The Cognizance of Cycle to Work Scheme: Analysis of The Irish Experience

By Soham Hemant Thacker

Abstract

This study analyzes the factors that contribute towards cycling to work and back home in Ireland in both males and females. The study has been carried out to analyze the factors amongst the middle-aged people in Ireland. Many governmental organizations in the developed countries are taking considerable measures to increase the use of a bicycle in commute distances. They are practicing different ways for increasing ensuring that cycling is very effective. The research work determines the impact of social influence, commute distance, cycling facilities and amenities provided by the organization, external factors, and cycling infrastructure impact on cycle to work. A quantitative research work has been carried out and a 5-point Likert scale has been used to obtain answers from the respondents. A total of 370 questionnaires have been collected. It is found that social influence, cycling facilities, external factors and cycling infrastructure impacts the level of cycling the most in Ireland in the cycle to work scheme. Amongst these independent variables, external factors impact the level of cycling the most. On the other hand, it was also found that commute distance does not impact the level of cycling amongst the people. Moreover, it also found that gender does not impact the level of cycling.

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Introduction

This study analyzes the factors that contribute towards cycling to work and back home in Ireland in both males and females. The study takes the middle-aged group as the sample of the study. Different factors that promote and hinder the cycle to work scheme are analyzed in the study. This chapter covers the background, research significance, objectives, research questions and structure of the research.

The study of Sharma et al., (2013) has stressed that there are different types of pollution and air pollution is one of them, and this air pollution is very harmful because it consists of many biological or chemical elements. They further stressed that these chemicals are introduced in the atmosphere through altered human activities. Also, the consequences of these chemicals on the earth's atmosphere and all the creatures are harmful. Likewise, the study of O'Connor et al. (2016) has included that transportation is one of the reasons behind the air pollution. However, this can be reduced by using different ways of transportation. O'Connor et al., (2016) study further explained that active transportation is the one best solution for sustainable transportation; active transportation includes cycling and walking. However, this study mainly focuses on the use of cycling as a sustainable solution.

According to Heinen, Maat and Wee (2013), the using of a bicycle as major transportation for work carries a significant impact on the overall economic well-being. Also, it helps people in fighting against different health issues such as obesity. They also included that cycling has a negative impact on environmental degradation. Martin (2007) study has added that the use of cycling decreases inconvenience because of traffic congestion and crowded areas. The use of cycling also increases urban livelihood (Heesch and Langdon. 2016). Selecting a bicycle as the dominant mode of transportation has numerous benefits. Firstly, it decreases the chances of cardiac diseases. Secondly, it very cost-effective because cycling has no fuel consumption requirement. Thirdly, it saves times in those areas where the ration of traffic congestion is very high.

Many governmental organizations in the developed countries are taking considerable measures to increase the use of a bicycle in commute distances. They are practising different ways for increasing ensuring that cycling is very effective. Therefore, this research study is focusing on the use of cycling in Ireland. The Revenue Irish Tax and Customs (2019) are stipulating altered benefits and allowances to the cycling to work scheme, and they are providing social and economic assistance to both the employees and the employer. Likewise, numerous other

countries are trying to increase the use of cycling in their countries; they are making altered policies for these different cycling schemes. For instance, the study of Heinen et al., (2013) has argued that many cities like Portland and Davis, YSA are working on the revisioning of the cycling system. They are separating the cycling lane, and other traffic lanes form each other, this will help the commuter cycling more efficaciously.

According to Borjesson and Eliassyon (2012), it is very important to understand that bicycle is a very effective way to commute to work or home, the bicycling has numerous outcomes. They further argued that the decision of selecting a bicycle as a mode of transportation has always influenced by certain factors, these influential factors can be both internal and external.

Cycling has numerous health benefits and it is also contributing to environmental preservation. The study of Oven et al., (2010) has explained different approaches for the promotion of cycling schemes such as public campaigns, different marketing and social initiatives, environmental consideration and numerous other ways that can promote the cycling schemes, these promotion approaches are required to be based on public motivation and public satisfaction of using and selecting cycling as transportation. Additionally, the study of Litman (2019) has argued that the promotion of effective cycling requires consistent research in the relevant area. However, some of the major cycling concern has already been evaluated in previous research studies. Nevertheless, there is very limited research data available on the active promotion of cycling to work scheme in Ireland. Further, climate, income level, age, infrastructure, work influence, social culture are the major determinants that are affecting the individual rationality and preferences during the selection of different modes of transportation. Therefore, this research study is also focusing on highlighting this factor and also analyzing the individual response in eradicating these obstacles. Additionally, the study is also focusing on different insights for the efficacious promotion of cycling to work schemes in Ireland. A plethora of literature is available on cycling, public health, social and economic concerns and safety and security as major difficulties. However, in the social and economic context, several discussion and research have been performed on identifying the practical issues in this project. According to Murphy and Usher, 2015), the increasing trend in popularity and the adoption of these bicycle scheme is not only because of effective formulation but also because of the social, economic and cultural uplift.

