dimensions in the Paris sample

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Experience indicators			
Social Life			0.10468.
Leisure		0.12151*	0.09157.
Physical Activity			
Neighbourhood Perception	0.16458.		0.14384.
Green Image	0.21453*		0.12139/
Summary statistics			
N	134	135	132
Adjusted R-squared	0.05226	0.0215	0.1152

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Neighbourhood Perception and *Green Image* are positively associated with *Hedonic WB*, with a respective contribution of 16% (marginally significant) and 21% (significant) in increase of the overall *Hedonic WB* for a 1-point increase of their value, other factors held constant. However, the adjusted R-squared of this model is still quite low (around 5%) so the influence discussed here is weak.

Neighbourhood Perception is a positive and marginally significant ($\beta = 0.14$) contributor to *Eudaimonic WB*. As well, the other indicators *Social Life* ($\beta = 0.10$), *Leisure* ($\beta = 0.09$) and

Green Image (β = 0.12) are slightly positively associated with Eudaimonia with a marginal significance.

Moreover, *Leisure* is positively related to *Life satisfaction* (β = 0.12, p<0.05), though only held accountable for 2% of accuracy according to the adjusted R-squared.

It is interesting to notice that the experience indicators have an explanatory power of 11% on eudaimonic well-being, which is comparatively higher than the contribution of those indicators on hedonic well-being and life satisfaction.

4.3.2.4 Regressions on the relationship of Proximity variables on Experience variables

Table 12: Regression of Proximity indicators over Experience indicators in the Paris sample

Variables	Social Life	Leisure	Physical Activity	Neighbourhood Perception	Green Image
Proximity indicators					
Accessibility				0.40147***	
Walking locally	0.31863***	0.25801**	0.17811.		0.10452.
Soft mode			0.44534***		
Social Capital	-0.40920.	-0.68355**			
Social Cohesion	0.25027.			0.20937*	
Summary statistics					
N	133	134	134	134	135
Adjusted R-squared	0.1236	0.08193	0.1279	0.1347	0.01969

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Walking Locally is a high positive and significant contributor to *Social Life*, meaning that the more you walk, the more you have a dynamic social life and you are likely to see friends and relative often (β = 0.28, p<0.001). Equally, *Social Cohesion* contributes to a dynamic *Social Life* with a positive coefficient (β = 0.25, p<0.1). However, more surprisingly, *Social Capital*, which represents the acquaintances of respondents with neighbours is highly negatively associated with *Social Life*, though marginally significantly (β = -0.41, p<0.1). This means that for one addition point on the social capital score, the local social life score would drop by 41%, holding other variables constant.

Similarly, *Leisure* is highly negatively associated to *Social Capital* (β = -.68, p<0.01), but is pushed up by *Walking locally* in a significant way (β = 0.25, p<0.01).

Physical Activity's main predictor in this model is *Soft Mode* (β = 0.44, p<0.001). This association makes sense because walking and biking are a type of physical exercise. In a lesser extent, and as logically though less significatively, *Walking Locally* is also positively associated with *Physical Activity* (β = 0.18, p<0.1).

Neighbourhood Perception is highly positively and highly significantly associated with *Accessibility* (β = 0.40, p<0.001), meaning people are more likely to find their neighbourhood attractive convenient if they benefit from a good level of accessibility. In addition, *Social Cohesion* drives as well positively the perception of one's neighbourhood (β = 0.21, p<0.05).

Last but not least, *Green image* is slightly positively associated with Walking Locally, though with a marginal significance (β = 0.10, p<0.1).

It is interesting to notice that *Social Life*, *Physical Activity* and *Neighbourhood Perception* have a higher adjusted R-squared than the other variables.

4.3.2.5 Review of the previous outcomes through multinominal logistic regressions

The following analysis had been conducted as a review of the previous linear regression analysis, in order to compare the results.
It can be noticed that only the most significant indicators had been held in the following models.

- ***On the Hedonic Well-being indicator***

Table 13: Outcomes of Multinominal logistic regression on HWB in the Paris sample

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-5.7350630	3.567224	0.1078986	
Proximity indicators				
Walking Locally	-0.7219923	0.3675273	0.04947689	-51.42165
Social Cohesion	-0.9712309	0.4708913	0.03915662	-62.13833
Experience indicators				
Social Life	1.0968920	0.3785485	0.003759990	199.48435
Green Image	1.1084843	0.4136045	0.007360924	202.97626
Socio-demographics indicators				
Age squared	0.11168749	0.05113818	0.0289598011	11.816337
Female	1.0986504	0.8422377	0.19208283	200.01144
College degree	2.945259	1.476423	4.605805e-02	1.801560e+03

The following model equation can be deduced from the interpretation of parameters of table 13:

$$\log\left(\frac{P(5<HWB<6)}{P(HWB<4)}\right) = -5.73 - 0.72X_{walking} - 0.97X_{social\ cohesion} + 1.1X_{social\ life} + 1.11X_{green\ image} + 0.11X_{age\ squared} + 1.1X_{female} + 2.94X_{college\ degree}$$

This model highlight the significant negative relationship between *Walking Locally* and *Hedonic WB*, as shown by the odds ratio : for a one-unit increase in the walking locally score, the odds of having a good HWB score rather than a low one decrease by 51%. Similarly, *Social Cohesion* has a negative significant association with *HWB* in this model, with a negative coefficient and odds ratio, the odds of having a good HWB score decreasing by 62% for a one-unit increase in the social cohesion score.

On the contrary, there are strong contributors to *HWB* in the experience indicators, such as *Social Life*, for whom a one-unit increase in the score increases the odds of being happy by almost 200%. *Green image* is also shown as a predictor of *HWB* since the odds of being happy here increase by 203% for a one-unit increase in *Green Image*.

Overall, the results of this model are rather coherent with the ones lead with a linear regression on the data, except that the *Accessibility* indicator is absent from the outcome equation.

- ***On the Life satisfaction indicator***

Table 14: Outcomes of Multinominal logistic regression on LS in the Paris sample

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-14.274831	4.048620	0.0004221243	
Proximity indicators				
Accessibility	1.8948907	0.6176697	0.002156366	565.1822
Experience indicators				
Leisure	0.7907965	0.2748272	0.004009265	120.51522
Socio-demographics indicators				
Age	-0.5621750	0.5928553	0.34300222	-43.00320
Partner	3.011103	1.0355685	0.003641194	1930.9792
Children	15.83049	0.7361558	0	750058326

The following model equation can be deduced from the interpretation of parameters of table 14:

$$\log\left(\frac{P(LS=7)}{P(LS<4)}\right) = -14.27 + 1.89X_{accessibility} + 0.79X_{leisure} - 0.56X_{age} + 3.01X_{partner} + 15.83X_{children}$$

Here, *Accessibility* is a strong predictor of *HWB*, as shown by the odds ratio : for a one-unit increase in the overall accessibility score, the odds of having a high life satisfaction is expected to increase by 565%. Similarly, the *HWB* is predicted by the *Leisure*, because the increase of one-unit in the leisure score will increase the odds of having a high life satisfaction by 120%.

Here the results are rather coherent with the ones of the stepwise overall linear regression, even though the *Social Life* indicator which was an important contributor in previous linear regression, had been kept in that model.

- ***On the Eudaimonic Well-being indicator***

Table 15: Outcomes of Multinominal logistic regression on EWB in the Paris sample

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-7.501725	1.998267	0.0001739554	
Experience indicators				
Social Life	0.9557960	0.4051445	0.01831693	160.07398
Leisure	0.9168741	0.3118086	0.003276795	150.14588
Socio-demographics indicators				
Children	3.6050710	1.323939	0.006469426	3578.4297

The following model equation can be deduced from the interpretation of parameters of table 15 :

$$\log\left(\frac{P(EWB>6)}{P(EWB<4)}\right) = -7.5 + 0.96X_{social\ life} + 0.92X_{leisure} + 3.60X_{children}$$

In this model, and according to the odds ratio interpretation, *Social Life* and *Leisure* contribute substantially to EWB, because a one-unit increase in social life is expected to raise the odds of having a high EWB score by 160% and the a one-unit increase in leisure will increase the very same odds by 150%.

At the exception of the absence of the *Accessibility* indicator, the model is coherent with the linear regression models lead over EWB.

4.3.3 Brief interpretation of the case study

In Paris, Accessibility is the main contributor to the dimensions of SWB. It is interesting to notice that Localised Social Life indicators are also indirect contributors to SWB, through their impact over the experience indicators (for instance, Social Cohesion is an enhancer of Neighbourhood Perception). Nevertheless, in this case, the Walkability indicators failed to prove any associations with the dimensions of SWB.

4. 4 The Barcelona case study

4.4.1 Descriptive analysis of the outcomes

The main information held in the collected data has been structured, aggregated and summarised in the following tables.
The questions are strictly the same than in the Paris Case. The details of the questions can be consulted in Annexe1.

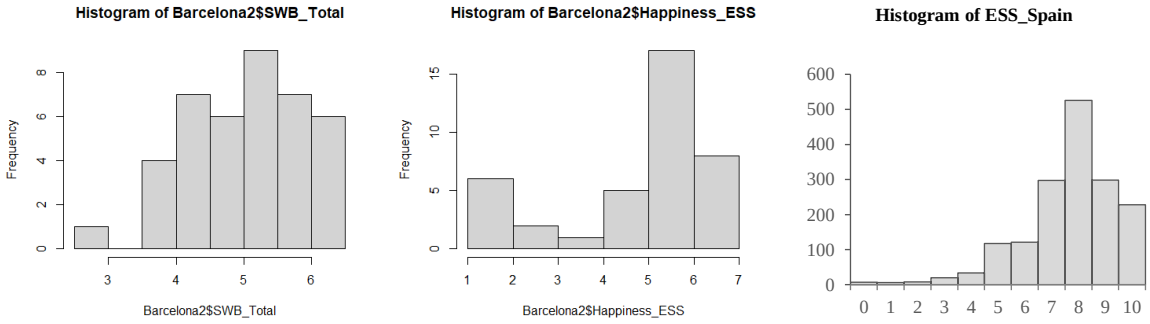
4.4.1.1 The Subjective Well-being measures

Table 16: Descriptive statistics of SWB variables in the Barcelona sample

Variable	Class	N	Min/Max	Mean	SD
SWB variables (dependent variables)					
Happiness_Total	numeric	40	1/7	5.08	0.85
Hedonic_T	numeric	40	1/7	4.38	1.11
Life_satisfaction	numeric	40	1/7	5.25	1.24
Eudaimonia_T	numeric	40	1/7	5.61	0.70
Happiness_ESS	factor	39	1/7	5.23	1.75
ESS_Spain	*factor*	*1661*	*0/10*	*7.69*	*2*

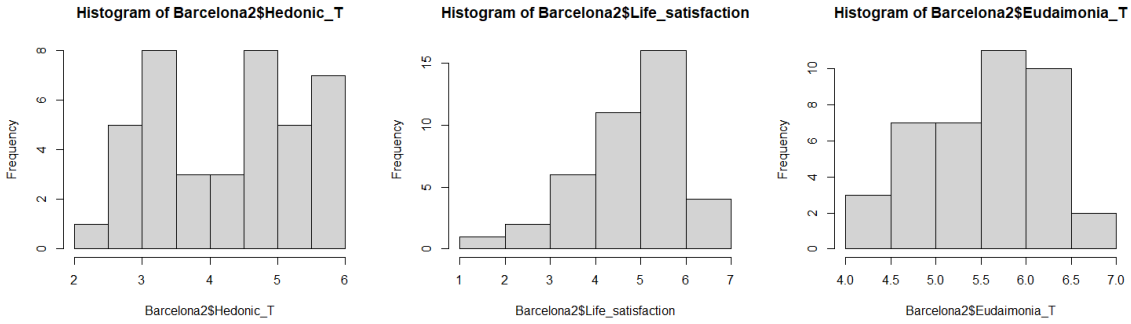
The average *Subjective Well-being* score for residents of Barcelona's sample is of 5.08 over a 1/7 scale, which is a rather high score, and also very similar in value to the Paris study case. Interestingly, this aggregated score is also lower than the *Happiness_ESS* score, of 5.23, although the value gap here is lighter than in the Paris sample. In that case, given the small sample size, it is not clear which SWB measure between *Subjective Well-being* and *Happiness_ESS*, approaches more the official data distribution.

Figure 6: Histograms of SWB dimensions in Barcelona



Similarly to Paris, the *Hedonic WB*, the *Life satisfaction* and the *Eudaimonic WB* scores are high in value, meaning that the Barcelona sample have an overall high level of well-being for each of its dimension. *Eudaimonic WB* has a rather low standard deviation score, meaning the responses were rather uniform for all participants of the questionnaire.

Figure 7: Histograms of SWB total scores in Barcelona



4.4.1.2 The Proximity measures

Table 17: Descriptive statistics of Proximity variables in the Barcelona sample

Variable	Class	N	Min/Max	Mean	SD
Proximity variables (independant variables)					
Soft Mode score	factor	40	0/5	2.00	1.45
Walking Locally	factor	36	1/7	5.39	1.95
Accessibility	numeric	36	1/7	5.78	0.87
Social capital	numeric	36	1/4	2.03	0.65
Social cohesion	numeric	33	1/7	4.22	1.00

The scores on *Walking Locally*, *Soft Mode* and *Accessibility* are also high in average and similar to the Paris sample's scores. However, it is interesting to notice that the localised life scores are higher than in Paris, respectively of 2.05, over ¼ for *Social Capital* and of 4.23 over 1/7 for *Social Cohesion*. The *Walking Locally* score has a rather high standard deviation, meaning that there is a noticeable gap about the tendency to walk locally of the respondents.

4.4.1.3 The Experience measures

Table 18: Descriptive statistics of Experience variables in the Barcelona sample

Variable	Class	N	Min/Max	Mean	SD
Experience variables (mediating variables)					
Social Life	factor	34	1/7	4.09	1.48
Leisure	factor	35	1/7	4.77	1.68
Physical activity	factor	35	1/7	3.91	1.63
Neighbourhood perception	numeric	35	1/7	4.29	1.14
Green image	numeric	35	1/7	5.89	0.82

The experience variables scores are pretty similar than the ones of the Paris analysis. The Barcelona sample population have a high *Social Life* and Leisure mean, though they have a rather important standard deviation value. *Physical Activity*, with a mean of 3.91 and standard deviation of 1.63 means that the level of exercising for the people of the sample is rather high, though not all the respondents have uniformed exercising habits. Finally, *Neighbourhood Perception* and *Green Image* have high average scores, respectively of 4.82 and 5.56 on a scale 1/7, with a low standard deviation.

4.4.2 Inferential analysis of the outcomes

Prior to running the linear regressions, the data was tested to meet the regression conditions (Smith 2015):

- The *Hedonic Well-being* indicator was not meeting the linear regression conditions so was removed from the analysis
- The independent variables (*LS* and *EWB*) are approaching a normal distribution (cf. Figure 6), so they meet the hypotheses of independence, linearity and of homogeneity of the variance.
- No perfect multicollinearity was found between the different variables (cf table of Pearson's correlation and comments in Annexe 2)

4.4.2.1 Linear regression on the overall model

Similarly to Paris, a first regression model was run with the complete set of indicators and through a stepwise analysis, in order to get the big picture of the relationships between the indicators.

Table 19: Stepwise linear regressions with all predictors in the Barcelona sample

Variables	Life Satisfaction	Eudaimonic WB
Proximity indicators		
Accessibility	0.5567*	-0.19974
Walking Locally		
Soft mode		0.19323**
Social Capital	1.7313***	
Social Cohesion	-0.5510*	
Experience indicators		
Social Life		0.22092**
Leisure		0.16389*
Physical Activity		
Neighbourhood Perception	1.0740***	
Green Image	-0.7087*	
Socio-demographics indicators		
Age squared		
Female		-0.29732
Partner		
Children		
College degree		-0.41935
Unemployed		
Low Income	0.7379/	
Health Problem	0.9711.	-0.50681*
Summary statistics		
N	21	21
Adjusted R-squared	0.5459	0.4881

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Those first regression models highlight the empirical determinants for each of SWB's components in the sample of Barcelona. To be noted, the cells left blank represent not significant indicators, which have then be released from the final models.

From the model applied on LS, the following equation can be deduced :

$$Y_{LS} = -0.45 + 0.56X_{accessibility} + 1.73X_{social\ capital} - 0.55X_{social\ cohesion} + 1.07X_{neighbourhood\ perception} - 0.71X_{green\ image} + 0.74X_{low\ income} + 0.97X_{health\ problem}$$

In this model, the main contributors to life satisfaction are accessibility, social capital, social cohesion, neighbourhood perception, green image as well as the perception of the present income and the health state. The model, having an adjusted R-squared of 0.54, has a quite strong explanatory power on life satisfaction, a bit stronger than expected according to the academic literature (Mouratidis 2019b).

From the model applied on EWB, the following equation can be deduced :

$$Y_{EWB} = 5.32 - 0.19X_{accessibility} + 0.19X_{soft\ mode} + 0.22X_{social\ life} + 0.16X_{leisure} - 0.29X_{female} - 0.41X_{degree} - 0.5X_{health\ problem}$$

In the sample, Eudaimonic WB is explained mainly by the level of accessibility of the neighbourhood, the soft mode score, the score on social life and leisure, the gender of the respondents as well as their level of higher education and state of health. Similarly to LS, EWB is explained by this model by approximately 48% so it held quite a strong explanatory power.

The following part will go further to explain the precedingly identified relationships by exploring the individual relationships between the variables had been investigated, according to the architecture of the conceptual framework (Table 4).

4.4.2.2 Regressions on the relationship of Proximity variables on SWB variables

Table 20: Regression of Proximity indicators over SWB dimensions in the Barcelona sample

Variables	Life Satisfaction	Eudaimonic WB
Proximity indicators		
Accessibility		
Walking Locally		0.09111/
Soft mode		
Social Capital	0.5601 /	
Social Cohesion		0.28465*
Summary statistics		
N	27	26
Adjusted R-squared	0.03756	0.1705

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Those regressions highlight the strong positive association, though marginally significant between *Social Capital* and *Life Satisfaction* ($\beta = 0.56$, $p<0.2$).
Eudaimonic WB is driven firstly by Social Cohesion ($\beta = 0.28$, $p<0.05$) and then by Walking locally but less significantly ($\beta = 0.9$).

4.4.2.3 Regressions on the relationship of Experience variables on SWB variables

Table 21: Regression of Experience indicators over SWB dimensions in the Barcelona sample

Variables	Life Satisfaction	Eudaimonic WB
Experience indicators		
Social Life		0.16363.
Leisure		0.14448*
Physical Activity		
Neighbourhood Perception	0.5637**	0.15800/
Green Image		
Summary statistics		
N	27	25
Adjusted R-squared	0.2374	0.3843

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Social Life is positively associated with *Eudaimonic WB* (β = 0.16, p<0.1). Likewise, in this model, *Leisure* is a positive predictor of *Eudaimonic WB* (β = 0.14, p<0.05). *Neighbourhood Perception* is a strong and significant driver of *Life Satisfaction* in this model (β = 0.56, p<0.01) and a slightly positive and marginally significant predictor of *Eudaimonic WB* (β = 0.16, p<0.2).

4.4.2.4 Regressions on the relationship of Proximity variables on Experience variables

Table 22: Regression of Proximity indicators over Experience indicators in the Barcelona sample

Variables	Social Life	Leisure	Physical Activity	Neighbourhood Perception	Green Image
Proximity indicators					
Accessibility	0.7422*	-0.4965/		0.40147***	
Walking Locally					
Soft mode			0.3803.		
Social Capital	0.5750/			-0.5429/	0.5328*
Social Cohesion		0.5733.		0.5338*	
Summary statistics					
N	26	26	27	26	27
Adjusted R-squared	0.2066	0.08113	0.09628	0.1134	0.131

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Social Life is highly positively associated with *Accessibility* (β = 0.74, p<0.05) and *Social Capital* (β = 0.57, p<0.2), with a marginal significancy for the latest.
Leisure is related to proximity indicators with a low significancy, negatively with *Accessibility*, and positively with *Social Cohesion*.
Physical Activity is positively related to *Soft Mode* but with a marginal significance.
Neighbourhood Perception is strongly associated with *Accessibility*, with a coefficient of 0.74 and a sufficient significancy. It is also positively associated with *Social Cohesion* and negatively associated with *Social Capital*.

Last but not least, *Green Image* had a high positive and significant relationship with *Social Capital* ($\beta = 0.53$, $p<0.05$).

4.4.2.5 Review of the previous outcomes through multinominal logistic regressions

Due to the small size of the sample, the multinominal logistic regression conducted was not significant. A significant model with a multinominal logistic regression could not be found, so will not be presented here.

4.4.3 Brief interpretation of the case study

In Barcelona, the most significant indicators to contribute to the SWB dimensions were the Social Local ties ones, which weight both directly on LS and EWB, and indirectly through their influence over Neighbourhood Perception, Social Life and Leisure. Surprisingly and contrary to the Paris sample case, Accessibility is not significantly associated in the detailed models (Tables 20 to 22) with any dimensions of SWB, though it displayed a light indirect participation to increase SWB through the experience variables. However, no conclusions can be drawn out of the comparison between the two cities, due to the sample size difference.

4. 5 The Milan case study

4.5.1 Descriptive analysis of the outcomes

The main information held in the collected data has been structured, aggregated and summarised in the following tables.
The questions are strictly the same than in the Paris case. Their details can be consulted in Annexe 1.