The cycle to work scheme encourages the employees working in Ireland to cycle to and from work. The employers pay for the bicycle, the equipment of the bicycle for their employees and the payback is made through the sacrifice of salary over a few months. The section 7 of the Finance (no.2) act 2008 introduced Income tax charge exemption. This was introduced under

the taxes consolidation act 1997 section 118 (Cycling Ireland, 2020). This benefit was introduced in the form of a bicycle for the employees.

The positive impacts of cycling have been documented well in the past. This has been done in terms of ecological footprints, regulation of traffic, improving the life quality and public health. Political and societal rationales have been motivated by the facts and various cities around the globe take measures accordingly in order to promote cycling.

Significance of research

Past researches have focused on the importance of cycling to and from work. The advantages have been highlighted in the past. Rérat (2018) points out that the motivation to cycle to and from work include the physical and mental well-being, independence and civic engagement. Different countries have carried out an analysis of the impact of the cycle to work scheme, including the study by Swift et al. (2016) in the UK. However, every country has a different impact on the scheme which needs to be studied in detail in order to come up with suitable strategies for the future implementation of similar schemes. The current research work will be highly beneficial for the stakeholders involved in the cycle to work scheme in Ireland. The stakeholders will be able to use the info in the study to make integral decisions for the upcoming years and how the program can be better executed. Any barriers that currently exist in the usage of the bicycle are also determined in the study, and the stakeholders and decision-makers can make use of the findings of the study in order to overcome barriers. The employers who have availed the scheme or plan to avail the scheme can also benefit from the findings and make decisions accordingly.

Structure of the research

In the first chapter on the research study, the background, context, the significance of the research and research aim is discussed. The second chapter of the study carries out a detailed critical review of the literature and then identifying the gap in the literature. The methodology chapter in the study identifies the techniques that have been employed and the approach being used in the study to answer the research question. The details of the sample and data collection are also provided in the chapter. The findings/results chapter highlights the findings that are obtained in the methodology chapter. Furthermore, in the chapter of discussion, the findings of the study are linked back to the literature, the practical implications are discussed, and limitations are highlighted. Lastly, the conclusion of the study provides a summary of the study and the future possibilities are discussed.

Literature Review

The literature study is the basic overview of relevant studies that have been performed in altered countries. Also, the literature is based on comprehended and classified information about the use of the bicycle as a major mode of transportation that leads to a sustainable environment. Additionally, several research-based policies have been conducted on cycling in different countries for the effective promotion of such schemes. Numerous countries develop these studies for encouraging different people the use of cycling. Some of the scholars have concluded that effectiveness in these cycling to work schemes. This study on the cycle to work scheme has aimed to provide an understanding and effectiveness of this scheme in the Irish people. Likewise, the previous study has also been used as a major reference in a similar field. The study has also provided the evaluation of different determinants that include, income level and age that are also highlighted in the previous literature. In this regard, the major focus on these determinants is presented.

International Cycling Schemes

Some countries such as Netherland and Denmark has created a safe and secure infrastructure through huge investment, it is because the increase in cycling is the major consideration in their sustainable environment program. The study of Heinen et al., (2013) has argued that less than 25% of the people are using cycle as a major mode of transportation. Likewise, in Australia, less than 2% of the people are using a bicycle in their daily travelling. The government, on the other hand, is providing different incentives and benefits to its people for increasing the use of cycling and encouraging public participation to support cycling. Conversely, there are several adverse impacts of cycling that creates obstruction is the people's mind who opts for cycling. The study of Gotshi, Garrard and Giles-Corti (2016) research has explained that there are some major hazards related to cycling such as the lack of safety that increases the chances of crashing and the exposure to different air pollution that emits from the automobiles in many cities.

Further, the study of Gotschi et al., (2016) has explained that cycling has more benefits than issues such as an increase in public health because of physical activities in cycling. On the other hand, safety is a minimal concern for the public. However, it has a significant impact on individual life. These issues decrease the will of that person who wants to ride the cycle again but also discourages other people who want to opt for cycling. Nonetheless, in the comparison of health benefits, the impact of air pollution is unavoidable because cycling has more physical benefits (Gotschi et al., 2016).

Impact of Cycling on Health

The above literature has explained the role of cycling to work scheme. However, for further understanding, it is mandatory to discuss its impact on health. Mueller et al. (2018) research on cycling impact on health has concluded that cycling has a significant impact on health and in many European countries. Cycling has brought around a 94% decrease in premature deaths in Europe. To analyze Mueller et al.'s (2018) research, it can be argued that cycling has many health benefits.

Further, it is mandatory to understand what health benefits are associated with cycling. Increase in cycling decreases many health-related diseases, and it helps the people into informal exercising. Further, their research has also discussed economic benefits. However, they did not mention what kind of economic benefits are associated with cycling. Götschi et al. (2016) have concluded that increased cycling has epidemiological evidence are available on cycling and health. Therefore, the fact cannot be denied that cycling has major health and environmental benefits. Their research requires further explanation. Cycling has some substantial benefits because it boosts physical activities; these benefits include less-impact injuries and crashes, machine cardio. In the past, when automobile and technology were not up to the mark, cycling was considered to be the primary source of transportation. The cycling trend in those days had brought a major decline in many health issues. However, increased industrialization has diminished the trend of cycling. Bourne et al. (2018) have also concluded that increased cycling has numerous health benefits such as cardiorespiratory, metabolic and psychological outcomes. The research of Bourne et al. (2018) discusses the concept of cycling both manual and electronic, they argued that it is not mandatory to have manual cycling. E-cycling also has many benefits. However, there are numerous researches on e-cycling and manual cycling, and they have concluded that manual cycling is more effective than e-cycling. It is evident that manual cycling requires more physical use than e-cycling. Therefore, the impact of manual cycling is also more effective than e-cycling. Further, their research has only highlighted psychological benefits, but they did not mention any of their names. Psychological benefits of cycling include a decrease in depression, release of stress hormones and an increase in cognitive power. All of these psychological benefits are also supported and explained in Flowers, Freeman and Gladwell's (2018) research. They have concluded that the cycling trend had caused a significant decline in psychological diseases.

Hence, it can be argued that cycling has a significant impact on health. It carries numerous health benefits such as cardiorespiratory, metabolic and psychological benefits. There is a

positive relationship between health and cycling.

Impact of Cycling on Environment

As the impact of cycling on health has been discussed, cycling also has a major impact on the environment. Now, in this section, the study is focusing is on the impact of cycling on the environment.

The study of Woodcock et al. (2018) discusses the impact of cycling on the environment they argued that cycling has less environmental impact than other modes of transportation. Further, around one short ton of carbon emission is control over ten bicycle production each year. Because of the production cost, time is comparatively less than the production of motorbikes and vehicles. The fact cannot be denied that cycling decrease production, which ultimately decreases carbon emission but Woodcock et al. (2018) has only covered the production and environment nexus of cycling. Besides this, there are numerous environmental health benefits such as emission of greenhouse gases and noise pollution. This is because the environment is the combination of many factors and production is only one of them. Furthermore, the study of Labetski and Chum (2017) on cycling and environment has concluded that there is a significant relation between cycling and social and environmental determinants. Cycling has brought a severe decline in road accidents and has reduced carbon emission. Their research is based on facts; cycling has a positive impact on infrastructure environments such as a decrease in traffic, road visibility and road accidents. However, they have only discussed on the single environmental element, i.e. infrastructure. Besides this, there are numerous other elements such as reduction of smog, uses of minimum resources, reduce water pollution and carbon-free. Cycling has brought a significant decline in smoke that result in increased invisibility in many countries.

Similarly, the production of the cycle requires very fewer resources and less time. Further, there is an indirect but negative relationship between cycling and water pollution. Bicycle consume fewer resources and requires less industrial contribution. Therefore, the pollution of the bicycle industry is very less than in other major industries.