4.5.1.1 The Subjective Well-being measures

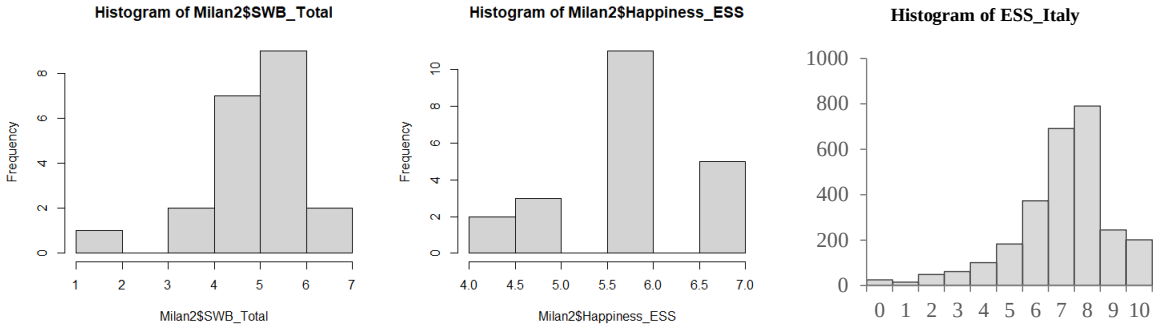
Table 23: Descriptive statistics of SWB variables in the Milan sample

Variable	Class	N	Min/Max	Mean	SD
SWB variables (dependent variables)					
SWB_Total	numeric	21	1/7	4.89	1.00
Hedonic_T	numeric	21	1/7	4.43	1.16
Life_satisfaction	numeric	21	1/7	4.90	1.61
Eudaimonia_T	numeric	21	1/7	5.34	0.92
Happiness_ESS	factor	21	1/7	5.90	0.89
ESS_Italy	*factor*	*2733*	*0/10*	*7,03*	*2*

Milan's average *Subjective Well-being* score is of 4.89, over a scale 1/7, which is slightly weaker score than in the other cases study but remains high. The gap with the *Happiness_ESS* score is then even more important, of 1 point of difference. Here, the *SWB_Total* score mean

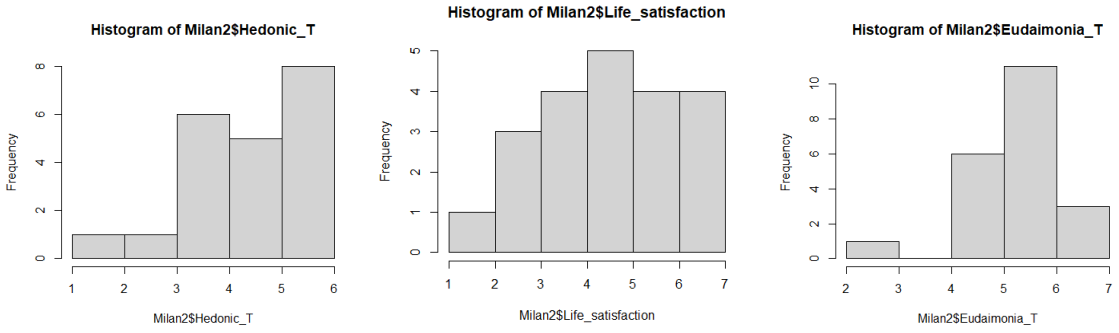
is very close to the *ESS_Italy's* mean, reported on a scale from 1 to 7 (which is around 4,9 after calculations).

Figure 8: Histograms of SWB total scores in Milan



The individual dimensions of SWB presents high average values, such as 4.52 for the *Hedonic WB*, 4.88 for the life satisfaction and 5.34 for *Eudaimonic WB*. It can be noticed that for those variables, the standard deviation are a bit higher than for the previous cities, but this can maybe be explained by the low size of the sample for Milan.

Figure 9: Histograms of SWB dimensions in Milan



4.5.1.2 The Proximity measures

Table 24: Descriptive statistics of Proximity variables in the Milan sample

Variable	Class	N	Min/Max	Mean	SD
Proximity variables (independant variables)					
Soft Mode score	factor	21	0/5	1.86	1.28
Walking Locally	factor	21	1/7	6.05	1.07
Accessibility	numeric	21	1/7	5.74	0.90
Social capital	numeric	21	1/4	1.74	0.72
Social cohesion	numeric	17	1/7	4.02	0.93

The city of Milan is perceived as very pedestrian friendly by the respondents, as the *Walking Locally* mean score is very high (6.19, on a scale 1/7 and with a standard deviation equal to 1). Likewise, the *Soft Mode* average is high, meaning that soft transportation means are often used by the respondents. The A*ccessibility* average value is also approaching the 6 (5.85 on a scale 1/7) so the city is perceived as very accessible. The respondents seem to have a rather

strong *Social Cohesion* in their neighbourhood since they rated it high in average (4.14 on 1/7), but they have a weaker *Social Capital* average level (1.72 on ¼).

4.5.1.3 The Experience measures

Table 25: Descriptive statistics of Experience variables in the Milan sample

Variable	Class	N	Min/Max	Mean	SD
Experience variables (mediating variables)					
Social Life	factor	19	1/7	4.63	1.74
Leisure	factor	19	1/7	5.32	1.63
Physical activity	factor	19	1/7	3.42	1.68
Neighbourhood perception	numeric	19	1/7	4.62	0.94
Green image	numeric	19	1/7	5.89	0.97

In Milan, the *Leisure* indicator has a very high average, of 5.60 over 1/7. The *Social Life* indicator average is high as well (4.93 over 1/7). The *Physical Activity* has a lower mean (3.53 over 1/7) in comparison, though this score is similar to other cities. In addition, the respondents have a very high average perception of the neighbourhood environment (5.19 over 1/7) and consider themselves as green (5.77 over 1/7).
Interestingly, in for this category of variables, the standard deviation is a bit higher than for other cities, meaning that the experience of the city are a bit different there, though it might due a bias from the small sample size.

4.5.2 Inferential analysis of the outcomes

Because of the small sample size for Milan's case study, the regression did not lead to any significant result. Therefore, the choice was made not to include this city in the inferential analysis.

4. 6 The Analysis of the merged samples

4.6.1 Descriptive analysis of the outcomes

This part is presenting data from the three case studies merged together as an additional last case. The main information held in the collected data has been structured, aggregated and summarised in the following tables.

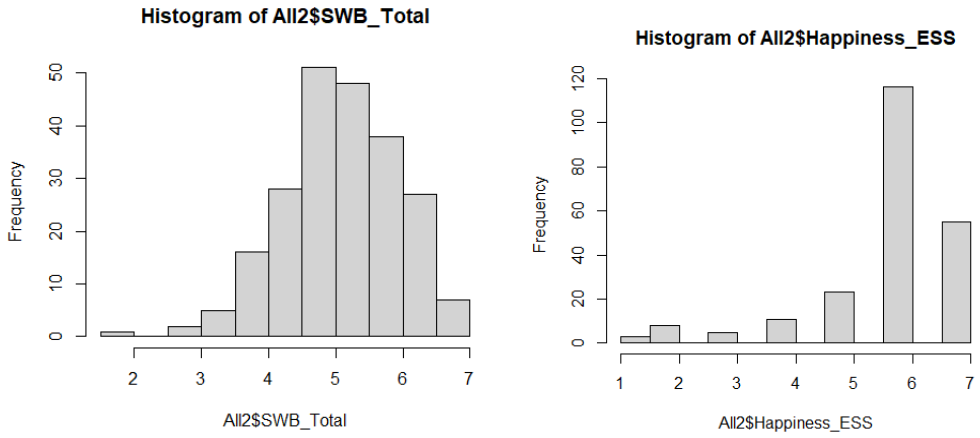
4.6.1.1 The Subjective Well-being measures

Table 26: Descriptive statistics of SWB variables for the merged samples

Variable	Class	N	Min/Max	Mean	SD
SWB variables (dependent variables)					
SWB_Total	numeric	223	1/7	5.09	0.86
Hedonic_T	numeric	223	1/7	4.56	1.04
Life_satisfaction	numeric	223	1/7	5.30	1.29
Eudaimonia_T	numeric	223	1/7	5.42	0.85
Happiness_ESS	factor	221	1/7	5.76	1.28

The mean of the aggregated score of *SWB* is high (5.10 over 1/7), which is not surprising given the precedent results of all individual case studies. There is as well a light gap with the *Happiness_ESS* score, comforting the idea that the aggregated score is a more precise measure of subjective well-being than the ready-made variable.

Figure 10: Histograms of SWB total scores for all three samples merged



The individual dimensions of SWB are also high in average. *Hedonic WB's* average is of 4.58, *Life Satisfaction's* mean is of 5.31 whereas *Eudaimonic WB's* mean is of 5.42.

Figure 11: Histograms of SWB dimensions for all three samples merged

4.6.1.2 The Proximity measures

Table 27: Descriptive statistics of Proximity variables for the merged samples

Variable	Class	N	Min/Max	Mean	SD
Proximity variables (independant variables)					
Soft Mode score	factor	223	0/5	1.78	1.20
Walking Locally score	factor	209	1/7	5.71	1.49
Accessibility	numeric	209	1/7	5.91	0.82
Social capital	numeric	209	1/4	1.84	0.62
Social cohesion	numeric	200	1/7	3.75	0.98

The *Accessibility* mean score rises at 5.91, with a rather low standard deviation, meaning that the respondents have a overall strong and positive perception of it. The walkability scores is high for *Walking Locally* (5.73) but rather low for *Soft Mode* (1.78). *Social Capital* has a lower average score comparatively, of 1.84 over 1 to 4, as well as *Social Cohesion* with a mean of 3.75 over 1/7, and both with quite low standard deviations.

4.6.1.3 The Experience measures

Table 28: Descriptive statistics of Experience variables for the merged samples

Variable	Class	N	Min/Max	Mean	SD
Experience variables (mediating variables)					
Social Life	factor	202	1/7	4.27	1.45
Leisure	factor	202	1/7	4.68	1.70
Physical activity	factor	203	1/7	3.60	1.64
Neighbourhood perception	numeric	203	1/7	4.46	0.99
Green image perception	numeric	203	1/7	5.65	0.95

The respondents have an average good opinion of their *Social Life*, with a mean of 4.27 over 1/7, as well as of their *Leisure*, with a mean of 4.68 (over 1/7), even though the standard deviation for those means is rather important (respectively of 1.45 and 1.70). The *Physical Activity* mean is a bit lower comparatively, but just like in the individual case studies (3.60 over 1/7). Interestingly, the *Neighbourhood Perception's* mean is rather high (4.46) with a low standard deviation, so the majority of people have a positive opinion about their neighbourhood. Equally, the *Green Image* indicator has a high mean of 5.65.

4.6.2 Inferential analysis of the outcomes

Prior to running the linear regressions, the data was tested to meet the regression conditions (Smith 2015):

- The independent variables are approaching a normal distribution (cf. Figure 11), so they meet the hypotheses of independence, linearity and of homogeneity of the variance.
- No perfect multicollinearity was found between the different variables (cf table of Pearson's correlation and comments in Annexe 2)

4.6.2.1 Linear regression on the overall model

Similarly to Paris and Barcelona, a first regression model was run with the complete set of indicators and through a stepwise analysis, in order to get the big picture of the relationships between the indicators.

Table 29: Stepwise linear regressions with all predictors for the merged samples

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Proximity indicators			
Accessibility	0.210430*	0.32397**	0.13957.
Walking Locally		-0.09881/	
Soft mode			
Social Capital			
Social Cohesion		-0.17414.	
Experience indicators			
Social Life		0.18610*	0.14086**
Leisure	0.092432*	0.10847.	0.11796**
Physical Activity			
Neighbourhood Perception	0.144004.	0.17001.	0.14334*
Green Image	0.130967.		
Socio-demographics indicators			
Age squared	0.020812***		
Female			
Partner		0.63921**	
Children		0.43722.	0.61873***
College degree			
Unemployed			
Low Income			
Health Problem	-0.471838*		
Summary statistics			
N	172	172	173
Adjusted R-squared	0.142	0.1481	0.2337

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Those first regression models highlight the empirical determinants for each of SWB's components for all the samples merged. To be noted, the cells left blank represent not significant indicators, which have be released from the final models.

From the model applied HWB, the following equation can be deduced :

$$Y_{HWB} = 1.39 + 0.21X_{accessibility} + 0.09X_{leisure} + 0.14X_{neighbourhood\ perception} + 0.13X_{green\ image} + 0.02X_{age\ squared} - 0.47X_{health\ problem}$$

This means that the main predictors of the hedonic well-being in this sample are accessibility, leisure, neighbourhood perception, green image, the squared age, and the perception of health.

This model though explains only around 14% of the HWB score according to the adjusted R-squared. This is aligned with findings from the literature (Mouratidis 2019b), though this traduces an overall low explanatory power of our potential predictors over the HWB score.

From the model applied on LS, the following equation can be deduced :

$$Y_{LS} = 2.12 + 0.32X_{accessibility} - 0.10X_{walking\ locally} - 0.17X_{social\ cohesion} + 0.19X_{social\ life} + 0.11X_{leisure} + 0.63X_{partner} + 0.43X_{children}$$

In this model, the main contributors to life satisfaction are accessibility, walking, social cohesion, social life, leisure score as well as having a partner and having children. The model, having an adjusted R-squared of 0.15, does not have a strong explanatory power on life satisfaction.

From the model applied on EWB, the following equation can be deduced :

$$Y_{EWB} = 2.65 + 0.14X_{accessibility} + 0.14X_{social\ life} + 0.12X_{leisure} + 0.14X_{neighbourhood\ perception} + 0.62X_{children}$$

In the sample, Eudaimonic WB is explained mainly by the level of accessibility of the neighbourhood, the score on social life and leisure, the neighbourhood perception of respondents, the gender of the respondents and whether they have children or not. Similarly to the other components of SWB, EWB is only explained by this model by approximately 23%.

The following part will go further to explain the precedingly identified relationships by exploring the individual relationships between the variables had been investigated, according to the architecture of the conceptual framework (Table 4).

4.6.2.2 Regressions on the relationship of Proximity variables on SWB variables

Table 30: Regression of Proximity indicators over SWB dimensions for the merged samples

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Proximity indicators			
Accessibility	0.25252**	0.3609**	0.16326*
Walking Locally			0.06860/
Travel mode			
Social Capital			
Social Cohesion			0.13027*
Summary statistics			
N	177	177	175
Adjusted R-squared	0.03478	0.04903	0.062

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

It can be noticed here that *Accessibility* is strongly positively related (and in a significant way) to the *Hedonic WB* with a coefficient of 0.25. *Accessibility* is also strongly and significantly correlated to *Life Satisfaction* ($\beta = 0.36$, $p<0.01$ and also, to a less extent, to *Eudaimonic WB* ($\beta = 0.16$, $p<0.05$).
Eudaimonic WB is as well related to *Walking Locally* less significantly ($\beta = 0.07$, $p<0.2$) and to *Social Cohesion* ($\beta = 0.13$, $p<0.05$).

Nevertheless, the explanatory powers of those models are rather low (adjusted R-squared around 0,3 to 0,6) so the influences described earlier are to be read with precaution.

4.6.2.3 Regressions on the relationship of Experience variables on SWB variables

Table 31: Regression of Proximity indicators over SWB dimensions for the merged samples

Variables	Hedonic WB	Life Satisfaction	Eudaimonic WB
Experience indicators			
Social Life			0.09129*
Leisure	0.08288.	0.10628.	0.08350*
Physical Activity			0.05871/
Neighbourhood Perception	0.17307*	0.15645.	0.14008*
Green Image	0.13846.		0.10253/
Summary statistics			
N	175	176	173
Adjusted R-squared	0.06307	0.03206	0.1587

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

In this model, *Hedonic WB* is positively associated with a high significance to the *Neighbourhood Perception*, and with a lower coefficient and a lower significance, to *Leisure* and *Green Image*.
Life satisfaction is slightly positively associated with *Leisure* and *Neighbourhood Perception*, with a marginal significance.
Eudaimonic WB is slightly positively related to *Social Life*, *Leisure* and *Neighbourhood Perception*, with a high significance and sightly positively related, though less significantly with *Physical* Activity and *Green Image*.

4.6.2.4 Regressions on the relationship of Proximity variables on Experience variables

Table 32: Regression of Proximity indicators over Experience indicators for the merged samples

Variables	Social Life	Leisure	Physical Activity	Neighbourhood Perception	Green Image
Proximity indicators					
Accessibility	0.19696/			0.38454***	
Walking Locally	0.27211***	0.1810*	0.12862/		0.08634.
Soft mode			0.37360***		
Social Capital	-0.28568/	-0.5222*			0.24818*
Social Cohesion	0.25354*	0.2363.		0.18362*	
Summary statistics					
N	174	175	176	176	176

Adjusted R-squared	0.1256	0.03968	0.0997	0.1272	0.04121

With

Significancy		
p< 0.001	***	good significance
p< 0.01	**	
p< 0.05	*	
p<0.1	.	marginal significance
p<0.2	/	

Those regressions show that *Social Life* is highly associated *Walking Locally* and *Social Cohesion*. With a weaker significancy, it is positively associated with *Accessibility* and negatively with *Social Capital*.
Leisure presents a significant relationship with *Walking Locally* ($\beta = 0.18$, $p<0.05$) and with *Social Capital* ($\beta = -0.52$, $p<0.05$) and a slightly less significant relationship with *Social Cohesion* ($\beta = 0.23$, $p<0.2$).
Like for all the cases studies, *Physical Activity* is related to *Soft Mode* ($\beta = 0.37$, $p<0.001$) but also to *Walking Locally* ($\beta = 0.13$, $p<0.2$).
Neighbourhood Perception is once again strongly associated with *Accessibility* ($\beta = 0.38$, $p<0.001$), and, in a lesser weight with social cohesion ($\beta = 0.18$, $p<0.05$).
Lastly, *Green image* is rather strongly related to *Social Capital* ($\beta = 0.25$, $p<0.05$) and slightly related to *Walking Locally* ($\beta = 0.08$, $p<0.1$).

4.6.2.5 Review of the previous outcomes through multinominal logistic regressions

The following analysis had been conducted as a review of the previous linear regression analysis, in order to compare the results.
It can be noticed that only the most significant indicators had been held in the following models.

- ***On the HWB indicator :***

Table 33: Outcomes of Multinominal logistic regression on HWB for the merged samples

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-3.6484046	2.295570	0.1119873	
Proximity indicators				
Walking Locally	-0.7133486	0.3087667	0.020870649	-50.99994
Experience indicators				
Social Life	0.7691971	0.2871894	0.007398326	115.80330
Green Image	0.8802504	0.3403359	0.009697966	141.15035
Socio-demographics indicators				
Age squared	3.259122e-02	0.03053812	0.28586775	3.3128128283
Female	1.4820133	0.6689269	0.02672516	340.1799

The following model equation can be deduced from the parameters interpretation of the regression table :

$$\log\left(\frac{P(5<HWB<6)}{P(HWB<4)}\right) = -3.35 - 0.71X_{walking\ locally} + 0.77X_{social\ life} + 0.88X_{green\ image} + 0.03X_{age\ squared} + 1.48X_{female}$$

This model highlight the significant negative relationship between *Walking Locally* and *Hedonic WB*, as shown by the odds ratio : for a one-unit increase in the walking locally score, the odds of being happy rather than unhappy decrease by 51%.

On the contrary, there are strong contributors to *Hedonic WB* amongst the experience indicators, like *Social Life*, for whom a one-unit increase in the score, the odds of having a high hedonic WB score increase by almost 116%. *Green image* is also shown as a predictor of HWB since the odds of having a high hedonic WB score here increases by 141% for a one-unit increase in the green image score.

Those outcomes are not very significant here with the outcomes of the linear regression analyses, because only *Green Image* here is a common predictor.

- ***On the LS indicator :***

Table 34: Outcomes of Multinominal logistic regression on HWB for the merged samples

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-11.598002	3.149001	0.0002304386	
Proximity indicators				
Accessibility	1.3761516	0.4849764	0.004545921	295.96340
Walking Locally	-0.1194321	0.2142181	0.57716814	-11.25758
Experience indicators				
Leisure	0.7268768	0.2287044	0.00148174	106.86097
Socio-demographics indicators				
Partner	2.1980329	0.7555288	0.003622804	800.72781

The following model equation can be deduced from the parameters interpretation of the regression table :

$$\log\left(\frac{P(LS=7)}{P(LS<4)}\right) = -11.60 + 1.37X_{accessibility} - 0.12X_{walking\ locally} + 0.73X_{leisure} + 2.19X_{partner}$$

Here, *Accessibility* is a strong predictor of HWB, as shown by the odds ratio : for a one-unit increase in the overall accessibility score, the odds of having a high life satisfaction is expected to increase by 296%. Similarly, *Life Satisfaction* is predicted by *Leisure*, because the increase of one-unit in the leisure score will increase the odds of having a high life satisfaction by 107%.

Those results are rather coherent with the results from the linear regressions, though the *Social Life* and the *Neighbourhood Perception* indicators are omitted here.

- ***On the EWB indicator:***

Table 35: Outcomes of Multinominal logistic regression on EWB for the merged samples

Variables	Value	Standard Error	p value	Odds ratio in %
Intercept	-13.018226	2.911806	7.791221e-06	
Experience indicators				
Social Life	1.0895753	0.3794709	0.004087852	197.30113
Leisure	0.8282945	0.2745113	0.00255002	128.94108
Neighbourhood Perception	0.9993115	0.4307196	0.0203356	171.64109
Socio-demographics indicators				
Partner	1.4258691	0.9019892	0.1139226	316.14729
Children	3.3899767	1.268176	0.007515132	2866.5262

The following model equation can be deduced from the parameters interpretation of the regression table :

$$\log\left(\frac{P(EWB>6)}{P(EWB<4)}\right) = -13.01 + 1.09X_{social\ life} + 0.83X_{leisure} + 1.00X_{neighbourhood\ perception} + 1.42X_{partner} + 3.39X_{children}$$

In this model, only experience indicators are expected to be contributors to EWB, excluding the control indicators. According to the odds ratio interpretation, *Social Life*, *Leisure* and *Neighbourhood Perception* contribute substantially to EWB, because a one-unit increase in social life is expected to raise the odds of having a high EWB score by 197%, the a one-unit increase in leisure will increase the very same odds by 129%, and the one-unit increase in neighbourhood perception will increase the very same odds by 172%.

Those outcomes are very coherent with the outcomes of the linear regression of experience indicators over *Eudaimonic WB*, although the *Accessibility* indicator is lacking here to really stick to the overall linear regression model.

4.6.3 Brief interpretation of the outcomes of the merged samples

The outcomes in the merged samples are, as expected, quite similar to the outcomes of the Paris study case, due to the major size of its sample compared to the other two case studies. Accessibility is the proximity dimension that influences the more SWB through both direct and indirect pathways. Interestingly, it can be noticed as well that the Localised Social Life indicators and the Walkability indicators have an indirect influence as well on SWB dimensions through in particular the Leisure, Neighbourhood Perception and Social Life indicators.

4.7 The literature comparison

The following table had been made based on a few studies from literature.

Table 36. Literature findings

	HWB	LS	EWB	Reference
Proximity indicators				
Accessibility	*+ (to SWB in general)*			Leyden et al. 2011
Walking Locally		+		Chng et al. 2016 in Chatterjee et al. 2020
Soft mode				
Social Capital				
Social Cohesion	*+ (to SWB in general)*			Leyden et al. 2011
Experience indicators				
Social Life	**+ (β = 0.3)**	**+ (β = 0.4)**	**+ (β = 0.4)**	Mouratidis 2019b
Leisure	+ (β = 0.1)	+ (β = 0.1)	+ (β = 0.1)	Mouratidis 2019b
Physical Activity				
Neighbourhood Perception	+ (β = 0.1)	+ (β = 0.05)		Mouratidis 2019b
Green Image			+	Paralkar et al. 2017

With :

Highly significant	
Marginally significant	
β positive	+
β negative	-
Strong (|β| > 0.2)	***bold***

The literature shows great proof of the relationships between the variables of the models. Nevertheless, it is important to bear in mind that those results were obtained through different studies, on different samples, with different indicators and with different analysis methods.