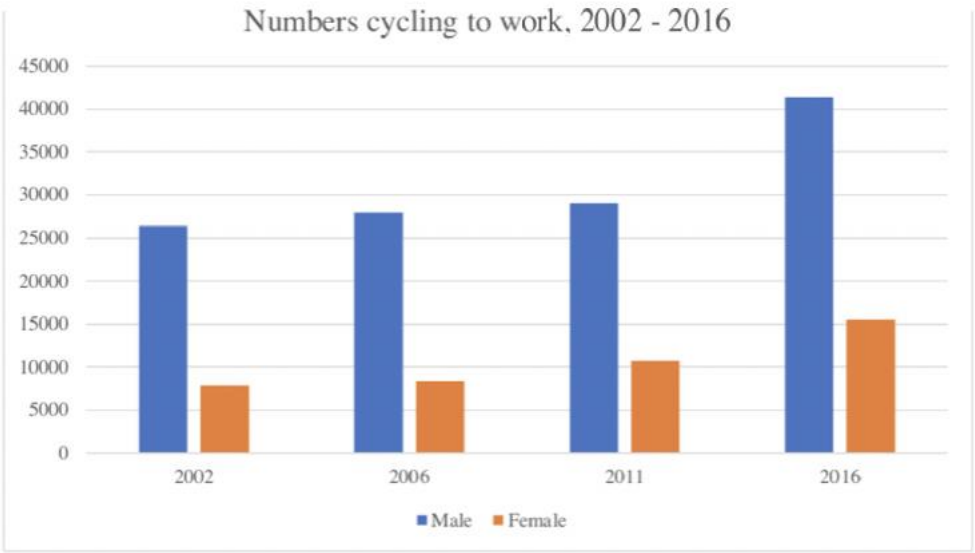
Hence, the fact cannot be denied that cycling has a major impact on the environment. It reduces environmental degradation and greenhouse emissions. This is the reason that most countries in Europe are now prioritizing the use of cycle as a mode of transportation. For instance, Ireland is now focusing on increasing cycling in the country. However, there are some barriers to cycling in Ireland which are explained in the current section. To obtain a more profound insight the demographics of cyclists is discussed below in terms of gender, age and income level.

Gender

According to Pucher and Dijkstra (2003) and Moudon et al., (2005), there is a frequency difference in the use of cycling in both males and females. The study has concluded that males are cycling more than females. Furthermore, another critical point of discussion is that research has shown that in the Netherland, females and males cycling states are almost similar. However, in many countries where the use of cycling is low, their male's cycling states are twice to women (Murphy and Usher, 2015). Conversely, the study of Gerrard (2003) has also added that those countries with high cycling states are because they are using cycling more regularly in their daily life. Hence, the study of Murphy and Usher (2015) again argued that in many countries where cycling activities is high, they usually do not consider gender inequality in cycling schemes.

In recent studies, the statistics have been included to provide contextual and static understating about the situation of cycling to work scheme in Ireland. The (Figure 1) below shows the states of males and females who are using a bicycle as their prior mode of transportation between the period of 2002 and 2016.

Figure 1. Numbers cycling to work



In Figure 1, these statistics are of Ireland cycling based on gender for the respective years (Central Statistics Office (CSO), 2019).

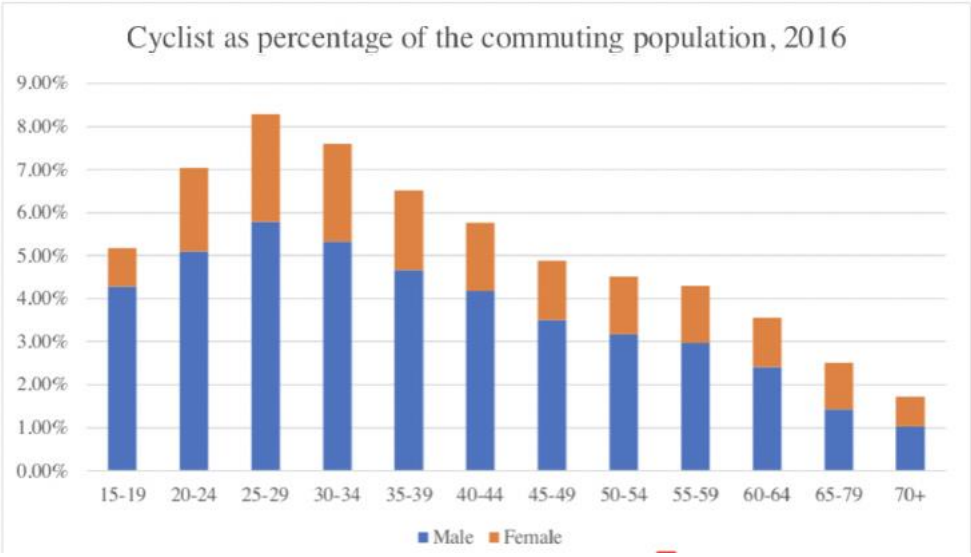
Suppose we analyze the states in Ireland context. In that case, it is understood that there is a sluggish increase in cycling in Ireland because the employees now prefer to use cycle as a major mode of transportation. Likewise, there is also an increase in both males and females

cycling states over time.