4.8 Results and discussion

The different cases studies offer some interesting insights about the research questions raised earlier. The following table summarises the influence of the proximity and experience indicators on SWB dimensions, through the analysis of the coefficients of regression.

Table 37: Summary of the results of the cases study and comparison with literature

	PARIS			**BARCELONA**		**ALL**			**LITTERATURE**		
	HWB	LS	EWB	LS	EWB	HWB	LS	EWB	HWB	LS	EWB
Proximity indicators											
Accessibility	***+***	***+***	***+***	***+***	-	***+***	***+***	+	*+ (to SWB in general)*		
Walking Locally	-		+		+		-	+		+	
Soft mode					+						
Social Capital				***+***							
Social Cohesion		-		***-***			-	+	*+ (to SWB in general)*		
Experience indicators											
Social Life	+	+	+		***+***	+	+	+	***+***	***+***	***+***
Leisure	+	+	+		+	+	+	+	+	+	+
Physical Activity								+			
Neighbourhood Perception	+		+	***+***		+	+	+	+	+	
Green Image	+		+	***-***		+		+			+

With

Highly significant	
Marginally significant	
Positive	+
Negative	-
Strong (|coef| > 0.2)	***bold***
indirect influence	

The empirical findings of this study, summarised in Table 37, suggest that proximity had an influence on the SWB dimensions through different pathways. Before commenting the results, it is important to bear in mind that, due to a small and misrepresentative sample in Barcelona, only the outcomes of the Paris study case can be generalised.

First of all, it has a direct impact on SWB, in particular the accessibility to resources and urban services is an important contributor of the built environment to well-being. This is aligned with academic literature (Leyden et al. 2011). It is very enlightening to notice that, in the Paris sample, the level of accessibility has a positive and rather strong influence on all of the dimensions of Subjective Well-being. Noticeably, the effect of accessibility in the Barcelona case is less significative, with only a positive and significative relation with Life Satisfaction and a non-significative negative association with Eudaimonic Well-being.

The data collected failed to prove a reliable, solid and significant association between the walkability variables and the dimensions of SWB. Indeed in the Paris case, a slightly positive association had been identified with Eudaimonic Well-being and a light negative association

had been proven with Hedonic Well-being, though with a marginal significance. No direct relationship could be identified with the use of a soft mode for any of the SWB dimensions. Besides, the use of soft active modes for daily activities is reported to have a light negative effect on Hedonic Well-being, and, simultaneously, a positive impact on Eudaimonic Well-being.

The Localised Social Life's indicators did not provide neither a clear evidence of their direct contribution to the SWB dimensions. It might even be an impediment to one's life satisfaction, as suggested by the negative effect of Social Cohesion on Life Satisfaction in Paris. A positive influence is indicated though in the Barcelona sample of Social Capital on Life Satisfaction. Conversely, in Barcelona, Social Cohesion is reported to have both a negative significant impact on Life Satisfaction, aligned with the results in Paris.

Furthermore, the proximity variables are reported to have an influence on major and relevant determinants of SWB. Social Life for instance is reported to be a strong contributor to SWB dimensions, confirming academic findings (Mouratidis 2019b). Indeed, personal relationships are considered as a major life domain that influence positively all dimensions of SWB, which is aligned with the findings of the Paris case in particular. Social Life had been proven here to be impacted positively by accessibility and social capital scores. Then, it strengthens the influence of accessibility and also of localised social life. Indeed, benefitting from a better accessibility to resources and from active local social connections, the opportunities to meet people and to maintain social networks within or outside of the neighbourhood are multiplied, allowing thereby to lead an active and blossoming social life.

In our samples, Leisure was found to have a significant positive impact on Eudaimonic Well-being and Life Satisfaction. Though, this is not coinciding with some academic evidences which failed to show an association between leisure satisfaction and SWB, it allows in our cases study to highlight an indirect positive contribution of walking locally and social cohesion as well as a negative one of accessibility.

Neighbourhood Perception was also shown as a potential positive contributor to Hedonic Well-being and Eudaimonic Well-being. This outcome is disaccording to some literature findings that demonstrated the positive contribution of a perceived neighbourhood environment over anxiety, because of the urban problems it might be associated with such as cleanliness and safety (Mouratidis 2019b). Nevertheless, strikingly, the same study could determine that, when urban main problems were solved, neighbourhood perception started to have a positive influence on life satisfaction and stopped having a significant relationship with anxiety. In the case of this paper, the neighbourhood perception participation to increase well-being is interesting because it exposes an indirect positive effect over SWB from accessibility and social cohesion and a potential threat by social capital.

Likewise, Green Image has proved to have a positive impact on both Hedonic Well-being and Eudaimonic Well-being. It is an addition proof that Walking Locally and Social Capital have an indirect impact on SWB dimensions.

Then, interesting indirect pathways were identified and allowed to explore the impact of Localised Social Life and Walkability indicators as well as the reinforcing influence of accessibility over the SWB dimensions. This proves that proximity indicators are also shaping experience variables, the experiences and opportunities one might have in an urban life, and then can indirectly weight on a subjective psychological status.

Besides the regression coefficient analysis, it is enlightening to have a closer look at the adjusted R-squared scores, which, except for the Barcelona sample, were not very high in value in the regression models. This can be explained by the fact that there might have been a few omitted predictors from the built environment that were not captured by the questionnaire. Then, the outcomes discussed previously need to be read with precaution because the influences and impacts commented are light overall. The analysis of the adjusted R-squared, beyond giving insights about the actual significance and relevance of the outcomes, is also very interesting because it put in emphasis the impact of variables through the transmitting variables. Indeed, the proximity variables themselves had a very light impact on SWB dimensions, with a weak adjusted R-squared score. However, their impact on experience variables were stronger, and so was the explanatory power of experience variables on SWB dimensions. This is an additional proof of the transmitting influence of proximity variables over SWB dimensions.

A few limitations to those findings can be discussed here. First of all, the topic of research SWB is strongly subjective and intangible making it difficult to measure, and then even more difficult to identify and analyse its drivers, leading to models with a very weak explanatory power in this paper. Moreover, the regression models show associations and relationships between variables but not causal relationships. Those causal relationships were deduced out of logic and with the academic findings exposed in the literature review, but this ought to be interpretated critically. Last but not least, and more importantly even, the samples in the three cities did not reach a 95% confidence interval, as expected in this type of statistical analysis to ensure the reliability of the data outcomes, due to the time and material constraints to collect the data. In particular, the sample size in Barcelona does not allow to generalise those findings for the whole Barcelona city and is only meaningful at the scale of our sample.

Chapter 5 : Conclusion

5.1 Answer to the research questions

This paper provided a multiple case studies evidence on the influence of proximity in a neighbourhood over the subjective well-being of its residents. It exposed not only the extent of the influence between a built environment characteristic and a perceived psychological state, but also explored a proposition of pathways to link both concepts through the study of the personal experiences which the residents might have in their city.

In particular, the accessibility dimension of proximity is a major predictor of subjective well-being, whether directly or indirectly. It has an impact on every dimension of well-being, from emotional and mental state towards the life satisfaction or the meaning and sense given to one's life. It also conveys opportunities in the life of urban dwellers in terms of personal relationships, leisure and apprehension of their local environment, which participates also in increasing the perceived well-being indirectly. The study also suggests that there is an influence of local social ties on the residents' well-being, indirectly and through the life experiences it shapes for the urban dwellers in their local environment. The same type of reasoning could be made for the Walkability indicators, whose link with subjective well-being, in spite of being quite marginally significant, is reinforced through the mediating experience variables.

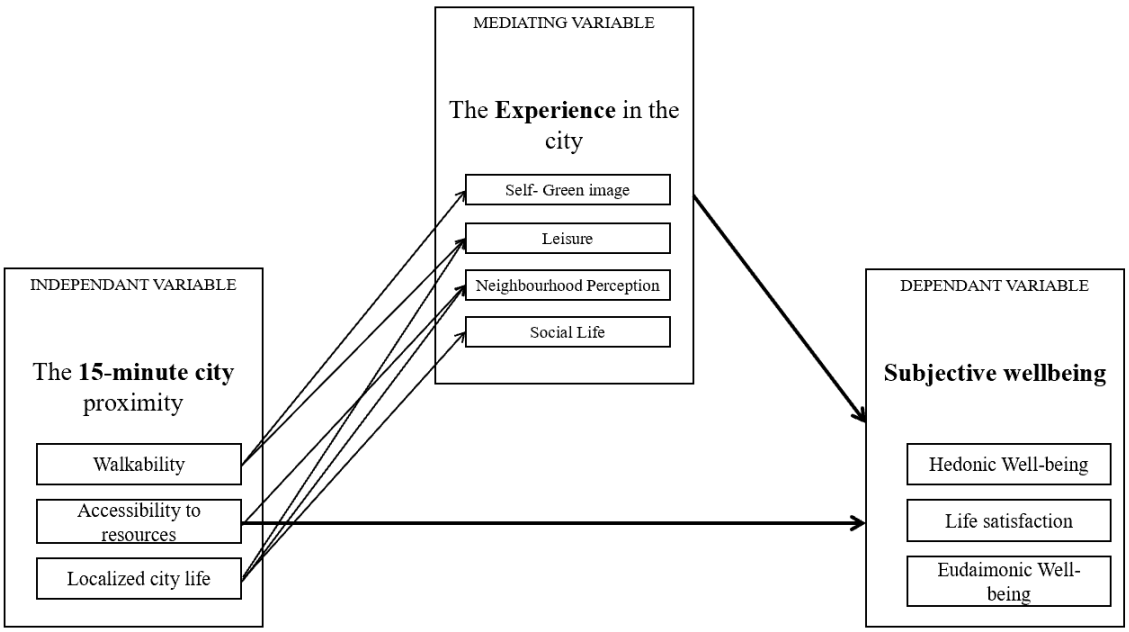
In conclusion, proximity does influence the different dimensions of subjective well-being. Though the direct influence remains quite light according to the empirical findings of this paper, it is accentuated by the influence of proximity on several major aspects of life which shape the daily experiences of urban residents and which have substantial effects on subjective well-being. Therefore, this paper confirms the emerging scope in literature which recommend to adopt an holistic and exhaustive reflection to link the built tangible environment to the subjective perceived well-being by studying the daily experiences and lifestyles of people (Mouratidis 2021). Additionally though not very strikingly due to the unsignificant results from the Walkability variable, the findings testify of a possible synergy between the development of an environmental neighbourhood like the 15MC with the emotional and mental state of its residents, contradicting the prejudices on ecological transition as a barrier to human self-fulfilment.

Hence, a 15-minute city oriented urban development seems to be a very interesting consideration for cities to have nowadays and an exciting ground of experimentations in order to combine both a social and environmental development. Even though the model as explored in Paris, Milan or Barcelona might not be replicable everywhere, it is worth leading a shared reflection on proximity at a neighbourhood scale, and in particular on how to adapt the land use towards more diversity simultaneously to the promotion of soft active mobility modes iso as to maximise the residents' quality of life.

5.2 Revised conceptual framework

Overall, proximity have an influence over subjective well-being in our cities. The previous concluding remarks lead to the update of the initial theoretical conceptual framework presented in chapter 2 :

Figure 12: Revised Conceptual Framework



5.3 Potential critics on the 15-minute city model

Overall, the proximity causal relationship with subjective well-being had been highlighted to a certain extent. Nevertheless, it is important to bear in mind that a little nuance about proximity can be made without challenging all that have been written before. Indeed, it was noticed that not all of its dimensions had the same weight to impact well-being. In particular, indicators which were prone to impeding subjective well-being were the ones for which the concept of proximity could be understood as closed, locking down people between themselves, rather than as an enhancer of opportunities and abilities at a local level. This was the case of the *Social Capital* indicator for instance.

Accordingly, it is important to bear in mind that an excessive proximity kills its own benefices. Proximity-oriented development ought not to develop gated communities, but should on the contrary exhale opportunities for the urban dwellers. The cities' objective have always been to make connection between people through mobility and exchanges of goods, services and information and the new focus on proximity should not derogate to that aim. Then, several voices from searchers had raised to alert on the potential danger that might cause a too important focus on proximity in a 15-minute city paradigm which could lead to a stronger exclusion of already marginalised and vulnerable people (Glaeser 2021).

5.4 Recommendations for further research

The topic of the 15-minute city is emerging in the debate about sustainable urban solutions, so there is still a lot to explore about it. This paper had been a very conceptual one, looking at the topic of subjective well-being in the 15-minute city with a broad angle. Thus, it might be interesting to adopt a more qualitative approach (mixed with quantitative or purely

qualitative) to look in more details for one territory at the particular contributors of subjective well-being. This would permit to understand with more depth the mechanisms linking the proximity characteristics to subjective well-being, in order to know which aspects of the 15MC need to be prioritised in projects in a particular context.

In addition, more respondents in each of the three cities (Paris, Barcelona and Milan), and in particular a similar amount of respondents for all case studies would have allowed as well to conduct a comparison between cities of the proximity predictors of SWB and to identify potential similarities or differences in the relationships and in their strengths, and thus to go a step further in the analysis. Then, a cross-cities or cross-context comparison could be a potential additional research to conduct, in particular to identify if the differences in the implementation of the 15MC and in the proximity spatial translation across the particular contexts have a differential impact over the determinants of Subjective Well-being.

Last but not least, only a perceived built environment had been evaluated in the study and it could be interested to conduct the same type of research with some objective geospatial analyses as it is sometimes conducted for this type of research which links spatial characteristics and well-being outcomes.

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Annexes

Annexe 1 : Variables table

in particular with the details of calculations (in orange) for the aggregated indicators

Variables	Question or calculation
Living in Paris	Do you live in Paris intramuros or in one of its bordering cities ?
Happiness_ESS	Taking all things together, how happy would you say you are?
Hedonic_1	The hedonic well-being is defined by the emotional state of a person at a particular moment - Overall, how happy did you feel yesterday?
Hedonic_2	- Overall, how relaxed did you feel yesterday?
Hedonic_3	- Overall, how much enjoyment did you feel yesterday?
Hedonic_4	- Overall, how energised did you feel yesterday?
Hedonic_5	- Overall, how tired did you feel yesterday?
Hedonic_6	- Overall, how stressed did you feel yesterday?
Hedonic_7	- Overall, how bored did you feel yesterday?
Hedonic_8	- Overall, how angry did you feel yesterday?
Hedonic_Pos	*Mean(Hedonic_1, Hedonic_2, Hedonic_3, Hedonic_4)*
Hedonic_Neg	*Mean(Hedonic_5, Hedonic_6, Hedonic_7, Hedonic_8)*
Hedonic_Total	*Mean(Hedonic_Pos, 7 - Hedonic_Neg)*
Life satisfaction	Life satisfaction is defined by a person's assessment about their own life. Overall, how satisfied are you with your life nowadays?
Eudaimonia_1	Eudaimonic Well-being is defined by the feeling of achievement and the sense of meaning about their life that a person can feel - I lead a purposeful and meaningful life.
Eudaimonia_2	- My social relationships are supportive and rewarding.
Eudaimonia_3	- I am engaged and interested in my daily activities.
Eudaimonia_4	- I actively contribute to the happiness and well-being of others.
Eudaimonia_5	- I am competent and capable in the activities that are important to me.
Eudaimonia_6	- I am a good person and live a good life.
Eudaimonia_7	- I am optimistic about my future.
Eudaimonia_8	- People respect me.
Eudaimonia_Total	*Mean of Eudaimonia scores, 1 to 8*
SWB_Total	*Mean of Hedonic_Total, Life satisfaction and Eudaimonia_Total*
Travel Mode_Work	What is your most frequently used mode of travel by purpose ? - Commuting to work.
Travel Mode_University	- Commuting to university.
Travel Mode_Children	- Accompanying children to school.
Travel Mode_Groceries	- Going for groceries.
Travel Mode_Leisure	- Going for leisure.
Soft_Mode_Work	*Take the value 1 of Travel Mode_Work = walking or Biking*
Soft_Mode_Uni	*Take the value 1 of Travel Mode_Uni = walking or Biking*
Soft_Mode_Children	*Take the value 1 of Travel Mode_Children = walking or Biking*
Soft_Mode_Groceries	*Take the value 1 of Travel Mode_Groceries = walking or Biking*

Soft_Mode_Leisure	*Take the value 1 of Travel Mode_Leisure = walking or Biking*
Soft_Mode	*Sum per row of all Soft_Mode variables (Work, Uni, Children, Groceries, Leisure)*
Walking Locally	How often do you walk (or bike) somewhere for less than 15 minutes from your home ?
Accessibility_Culture	Would you say that you have an easy access in your neighbourhood (meaning less than 15 min walking or biking) to - Culture facilities (theater, cinema, museum...)
Accessibility_Sport	- Sport facilities (gymnase, stadium...)
Accessibility_Park	- Parks
Accessibility_Grocery	- Grocery stores
Accessibility_Retails	- Retails of goods and services
Accessibility_Restaurant	- Restaurants and bars
Accessibility_School	- Schools and education facilities
Accessibility_Civic	- Civic institutions (municipal services, citizen kiosk...)
Accessibility_Health	- Health facilities
Accessibility_Total	*Mean of Accessibility scores*
Social Capital_1	How is the local social capital in the neighbourhood ? - How often do you have contact with your neighbors?
Social Capital_2	- How often do you or one of your neighbors ask one another for advice on personal matters?
Social Capital_3	- How many people in your neighborhood do you know by face?
Social Capital_4	- If your neighbors are not home, how often do you watch out for them (stay vigilant against robberies, water plants...) ?
Social Capital_Total	*Mean of Social Capital 1 to 4*
Social Cohesion_1	How is the local cohesion in the neighbourhood ? - People in my neighbourhood are willing to help their neighbors.
Social Cohesion_2	- People in my neighborhood feel connected to one another.
Social Cohesion_3	- People in my neighborhood can be trusted.
Social Cohesion_4	- People in my neighborhood generally do not get along with one another.
Social Cohesion_Total	*Mean of Social Cohesion 1 to 4*
Social Life	How often do you meet your friends and relatives ?
Leisure	How satisfied are you with the time you spend on your leisure activities ?
Physical Activity	How often do you practice a physical activity (e.g. exercise, manual work, brisk walking, cycling) for 20 minutes or more in a week ?
Neighbourhood perception_1	How do you perceive your neighbourhood ? - My neighbourhood is beautiful.
Neighbourhood perception_2	- Streets, sidewalks, and other public places are clean.
Neighbourhood perception_3	- I feel safe walking around at night.
Neighbourhood perception_4	- Air pollution is a serious problem in my neighbourhood.
Neighbourhood perception_Total	*Mean of Neighbourhood perception 1 to 4*
Green_1	How green would you say you are ? - I feel that I am aware of the climate change issues and its implications on society.

Green_2	- I feel that I lead a green life and that I have an environmental behaviour.
Green_Total	*Mean of Green 1 and 2*
Age	How old are you ?
Gender	To what gender do you assign yourself ?
Partner	Do you have a partner ?
Children	Do you have children ?
Education	What is your level of education ?
Employment status	What is your employment status ?
Income	How confortable do you feel with your present household income ?
Health	Do you face any health problem ?

Annexe 2 : Pearson's correlation tables

- **Paris study case**

	LS	Walk.	Soc.L.	Leis.	Phy. Act.	Age.sq.	Female	Partner	Children	Degree	Unempl.	Low Inc.	Health	HWB	EWB	Acc.	Soft M.	Soc. Cap.	Soc.Co.	NP	Green
LS	1	0,03	0,15	0,17	0,12	0,16	-0,08	0,21	0,20	0,02	-0,04	-0,12	-0,10	0,50	0,60	0,25	0,09	0,04	-0,06	0,07	0,09
Walk.	0,03	1	0,33	0,20	0,25	-0,04	-0,06	-0,17	-0,06	-0,11	0,02	-0,08	0,09	0,00	0,18	0,26	0,30	0,09	0,05	0,14	0,16
Soc.L.	0,15	0,33	1	0,37	0,22	-0,25	-0,09	-0,27	-0,33	-0,06	0,07	-0,07	0,01	0,09	0,26	0,18	0,12	-0,07	0,11	0,16	0,08
Leis.	0,17	0,20	0,37	1	0,42	-0,09	-0,15	-0,17	-0,18	-0,06	0,07	-0,02	-0,04	0,16	0,27	0,07	0,06	-0,22	-0,04	0,19	0,08
Phy. Act.	0,12	0,25	0,22	0,42	1	0,09	0,02	-0,07	0,04	-0,23	0,07	-0,03	0,00	0,12	0,22	0,12	0,34	0,04	-0,01	0,11	0,04
Age.sq.	0,16	-0,04	-0,25	-0,09	0,09	1	-0,01	0,19	0,76	-0,17	-0,04	-0,16	-0,08	0,32	0,19	0,05	0,00	0,34	0,14	0,00	-0,05
Female	-0,08	-0,06	-0,09	-0,15	0,02	-0,01	1	0,06	0,04	-0,05	0,08	0,01	-0,10	-0,07	-0,15	0,03	0,01	-0,12	-0,08	-0,19	0,15
Partner	0,21	-0,17	-0,27	-0,17	-0,07	0,19	0,06	1	0,28	0,14	-0,01	-0,12	-0,14	0,10	0,02	-0,02	0,03	0,11	-0,03	-0,18	0,15
Children	0,20	-0,06	-0,33	-0,18	0,04	0,76	0,04	0,28	1	-0,08	-0,06	-0,22	-0,08	0,27	0,19	0,01	0,10	0,30	0,16	-0,06	-0,03
Degree	0,02	-0,11	-0,06	-0,06	-0,23	-0,17	-0,05	0,14	-0,08	1	-0,20	0,02	-0,11	0,13	-0,08	-0,05	0,01	-0,28	-0,15	0,03	-0,04
Unempl.	-0,04	0,02	0,07	0,07	0,07	-0,04	0,08	-0,01	-0,06	-0,20	1	-0,11	0,18	-0,02	0,05	-0,07	-0,10	0,21	0,18	0,03	-0,02
Low Inc.	-0,12	-0,08	-0,07	-0,02	-0,03	-0,16	0,01	-0,12	-0,22	0,02	-0,11	1	-0,01	-0,28	-0,13	-0,23	-0,14	-0,07	-0,12	-0,17	-0,09
Health	-0,10	0,09	0,01	-0,04	0,00	-0,08	-0,10	-0,14	-0,08	-0,11	0,18	-0,01	1	-0,13	-0,05	0,10	0,04	0,03	0,05	0,06	0,00
HWB	0,50	0,00	0,09	0,16	0,12	0,32	-0,07	0,10	0,27	0,13	-0,02	-0,28	-0,13	1	0,37	0,23	0,07	0,03	0,00	0,16	0,20
EWB	0,60	0,18	0,26	0,27	0,22	0,19	-0,15	0,02	0,19	-0,08	0,05	-0,13	-0,05	0,37	1	0,24	0,09	0,11	0,10	0,22	0,15
Acc.	0,25	0,26	0,18	0,07	0,12	0,05	0,03	-0,02	0,01	-0,05	-0,07	-0,23	0,10	0,23	0,24	1	0,41	0,06	0,03	0,32	0,16
Soft M.	0,09	0,30	0,12	0,06	0,34	0,00	0,01	0,03	0,10	0,01	-0,10	-0,14	0,04	0,07	0,09	0,41	1	0,03	0,11	0,16	0,10
Soc. Cap.	0,04	0,09	-0,07	-0,22	0,04	0,34	-0,12	0,11	0,30	-0,28	0,21	-0,07	0,03	0,03	0,11	0,06	0,03	1	0,45	0,12	0,12
Soc.Co.	-0,06	0,05	0,11	-0,04	-0,01	0,14	-0,08	-0,03	0,16	-0,15	0,18	-0,12	0,05	0,00	0,10	0,03	0,11	0,45	1	0,21	0,02
NP	0,07	0,14	0,16	0,19	0,11	0,00	-0,19	-0,18	-0,06	0,03	0,03	-0,17	0,06	0,16	0,22	0,32	0,16	0,12	0,21	1	0,00
Green	0,09	0,16	0,08	0,08	0,04	-0,05	0,15	0,15	-0,03	-0,04	-0,02	-0,09	0,00	0,20	0,15	0,16	0,10	0,12	0,02	0,00	1

In particular, the cells in red display the correlation coefficients which are higher that 0.6. It can be noticed that, at the exception of the Age-squared-Children *coefficient (0,76), there is no strong correlations between the predictors variables and each of the dependant variables (HWB, LS and EWB), or between the predictors themselves. The use of a stepwise regression method enabled to get rid of the potential bias that would had been induced by the correlation between Age-squared and Children.*

- **Barcelona study case**

	LS	Walk.	Soc.L.	Leis.	Phy. Act.	Age-sq.	Female	Partner	Children	Degree	Unempl.	Low Inc.	Health	EWB	Acc.	Soft M.	Soc. Cap.	Soc.Co.	NP	Green
LS	1	-0,04	0,38	0,24	-0,05	-0,15	0,02	-0,03	-0,23	-0,27	0,14	-0,07	-0,12	0,45	0,17	0,04	0,27	0,09	0,51	0,08
Walk.	-0,04	1	0,20	-0,05	0,12	-0,16	-0,12	0,23	-0,10	0,15	0,22	0,04	-0,26	0,27	0,23	0,49	0,05	0,00	0,03	0,15
Soc.L.	0,38	0,20	1	0,16	0,25	-0,27	-0,11	-0,37	-0,15	0,15	0,08	-0,30	-0,35	0,53	0,44	0,05	0,21	0,32	0,50	0,39
Leis.	0,24	-0,05	0,16	1	0,19	0,23	0,13	0,05	0,07	-0,13	0,19	0,21	0,17	0,41	-0,17	-0,03	0,19	0,26	0,14	0,20
Phy. Act.	-0,05	0,12	0,25	0,19	1	-0,15	-0,06	0,02	0,05	0,20	0,35	-0,18	-0,03	0,27	0,06	0,36	0,09	0,10	0,13	0,32
Age-sq.	-0,15	-0,16	-0,27	0,23	-0,15	1	0,32	0,06	0,82	-0,20	-0,20	0,13	0,43	0,01	-0,53	0,22	0,39	0,04	-0,53	-0,03
Female	0,02	-0,12	-0,11	0,13	-0,06	0,32	1	0,02	0,19	-0,40	-0,07	0,19	0,27	-0,11	-0,33	0,06	0,33	0,01	-0,14	0,29
Partner	-0,03	0,23	-0,37	0,05	0,02	0,06	0,02	1	0,08	-0,01	-0,24	0,26	0,14	-0,12	0,09	0,46	0,05	-0,05	-0,30	0,08
Children	-0,23	-0,10	-0,15	0,07	0,05	0,82	0,19	0,08	1	-0,02	-0,26	0,03	0,32	-0,01	-0,48	0,30	0,50	0,02	-0,53	0,10
Degree	-0,27	0,15	0,15	-0,13	0,20	-0,20	-0,40	-0,01	-0,02	1	0,14	-0,19	-0,17	-0,06	0,13	0,14	-0,43	0,23	0,11	-0,18
Unempl.	0,14	0,22	0,08	0,19	0,35	-0,20	-0,07	-0,24	-0,26	0,14	1	0,01	0,09	0,20	-0,14	-0,04	-0,02	0,11	0,32	0,10
Low Inc.	-0,07	0,04	-0,30	0,21	-0,18	0,13	0,19	0,26	0,03	-0,19	0,01	1	0,61	-0,25	-0,30	0,05	-0,21	-0,29	-0,37	0,06
Health	-0,12	-0,26	-0,35	0,17	-0,03	0,43	0,27	0,14	0,32	-0,17	0,09	0,61	1	-0,29	-0,50	0,15	-0,03	-0,27	-0,49	0,13
EWB	0,45	0,27	0,53	0,41	0,27	0,01	-0,11	-0,12	-0,01	-0,06	0,20	-0,25	-0,29	1	0,13	0,29	0,28	0,39	0,50	0,30
Acc.	0,17	0,23	0,44	-0,17	0,06	-0,53	-0,33	0,09	-0,48	0,13	-0,14	-0,30	-0,50	0,13	1	0,08	-0,10	0,35	0,33	0,11
Soft M.	0,04	0,49	0,05	-0,03	0,36	0,22	0,06	0,46	0,30	0,14	-0,04	0,05	0,15	0,29	0,08	1	0,14	0,21	-0,05	0,11
Soc. Cap.	0,27	0,05	0,21	0,19	0,09	0,39	0,33	0,05	0,50	-0,43	-0,02	-0,21	-0,03	0,28	-0,10	0,14	1	0,31	-0,16	0,40
Soc.Co.	0,09	0,00	0,32	0,26	0,10	0,04	0,01	-0,05	0,02	0,23	0,11	-0,29	-0,27	0,39	0,35	0,21	0,31	1	0,32	0,11
NP	0,51	0,03	0,50	0,14	0,13	-0,53	-0,14	-0,30	-0,53	0,11	0,32	-0,37	-0,49	0,50	0,33	-0,05	-0,16	0,32	1	0,13
Green	0,08	0,15	0,39	0,20	0,32	-0,03	0,29	0,08	0,10	-0,18	0,10	0,06	0,13	0,30	0,11	0,11	0,40	0,11	0,13	1

In particular, the cells in red display the correlation coefficients which are higher that 0.6. It can be noticed that, at the exception of the Age-squared-Children *coefficient (0,82), there is no strong correlations between the predictors variables and each of the dependant variables (HWB, LS and EWB), or between the predictors themselves. The use of a stepwise regression method enabled to get rid of the potential bias that would had been induced by the correlation between Age-squared and Children.*

- **All samples merged together**

	LS	Walk.	Soc. L.	Leis.	Phy. Act.	Age.sq.	Female	Partner	Children	Degree	Unempl.	Low Inc.	Health	HWB	EWB	Acc.	Soft M.	Soc. Cap.	Soc.Co.	NP	Green
LS	1	-0,01	0,15	0,17	0,09	0,06	-0,03	0,18	0,07	-0,05	0,02	-0,16	-0,06	0,46	0,56	0,23	0,05	0,07	-0,03	0,15	0,06
Walk.	-0,01	1	0,32	0,16	0,21	-0,12	-0,07	-0,12	-0,10	0,00	0,08	-0,05	-0,04	0,03	0,17	0,26	0,34	0,08	0,03	0,12	0,16
Soc.L.	0,15	0,32	1	0,36	0,25	-0,25	-0,06	-0,33	-0,29	0,01	0,06	-0,11	-0,06	0,14	0,29	0,20	0,10	-0,01	0,14	0,22	0,16
Leis.	0,17	0,16	0,36	1	0,40	-0,01	-0,09	-0,15	-0,13	-0,07	0,09	0,02	0,06	0,19	0,31	0,01	0,06	-0,12	0,05	0,19	0,14
Phy. Act.	0,09	0,21	0,25	0,40	1	0,06	-0,01	-0,05	0,06	-0,14	0,15	-0,07	0,07	0,09	0,24	0,12	0,31	0,11	0,08	0,11	0,10
Age.sq.	0,06	-0,12	-0,25	-0,01	0,06	1	0,03	0,24	0,78	-0,24	-0,03	-0,06	0,19	0,18	0,17	-0,14	0,09	0,37	0,18	-0,17	0,01
Female	-0,03	-0,07	-0,06	-0,09	-0,01	0,03	1	0,01	0,04	-0,12	0,02	0,03	-0,02	0,02	-0,11	-0,04	0,02	-0,10	-0,11	-0,14	0,11
Partner	0,18	-0,12	-0,33	-0,15	-0,05	0,24	0,01	1	0,28	0,06	-0,03	-0,06	-0,01	0,06	0,01	-0,01	0,11	0,13	0,01	-0,21	0,14
Children	0,07	-0,10	-0,29	-0,13	0,06	0,78	0,04	0,28	1	-0,11	-0,08	-0,14	0,10	0,14	0,15	-0,12	0,18	0,36	0,17	-0,20	0,01
Degree	-0,05	0,00	0,01	-0,07	-0,14	-0,24	-0,12	0,06	-0,11	1	-0,09	-0,03	-0,16	0,00	-0,09	0,01	0,03	-0,32	-0,09	0,07	-0,08
Unempl.	0,02	0,08	0,06	0,09	0,15	-0,03	0,02	-0,03	-0,08	-0,09	1	-0,06	0,16	0,05	0,09	-0,10	-0,06	0,15	0,17	0,11	0,03
Low Inc.	-0,16	-0,05	-0,11	0,02	-0,07	-0,06	0,03	-0,06	-0,14	-0,03	-0,06	1	0,10	-0,18	-0,15	-0,26	-0,07	-0,11	-0,14	-0,17	-0,05
Health	-0,06	-0,04	-0,06	0,06	0,07	0,19	-0,02	-0,01	0,10	-0,16	0,16	0,10	1	-0,11	-0,02	-0,05	0,08	0,10	0,08	-0,09	0,10
HWB	0,46	0,03	0,14	0,19	0,09	0,18	0,02	0,06	0,14	0,00	0,05	-0,18	-0,11	1	0,36	0,20	0,02	0,08	0,01	0,20	0,15
EWB	0,56	0,17	0,29	0,31	0,24	0,17	-0,11	0,01	0,15	-0,09	0,09	-0,15	-0,02	0,36	1	0,20	0,13	0,13	0,17	0,25	0,17
Acc.	0,23	0,26	0,20	0,01	0,12	-0,14	-0,04	-0,01	-0,12	0,01	-0,10	-0,26	-0,05	0,20	0,20	1	0,30	0,05	0,10	0,33	0,11
Soft M.	0,05	0,34	0,10	0,06	0,31	0,09	0,02	0,11	0,18	0,03	-0,06	-0,07	0,08	0,02	0,13	0,30	1	0,08	0,17	0,08	0,08
Soc. Cap.	0,07	0,08	-0,01	-0,12	0,11	0,37	-0,10	0,13	0,36	-0,32	0,15	-0,11	0,10	0,08	0,13	0,05	0,08	1	0,47	0,04	0,18
Soc.Co.	-0,03	0,03	0,14	0,05	0,08	0,18	-0,11	0,01	0,17	-0,09	0,17	-0,14	0,08	0,01	0,17	0,10	0,17	0,47	1	0,21	0,07
NP	0,15	0,12	0,22	0,19	0,11	-0,17	-0,14	-0,21	-0,20	0,07	0,11	-0,17	-0,09	0,20	0,25	0,33	0,08	0,04	0,21	1	0,03
Green	0,06	0,16	0,16	0,14	0,10	0,01	0,11	0,14	0,01	-0,08	0,03	-0,05	0,10	0,15	0,17	0,11	0,08	0,18	0,07	0,03	1

In particular, the cells in red display the correlation coefficients which are higher that 0.6. Similarly, at the exception of the Age-squared-Children *coefficient (0,78), there is no strong correlation between the predictors variables and each of the dependant variables (HWB, LS and EWB), or between the predictors themselves. The use of a stepwise regression method enabled to get rid of the potential bias that would had been induced by the correlation between Age-squared and Children.*

Annexe 3 : Regressions outcomes

- **Paris outcomes**

HWB with all (linear)

```
Call:
lm(formula = Paris.HedonicT$Hedonic_T ~ ., data = Paris.HedonicT)

Residuals:
     Min       1Q   Median       3Q      Max
-2.05492 -0.57597  0.06176  0.58704  2.06551

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         1.21649    0.95439   1.275  0.20496
Walking            -0.07833    0.05941  -1.318  0.18993
SocialLife          0.10326    0.06741   1.532  0.12824
Leisure             0.03980    0.05584   0.713  0.47747
PhysicalActivity    0.05175    0.05795   0.893  0.37373
AgeRegSquare        0.02634    0.01158   2.274  0.02478 *
Female             -0.22444    0.18236  -1.231  0.22089
PartnerReg         -0.02703    0.17177  -0.157  0.87524
ChildrenReg         0.37956    0.32176   1.180  0.24055
Degree              0.74370    0.32287   2.303  0.02302 *
Unemployed          0.55992    0.69111   0.810  0.41948
LowIncome          -0.29270    0.16491  -1.775  0.07851 .
HealthPb           -0.35753    0.27840  -1.284  0.20161
Accessibility_Total 0.22720    0.11717   1.939  0.05490 .
Soft_Mode          -0.06888    0.08551  -0.805  0.42217
SocialCapital_T    -0.11854    0.16789  -0.706  0.48157
SocialCohesion_T   -0.05992    0.09293  -0.645  0.52033
NP_T                0.06911    0.08836   0.782  0.43567
Green_T             0.23481    0.08767   2.678  0.00846 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8725 on 117 degrees of freedom
Multiple R-squared:  0.3346,    Adjusted R-squared:  0.2322
F-statistic: 3.268 on 18 and 117 DF,  p-value: 5.787e-05
```

HWB with all (linear stepwise)

```
Call:
lm(formula = Paris.HedonicT$Hedonic_T ~ SocialLife + AgeRegSquare +
    Degree + LowIncome + Accessibility_Total + Green_T, data = Paris.HedonicT)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2231 -0.6335  0.1301  0.6060  1.9470

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         1.204148   0.817596   1.473  0.14324
SocialLife          0.109325   0.058152   1.880  0.06237 .
AgeRegSquare        0.035025   0.007679   4.561 1.17e-05 ***
Degree              0.818360   0.292588   2.797  0.00595 **
LowIncome          -0.337052   0.157451  -2.141  0.03418 *
Accessibility_Total 0.163601   0.101173   1.617  0.10831
Green_T             0.192745   0.082274   2.343  0.02067 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8702 on 129 degrees of freedom
Multiple R-squared:  0.2702,    Adjusted R-squared:  0.2363
F-statistic: 7.961 on 6 and 129 DF,  p-value: 2.59e-07
```

LS with all (linear)

```
Call:
lm(formula = Paris.LS$Life_satisfaction ~ ., data = Paris.LS)

Residuals:
    Min      1Q  Median      3Q     Max
-3.3620 -0.7149  0.0810  0.7713  2.1392

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         2.107472   1.249318   1.687   0.0943 .
Walking            -0.071618   0.077774  -0.921   0.3590
SocialLife          0.210157   0.088240   2.382   0.0188 *
Leisure             0.100723   0.073102   1.378   0.1709
PhysicalActivity    0.020285   0.075860   0.267   0.7896
AgeRegSquare       -0.003648   0.015163  -0.241   0.8103
Female             -0.243728   0.238716  -1.021   0.3094
PartnerReg          0.493579   0.224847   2.195   0.0301 *
ChildrenReg         0.902417   0.421197   2.143   0.0342 *
Degree              0.112504   0.422645   0.266   0.7906
Unemployed          0.056845   0.904684   0.063   0.9500
LowIncome           0.030422   0.215867   0.141   0.8882
HealthPb           -0.280560   0.364438  -0.770   0.4429
Accessibility_Total 0.374923   0.153377   2.444   0.0160 *
Soft_Mode          -0.051914   0.111939  -0.464   0.6437
SocialCapital_T     0.072606   0.219776   0.330   0.7417
SocialCohesion_T   -0.171060   0.121649  -1.406   0.1623
NP_T                0.012945   0.115661   0.112   0.9111
Green_T             0.044785   0.114764   0.390   0.6971
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.142 on 117 degrees of freedom
Multiple R-squared:  0.2391,    Adjusted R-squared:  0.122
F-statistic: 2.042 on 18 and 117 DF,  p-value: 0.01234
```

LS with all (linear stepwise)

```
Call:
lm(formula = Paris.LS$Life_satisfaction ~ SocialLife + Leisure +
    PartnerReg + ChildrenReg + Accessibility_Total + SocialCohesion_T,
    data = Paris.LS)

Residuals:
    Min      1Q  Median      3Q     Max
-3.4429 -0.7476  0.0804  0.7428  2.1757

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         2.29992    0.85503   2.690  0.00809 **
SocialLife          0.19702    0.08184   2.407  0.01748 *
Leisure             0.11100    0.06032   1.840  0.06802 .
PartnerReg          0.54964    0.20256   2.714  0.00757 **
ChildrenReg         0.81885    0.27144   3.017  0.00308 **
Accessibility_Total 0.31220    0.12403   2.517  0.01305 *
SocialCohesion_T   -0.15373    0.10238  -1.502  0.13565
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.102 on 129 degrees of freedom
Multiple R-squared:  0.2182,    Adjusted R-squared:  0.1819
F-statistic: 6.001 on 6 and 129 DF,  p-value: 1.47e-05
```

EWB with all (linear)

```
Call:
lm(formula = Paris.Eudaimonic$Eudaimonia_T ~ ., data = Paris.Eudaimonic)

Residuals:
    Min      1Q  Median      3Q     Max
-2.8986 -0.4130  0.1052  0.4871  1.6328

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          1.9929614  0.8966891   2.223   0.0282 *
Walking              0.0152177  0.0558219   0.273   0.7856
SocialLife           0.1558034  0.0633336   2.460   0.0154 *
Leisure              0.0741811  0.0524684   1.414   0.1601
PhysicalActivity     0.0487835  0.0544482   0.896   0.3721
AgeRegSquare         0.0030566  0.0108832   0.281   0.7793
Female              -0.2652798  0.1713364  -1.548   0.1243
PartnerReg           0.0944168  0.1613822   0.585   0.5596
ChildrenReg          0.6473805  0.3023113   2.141   0.0343 *
Degree              -0.0307032  0.3033504  -0.101   0.9196
Unemployed           0.4177260  0.6493304   0.643   0.5213
LowIncome            0.0529556  0.1549368   0.342   0.7331
HealthPb            -0.1712452  0.2615730  -0.655   0.5140
Accessibility_Total  0.1999734  0.1100853   1.817   0.0718 .
Soft_Mode           -0.0890627  0.0803435  -1.109   0.2699
SocialCapital_T     -0.0246641  0.1577425  -0.156   0.8760
SocialCohesion_T     0.0007386  0.0873126   0.008   0.9933
NP_T                 0.1006950  0.0830146   1.213   0.2276
Green_T              0.1190691  0.0823714   1.446   0.1510
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8197 on 117 degrees of freedom
Multiple R-squared:  0.2791,    Adjusted R-squared:  0.1682
F-statistic: 2.517 on 18 and 117 DF,  p-value: 0.001622
```

EWB with all (linear stepwise)

```
Call:
lm(formula = Paris.Eudaimonic$Eudaimonia_T ~ SocialLife + Leisure +
    Female + ChildrenReg + Accessibility_Total + Green_T, data = Paris.Eudaimonic)

Residuals:
     Min       1Q   Median       3Q      Max
-2.83809 -0.51675  0.08334  0.51166  1.57944

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.51171    0.65032   3.862 0.000177 ***
SocialLife           0.15696    0.05737   2.736 0.007100 **
Leisure              0.10525    0.04377   2.404 0.017618 *
Female              -0.25943    0.15616  -1.661 0.099084 .
ChildrenReg          0.71107    0.18775   3.787 0.000232 ***
Accessibility_Total  0.18658    0.09053   2.061 0.041317 *
Green_T              0.11446    0.07603   1.506 0.134634
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7961 on 129 degrees of freedom
Multiple R-squared:  0.2503,    Adjusted R-squared:  0.2154
F-statistic: 7.176 on 6 and 129 DF,  p-value: 1.278e-06
```

HWB with proximity (linear)

```
Call:
lm(formula = Paris3$Hedonic_T ~ Paris3$Accessibility_Total +
    Paris3$Walking + Paris3$Soft_Mode + Paris3$SocialCapital_T +
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.1423 -0.6439  0.0866  0.6610  1.9856

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               3.00189    0.76867   3.905  0.00015 ***
Paris3$Accessibility_Total  0.32413    0.12088   2.681  0.00828 **
Paris3$Walking             -0.04286    0.06208  -0.690  0.49117
Paris3$Soft_Mode           -0.01770    0.08826  -0.201  0.84135
Paris3$SocialCapital_T      0.04909    0.16036   0.306  0.76001
Paris3$SocialCohesion_T    -0.01581    0.09955  -0.159  0.87403
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9846 on 130 degrees of freedom
Multiple R-squared:  0.05841,   Adjusted R-squared:  0.02219
F-statistic: 1.613 on 5 and 130 DF,  p-value: 0.1611
```

HWB with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$Hedonic_T ~ Paris3$Accessibility_Total, data = Paris3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.04159 -0.64808  0.06588  0.67673  1.96447

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               2.9300     0.6460   4.536 1.26e-05 ***
Paris3$Accessibility_Total  0.2949     0.1072   2.751  0.00677 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9723 on 134 degrees of freedom
Multiple R-squared:  0.05345,   Adjusted R-squared:  0.04639
F-statistic: 7.567 on 1 and 134 DF,  p-value: 0.006766
```

LS with proximity (linear)

```
Call:
lm(formula = Paris3$Life_satisfaction ~ Paris3$Accessibility_Total +
    Paris3$Walking + Paris3$Soft_Mode + Paris3$SocialCapital_T +
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.2645 -0.6562  0.2056  0.9007  1.8970