Age

The study of Moudon et al., (2005) and Pucher, Kamanoff and Schimek (1999) has suggested that in the United States, the percentage of cycling has rapidly decreased because of the age factor but the pace of diminishing in the cycling states in European countries is very slow (Pucher and Dijkstra, 2003). Further, the research findings of Moudon et al., (2005) has added that the cycling ration between the age of 25 to 45 is high. However, the age of 55 or above has recorded a significant decline in cycling because of deteriorating health. Furthermore, to support this argument further, the recent study has presented that the displays the age factor in Ireland demography. In the graph, 15 to 70 and above is the recorded duration. The age gap has also been discussed in which the rate of using cycles amid the age of 25 to 29 has shown around 8% decline. In the last, the age of 70 or above has shown around 2% use of cycling.

Figure 2. Cyclist as percentage of the commuting population



In Figure 2, the graph has shown the percentage of cyclist in the commuting population in 2016 (CSO, 2016).

Nevertheless, one of the high considering dimension of the cycle is associated with diverse factors such as physical characteristics of cycling, low-income and purchasing power for buying a car in the young age groups. It has also been noted that most of the individuals in this age group were living in central areas (Murphy and Usher, 2015).

Income-Level

In the proposed literature, the relationship amid income-level and cycling is not prominent for

understanding. The research study of Murphy and Usher (2015) has explained that in a few communities, the cycle is determined as a sign of the standard of living, those who use cycle are believed to be reduced. On the other hand, in many countries, it is believed that cycling is the customs of wealthy people. For instance, in some countries such as Germany, Denmark and Netherland, the use of cycling is common in all the socioeconomic gatherings. Furthermore, the study of Pucher and Beuhler (2006) the evaluation of cycling in Germany, the United Kingdom and Netherland the cycling ratio in high-income groups is comparatively less than of low-income groups.

The research studies of Parkin, Wardrnan and Page (2008) and Wardman, Tight and Page (2007) has concluded that the states of cycling levels in the groups without cars is essential. However, the research study of Parkin, Ryly and Jones (2007) has argued that the cycling ratio in car and households owned groups in the United Kingdom is high compared to those non-car owned households. Further, the study of Murphy and Usher (2015) has argued that cycling levels based on locality are more considerable for discussion, despite the less importance. Further, the study of Zacharias (2005) has concluded that cycling levels are not affected by the income groups in society. However, it is affected by the neighbourhood.

On the other hand, Su et al., (2010) research study have concluded that the promotion of cycling should be based on the coming generation who are cycling ambassador to the communities. They will help the communities in the use of cycling if the weather and environmental conditions are desirable. Also, they need to stress on different schools and colleges. This will also enhance awareness in these cycling to works schemes and will encourage the employees for suing cycle as major mode for transportation for work. Further, it is only possible if all the concerned barriers are analyzed and removed.

The role of Government

Further, to commute a short distance in any city, cycling is a more efficient and effective mode of transport. Furthermore, for covering different long-distance initiatives has been proposed to increase the use of bike-and-ride scheme (Martens, 2007). This research has also discovered different results of the bike-and-ride schemes. The study of Martens (2004) has argued that bike-and-ride schemes have been observed in some countries such as the United Kingdom, Netherland and Germany.

Government influence on schemes

The study of DeMaio, (2009) has argued that in Amsterdam in 1965, for the initial experiment bicycling scheme was adopted. Further, the second-generation for the bicycling was implemented in Denmark in 1991, and the third generation scheme was observed in 1995 and 1995, respectively (DeMaio, 2009). The study of Murphy and Usher (2015) has argued that in recent years, the cyclings schemes has improved because of the inclusion of technology and other innovative elements, the best example of these schemes are UPS tracking system in cycles, smart-phone demes and high-technology locks system. Further, according to Midgley (2009), the total number of schemes in European counties were only five, such as (Germany, France, Italy, Portugal and France). However, in the present times, the around 375 different bicycle schemes has been initiated in different regions. These schemes are initiated in 33 different counties, and the region is using around 236000 bicycles. Nonetheless, the study of Lanzendorf and Busch-Geertsema (2014) has included that Germany is on the road of completing the goal for initiating bicycle schemes. The barriers that constraint the efficient promotion of usage of a bicycle is provided in the next section.

Barriers constraining efficient promotion of bicycle usage in Ireland

Ever since Ireland has made policies to sustain green consumption and conserve the environment, the country is initiating eco-friendly projects. One of them is the installation of cycling to work scheme. The Irish government is aware of cycling and its benefits on health and the environment. However, certain barriers in Ireland need considerable reasoning. The barriers are explained below.