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               3.42057    0.93434   3.661 0.000364 ***
Paris3$Accessibility_Total  0.39424    0.14694   2.683 0.008243 **
Paris3$Walking             -0.03936    0.07546  -0.522 0.602848
Paris3$Soft_Mode            0.01517    0.10729   0.141 0.887793
Paris3$SocialCapital_T      0.15009    0.19492   0.770 0.442691
Paris3$SocialCohesion_T    -0.12641    0.12100  -1.045 0.298104
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.197 on 130 degrees of freedom
Multiple R-squared:  0.07158,   Adjusted R-squared:  0.03588
F-statistic: 2.005 on 5 and 130 DF,  p-value: 0.08214
```

LS with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$Life_satisfaction ~ Paris3$Accessibility_Total,
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.4495 -0.6643  0.2069  0.8391  1.8082

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               3.0872     0.7875   3.920  0.00014 ***
Paris3$Accessibility_Total  0.3866     0.1307   2.958  0.00366 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.185 on 134 degrees of freedom
Multiple R-squared:  0.0613,    Adjusted R-squared:  0.05429
F-statistic:  8.75 on 1 and 134 DF,  p-value: 0.003661
```

EWB with proximity (linear)

```
Call:
lm(formula = Paris3$Eudaimonia_T ~ Paris3$Accessibility_Total +
    Paris3$Walking + Paris3$Soft_Mode + Paris3$SocialCapital_T +
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.7207 -0.5511  0.0404  0.6512  1.5659

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               3.07726    0.68471   4.494 1.53e-05 ***
Paris3$Accessibility_Total  0.25580    0.10768   2.376    0.019 *
Paris3$Walking              0.07726    0.05530   1.397    0.165
Paris3$Soft_Mode           -0.04318    0.07862  -0.549    0.584
Paris3$SocialCapital_T      0.07791    0.14284   0.545    0.586
Paris3$SocialCohesion_T     0.06594    0.08867   0.744    0.458
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.877 on 130 degrees of freedom
Multiple R-squared:  0.08308,   Adjusted R-squared:  0.04781
F-statistic: 2.356 on 5 and 130 DF,  p-value: 0.04394
```

EWB with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$Eudaimonia_T ~ Paris3$Accessibility_Total,
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.9276 -0.5841  0.1293  0.6092  1.6113

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)               3.70805    0.58199   6.371 2.78e-09 ***
Paris3$Accessibility_Total  0.27502    0.09658   2.847   0.0051 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.876 on 134 degrees of freedom
Multiple R-squared:  0.05705,   Adjusted R-squared:  0.05002
F-statistic: 8.108 on 1 and 134 DF,  p-value: 0.005102
```

HWB with experience (linear)

```
Call:
lm(formula = Paris3$Hedonic_T ~ Paris3$SocialLife + Paris3$Leisure +
    Paris3$PhysicalActivity + Paris3$NP_T + Paris3$Green_T, data = Paris3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.08851 -0.54837  0.08038  0.70295  1.85393

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)           2.527600   0.666543   3.792 0.000228 ***
Paris3$SocialLife     0.008791   0.066462   0.132 0.894974
Paris3$Leisure        0.050690   0.057357   0.884 0.378462
Paris3$PhysicalActivity 0.034923   0.057058   0.612 0.541574
Paris3$NP_T           0.140002   0.087145   1.607 0.110583
Paris3$Green_T        0.203465   0.090723   2.243 0.026610 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9723 on 130 degrees of freedom
Multiple R-squared:  0.08172,   Adjusted R-squared:  0.04641
F-statistic: 2.314 on 5 and 130 DF,  p-value: 0.04738
```

HWB with experience (linear stepwise)

```
Call:
lm(formula = Paris3$Hedonic_T ~ Paris3$NP_T + Paris3$Green_T,
    data = Paris3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.17486 -0.56571  0.09576  0.68307  1.98595

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.74801    0.63867   4.303 3.24e-05 ***
Paris3$NP_T   0.16500    0.08487   1.944   0.0540 .
Paris3$Green_T  0.21432    0.09001   2.381   0.0187 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9693 on 133 degrees of freedom
Multiple R-squared:  0.06627,   Adjusted R-squared:  0.05223
F-statistic:  4.72 on 2 and 133 DF,  p-value: 0.01047
```

LS with experience (linear)

```
Call:
lm(formula = Paris3$Life_satisfaction ~ Paris3$SocialLife + Paris3$Leisure +
    Paris3$PhysicalActivity + Paris3$NP_T + Paris3$Green_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.5374 -0.6408  0.1643  0.9037  2.0147

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)           3.84742    0.83092   4.630 8.74e-06 ***
Paris3$SocialLife     0.08254    0.08285   0.996    0.321
Paris3$Leisure        0.07575    0.07150   1.059    0.291
Paris3$PhysicalActivity  0.03688    0.07113   0.518    0.605
Paris3$NP_T           0.03614    0.10864   0.333    0.740
Paris3$Green_T        0.10032    0.11310   0.887    0.377
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.212 on 130 degrees of freedom
Multiple R-squared:  0.04768,   Adjusted R-squared:  0.01105
F-statistic: 1.302 on 5 and 130 DF,  p-value: 0.2671
```

LS with experience (linear stepwise)

```
Call:
lm(formula = Paris3$Life_satisfaction ~ Paris3$Leisure, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.5736 -0.5736  0.4264  0.8265  1.9188

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   4.83498    0.29605  16.332   <2e-16 ***
Paris3$Leisure  0.12310    0.06076   2.026   0.0447 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.205 on 134 degrees of freedom
Multiple R-squared:  0.02972,   Adjusted R-squared:  0.02248
F-statistic: 4.105 on 1 and 134 DF,  p-value: 0.04475
```

EWB with experience (linear)

```
Call:
lm(formula = Paris3$Eudaimonia_T ~ Paris3$SocialLife + Paris3$Leisure +
    Paris3$PhysicalActivity + Paris3$NP_T + Paris3$Green_T, data = Paris3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.73918 -0.62971  0.07852  0.58631  1.80725

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)           3.08475    0.57793   5.338 4.07e-07 ***
Paris3$SocialLife     0.10180    0.05763   1.767   0.0796 .
Paris3$Leisure        0.07001    0.04973   1.408   0.1616
Paris3$PhysicalActivity  0.05903    0.04947   1.193   0.2350
Paris3$NP_T           0.14200    0.07556   1.879   0.0624 .
Paris3$Green_T        0.11950    0.07866   1.519   0.1312
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8431 on 130 degrees of freedom
Multiple R-squared:  0.1528,    Adjusted R-squared:  0.1202
F-statistic: 4.689 on 5 and 130 DF,  p-value: 0.0005721
```

EWB with experience (linear stepwise)

```
Call:
lm(formula = Paris3$Eudaimonia_T ~ Paris3$SocialLife + Paris3$Leisure +
    Paris3$NP_T + Paris3$Green_T, data = Paris3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.79370 -0.58118  0.04721  0.56108  1.81447

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)      3.15870    0.57552   5.488 2.02e-07 ***
Paris3$SocialLife  0.10697    0.05756   1.859   0.0653 .
Paris3$Leisure     0.09165    0.04638   1.976   0.0503 .
Paris3$NP_T        0.14479    0.07565   1.914   0.0578 .
Paris3$Green_T     0.12037    0.07879   1.528   0.1290
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8444 on 131 degrees of freedom
Multiple R-squared:  0.1435,    Adjusted R-squared:  0.1173
F-statistic: 5.487 on 4 and 131 DF,  p-value: 0.000408
```

Social Life with proximity (linear)

```
Call:
lm(formula = Paris3$SocialLife ~ Paris3$Accessibility_Total + 
    Paris3$Walking + Paris3$Soft_Mode + Paris3$SocialCapital_T + 
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-2.9580 -0.8040 -0.2059  0.9558  2.9953 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)               1.14634    1.00109   1.145 0.254272    
Paris3$Accessibility_Total  0.20768    0.15743   1.319 0.189424    
Paris3$Walking              0.30108    0.08085   3.724 0.000291 ***
Paris3$Soft_Mode           -0.04188    0.11495  -0.364 0.716231    
Paris3$SocialCapital_T     -0.41621    0.20884  -1.993 0.048362 *  
Paris3$SocialCohesion_T     0.25266    0.12964   1.949 0.053465 .  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.282 on 130 degrees of freedom
Multiple R-squared:  0.1552,    Adjusted R-squared:  0.1227 
F-statistic: 4.777 on 5 and 130 DF,  p-value: 0.0004847
```

Social Life with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$SocialLife ~ Paris3$Walking + Paris3$SocialCapital_T + 
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-2.9474 -0.7380 -0.1683  0.8736  2.9673 

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)    
(Intercept)             2.1897     0.6160   3.555 0.000526 ***
Paris3$Walking          0.3207     0.0762   4.210  4.7e-05 ***
Paris3$SocialCapital_T -0.4011     0.2081  -1.928 0.056030 .  
Paris3$SocialCohesion_T  0.2469     0.1286   1.919 0.057149 .  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.281 on 132 degrees of freedom
Multiple R-squared:  0.1438,    Adjusted R-squared:  0.1243 
F-statistic:  7.39 on 3 and 132 DF,  p-value: 0.0001292
```

Leisure with proximity (linear)

```
Call:
lm(formula = Paris3$Leisure ~ Paris3$Accessibility_Total + Paris3$Walking + 
    Paris3$Soft_Mode + Paris3$SocialCapital_T + Paris3$SocialCohesion_T, 
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.4640 -1.4223  0.5223  1.2244  3.1167 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)   
(Intercept)               3.58701    1.28788   2.785  0.00615 **
Paris3$Accessibility_Total  0.09134    0.20253   0.451  0.65276   
Paris3$Walking              0.25261    0.10402   2.429  0.01653 * 
Paris3$Soft_Mode           -0.03061    0.14788  -0.207  0.83633   
Paris3$SocialCapital_T     -0.77831    0.26867  -2.897  0.00442 **
Paris3$SocialCohesion_T     0.12850    0.16679   0.770  0.44242   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.65 on 130 degrees of freedom
Multiple R-squared:  0.1007,    Adjusted R-squared:  0.06615 
F-statistic: 2.912 on 5 and 130 DF,  p-value: 0.01587
```

Leisure with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$Leisure ~ Paris3$Walking + Paris3$SocialCapital_T, 
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.2861 -1.3407  0.5137  1.2265  3.0759 

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)    
(Intercept)             4.32448    0.69279   6.242 5.38e-09 ***
Paris3$Walking          0.25897    0.09729   2.662  0.00873 ** 
Paris3$SocialCapital_T -0.68097    0.23785  -2.863  0.00488 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.636 on 133 degrees of freedom
Multiple R-squared:  0.09541,   Adjusted R-squared:  0.08181 
F-statistic: 7.014 on 2 and 133 DF,  p-value: 0.00127
```

Physical Activity with proximity (linear)

```
Call:
lm(formula = Paris3$PhysicalActivity ~ Paris3$Accessibility_Total + 
    Paris3$Walking + Paris3$Soft_Mode + Paris3$SocialCapital_T + 
    Paris3$SocialCohesion_T, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.3021 -1.2257 -0.0984  0.9471  3.1797 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)               2.50629    1.19256   2.102 0.037517 *  
Paris3$Accessibility_Total -0.12170    0.18754  -0.649 0.517529    
Paris3$Walking              0.19360    0.09632   2.010 0.046501 *  
Paris3$Soft_Mode            0.46971    0.13694   3.430 0.000809 ***
Paris3$SocialCapital_T      0.14423    0.24879   0.580 0.563090    
Paris3$SocialCohesion_T    -0.12207    0.15444  -0.790 0.430728    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.528 on 130 degrees of freedom
Multiple R-squared:  0.1454,    Adjusted R-squared:  0.1125 
F-statistic: 4.423 on 5 and 130 DF,  p-value: 0.0009417
```

Physical Activity with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$PhysicalActivity ~ Paris3$Walking + Paris3$Soft_Mode, 
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.3111 -1.2695 -0.1236  0.9180  3.1159 

Coefficients:
                Estimate Std. Error t value Pr(>|t|)    
(Intercept)      1.71727    0.53815   3.191 0.001769 ** 
Paris3$Walking   0.18754    0.09405   1.994 0.048203 *  
Paris3$Soft_Mode  0.42703    0.12589   3.392 0.000914 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.516 on 133 degrees of freedom
Multiple R-squared:  0.1385,    Adjusted R-squared:  0.1255 
F-statistic: 10.69 on 2 and 133 DF,  p-value: 4.968e-05
```

NP with proximity (linear)

```
Call:
lm(formula = Paris3$NP_T ~ Paris3$Accessibility_Total + Paris3$Walking + 
    Paris3$Soft_Mode + Paris3$SocialCapital_T + Paris3$SocialCohesion_T, 
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-2.4365 -0.6007  0.1793  0.6626  2.3215 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)               1.25397    0.72145   1.738 0.084555 .  
Paris3$Accessibility_Total  0.38495    0.11346   3.393 0.000917 ***
Paris3$Walking              0.03094    0.05827   0.531 0.596358    
Paris3$Soft_Mode            0.00222    0.08284   0.027 0.978662    
Paris3$SocialCapital_T      0.00669    0.15051   0.044 0.964616    
Paris3$SocialCohesion_T     0.20553    0.09343   2.200 0.029590 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9241 on 130 degrees of freedom
Multiple R-squared:  0.149,     Adjusted R-squared:  0.1163 
F-statistic: 4.554 on 5 and 130 DF,  p-value: 0.0007368
```

NP with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$NP_T ~ Paris3$Accessibility_Total + Paris3$SocialCohesion_T, 
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max 
-2.4192 -0.6117  0.1541  0.6449  2.3405 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)               1.33542    0.66887   1.997 0.047919 *  
Paris3$Accessibility_Total  0.40154    0.10089   3.980 0.000113 ***
Paris3$SocialCohesion_T     0.20938    0.08219   2.548 0.011985 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9147 on 133 degrees of freedom
Multiple R-squared:  0.147,     Adjusted R-squared:  0.1342 
F-statistic: 11.46 on 2 and 133 DF,  p-value: 2.557e-05
```

Green Image with proximity (linear)

```
Call:
lm(formula = Paris3$Green_T ~ Paris3$Accessibility_Total + Paris3$Walking +
    Paris3$Soft_Mode + Paris3$SocialCapital_T + Paris3$SocialCohesion_T,
    data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.8787 -0.5736  0.1402  0.6515  1.7249

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.16412    0.71783   5.801 4.76e-08 ***
Paris3$Accessibility_Total  0.13097    0.11289   1.160    0.248
Paris3$Walking          0.07619    0.05798   1.314    0.191
Paris3$Soft_Mode        0.01859    0.08243   0.226    0.822
Paris3$SocialCapital_T  0.18667    0.14975   1.247    0.215
Paris3$SocialCohesion_T -0.04111    0.09296  -0.442    0.659
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9195 on 130 degrees of freedom
Multiple R-squared:  0.05241,   Adjusted R-squared:  0.01597
F-statistic: 1.438 on 5 and 130 DF,  p-value: 0.2149
```

Green Image with proximity (linear stepwise)

```
Call:
lm(formula = Paris3$Green_T ~ Paris3$Walking, data = Paris3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.7216 -0.6393  0.1218  0.6945  1.6740

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    5.01275    0.32275  15.531   <2e-16 ***
Paris3$Walking  0.10443    0.05437   1.921   0.0569 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9178 on 134 degrees of freedom
Multiple R-squared:  0.0268,    Adjusted R-squared:  0.01953
F-statistic: 3.689 on 1 and 134 DF,  p-value: 0.05688
```

HWB with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = Paris.HedonicT$Hedonic_T ~ Walking + SocialLife +
    AgeRegSquare + Female + Degree + SocialCohesion_T + Green_T,
    data = Paris.HedonicT)

Coefficients:
                  (Intercept)    Walking SocialLife AgeRegSquare     Female    Degree
Happy               -5.927923 -0.7284426  1.1191671   0.11501110  1.1283363  3.025894
Moderately happy    -0.824668 -0.5004274  0.6084517   0.01571141  0.9340045  1.243850
Moderately unhappy  -1.796934 -0.6496709  0.8969323  -0.04162505  1.9229739  1.273678
Very Happy         -34.670507  0.1683627  1.3672948   0.21839896 -0.6217748 19.879674
                  SocialCohesion_T   Green_T
Happy                   -0.9676123 1.1088059
Moderately happy        -0.6604900 0.6753145
Moderately unhappy      -0.8263671 0.6904235
Very Happy               0.5336274 0.6716862

Std. Errors:
                  (Intercept)   Walking SocialLife AgeRegSquare    Female   Degree
Happy               3.596630 0.3680636  0.3811162   0.05170133 0.8444977 1.498671
Moderately happy    2.821169 0.3549308  0.3572279   0.04977390 0.7771084 1.078803
Moderately unhappy  3.377234 0.3801201  0.3933269   0.07598378 0.9504408 1.248148
Very Happy          3.070306 0.5586914  0.4838514   0.06583465 1.1474676 3.070443
                  SocialCohesion_T   Green_T
Happy                   0.4713930 0.4140749
Moderately happy        0.4408320 0.3634859
Moderately unhappy      0.4775151 0.4236608
Very Happy              0.7606052 0.6002534

Residual Deviance: 316.6399
AIC: 380.6399
```

LS with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = Paris.LS$Life_satisfaction ~ Leisure + PartnerReg +
    Accessibility_Total, data = Paris.LS)

Coefficients:
                  (Intercept)   Leisure PartnerReg Accessibility_Total
 Very Happy         -14.191844 0.7166041   3.266936           1.7232876
Happy                -4.364678 0.3091223   1.564593           0.7191763
Moderately happy     -4.083210 0.3839691   2.122033           0.5142048
Moderately unhappy   -4.087637 0.2617636   1.368065           0.6027477

Std. Errors:
                  (Intercept)   Leisure PartnerReg Accessibility_Total
 Very Happy           3.840882 0.2663834  1.0114816           0.5805752
Happy                 2.923891 0.2233686  0.8927997           0.4733476
Moderately happy      3.018927 0.2327318  0.9168932           0.4873372
Moderately unhappy    3.141043 0.2391238  0.9428487           0.5077155

Residual Deviance: 373.6468
AIC: 405.6468
```

EWB with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = Paris.Eudaimonic$Eudaimonia_T ~ SocialLife +
    Leisure + ChildrenReg, data = Paris.Eudaimonic)

Coefficients:
                  (Intercept) SocialLife   Leisure ChildrenReg
Happy               -2.336923  0.5277137 0.5165148   1.6017878
Moderately happy    -1.334439  0.2381490 0.5207682   0.7333124
Very Happy          -7.458759  0.9527738 0.9112075   3.5882250

Std. Errors:
                  (Intercept) SocialLife   Leisure ChildrenReg
Happy               1.564386  0.3673031 0.2717833    1.196031
Moderately happy    1.553544  0.3700488 0.2735356    1.230398
Very Happy          1.996192  0.4049225 0.3109222    1.322723

Residual Deviance: 298.3068
AIC: 322.3068
```

- **Barcelona outcomes**

LS with all (linear)

```
Call:
lm(formula = Barcelona.LS$Life_satisfaction ~ ., data = Barcelona.LS)

Residuals:
    Min      1Q  Median      3Q     Max
-1.7457 -0.2547  0.1197  0.5442  0.9541

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         -0.28272    4.43610  -0.064   0.9504
Walking             -0.18530    0.26573  -0.697   0.5015
SocialLife           0.16199    0.30924   0.524   0.6118
Leisure              0.09124    0.25739   0.354   0.7304
PhysicalActivity    -0.10668    0.30752  -0.347   0.7359
AgeRegSquare         0.02645    0.03614   0.732   0.4810
Female              -0.10484    0.59045  -0.178   0.8626
PartnerReg           0.31830    1.10859   0.287   0.7799
ChildrenReg         -1.17743    1.28524  -0.916   0.3812
Degree               0.73207    1.07710   0.680   0.5121
Unemployed           0.21837    1.67609   0.130   0.8989
LowIncome            0.82938    0.75091   1.104   0.2952
HealthPb             0.36214    1.19578   0.303   0.7682
Accessibility_Total  0.46164    0.47691   0.968   0.3559
Soft_Mode            0.20893    0.48573   0.430   0.6762
SocialCapital_T      2.03051    0.87846   2.311   0.0434 *
SocialCohesion_T    -0.84005    0.45338  -1.853   0.0936 .
NP_T                 0.91693    0.48537   1.889   0.0882 .
Green_T             -0.57592    0.47494  -1.213   0.2531
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.153 on 10 degrees of freedom
Multiple R-squared:  0.7351,    Adjusted R-squared:  0.2582
F-statistic: 1.541 on 18 and 10 DF,  p-value: 0.245
```

LS with all (linear stepwise)

```
Call:
lm(formula = Barcelona.LS$Life_satisfaction ~ LowIncome + HealthPb +
    Accessibility_Total + SocialCapital_T + SocialCohesion_T +
    NP_T + Green_T, data = Barcelona.LS)

Residuals:
     Min       1Q   Median       3Q      Max
-2.02983 -0.53380  0.05224  0.60219  1.64666

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         -0.4551     1.8197  -0.250 0.804961
LowIncome            0.7379     0.4466   1.652 0.113332
HealthPb             0.9711     0.5338   1.819 0.083155 .
Accessibility_Total  0.5567     0.2468   2.255 0.034913 *
SocialCapital_T      1.7313     0.3686   4.697 0.000123 ***
SocialCohesion_T    -0.5510     0.2234  -2.467 0.022319 *
NP_T                 1.0740     0.1877   5.722 1.11e-05 ***
Green_T             -0.7087     0.2533  -2.798 0.010777 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9023 on 21 degrees of freedom
Multiple R-squared:  0.6595,    Adjusted R-squared:  0.5459
F-statistic: 5.809 on 7 and 21 DF,  p-value: 0.0007621
```

EWB with all (linear)

```
Call:
lm(formula = Barcelona.Eudaimonic$Eudaimonia_T ~ ., data = Barcelona.Eudaimonic)

Residuals:
     Min       1Q   Median       3Q      Max
-0.60833 -0.22718 -0.01529  0.18283  0.72486

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)        5.1513612  2.3191684   2.221   0.0506 .
Walking           -0.0354524  0.1389246  -0.255   0.8037
SocialLife         0.1489038  0.1616711   0.921   0.3787
Leisure            0.1479789  0.1345636   1.100   0.2972
PhysicalActivity  -0.0730072  0.1607715  -0.454   0.6594
AgeRegSquare       0.0067975  0.0188919   0.360   0.7265
Female            -0.4572261  0.3086821  -1.481   0.1694
PartnerReg        -0.2178065  0.5795658  -0.376   0.7149
ChildrenReg       -0.3110418  0.6719167  -0.463   0.6533
Degree            -0.4657474  0.5631022  -0.827   0.4275
Unemployed         0.3164670  0.8762503   0.361   0.7255
LowIncome         -0.1368620  0.3925708  -0.349   0.7346
HealthPb          -0.6158536  0.6251467  -0.985   0.3478
Accessibility_Total -0.2829874  0.2493249  -1.135   0.2828
Soft_Mode          0.2883845  0.2539372   1.136   0.2826
SocialCapital_T   -0.1034856  0.4592520  -0.225   0.8263
SocialCohesion_T   0.0898545  0.2370224   0.379   0.7125
NP_T               0.0004522  0.2537487   0.002   0.9986
Green_T            0.2560904  0.2482941   1.031   0.3267
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6029 on 10 degrees of freedom
Multiple R-squared:  0.7176,    Adjusted R-squared:  0.2094
F-statistic: 1.412 on 18 and 10 DF,  p-value: 0.2937
```

EWB with all (linear stepwise)

```
Call:
lm(formula = Barcelona.Eudaimonic$Eudaimonia_T ~ SocialLife +
    Leisure + Female + Degree + HealthPb + Accessibility_Total +
    Soft_Mode, data = Barcelona.Eudaimonic)

Residuals:
     Min       1Q   Median       3Q      Max
-0.84178 -0.21981  0.01325  0.28344  0.99110

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)         5.32291    0.91482   5.819 8.93e-06 ***
SocialLife          0.22092    0.07748   2.851  0.00956 **
Leisure             0.16389    0.06670   2.457  0.02279 *
Female             -0.29732    0.21648  -1.373  0.18412
Degree             -0.41935    0.25139  -1.668  0.11014
HealthPb           -0.50681    0.23248  -2.180  0.04078 *
Accessibility_Total -0.19974    0.13389  -1.492  0.15063
Soft_Mode           0.19323    0.06785   2.848  0.00964 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.4851 on 21 degrees of freedom
Multiple R-squared:  0.6161,    Adjusted R-squared:  0.4881
F-statistic: 4.815 on 7 and 21 DF,  p-value: 0.002315
```

LS with proximity (linear)

```
Call:
lm(formula = Barcelona3$Life_satisfaction ~ Barcelona3$Accessibility_Total + 
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T + 
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.0317 -0.3443  0.2250  0.7106  1.6909 

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  2.55464    2.02685   1.260    0.220
Barcelona3$Accessibility_Total  0.41741    0.33483   1.247    0.225
Barcelona3$Walking             -0.10069    0.15503  -0.649    0.522
Barcelona3$Soft_Mode            0.06917    0.21782   0.318    0.754
Barcelona3$SocialCapital_T      0.69396    0.44183   1.571    0.130
Barcelona3$SocialCohesion_T    -0.17733    0.33090  -0.536    0.597

Residual standard error: 1.375 on 23 degrees of freedom
Multiple R-squared:  0.1338,    Adjusted R-squared:  -0.05454 
F-statistic: 0.7104 on 5 and 23 DF,  p-value: 0.6218
```

LS with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$Life_satisfaction ~ Barcelona3$SocialCapital_T, 
    data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.2138 -0.4938  0.3463  0.7862  1.7862 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)               4.0936     0.8757   4.674 7.31e-05 ***
Barcelona3$SocialCapital_T  0.5601     0.3872   1.447     0.16    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.314 on 27 degrees of freedom
Multiple R-squared:  0.07193,   Adjusted R-squared:  0.03756 
F-statistic: 2.093 on 1 and 27 DF,  p-value: 0.1595
```

EWB with proximity (linear)

```
Call:
lm(formula = Barcelona3$Eudaimonia_T ~ Barcelona3$Accessibility_Total + 
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T + 
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.18229 -0.43996 -0.05612  0.37816  1.07254 

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)    
(Intercept)                  3.87812    0.94793   4.091 0.000449 ***
Barcelona3$Accessibility_Total -0.02684    0.15660  -0.171 0.865406    
Barcelona3$Walking             0.07692    0.07250   1.061 0.299724    
Barcelona3$Soft_Mode           0.04270    0.10187   0.419 0.679028    
Barcelona3$SocialCapital_T     0.15863    0.20664   0.768 0.450507    
Barcelona3$SocialCohesion_T    0.24633    0.15476   1.592 0.125098    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6431 on 23 degrees of freedom
Multiple R-squared:  0.2611,    Adjusted R-squared:  0.1005 
F-statistic: 1.626 on 5 and 23 DF,  p-value: 0.193
```

EWB with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$Eudaimonia_T ~ Barcelona3$Walking + Barcelona3$SocialCohesion_T, 
    data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.25307 -0.44661  0.02549  0.41182  0.90844 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)              3.92366    0.62314   6.297 1.15e-06 ***
Barcelona3$Walking       0.09111    0.05758   1.582   0.1257    
Barcelona3$SocialCohesion_T  0.28465    0.12432   2.290   0.0304 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6176 on 26 degrees of freedom
Multiple R-squared:  0.2298,    Adjusted R-squared:  0.1705 
F-statistic: 3.878 on 2 and 26 DF,  p-value: 0.03359
```

LS with experience (linear)

```
Call:
lm(formula = Barcelona3$Life_satisfaction ~ Barcelona3$SocialLife + 
    Barcelona3$Leisure + Barcelona3$PhysicalActivity + Barcelona3$NP_T + 
    Barcelona3$Green_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max 
-3.09589 -0.31850 -0.03055  0.77802  1.67546 

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)  
(Intercept)                2.68196    1.77887   1.508   0.1453  
Barcelona3$SocialLife      0.19851    0.20037   0.991   0.3321  
Barcelona3$Leisure         0.17641    0.15868   1.112   0.2777  
Barcelona3$PhysicalActivity -0.15690    0.16114  -0.974   0.3403  
Barcelona3$NP_T            0.45214    0.21456   2.107   0.0462 *
Barcelona3$Green_T        -0.06477    0.30223  -0.214   0.8322  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.196 on 23 degrees of freedom
Multiple R-squared:  0.3446,    Adjusted R-squared:  0.2021 
F-statistic: 2.419 on 5 and 23 DF,  p-value: 0.0668
```

LS with experience (linear stepwise)

```
Call:
lm(formula = Barcelona3$Life_satisfaction ~ Barcelona3$NP_T, 
    data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.1247 -0.5339  0.0434  0.6207  1.6071 

Coefficients:
             Estimate Std. Error t value Pr(>|t|)   
(Intercept)    2.8565     0.8167   3.498  0.00164 **
Barcelona3$NP_T   0.5637     0.1808   3.117  0.00431 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.169 on 27 degrees of freedom
Multiple R-squared:  0.2646,    Adjusted R-squared:  0.2374 
F-statistic: 9.715 on 1 and 27 DF,  p-value: 0.004306
```

EWB with experience (linear)

```
Call:
lm(formula = Barcelona3$Eudaimonia_T ~ Barcelona3$SocialLife + 
    Barcelona3$Leisure + Barcelona3$PhysicalActivity + Barcelona3$NP_T + 
    Barcelona3$Green_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.47118 -0.23019  0.00968  0.13615  1.26794 

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)    
(Intercept)                3.22659    0.81636   3.952 0.000633 ***
Barcelona3$SocialLife      0.14225    0.09195   1.547 0.135527    
Barcelona3$Leisure         0.13428    0.07282   1.844 0.078115 .  
Barcelona3$PhysicalActivity  0.03649    0.07395   0.493 0.626398    
Barcelona3$NP_T            0.16130    0.09847   1.638 0.115012    
Barcelona3$Green_T         0.05080    0.13870   0.366 0.717499    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5489 on 23 degrees of freedom
Multiple R-squared:  0.4617,    Adjusted R-squared:  0.3447 
F-statistic: 3.946 on 5 and 23 DF,  p-value: 0.009921
```

EWB with experience (linear stepwise)

```
Call:
lm(formula = Barcelona3$Eudaimonia_T ~ Barcelona3$SocialLife + 
    Barcelona3$Leisure + Barcelona3$NP_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.48385 -0.25333 -0.01685  0.19981  1.29861 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)          3.55392    0.48316   7.356 1.05e-07 ***
Barcelona3$SocialLife  0.16363    0.08250   1.983   0.0584 .  
Barcelona3$Leisure     0.14448    0.06914   2.090   0.0470 *  
Barcelona3$NP_T        0.15800    0.09508   1.662   0.1090    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5321 on 25 degrees of freedom
Multiple R-squared:  0.4503,    Adjusted R-squared:  0.3843 
F-statistic: 6.826 on 3 and 25 DF,  p-value: 0.001625
```

Social Life with proximity (linear)

```
Call:
lm(formula = Barcelona3$SocialLife ~ Barcelona3$Accessibility_Total +
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.21148 -0.87194  0.05467  1.02387  1.80907

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  -1.7281     1.9359  -0.893   0.3813
Barcelona3$Accessibility_Total   0.6129     0.3198   1.916   0.0678 .
Barcelona3$Walking               0.1118     0.1481   0.755   0.4579
Barcelona3$Soft_Mode            -0.1216     0.2080  -0.585   0.5645
Barcelona3$SocialCapital_T       0.4800     0.4220   1.138   0.2670
Barcelona3$SocialCohesion_T      0.2129     0.3160   0.674   0.5073
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.313 on 23 degrees of freedom
Multiple R-squared:  0.2898,    Adjusted R-squared:  0.1354
F-statistic: 1.877 on 5 and 23 DF,  p-value: 0.1376
```

Social Life with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$SocialLife ~ Barcelona3$Accessibility_Total +
    Barcelona3$SocialCapital_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.23744 -0.89902  0.03739  1.11364  2.11184

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  -1.4358     1.8218  -0.788   0.4378
Barcelona3$Accessibility_Total   0.7422     0.2677   2.773   0.0101 *
Barcelona3$SocialCapital_T       0.5750     0.3727   1.543   0.1350
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.258 on 26 degrees of freedom
Multiple R-squared:  0.2633,    Adjusted R-squared:  0.2066
F-statistic: 4.647 on 2 and 26 DF,  p-value: 0.01882
```

Leisure with proximity (linear)

```
Call:
lm(formula = Barcelona3$Leisure ~ Barcelona3$Accessibility_Total +
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.0331 -0.6478  0.4487  0.8607  1.5641

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  5.09394    2.19806   2.317   0.0297 *
Barcelona3$Accessibility_Total -0.50992    0.36312  -1.404   0.1736
Barcelona3$Walking           0.05759    0.16812   0.343   0.7350
Barcelona3$Soft_Mode        -0.13604    0.23622  -0.576   0.5703
Barcelona3$SocialCapital_T   0.11638    0.47915   0.243   0.8103
Barcelona3$SocialCohesion_T  0.59629    0.35885   1.662   0.1102
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.491 on 23 degrees of freedom
Multiple R-squared:  0.161,     Adjusted R-squared:  -0.02136
F-statistic: 0.8829 on 5 and 23 DF,  p-value: 0.5083
```

Leisure with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$Leisure ~ Barcelona3$Accessibility_Total +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.0788 -0.5867  0.3507  0.9542  1.7186

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  5.3790     1.8539   2.901  0.00747 **
Barcelona3$Accessibility_Total -0.4965     0.3195  -1.554  0.13224
Barcelona3$SocialCohesion_T  0.5733     0.3039   1.887  0.07041 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.414 on 26 degrees of freedom
Multiple R-squared:  0.1468,    Adjusted R-squared:  0.08113
F-statistic: 2.236 on 2 and 26 DF,  p-value: 0.127
```

Physical Activity with proximity (linear)

```
Call:
lm(formula = Barcelona3$PhysicalActivity ~ Barcelona3$Accessibility_Total +
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.5850 -0.9146 -0.3015  1.0498  2.7626

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  2.80249    2.28186   1.228    0.232
Barcelona3$Accessibility_Total  0.09655    0.37696   0.256    0.800
Barcelona3$Walking          -0.06697    0.17453  -0.384    0.705
Barcelona3$Soft_Mode         0.41832    0.24523   1.706    0.102
Barcelona3$SocialCapital_T   0.11754    0.49742   0.236    0.815
Barcelona3$SocialCohesion_T -0.02428    0.37253  -0.065    0.949

Residual standard error: 1.548 on 23 degrees of freedom
Multiple R-squared:  0.1369,    Adjusted R-squared:  -0.05079
F-statistic: 0.7293 on 5 and 23 DF,  p-value: 0.6087
```

Physical Activity with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$PhysicalActivity ~ Barcelona3$Soft_Mode,
    data = Barcelona3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.6100 -0.9903 -0.3706  1.0097  2.7704

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)       3.2296     0.4979   6.486 5.94e-07 ***
Barcelona3$Soft_Mode   0.3803     0.1906   1.996   0.0561 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.436 on 27 degrees of freedom
Multiple R-squared:  0.1286,    Adjusted R-squared:  0.09628
F-statistic: 3.983 on 1 and 27 DF,  p-value: 0.05614
```

NP with proximity (linear)

```
Call:
lm(formula = Barcelona3$NP_T ~ Barcelona3$Accessibility_Total +
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.10098 -0.51497 -0.00745  0.62457  2.03701

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  1.98994    1.75423   1.134    0.268
Barcelona3$Accessibility_Total  0.24553    0.28980   0.847    0.406
Barcelona3$Walking           0.03633    0.13417   0.271    0.789
Barcelona3$Soft_Mode        -0.11696    0.18852  -0.620    0.541
Barcelona3$SocialCapital_T  -0.44879    0.38240  -1.174    0.253
Barcelona3$SocialCohesion_T  0.46939    0.28639   1.639    0.115

Residual standard error: 1.19 on 23 degrees of freedom
Multiple R-squared:  0.2209,    Adjusted R-squared:  0.05152
F-statistic: 1.304 on 5 and 23 DF,  p-value: 0.2967
```

NP with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$NP_T ~ Barcelona3$SocialCapital_T + Barcelona3$SocialCohesion_T,
    data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.31212 -0.52836  0.06128  0.66189  1.94244

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)              3.2674     1.1036   2.961  0.00647 **
Barcelona3$SocialCapital_T  -0.5429     0.3568  -1.522  0.14019
Barcelona3$SocialCohesion_T  0.5338     0.2437   2.190  0.03766 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.151 on 26 degrees of freedom
Multiple R-squared:  0.1767,    Adjusted R-squared:  0.1134
F-statistic:  2.79 on 2 and 26 DF,  p-value: 0.07984
```

Green with proximity (linear)	Green with proximity (linear stepwise)

```
Call:
lm(formula = Barcelona3$Green_T ~ Barcelona3$Accessibility_Total +
    Barcelona3$Walking + Barcelona3$Soft_Mode + Barcelona3$SocialCapital_T +
    Barcelona3$SocialCohesion_T, data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-1.95253 -0.46001 -0.07623  0.60806  1.49286

Coefficients:
                            Estimate Std. Error t value Pr(>|t|)
(Intercept)                  3.91724    1.23500   3.172  0.00426 **
Barcelona3$Accessibility_Total  0.15704    0.20402   0.770  0.44930
Barcelona3$Walking              0.03311    0.09446   0.351  0.72911
Barcelona3$Soft_Mode            0.01180    0.13272   0.089  0.92992
Barcelona3$SocialCapital_T      0.58334    0.26922   2.167  0.04085 *
Barcelona3$SocialCohesion_T    -0.08056    0.20163  -0.400  0.69316
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8379 on 23 degrees of freedom
Multiple R-squared:  0.1996,    Adjusted R-squared:  0.02554
F-statistic: 1.147 on 5 and 23 DF,  p-value: 0.3647
```

```
Call:
lm(formula = Barcelona3$Green_T ~ Barcelona3$SocialCapital_T,
    data = Barcelona3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.12280 -0.48961 -0.09004  0.67634  1.27677

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)               4.7909     0.5275   9.083 1.07e-09 ***
Barcelona3$SocialCapital_T   0.5328     0.2332   2.285   0.0304 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7913 on 27 degrees of freedom
Multiple R-squared:  0.162,     Adjusted R-squared:  0.131
F-statistic: 5.219 on 1 and 27 DF,  p-value: 0.03042
```

- **Outcomes of all samples merged**

HWB with all (linear)	HWB with all (linear stepwise)

```
Call:
lm(formula = All.HedonicT$Hedonic_T ~ ., data = All.HedonicT)

Residuals:
    Min      1Q  Median      3Q     Max
-2.1578 -0.6586  0.1733  0.6494  2.2092

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          1.419792   0.877872   1.617   0.1078
Walking             -0.036975   0.054221  -0.682   0.4963
SocialLife           0.090354   0.063722   1.418   0.1582
Leisure              0.095467   0.052546   1.817   0.0711 .
PhysicalActivity    -0.015019   0.052648  -0.285   0.7758
AgeRegSquare         0.018128   0.009857   1.839   0.0678 .
Female               0.090499   0.163459   0.554   0.5806
PartnerReg           0.112317   0.166973   0.673   0.5021
ChildrenReg          0.242821   0.301277   0.806   0.4215
Degree               0.156290   0.281833   0.555   0.5800
Unemployed           0.590501   0.525077   1.125   0.2624
LowIncome           -0.126397   0.155599  -0.812   0.4178
HealthPb            -0.406949   0.224523  -1.813   0.0718 .
Accessibility_Total  0.241881   0.105028   2.303   0.0226 *
Soft_Mode           -0.063285   0.074650  -0.848   0.3978
SocialCapital_T      0.035819   0.156511   0.229   0.8193
SocialCohesion_T    -0.131128   0.087995  -1.490   0.1381
NP_T                 0.159705   0.082107   1.945   0.0535 .
Green_T              0.109824   0.084305   1.303   0.1945
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9532 on 160 degrees of freedom
Multiple R-squared:  0.2135,    Adjusted R-squared:  0.125
F-statistic: 2.413 on 18 and 160 DF,  p-value: 0.001905
```

```
Call:
lm(formula = All.HedonicT$Hedonic_T ~ Leisure + AgeRegSquare +
    HealthPb + Accessibility_Total + NP_T + Green_T, data = All.HedonicT)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2836 -0.6229  0.1786  0.7077  1.9401

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          1.395866   0.693590   2.013 0.045725 *
Leisure              0.092432   0.043808   2.110 0.036312 *
AgeRegSquare         0.020812   0.005868   3.547 0.000502 ***
HealthPb            -0.471838   0.212823  -2.217 0.027931 *
Accessibility_Total  0.210430   0.093626   2.248 0.025875 *
NP_T                 0.144004   0.076053   1.893 0.059974 .
Green_T              0.130967   0.078282   1.673 0.096143 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9439 on 172 degrees of freedom
Multiple R-squared:  0.171,     Adjusted R-squared:  0.142
F-statistic: 5.912 on 6 and 172 DF,  p-value: 1.242e-05
```

LS with all (linear)

```
Call:
lm(formula = All.LS$Life_satisfaction ~ ., data = All.LS)

Residuals:
    Min      1Q  Median      3Q     Max
-3.7080 -0.6562  0.1212  0.8031  2.1729

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.730908   1.084897   2.517  0.01281 *
Walking             -0.096569   0.067008  -1.441  0.15149
SocialLife           0.186165   0.078750   2.364  0.01928 *
Leisure              0.132614   0.064938   2.042  0.04278 *
PhysicalActivity    -0.031987   0.065064  -0.492  0.62366
AgeRegSquare        -0.002909   0.012182  -0.239  0.81154
Female              -0.021289   0.202007  -0.105  0.91620
PartnerReg           0.655427   0.206349   3.176  0.00179 **
ChildrenReg          0.451476   0.372325   1.213  0.22708
Degree              -0.272047   0.348297  -0.781  0.43591
Unemployed           0.386189   0.648903   0.595  0.55259
LowIncome           -0.116791   0.192294  -0.607  0.54447
HealthPb            -0.169176   0.277471  -0.610  0.54292
Accessibility_Total  0.334333   0.129797   2.576  0.01090 *
Soft_Mode           -0.025930   0.092255  -0.281  0.77902
SocialCapital_T      0.157419   0.193421   0.814  0.41693
SocialCohesion_T    -0.223402   0.108747  -2.054  0.04157 *
NP_T                 0.154745   0.101470   1.525  0.12922
Green_T             -0.056258   0.104186  -0.540  0.58996
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.178 on 160 degrees of freedom
Multiple R-squared:  0.2046,    Adjusted R-squared:  0.1151
F-statistic: 2.286 on 18 and 160 DF,  p-value: 0.00343
```

LS with all (linear stepwise)

```
Call:
lm(formula = All.LS$Life_satisfaction ~ Walking + SocialLife +
    Leisure + PartnerReg + ChildrenReg + Accessibility_Total +
    SocialCohesion_T + NP_T, data = All.LS)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0750 -0.7242  0.1676  0.8893  2.3186

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.12177    0.77506   2.738  0.00685 **
Walking             -0.09881    0.06111  -1.617  0.10779
SocialLife           0.18610    0.07523   2.474  0.01435 *
Leisure              0.10847    0.05661   1.916  0.05702 .
PartnerReg           0.63921    0.19355   3.303  0.00117 **
ChildrenReg          0.43722    0.23095   1.893  0.06004 .
Accessibility_Total  0.32397    0.11873   2.729  0.00703 **
SocialCohesion_T    -0.17414    0.09418  -1.849  0.06619 .
NP_T                 0.17001    0.09686   1.755  0.08102 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.156 on 170 degrees of freedom
Multiple R-squared:  0.1864,    Adjusted R-squared:  0.1481
F-statistic: 4.868 on 8 and 170 DF,  p-value: 2.019e-05
```

EWB with all (linear)

```
Call:
lm(formula = All.Eudaimonic$Eudaimonia_T ~ ., data = All.Eudaimonic)

Residuals:
    Min      1Q  Median      3Q     Max
-2.8368 -0.4578  0.0480  0.4605  1.7135

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.446535   0.697338   3.508 0.000585 ***
Walking              0.018358   0.043070   0.426 0.670513
SocialLife           0.139365   0.050618   2.753 0.006583 **
Leisure              0.091151   0.041740   2.184 0.030434 *
PhysicalActivity     0.026779   0.041821   0.640 0.522883
AgeRegSquare         0.006656   0.007830   0.850 0.396537
Female              -0.162487   0.129844  -1.251 0.212615
PartnerReg           0.130872   0.132635   0.987 0.325275
ChildrenReg          0.456257   0.239319   1.906 0.058380 .
Degree              -0.182021   0.223874  -0.813 0.417397
Unemployed           0.419589   0.417094   1.006 0.315944
LowIncome           -0.006456   0.123600  -0.052 0.958408
HealthPb            -0.165889   0.178350  -0.930 0.353703
Accessibility_Total  0.134730   0.083429   1.615 0.108303
Soft_Mode           -0.025446   0.059298  -0.429 0.668412
SocialCapital_T     -0.062421   0.124325  -0.502 0.616302
SocialCohesion_T     0.015094   0.069899   0.216 0.829305
NP_T                 0.137750   0.065222   2.112 0.036236 *
Green_T              0.081666   0.066968   1.219 0.224456
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7572 on 160 degrees of freedom
Multiple R-squared:  0.2903,    Adjusted R-squared:  0.2105
F-statistic: 3.636 on 18 and 160 DF,  p-value: 5.137e-06
```