O'Connor et al.'s (2016) research on cycling and barriers has concluded one major barrier, they argued that infrastructure such as cycling-ways and cycling parking is the major issue in Dublin. To explain their research, it can be argued that the research study was significantly based on Dublin city. However, poor infrastructure is the major barrier in many areas of Ireland. For a sustainable green transport system, the Irish government is planning to provide inter-cities cycling network. The task has already been given to the National Transport Authority (NTA). The cycling network is an extensive and comprehensive way of connecting altered cities. However, this project requires a certain recommendation based on infrastructure improvement. Such as the construction of altered cycling routes to avoid traffic, Collison. The National Transport authority needs to evaluate the best parking lots for cycling. Further, the project will not bear fruits if it is limited to Dublin only, the cycling needs to be considered as

the country major public transport system to decrease greenhouse effects. Likewise, O'Connor et al.'s (2016) research forgot to mention the importance of infrastructure development in cycling projects. The infrastructure is playing a significant role in cycling projects. It will help the cyclers to identify their way and will help them to know where their destination is. Further, talking about cycling parking, the parking is indeed very crucial the NTA needs to provide safe and secure parking areas, they need to install AI artificial intelligence-based technology to avoid theft and other undesired happenings. The same issues of infrastructure were also discussed by Dhakal and Chevalier (2017) they also stressed that infrastructure development is mandatory in Ireland for any sustainable transport system. So, if this argument is linked, we the cycling projects, it is understandable that poor infrastructure is the major barrier cycling to work scheme. Inadequate roads, weak sewerage system, unidentified parking lots will make it difficult for the cyclers. Ireland government needs to think about infrastructure development for better cycling.

The study of Hayes et al. (2019) has highlighted another vital factor that is influencing cycling in Ireland. The important fact is coordination among different departments to boost cycling in the country. The coordination is a crucial element to achieve different goals and objectives. Lack of coordination and cooperation among Ireland institution needs major improvement. However, their research didn't mention about institutional framework because the effective cooperation and coordination requires structural reforms. Likewise, another important requisite for departmental coordination is to define what best technique is to link all the departments. For instance, National traffic authority (NTA) needs to enhance its coordination and cooperation with different departments.

Aldred et al. (2017) identified "Gender and Age" is another important barrier in Ireland. They argued that gender and age had raised many questions on cycling project in Ireland. In gender women ratio to drive cycle is less than men. Further, old age people are finding it hard to use cycle as a major mode of transportation. Their research has rightly pointed out that age and gender are two major barriers in cycling to work scheme. However, their research has forgotten to discuss that technological advancement has upgraded cycling transportation, such as the use of e-cycling, which is based on an automatic mechanism. These rechargeable cycles are now helping old age people without and hazardous impact on the environment.

Further, gender differences can be tackled through the availability of women cycles. The fact cannot be denied that these are barriers; however, effective policies by the National Transport Authority can eradicate all these barriers. These barriers were also highlighted in Hayes et al. (2019) research. Further, the developed countries are known for women empowerment;

therefore, women cycling will be not any serious obstacle for cycling to work scheme. All they need to raise awareness about the benefits of this scheme. Russell-Edmonds (2019) also discussed the issue of women cycling in Ireland.

According to Jones (2017), most of the people in Ireland don't know how to cycle. It is because they are not told of how to ride from their childhood. To evaluate Jones (2017) research on the cycling barrier, it can be counter-argued that Jones (2017) has generalized the Irish people. Likewise, many people and students are riding cycles to reach to colleges and other working areas. The people of Galway, Cork, Belfast and Kinsale has the highest ration of local cycling. So, it will not be appropriate to generalize entire Ireland on some limited people.

Rérat (2019) research has argued that low-level funding is another major barrier in cycling to work scheme in Ireland. There is enough funding for cycling to construct roads, parking areas. To carry his research idea, it can be argued that low-level funding is not only affecting the physical program of the project but also creating hurdles for cycling provisions to control the impact on climate change emissions. Further, low funding will cause a delay in small tasks and packages. It is due to the ineffective management among state institutions to complete and enhance this scheme in Ireland.

The above discussed are the major barriers which have carry a large impact on cycling to work scheme in Ireland. However, there are many small barriers which have a substantial impact on the scheme and the people decision to use cycles and mode of transportation.

1. Inappropriate weather condition is another important barrier which restricts people from using the bicycle. Cycling in bad weather brings a decline in the level of comforts such as riding in rain and snowfall.

2. Logistical constraints are another important barrier because cycling constraint people to carry heavy stuff. This is why most people prefer to drive vehicles instead of cycling.

3. Another important barrier which is associated with cycling is road safety and security. The infrastructure of cohabitation with cars is very crucial. Most of the people are usually afraid of riding because riding is more vulnerable than driving.

4. Comfort in travelling is another major barrier in cycling to work scheme. The people nowadays prefer to drive rather than ride because of the high standard of comfort in modern vehicles. This limits the decision-making process of the people in Ireland.