EWB with all (linear stepwise)

```
Call:
lm(formula = All.Eudaimonic$Eudaimonia_T ~ SocialLife + Leisure +
    ChildrenReg + Accessibility_Total + NP_T, data = All.Eudaimonic)

Residuals:
     Min       1Q   Median       3Q      Max
-2.86690 -0.41360  0.03212  0.53784  1.61497

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.64915    0.46712   5.671 5.84e-08 ***
SocialLife           0.14086    0.04515   3.120  0.00212 **
Leisure              0.11796    0.03646   3.235  0.00146 **
ChildrenReg          0.61873    0.14163   4.368 2.15e-05 ***
Accessibility_Total  0.13957    0.07427   1.879  0.06191 .
NP_T                 0.14334    0.06034   2.375  0.01863 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.746 on 173 degrees of freedom
Multiple R-squared:  0.2552,    Adjusted R-squared:  0.2337
F-statistic: 11.86 on 5 and 173 DF,  p-value: 7.146e-10
```

HWB with proximity (linear)

```
Call:
lm(formula = All3$Hedonic_T ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2499 -0.6967  0.1274  0.7993  1.9664

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.06163    0.63999   4.784 3.67e-06 ***
All3$Accessibility_Total  0.27474    0.09976   2.754  0.00651 **
All3$Walking          -0.01166    0.05334  -0.219  0.82722
All3$Soft_Mode        -0.03730    0.07184  -0.519  0.60428
All3$SocialCapital_T   0.14940    0.13886   1.076  0.28345
All3$SocialCohesion_T -0.04452    0.08853  -0.503  0.61569
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.008 on 173 degrees of freedom
Multiple R-squared:  0.04875,   Adjusted R-squared:  0.02126
F-statistic: 1.773 on 5 and 173 DF,  p-value: 0.1207
```

HWB with proximity (linear stepwise)

```
Call:
lm(formula = All3$Hedonic_T ~ All3$Accessibility_Total, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.3091 -0.7525  0.0659  0.8006  1.9549

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.17026    0.55423   5.720 4.46e-08 ***
All3$Accessibility_Total  0.25252    0.09274   2.723  0.00712 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.001 on 177 degrees of freedom
Multiple R-squared:  0.0402,    Adjusted R-squared:  0.03478
F-statistic: 7.414 on 1 and 177 DF,  p-value: 0.007121
```

LS with proximity (linear)

```
Call:
lm(formula = All3$Life_satisfaction ~ All3$Accessibility_Total +
    All3$Walking + All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.1039 -0.6488  0.2076  0.8673  1.9295

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.44000    0.77680   4.428 1.68e-05 ***
All3$Accessibility_Total  0.39901    0.12108   3.295  0.00119 **
All3$Walking           -0.07022    0.06474  -1.085  0.27960
All3$Soft_Mode          0.01229    0.08720   0.141  0.88812
All3$SocialCapital_T    0.22743    0.16854   1.349  0.17898
All3$SocialCohesion_T  -0.13272    0.10745  -1.235  0.21846
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.224 on 173 degrees of freedom
Multiple R-squared:  0.07198,   Adjusted R-squared:  0.04516
F-statistic: 2.684 on 5 and 173 DF,  p-value: 0.02306
```

LS with proximity (linear stepwise)

```
Call:
lm(formula = All3$Life_satisfaction ~ All3$Accessibility_Total,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.2055 -0.6265  0.2532  0.8472  1.8948

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.2205     0.6760   4.764 3.94e-06 ***
All3$Accessibility_Total  0.3609     0.1131   3.190  0.00168 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.221 on 177 degrees of freedom
Multiple R-squared:  0.05438,   Adjusted R-squared:  0.04903
F-statistic: 10.18 on 1 and 177 DF,  p-value: 0.001681
```

EWB with proximity (linear)

```
Call:
lm(formula = All3$Eudaimonia_T ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.66010 -0.55772  0.07177  0.56869  1.48383

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.52469    0.52608   6.700 2.82e-10 ***
All3$Accessibility_Total  0.16012    0.08200   1.953   0.0525 .
All3$Walking           0.06340    0.04385   1.446   0.1500
All3$Soft_Mode         0.01405    0.05906   0.238   0.8122
All3$SocialCapital_T   0.08252    0.11414   0.723   0.4707
All3$SocialCohesion_T  0.10359    0.07277   1.424   0.1564
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8287 on 173 degrees of freedom
Multiple R-squared:  0.08085,   Adjusted R-squared:  0.05429
F-statistic: 3.043 on 5 and 173 DF,  p-value: 0.01168
```

EWB with proximity (linear stepwise)

```
Call:
lm(formula = All3$Eudaimonia_T ~ All3$Accessibility_Total + All3$Walking +
    All3$SocialCohesion_T, data = All3)

Residuals:
     Min       1Q   Median       3Q      Max
-2.66248 -0.56424  0.06633  0.56128  1.49040

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3.55970    0.50803   7.007 5.06e-11 ***
All3$Accessibility_Total  0.16326    0.07962   2.051   0.0418 *
All3$Walking           0.06860    0.04170   1.645   0.1017
All3$SocialCohesion_T  0.13027    0.06338   2.055   0.0413 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8253 on 175 degrees of freedom
Multiple R-squared:  0.07781,   Adjusted R-squared:  0.062
F-statistic: 4.922 on 3 and 175 DF,  p-value: 0.002625
```

HWB with experience (linear)

```
Call:
lm(formula = All3$Hedonic_T ~ All3$SocialLife + All3$Leisure +
    All3$PhysicalActivity + All3$NP_T + All3$Green_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2058 -0.6382  0.1020  0.8003  1.9126

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          2.676247   0.574490   4.658 6.33e-06 ***
All3$SocialLife      0.025407   0.058215   0.436   0.6631
All3$Leisure         0.074479   0.051261   1.453   0.1481
All3$PhysicalActivity 0.004295   0.050499   0.085   0.9323
All3$NP_T            0.167275   0.075726   2.209   0.0285 *
All3$Green_T         0.133920   0.081979   1.634   0.1042
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9914 on 173 degrees of freedom
Multiple R-squared:  0.07997,   Adjusted R-squared:  0.05338
F-statistic: 3.007 on 5 and 173 DF,  p-value: 0.01251
```

HWB with experience (linear stepwise)

```
Call:
lm(formula = All3$Hedonic_T ~ All3$Leisure + All3$NP_T + All3$Green_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2307 -0.6420  0.1418  0.7926  1.8872

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.70772    0.56602   4.784 3.64e-06 ***
All3$Leisure  0.08288    0.04559   1.818   0.0708 .
All3$NP_T     0.17307    0.07427   2.330   0.0209 *
All3$Green_T  0.13846    0.08094   1.711   0.0889 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9864 on 175 degrees of freedom
Multiple R-squared:  0.07886,   Adjusted R-squared:  0.06307
F-statistic: 4.994 on 3 and 175 DF,  p-value: 0.002391
```

LS with experience (linear)

```
Call:
lm(formula = All3$Life_satisfaction ~ All3$SocialLife + All3$Leisure +
    All3$PhysicalActivity + All3$NP_T + All3$Green_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0324 -0.6989  0.2318  0.9324  2.1189

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          3.806358   0.717500   5.305 3.41e-07 ***
All3$SocialLife      0.070586   0.072707   0.971    0.333
All3$Leisure         0.081522   0.064022   1.273    0.205
All3$PhysicalActivity 0.005426   0.063070   0.086    0.932
All3$NP_T            0.140405   0.094577   1.485    0.139
All3$Green_T         0.038443   0.102386   0.375    0.708
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.238 on 173 degrees of freedom
Multiple R-squared:  0.04968,   Adjusted R-squared:  0.02221
F-statistic: 1.809 on 5 and 173 DF,  p-value: 0.1135
```

LS with experience (linear stepwise)

```
Call:
lm(formula = All3$Life_satisfaction ~ All3$Leisure + All3$NP_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0384 -0.6923  0.2686  0.8582  2.0848

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   4.15502    0.45834   9.065 2.39e-16 ***
All3$Leisure  0.10628    0.05642   1.884   0.0612 .
All3$NP_T     0.15645    0.09276   1.687   0.0935 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.232 on 176 degrees of freedom
Multiple R-squared:  0.04293,   Adjusted R-squared:  0.03206
F-statistic: 3.947 on 2 and 176 DF,  p-value: 0.02104
```

EWB with experience (linear)

```
Call:
lm(formula = All3$Eudaimonia_T ~ All3$SocialLife + All3$Leisure +
    All3$PhysicalActivity + All3$NP_T + All3$Green_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.7452 -0.5653  0.1019  0.5134  1.7782

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          3.19830    0.45290   7.062 3.83e-11 ***
All3$SocialLife      0.09129    0.04589   1.989   0.0483 *
All3$Leisure         0.08350    0.04041   2.066   0.0403 *
All3$PhysicalActivity  0.05871    0.03981   1.475   0.1421
All3$NP_T            0.14008    0.05970   2.346   0.0201 *
All3$Green_T         0.10253    0.06463   1.586   0.1145
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7816 on 173 degrees of freedom
Multiple R-squared:  0.1823,    Adjusted R-squared:  0.1587
F-statistic: 7.715 on 5 and 173 DF,  p-value: 1.424e-06
```

EWB with experience (linear stepwise)

```
Call:
lm(formula = All3$Eudaimonia_T ~ All3$SocialLife + All3$Leisure +
    All3$PhysicalActivity + All3$NP_T + All3$Green_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.7452 -0.5653  0.1019  0.5134  1.7782

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          3.19830    0.45290   7.062 3.83e-11 ***
All3$SocialLife      0.09129    0.04589   1.989   0.0483 *
All3$Leisure         0.08350    0.04041   2.066   0.0403 *
All3$PhysicalActivity  0.05871    0.03981   1.475   0.1421
All3$NP_T            0.14008    0.05970   2.346   0.0201 *
All3$Green_T         0.10253    0.06463   1.586   0.1145
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7816 on 173 degrees of freedom
Multiple R-squared:  0.1823,    Adjusted R-squared:  0.1587
F-statistic: 7.715 on 5 and 173 DF,  p-value: 1.424e-06
```

Social Life with proximity (linear)

```
Call:
lm(formula = All3$SocialLife ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.9318 -0.8629 -0.2513  1.0130  3.1659

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            0.94904    0.83605   1.135    0.258
All3$Accessibility_Total  0.22150    0.13032   1.700    0.091 .
All3$Walking           0.28922    0.06968   4.150  5.2e-05 ***
All3$Soft_Mode        -0.07976    0.09385  -0.850    0.397
All3$SocialCapital_T  -0.28925    0.18140  -1.595    0.113
All3$SocialCohesion_T  0.26734    0.11565   2.312    0.022 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.317 on 173 degrees of freedom
Multiple R-squared:  0.1488,    Adjusted R-squared:  0.1242
F-statistic: 6.048 on 5 and 173 DF,  p-value: 3.465e-05
```

Social Life with proximity (linear stepwise)

```
Call:
lm(formula = All3$SocialLife ~ All3$Accessibility_Total + All3$Walking +
    All3$SocialCapital_T + All3$SocialCohesion_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.8358 -0.8251 -0.2798  1.0085  3.1862

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            1.08312    0.82038   1.320    0.188
All3$Accessibility_Total  0.19696    0.12698   1.551    0.123
All3$Walking           0.27211    0.06666   4.082 6.79e-05 ***
All3$SocialCapital_T  -0.28568    0.18120  -1.577    0.117
All3$SocialCohesion_T  0.25354    0.11441   2.216    0.028 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.316 on 174 degrees of freedom
Multiple R-squared:  0.1452,    Adjusted R-squared:  0.1256
F-statistic: 7.392 on 4 and 174 DF,  p-value: 1.603e-05
```

Leisure with proximity (linear)

```
Call:
lm(formula = All3$Leisure ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
   Min     1Q Median     3Q    Max
-4.084 -1.579  0.579  1.253  2.724

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.155435   1.042554   3.986  9.9e-05 ***
All3$Accessibility_Total -0.078310   0.162503  -0.482   0.6305
All3$Walking            0.192303   0.086894   2.213   0.0282 *
All3$Soft_Mode         -0.002117   0.117036  -0.018   0.9856
All3$SocialCapital_T   -0.524625   0.226201  -2.319   0.0215 *
All3$SocialCohesion_T   0.243577   0.144215   1.689   0.0930 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.642 on 173 degrees of freedom
Multiple R-squared:  0.05722,   Adjusted R-squared:  0.02997
F-statistic:   2.1 on 5 and 173 DF,  p-value: 0.06765
```

Leisure with proximity (linear stepwise)

```
Call:
lm(formula = All3$Leisure ~ All3$Walking + All3$SocialCapital_T +
    All3$SocialCohesion_T, data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.1107 -1.5450  0.5621  1.2777  2.7099

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          3.7752     0.6710   5.626  7.2e-08 ***
All3$Walking         0.1810     0.0799   2.266   0.0247 *
All3$SocialCapital_T  -0.5222     0.2250  -2.321   0.0214 *
All3$SocialCohesion_T  0.2363     0.1414   1.671   0.0965 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.634 on 175 degrees of freedom
Multiple R-squared:  0.05587,   Adjusted R-squared:  0.03968
F-statistic: 3.452 on 3 and 175 DF,  p-value: 0.01783
```

Physical Activity with proximity (linear)

```
Call:
lm(formula = All3$PhysicalActivity ~ All3$Accessibility_Total +
    All3$Walking + All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.2980 -1.2122 -0.0364  0.9705  3.3759

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            1.843985   0.978363   1.885  0.06114 .
All3$Accessibility_Total  0.004397   0.152498   0.029  0.97703
All3$Walking           0.122964   0.081544   1.508  0.13339
All3$Soft_Mode         0.367442   0.109830   3.346  0.00101 **
All3$SocialCapital_T   0.225333   0.212274   1.062  0.28993
All3$SocialCohesion_T -0.009529   0.135335  -0.070  0.94395
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.541 on 173 degrees of freedom
Multiple R-squared:  0.1168,    Adjusted R-squared:  0.09123
F-statistic: 4.574 on 5 and 173 DF,  p-value: 0.0006067
```

Physical Activity with proximity (linear stepwise)

```
Call:
lm(formula = All3$PhysicalActivity ~ All3$Walking + All3$Soft_Mode,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-3.2370 -1.2370 -0.1084  0.9559  3.6555

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.21588    0.44665   4.961 1.64e-06 ***
All3$Walking  0.12862    0.07958   1.616 0.107842
All3$Soft_Mode  0.37360    0.10510   3.555 0.000486 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.534 on 176 degrees of freedom
Multiple R-squared:  0.1098,    Adjusted R-squared:  0.0997
F-statistic: 10.86 on 2 and 176 DF,  p-value: 3.584e-05
```

NP with proximity (linear)

```
Call:
lm(formula = All3$NP_T ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.4288 -0.5569  0.1071  0.5843  2.3608

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             1.47165    0.60374   2.438  0.01580 *
All3$Accessibility_Total  0.38778    0.09410   4.121 5.85e-05 ***
All3$Walking              0.03520    0.05032   0.700  0.48514
All3$Soft_Mode           -0.05044    0.06777  -0.744  0.45771
All3$SocialCapital_T     -0.12897    0.13099  -0.985  0.32621
All3$SocialCohesion_T     0.22979    0.08351   2.752  0.00656 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.951 on 173 degrees of freedom
Multiple R-squared:  0.1453,    Adjusted R-squared:  0.1206
F-statistic: 5.882 on 5 and 173 DF,  p-value: 4.777e-05
```

NP with proximity (linear stepwise)

```
Call:
lm(formula = All3$NP_T ~ All3$Accessibility_Total + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-2.4012 -0.6176  0.1254  0.6242  2.3609

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             1.52408    0.56784   2.684  0.00797 **
All3$Accessibility_Total  0.38454    0.08824   4.358 2.23e-05 ***
All3$SocialCohesion_T     0.18362    0.07276   2.524  0.01250 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9474 on 176 degrees of freedom
Multiple R-squared:  0.137,     Adjusted R-squared:  0.1272
F-statistic: 13.97 on 2 and 176 DF,  p-value: 2.338e-06
```

Green Image with proximity (linear)

```
Call:
lm(formula = All3$Green_T ~ All3$Accessibility_Total + All3$Walking +
    All3$Soft_Mode + All3$SocialCapital_T + All3$SocialCohesion_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0636 -0.5143  0.0855  0.7339  1.7396

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.407470   0.576864   7.640 1.42e-12 ***
All3$Accessibility_Total  0.078327   0.089916   0.871   0.3849
All3$Walking              0.074790   0.048080   1.556   0.1216
All3$Soft_Mode            0.002858   0.064758   0.044   0.9648
All3$SocialCapital_T      0.263275   0.125161   2.103   0.0369 *
All3$SocialCohesion_T    -0.024391   0.079797  -0.306   0.7602
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9087 on 173 degrees of freedom
Multiple R-squared:  0.05669,   Adjusted R-squared:  0.02943
F-statistic:  2.08 on 5 and 173 DF,  p-value: 0.07019
```

Green Image with proximity (linear stepwise)

```
Call:
lm(formula = All3$Green_T ~ All3$Walking + All3$SocialCapital_T,
    data = All3)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0411 -0.5087  0.0515  0.7134  1.7314

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)           4.74796    0.32232  14.730   <2e-16 ***
All3$Walking          0.08634    0.04416   1.955   0.0522 .
All3$SocialCapital_T  0.24818    0.10981   2.260   0.0250 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9032 on 176 degrees of freedom
Multiple R-squared:  0.05198,   Adjusted R-squared:  0.04121
F-statistic: 4.825 on 2 and 176 DF,  p-value: 0.009117
```

HWB with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = All.HedonicT$Hedonic_T ~ Walking + SocialLife +
    AgeRegSquare + Female + Green_T, data = All.HedonicT)

Coefficients:
                  (Intercept)    Walking SocialLife  AgeRegSquare     Female   Green_T
Happy              -3.6484046 -0.7133486  0.7691971  3.259122e-02  1.4820133 0.8802504
Moderately happy   -0.2497437 -0.5297276  0.4192616 -7.103988e-03  0.8699700 0.5157978
Moderately unhappy -2.2349568 -0.8121325  0.6476498  1.897225e-06  1.2731248 0.8351337
Very Happy         -4.3847891 -0.2181057  0.8317883  7.323416e-02 -0.2417137 0.1764199

Std. Errors:
                  (Intercept)   Walking SocialLife AgeRegSquare    Female   Green_T
Happy                2.295570 0.3087667  0.2871894   0.03053812 0.6689269 0.3403359
Moderately happy     2.032249 0.3034419  0.2796877   0.03115824 0.6308426 0.3127910
Moderately unhappy   2.374459 0.3140714  0.2980245   0.03315646 0.7008156 0.3573667
Very Happy           3.229022 0.4360247  0.3688713   0.03554562 0.9016341 0.4704437

Residual Deviance: 462.1571
AIC: 510.1571
```

LS with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = All.LS$Life_satisfaction ~ Walking + Leisure +
    PartnerReg + Accessibility_Total, data = All.LS)

Coefficients:
                  (Intercept)    Walking   Leisure PartnerReg Accessibility_Total
 Very Happy         -11.598002 -0.1194321 0.7268768  2.1980329           1.3761516
Happy                -2.921221  0.2058846 0.2863959  0.7895275           0.2733773
Moderately happy     -2.375934  0.1220884 0.2556188  1.0886110           0.2102038
Moderately unhappy   -1.844822  0.4447816 0.2259148  0.2212649          -0.1901848

Std. Errors:
                  (Intercept)   Walking   Leisure PartnerReg Accessibility_Total
 Very Happy           3.149001 0.2142181 0.2287044  0.7555288           0.4849764
Happy                 2.348081 0.1982523 0.1816267  0.6243375           0.3970197
Moderately happy      2.396285 0.2000242 0.1874253  0.6439891           0.4055099
Moderately unhappy    2.585787 0.2454722 0.1980586  0.6863244           0.4323390

Residual Deviance: 495.6122
AIC: 535.6122
```

EWB with all (multinominal logistic regression - stepwise)

```
Call:
multinom(formula = All.Eudaimonic$Eudaimonia_T ~ SocialLife +
    Leisure + PartnerReg + ChildrenReg + NP_T, data = All.Eudaimonic)

Coefficients:
                (Intercept) SocialLife   Leisure PartnerReg ChildrenReg      NP_T
Happy             -3.696369  0.5027853 0.4969990 -0.1437302   2.1264589 0.3784878
Moderately happy  -2.846876  0.2461309 0.3753160  0.1921761   0.8747615 0.4595115
Very Happy       -13.018226  1.0895753 0.8282945  1.4258691   3.3899767 0.9993115

Std. Errors:
                (Intercept) SocialLife   Leisure PartnerReg ChildrenReg      NP_T
Happy             2.297575  0.3424150 0.2309993  0.7614556    1.176548 0.3811529
Moderately happy  2.295916  0.3451685 0.2327083  0.7639888    1.207173 0.3857917
Very Happy        2.911806  0.3794709 0.2745113  0.9019892    1.268176 0.4307196

Residual Deviance: 371.1283
AIC: 407.1283
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Annexe 4 : Questionnaire – Text Paris Version (English/French)

Start of Block: INTRODUCTION

You are invited to participate in an online survey about the well-being of residents in a sustainable 15-minute city model.

In **a 15-minute city**, all the basic needs of the residents are reachable within 15 minutes of walking or cycling (Moreno et al. 2021). In particular, Paris can be seen to some extent as a 15-minute city. The aim of this study is to explain in what ways an urban development model like the 15 minute city can achieve its objective of providing a good life to its residents while managing a transition in resources consumption.

I am conducting this research to complete my master thesis at the Institute for Housing and Urban Development Studies, in the Erasmus University Rotterdam. This questionnaire will take approximately 5 to 10 minutes to complete.

By filling up this questionnaire, you are consenting to participate in this study. You can refuse to take part in the research and exit the survey at any time. Your answers to this survey are confidential. If you have any questions about the study or the procedure, feel free to contact me at 590214cs@student.eur.nl (Clara Sankari).

Bonjour et bienvenue sur la page de ce questionnaire en ligne qui porte sur le bien-être des résidents au sein de la Ville du Quart d'Heure.

La Ville du Quart d'Heure se caractérise par le fait que les résidents peuvent accéder à tous leurs besoins en moins de 15 minutes de marche ou de vélo (Moreno et al. 2021). En particulier, on peut considérer, dans une certaine mesure, Paris comme une Ville du Quart d'Heure.
L'objectif de cette étude est d'expliquer comment un modèle urbain durable et peu consommateur de ressources tel que la Ville du Quart d'Heure permet d'apporter du bien-être à ses résidents.

Je conduis cette étude dans le cadre de mon mémoire de fin d'études au sein de l'Institute for Housing and Urban Development Studies, de l'Université Erasmus de Rotterdam aux Pays-Bas. Il vous faudra compter entre 5 et 10 minutes pour remplir ce questionnaire.

En répondant à ce questionnaire, vous acceptez de participer à cette étude. Vous pouvez retirer votre consentement à tout moment et quitter la page du questionnaire. Vos réponses à ce questionnaire sont

confidentielles. Si vous avez la moindre question, vous pouvez me contacter à l'adresse suivante : 590214cs@student.eur.nl (Clara Sankari).

Living in Paris Do you live in Paris intramuros or in one of its bordering cities (Arcueil, Aubervilliers, Bagnolet, Boulogne Billancourt, Charenton, Clichy, Fontenay-sous-Bois, Gentilly, Issy les Moulineaux, Ivry, Joinville, Le Kremlin Bicêtre, Le Pré St Gervais, Les Lilas, Levallois-Perret, Malakoff, Montreuil, Montrouge, Neuilly, Nogent-sur-Marne, Pantin, Puteaux, Saint Cloud, Saint Denis, Saint Mandé, Saint Maurice, Saint Ouen, Suresnes, Vanves, Vincennes) ?

- Yes, in Paris (1)
- Yes, in one of the bordering cities (3)
- No (2)

Living in Paris Vivez-vous à Paris intramuros ou dans une de ses communes limitrophes (Arcueil, Aubervilliers, Bagnolet, Boulogne Billancourt, Charenton, Clichy, Fontenay-sous-Bois, Gentilly, Issy les Moulineaux, Ivry, Joinville, Le Kremlin Bicêtre, Le Pré St Gervais, Les Lilas, Levallois-Perret, Malakoff, Montreuil, Montrouge, Neuilly, Nogent-sur-Marne, Pantin, Puteaux, Saint Cloud, Saint Denis, Saint Mandé, Saint Maurice, Saint Ouen, Suresnes, Vanves, Vincennes) ?

- Oui, à Paris (1)
- Oui, dans une commune limitrophe (3)
- Non (2)

Skip To: End of Survey If Do you live in Paris intramuros or in one of its bordering cities (Arcueil, Aubervilliers, Bagnol... = No

End of Block: INTRODUCTION

Start of Block: Your level of Well-being

Q6 **Subjective wellbeing** can be defined as the way people feel about their own lives and experiences (OECD 2013) and is usually composed of three dimensions : the hedonic well-being, the life satisfaction and the eudaimonic well-being.

Q6
Le **bien-être subjectif** peut se définir comme la perception qu'une personne a de sa vie et de ses expériences (OCDE 2013). Il se compose en général de trois dimensions : le bien-être hédonique, la satisfaction à l'égard de sa vie et le bien-être eudaimonique.

Q7 Taking all things together, how happy would you say you are?

- Extremely unhappy (1)
- Moderately unhappy (2)
- Slightly unhappy (3)
- Neither happy nor unhappy (4)
- Slightly happy (5)
- Moderately happy (6)
- Extremely happy (7)
- NA (8)

Q7 Tout bien considéré, dans quelle mesure diriez-vous que vous êtes heureux.se ?

- Extrêmement malheureux.se (1)
- Modérément malheureux.se (2)
- Légèrement malheureux.se (3)
- Ni heureux.se ni malheureux.se (4)
- Légèrement heureux.se (5)
- Modérément heureux.se (6)
- Extrêmement heureux.se (7)
- N/A (8)

Q9 The **hedonic well-being** is defined by the emotional state of a person at a particular moment

	1 - not at all (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 - completely (7)	NA (8)
Overall, how happy did you feel yesterday? (1)	○	○	○	○	○	○	○	○
Overall, how relaxed did you feel yesterday? (4)	○	○	○	○	○	○	○	○
Overall, how much enjoyment did you feel yesterday? (6)	○	○	○	○	○	○	○	○
Overall, how energised did you feel yesterday? (8)	○	○	○	○	○	○	○	○
Overall, how tired did you feel yesterday? (10)	○	○	○	○	○	○	○	○
Overall, how stressed did you feel yesterday? (12)	○	○	○	○	○	○	○	○
Overall, how bored did you feel yesterday? (14)	○	○	○	○	○	○	○	○
Overall, how angry did you feel yesterday? (16)	○	○	○	○	○	○	○	○

Q9 Le **bien-être hédonique** se définit comme l'état émotionnel d'une personne à un certain moment.

	1 - pas du tout (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 - complètement (7)	N/A (8)
Globalement, dans quelle mesure vous sentiez-vous heureux.se hier ? (1)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure étiez-vous détendu.e hier ? (4)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure vous êtes-vous réjoui.e hier ? (6)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure vous sentiez-vous énergique hier ? (8)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure vous sentiez-vous fatigué.e hier ? (10)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure vous sentiez-vous stressé.e hier ? (12)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure vous êtes-vous ennuyé.e hier ? (14)	○	○	○	○	○	○	○	○
Globalement, dans quelle mesure étiez-vous énervé.e hier ? (16)	○	○	○	○	○	○	○	○

Q10
Life satisfaction is defined by a person's assessment about their own life.
Overall, how satisfied are you with your life nowadays?

- ○ 1 - not at all (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 - completely (7)
- ○ NA (8)

Q10
La **satisfaction à l'égard de sa vie** se mesure par l'appréciation qu'une personne a en ce qui concerne sa propre vie.
De manière générale, être vous satisfait.e de votre vie en ce moment ?

- ○ 1 - Pas du tout (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 - Totalement (7)
- ○ N/A (8)

Q11 **Eudaimonic Well-being** is defined by the feeling of achievement and the sense of meaning about their life that a person can feel

	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Mixed or Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)	NA (8)
I lead a purposeful and meaningful life. (1)	○	○	○	○	○	○	○	○
My social relationships are supportive and rewarding. (2)	○	○	○	○	○	○	○	○
I am engaged and interested in my daily activities. (3)	○	○	○	○	○	○	○	○
I actively contribute to the happiness and well-being of others. (4)	○	○	○	○	○	○	○	○
I am competent and capable in the activities that are important to me. (5)	○	○	○	○	○	○	○	○
I am a good person and live a good life. (6)	○	○	○	○	○	○	○	○
I am optimistic about my future. (7)	○	○	○	○	○	○	○	○
People respect me. (8)	○	○	○	○	○	○	○	○

Q11 Le **bien-être eudaimonique** se définit par le sentiment d'accomplissement ou de sens qu'une personne peut ressentir à l'égard de sa vie

	Pas du tout d'accord (1)	Pas d'accord (2)	Plutôt pas d'accord (3)	Ni d'accord ni pas d'accord (4)	Plutôt d'accord (5)	D'accord (6)	Tout à fait d'accord (7)	N / A (8)
Je mène une vie utile et pleine de sens. (1)	○	○	○	○	○	○	○	○
Mes relations sociales m'apportent du soutien et sont enrichissantes. (2)	○	○	○	○	○	○	○	○
Je suis engagé.e et intéressé.e par ce que je fais au quotidien. (3)	○	○	○	○	○	○	○	○
Je contribue activement au bonheur et au bien-être des autres. (4)	○	○	○	○	○	○	○	○
Je suis compétent.e dans les activités qui me tiennent à cœur. (5)	○	○	○	○	○	○	○	○
Je suis quelqu'un de bien et je mène une belle vie. (6)	○	○	○	○	○	○	○	○
Je suis optimiste à propos de mon avenir. (7)	○	○	○	○	○	○	○	○
Je me sens respecté.e par les autres. (8)	○	○	○	○	○	○	○	○

End of Block: Your level of Well-being

Start of Block: The level of proximity in the city you live in

Q28 What is your most frequently used mode of travel by purpose ?

	Walking (1)	Biking (2)	Public transports (3)	Individual car (4)	Other (5)	NA (6)
Commuting to work. (1)	○	○	○	○	○	○
Commuting to university. (4)	○	○	○	○	○	○
Accompanying children to school. (5)	○	○	○	○	○	○
Going for groceries. (2)	○	○	○	○	○	○
Going for leisure. (3)	○	○	○	○	○	○

Q28 Quel mode de transport utilisez-vous le plus fréquemment pour les trajets suivants ?

	Marche (1)	Vélo (2)	Transports en commun (3)	Voiture individuelle (4)	Autre (5)	N / A (6)
Vous rendre au travail. (1)	○	○	○	○	○	○
Vous rendre à l'université. (4)	○	○	○	○	○	○
Accompagner les enfants à l'école. (5)	○	○	○	○	○	○
Faire vos courses alimentaires. (2)	○	○	○	○	○	○
Vous rendre à vos loisirs. (3)	○	○	○	○	○	○

Q12 How often do you walk (or bike) somewhere for less than 15 minutes from your home ?

- Never (1)
- 2-3 times a month (2)
- Once a week (3)
- 2-3 times a week (4)
- 4-5 times a week (5)
- Almost every day (6)
- Every day (7)
- NA (8)

Q12 À quelle fréquence marchez-vous (ou faites-vous du vélo) pour un déplacement à moins de 15 minutes de votre domicile ?

- Jamais (1)
- 2-3 fois par mois (2)
- Une fois par semaine (3)
- 2-3 fois par semaine (4)
- 4-5 fois par semaine (5)
- Presque tous les jours (6)
- Tous les jours (7)
- N / A (8)

Q28 Would you say that you have an easy access in your neighbourhood (meaning less than 15 min walking or biking) to

	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)	NA (8)
Culture facilities (theater, cinema, museum...) (1)	○	○	○	○	○	○	○	○
Sport facilities (gymnase, stadium...) (9)	○	○	○	○	○	○	○	○
Parks (2)	○	○	○	○	○	○	○	○
Grocery stores (3)	○	○	○	○	○	○	○	○
Retails of goods and services (4)	○	○	○	○	○	○	○	○
Restaurants and bars (5)	○	○	○	○	○	○	○	○
Schools and education facilities (6)	○	○	○	○	○	○	○	○
Civic institutions (municipal services, citizen kiosk...) (7)	○	○	○	○	○	○	○	○
Health facilities (8)	○	○	○	○	○	○	○	○

Q28 Diriez-vous que vous avez un accès facile (c'est-à-dire moins de 15 minutes à pied ou à vélo) dans votre quartier pour les lieux suivants :

	Pas du tout d'accord (1)	Pas d'accord (2)	Plutôt pas d'accord (3)	Ni d'accord ni pas d'accord (4)	Plutôt d'accord (5)	D'accord (6)	Tout à fait d'accord (7)	N / A (8)
Equipements culturels (théâtre, cinéma, musée...) (1)	○	○	○	○	○	○	○	○
Equipements sportifs (gymnase, stade...) (9)	○	○	○	○	○	○	○	○
Parcs (2)	○	○	○	○	○	○	○	○
Épiceries et commerces de bouche (3)	○	○	○	○	○	○	○	○
Commerces de biens et services (4)	○	○	○	○	○	○	○	○
Restaurants et bars (5)	○	○	○	○	○	○	○	○
Ecoles ou établissements d'enseignement (6)	○	○	○	○	○	○	○	○
Institutions civiques (services municipaux, kiosques citoyens...) (7)	○	○	○	○	○	○	○	○
Services de santé (cabinets médicaux ou paramédicaux, pharmacies, ...) (8)	○	○	○	○	○	○	○	○

Q29 How is the local social capital in the neighbourhood ?

	Never/None (1)	Sometimes/Few (2)	Often/ Many (3)	Always / Everyone (4)	NA (5)
How often do you have contact with your neighbors? (1)	○	○	○	○	○
How often do you or one of your neighbors ask one another for advice on personal matters? (2)	○	○	○	○	○
How many people in your neighborhood do you know by face? (3)	○	○	○	○	○
If your neighbors are not home, how often do you watch out for them (stay vigilant against robberies, water plants...) ? (4)	○	○	○	○	○

Q29 Quel est le niveau de capital social au sein de votre quartier ?

	Jamais/Aucun (1)	Parfois/Peu (2)	Souvent/ Beaucoup (3)	Toujours / Tout le monde (4)	N / A (5)
À quelle fréquence avez-vous des contacts avec vos voisins ? (1)	○	○	○	○	○
À quelle fréquence échangez-vous des conseils avec vos voisins ? (2)	○	○	○	○	○
Combien de personnes dans votre quartier connaissez-vous de vue ? (3)	○	○	○	○	○
Si vos voisins ne sont pas chez eux, à quelle fréquence leur rendez-vous service (arrosage des plantes, vigilance contre un cambriolage...) ? (4)	○	○	○	○	○

Q30 How is the local cohesion in the neighbourhood ?

	Strongly disagree (1)	Disagree (2)	Slighly disagree (3)	Neither agree nor disagree (4)	Slighly agree (5)	Agree (6)	Strongly agree (7)	NA (8)
People in my neighbourhood are willing to help their neighbors. (1)	○	○	○	○	○	○	○	○
People in my neighborhood feel connected to one another. (2)	○	○	○	○	○	○	○	○
People in my neighborhood can be trusted. (3)	○	○	○	○	○	○	○	○
People in my neighborhood generally do not get along with one another. (4)	○	○	○	○	○	○	○	○

Q30 Quel est le niveau de cohésion sociale au sein de votre quartier ?

	Pas du tout d'accord (1)	Pas d'accord (2)	Plutôt pas d'accord (3)	Ni d'accord ni pas d'accord (4)	Plutôt d'accord (5)	D'accord (6)	Tout à fait d'accord (7)	N / A (8)
Les gens de mon quartier sont prêts à aider leurs voisins. (1)	○	○	○	○	○	○	○	○
Les gens de mon quartier se sentent proches les uns aux autres. (2)	○	○	○	○	○	○	○	○
Les gens de mon quartier se font confiance. (3)	○	○	○	○	○	○	○	○
En général, les gens de mon quartier ne s'entendent pas. (4)	○	○	○	○	○	○	○	○

End of Block: The level of proximity in the city you live in

Start of Block: Your experience in the city

Q13 How often do you meet your friends and relatives ?

- Never (1)
- 2-3 times a month (2)
- Once a week (3)
- 2-3 times a week (4)
- 4-5 times a week (5)
- Almost every day (6)
- Every day (7)
- NA (8)

Q13 À quelle fréquence vous voyez-vous avec vos amis et vos proches ?

- Jamais (1)
- 2-3 fois par mois (2)
- Une fois par semaine (3)
- 2-3 fois par semaine (4)
- 4-5 fois par semaine (5)
- Presque tous les jours (6)
- Tous les jours (7)
- N / A (8)

Q14 How satisfied are you with the time you spend on your leisure activities ?

- Extremely dissatisfied (1)
- Moderately dissatisfied (2)
- Slightly dissatisfied (3)
- Neither satisfied nor dissatisfied (4)
- Slightly satisfied (5)
- Moderately satisfied (6)
- Extremely satisfied (7)
- NA (8)

Q14 Etes-vous satisfait.e du temps que vous consacrez à vos loisirs ?

- Extrêmement insatisfait.e (1)
- Plutôt insatisfait.e (2)
- Légèrement insatisfait.e (3)
- Ni satisfait.e ni insatisfait.e (4)
- Légèrement satisfait.e (5)
- Plutôt satisfait.e (6)
- Extrêmement satisfait.e (7)
- N / A (8)

Q15 How often do you practice a physical activity (e.g. exercise, manual work, brisk walking, cycling) for 20 minutes or more in a week ?

- Never (1)
- 2-3 times a month (2)
- Once a week (3)
- 2-3 times a week (4)
- 4-5 times a week (5)
- Almost every day (6)
- Every day (7)
- NA (8)

Q15 À quelle fréquence pratiquez-vous une activité physique (ex. : sport, travail manuel, marche rapide, vélo) pendant 20 minutes ou plus par semaine ?

- Jamais (1)
- 2-3 fois par mois (2)
- Une fois par semaine (3)
- 2-3 fois par semaine (4)
- 4-5 fois par semaine (5)
- Presque tous les jours (6)
- Tous les jours (7)
- N / A (8)

Q17 How do you perceive your neighbourhood ?

	Strongly disagree (1)	Disagree (2)	Slighly disagree (3)	Neither agree nor disagree (4)	Slighly agree (5)	Agree (6)	Strongly agree (7)	NA (8)
My neighbourhood is beautiful. (1)	○	○	○	○	○	○	○	○
Streets, sidewalks, and other public places are clean. (2)	○	○	○	○	○	○	○	○
I feel safe walking around at night. (3)	○	○	○	○	○	○	○	○
Air pollution is a serious problem in my neighbourhood. (4)	○	○	○	○	○	○	○	○

Q17 Comment percevez-vous votre quartier ?

	Pas du tout d'accord (1)	Pas d'accord (2)	Plutôt pas d'accord (3)	Ni d'accord ni pas d'accord (4)	Plutôt d'accord (5)	D'accord (6)	Tout à fait d'accord (7)	N / A (8)
Mon quartier est beau. (1)	○	○	○	○	○	○	○	○
Les rues, trottoirs et autres lieux publics sont propres. (2)	○	○	○	○	○	○	○	○
Je me sens en sécurité en me promenant la nuit. (3)	○	○	○	○	○	○	○	○
La pollution de l'air est un problème préoccupant dans mon quartier. (4)	○	○	○	○	○	○	○	○

Q18 How green would you say you are ?

	Strongly disagree (1)	Disagree (2)	Slighly disagree (3)	Neither agree nor disagree (4)	Slighty agree (5)	Agree (6)	Strongly agree (7)	NA (8)
I feel that I am aware of the climate change issues and its implications on society. (1)	○	○	○	○	○	○	○	○
I feel that I lead a green life and that I have an environmental behaviour. (2)	○	○	○	○	○	○	○	○

Q18 Comment percevez-vous votre sensibilité aux enjeux environnementaux ?

	Pas du tout d'accord (1)	Pas d'accord (2)	Plutôt pas d'accord (3)	Ni d'accord ni pas d'accord (4)	Plutôt d'accord (5)	D'accord (6)	Tout à fait d'accord (7)	N / A (8)
Je pense que je suis conscient.e des enjeux du changement climatique et de ses implications sur la société. (1)	○	○	○	○	○	○	○	○
Je pense être écologique dans mes actions au quotidien et avoir un comportement respectueux de l'environnement. (2)	○	○	○	○	○	○	○	○

End of Block: Your experience in the city

Start of Block: Block 4

Q19 How old are you ?

- ○ Under 18 (1)
- ○ 18 - 24 (2)
- ○ 25 - 34 (3)
- ○ 35 - 44 (4)
- ○ 45 - 54 (5)
- ○ 55 - 64 (6)
- ○ 65 - 74 (7)
- ○ 75 or older (8)

Q19 Quel âge avez-vous ?

- Moins de 18 (1)
- 18 - 24 (2)
- 25 - 34 (3)
- 35 - 44 (4)
- 45 - 54 (5)
- 55 - 64 (6)
- 65 - 74 (7)
- 75 ou plus (8)

Q20 To what gender do you assign yourself ?

- Male (1)
- Female (2)
- Other (3)

Q20 A quel genre vous identifiez-vous ?

- Homme (1)
- Femme (2)
- Autre (3)

Q21 Do you have a partner ?

- Yes (1)
- No (2)

Q21 Etes-vous en couple ?

- ○ Oui (1)
- ○ Non (2)

Q22 Do you have children ?

- ○ Yes (1)
- ○ No (2)

Q22 Avez-vous des enfants ?

- ○ Oui (1)
- ○ Non (2)

Q23 What is your level of education ?

- ○ No diploma (6)
- ○ Less than high school (1)
- ○ High school graduate (2)
- ○ Bachelor or equivalent (3)
- ○ Master or equivalent (4)
- ○ Doctorate or equivalent (8)

Q23 Quel est votre niveau d'études ?

- ○ Aucun diplôme (6)
- ○ Brevet des collèges ou équivalent (1)
- ○ Baccalauréat ou équivalent (2)
- ○ Licence ou équivalent (3)
- ○ Master ou équivalent (4)
- ○ Doctorat ou équivalent (8)

Q24 What is your employment status ?

- ○ Employed (9)
- ○ Unemployed looking for work (11)
- ○ Retired (13)
- ○ Student (14)
- ○ Other (17)

Q24 Quelle est votre situation professionnelle ?

- ○ En situation d'emploi (9)
- ○ Au chômage (11)
- ○ Retraité.e (13)
- ○ Etudiant.e (14)
- ○ Autre (17)

Q25 How confortable do you feel with your present household income ?

- It is very difficult or difficult to live on my/our present income (2)
- My/our present income is sufficient to live (3)
- My/our present income provides me/us with a confortable or very confortable life (4)
- NA (5)

Q25 Quelle est votre perception de vos revenus ou des revenus de votre foyer ?

- Il est très difficile ou difficile de vivre avec mes/nos revenus actuels. (2)
- Mes/nos revenus actuels sont suffisants pour vivre. (3)
- Mes/nos revenus actuels me/nous permettent de mener une vie plutôt confortable ou confortable. (4)
- N/A (5)

Q26 Do you face any health problem ?

- Yes a lot (1)
- Yes to some extent (2)
- No (3)
- NA (4)

Q26 Avez-vous des problèmes de santé ?

- Oui, beaucoup (1)
- Oui, dans une certaine mesure (2)
- Non (3)
- N/A (4)

Q31
A huge thanks for your participation !
Do you have any comments or remark for me ? You can also contact me directly on my email adress : 590214cs@student.eur.nl._____

Q31
Un immense merci pour votre participation !
Avez vous des commentaires ou remarques à me faire ? Vous pouvez aussi directement me contacter par email : 590214cs@student.eur.nl._____

Q32 If you are interested in the results of this study, please leave your email here. Note that this question is not linked to your previsous responses and threfore, confidentiality and anonymity will be maintained. _____

Q32
Si les résultats de cette étude vous intéressent, vous pouvez me laisser vos coordonnées mail ci-dessous. A noter que cette réponse ne sera pas liée aux précédentes, ceci afin de préserver la confidentialité et l'anonymat des réponses._____

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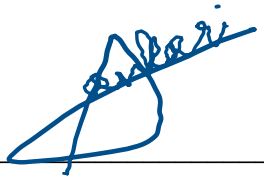
Your Signature(s) : 

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