These cohort barriers are also discussed in Rérat (2019) research but his research was broader and more complex to understand. However, it can be argued that there are certain barriers for cycling to work scheme in Ireland. Now, it is also mandatory to discuss the importance of cycling for Ireland.

The barriers do exist; however, details of the cycle to work scheme in Ireland are discussed below:

Irelands' cycle to work scheme

The cycling to work scheme in Ireland goal is to encourage cycling in Ireland. Under this scheme, the people and the employees can buy bicycles and other safety equipment for the other employees. Revenue (2019) research has argued that the cycle to works scheme does not have any charges. The employees can plan "salary sacrifice" a limited agreement for around 12 months in this scheme. Further, in this agreement, to cover the expanses of this scheme, the employees need to stipulate reasonable sum from his/her gross pay, this scheme can only be taken once in every five years.

The top limit of each bicycle is around € l,000. The facility of purchasing these bicycle is available on any shop that is affiliated with the government scheme (Revenue, 2019).

Further, the scheme is also covering altered additional accessories and safety equipment that includes, Lights, Mirrors and Mudgards, lock and cables, panniers, baggage carriers and bands, puncture restoration kits and Air pumps, reflective apparel both front and rear reflectors. (Revenue, 2019).

Further, there are numerous policies of the government policies and employees benefits, such as fiscal incentives and other perks that help in the promotion of this cycle to works scheme. All of these factors have a major impact on promoting the cycle to work scheme for employees. The commissioners on these statistics have argued that " the report on this cycle to work scheme has provided only for the five years and the total number is around 7000. However, no recent statistics are available on this scheme.

The Ireland approach towards the safety and infrastructure of this scheme

Ryan (2020) studied has explained that the Road Safety Authority has shown that most of the accidents on the roads are cyclist accidents. The RSA has also requested the government to increase its investment in the cycling infrastructure. Further, the RSA has explained that "the failure to observe" the main reason behind most of the accidents because they do not realise, around two in every five accidents are because of this factor. The study has also argued that

the ratio of cycling accidents has increased from 211 in 2006 to 1056 in 2018. Further, in the year amid 2006 and-2016 the around 52% increase has been recorded in the cycling accidents. Most of them were the people fo school, colleges and work (Ryan, 2020). Moyagh Murdock, the CEO of RSA, has argued that" it is important to eradicate the probability of conflicts by stipulating effective cycling infrastructure. Further, the announcement of creating cycling lanes in Dublin is indeed a major development, however, a lot of work is still needed to be done".

Importance of cycle to work scheme in Ireland

There is a certain importance of cycling to work scheme in Ireland. Rérat (2019) research has concluded that bicycling is very important because it has many physical advantages. Such as depression, hard physical fitness, muscle fitness. To evaluate his research, it can argue that cycling is beneficial for health. However, besides health fitness, there are certainly psychological benefits as well. Consistent cycling releases depression and enhances the sensory organs.

Further, talking about Irish people, where obesity ratio is very high, they need to use cycle as a major mean of transportation. It is because the health issues in Ireland are increasing day by day due to the overconsumption of meat and other non-vegan commodities. The country is consuming around 87000 tons of meat every year. Therefore, the Irish people need to use cycling and the major mode of transportation. The use of transportation can bring a major decline in heart diseases because it can help the Irish people to burn their calories.

Doorley, Pakrashi and Ghosh (2018) have explained the importance of cycling to work scheme in Ireland. They argued that cycling transport had decreased the negative external cost, such as noise and air pollution and CO2 emission. To evaluate and carry this view about the importance of cycling, it can be argued that their research has only discussed the external cost of cycling in Ireland, there is internal cost as well. The internal cost refers to transportation and maintenance cost. Increase in cycling has dragged down transportation cost for many middle-class families. It is because cycling does not need any fuel cost and it is a more efficient mode of transportation. Furthermore, the maintenance cost of cycling is also very cheap compared to other modes of transportation. These are two important considering elements for many Irish families because most of the population in Ireland has moderate income.

Han et al. (2020) have concluded that cycling is very important for boosting tourism in Ireland. They argued that many countries are using cycling as a major tourism mode of transportation that includes Poland, the United Kingdom and Finland. Cycling indeed plays an important role in tourism. However, it also provides an opportunity for local people to use cycling as a major

source of income. Some countries, such as India and Bangladesh, are using cycling as a public carrier.

Similar Studies

Certain work has been done on cycling and its importance, barriers and benefits. For instance, Foley et al. (2019) discussed cycling and mandatory measures to ensure safety. Their research discussed the drawbacks of cycling in Ireland. Their research explained that it is mandatory to take reasonable safety measure in cycling. If we critically analyze their research, it can be argued that the drawbacks of cycling are comparatively minimum than of its benefits. The fact cannot be denied that the cycle does need safety precaution. However, these precautioned are always directed by state laws. For instance, developed countries such as Ireland people are known as law-abiding citizens. The cycling laws in Ireland are more rigid and more effective than in other European countries. So, cycling to work scheme has directed certain safety measures to avoid road accidents. Doorley et al. (2018) has discussed cycling and its impact on the environment and time in the context of Ireland. They explained why cycling is important for Ireland sustainable transport system. Their research has identified only one environmental element, i.e. carbon emission. However, there are undoubtedly other environmental benefits, such as a decrease in noise and water pollution.

Further, cycling is indeed time costly, but it is for those who use cycling as a professional mode of transportation. Time is not a barrier for many students or informal people. Likewise, it provides a green transportation mode to the Irish people without the huge cost. Ravensbergen, Buliung and Laliberté (2019) research have concluded their research on cycling and the role of women in Ireland. Their research has identified that women cycling in Ireland are proportionally low than men. The study supports their argument that women ration is comparatively low. However, over the past couple of years, the number of females cycling in Ireland has quadrupled, and they are enjoying many benefits. It is because of the establishment of Women Commission of Cycling in 2002. So, the situation is improving, but there are still exemptions. Further, the induction of "Bike for life" concept has made it easy for women to ride cycles. Kahlmeier et al.'s (2017) research use the health economic assessment tool (HEAT) for cycling to identify, health-related benefits and drawbacks of cycling across Europe. Their research was very generalized because their research targeted all the Europe irrespective of geographies, cultures and state/governmental structure. The conclusion needs to be more emphasized in specified areas for valid results. However, their the identified pros and cons of cycling such as low-cost but time-consuming, affordable but slow and reliable but

vulnerable, has its importance. Further, it is not mandatory that all these identified pros and cons remain similar in Ireland.

Lanzendorf and Busch-Cheertsema (2014) and Heinen et al., (2013) has argued that this program has provided major benefits to the employees and employers. From 2012, the number of bicycling through this program has increased. However, the study of Synek and Koeingstorfer (2019) has argued that despite the success of these programs, many businesses and employees are showing resistance to such schemes. Synek and Koenigstorfer (2019) research further argued that numerous policies had been presented for the infrastructure development and promotion campaigns for encouraging the German citizens to opt for cycling instead of a car for their work. Also, considerable positives have been recorded in some cities that include Berlin and Munich (Lanzendorf and Busch-Geertserna, 2014).

Nonetheless, these facilities have to provide helped the scheme in maintaining an affirmative image of the use of a bicycle as a major mode of transport. The research of Synek and Koenigstorfer (2019) has shown that around 9% employees in Germany are using a bicycle as a major transport for work despite knowing that Germany is has a rich history of having most cars. Likewise, Lanzendorf and Busch-Geertsema (2014) have also realized the potential.

Major Challenges in Effective Promotion

The study of Litman (2019) has argued that the health authorities and a health professional have concluded on the existing data that cycling does have a significant role in the health prospects, further, the additional benefits that includes air contamination, cost efficiency and accessible to employees has been overlooked. Heinen et al., (2013) research have also explained that climate conditions and infrastructure facilities are not only the main consideration in the bicycle community but social attitudes and cultural expectation are also the main reasons. It is because these social and cultural attitudes do affect the decision of co-workers and individuals in opting for cycles. Further, according to the findings of Dill and Voros (2007), numerous factor is influencing the demand of bicycles, such as the amount of cycling and the gratification of reaching to work, because it is the central part in the job location, other amenities at work that includes (showers and lockers), the organization type and structure or the other factors that impacts the decision of cycling.

The research of Heinen et al., (2013) has also argued that the cycling can be influenced by many factors that include parking, infrastructure, the attitude of the organization at the workplace, social determination and other additional facilities. All of these are playing a significant role in the decision of opting for cycling. Further, the attitude of employees in opting

for cycling as a major source of transport also plays a significant role. Conversely, those employees who have a short time will have difficulties in accepting such mode of transport. On the other hand, providing car parking to the car owed people in public areas is also harming the overall bicycling concepts. The study of Heinen et al., (2013) has explained that those students who were provided with the transportation pass or not opting for cycling and has a major impact on the cycling schemes.

Related theory and concepts

There are also cycling-related theories and concepts which has discussed how cycling can help in altered dimensions. For instance, Behrendt (2016) has discussed the concept of cycling and smart cities. Their research discussed internet cycling and intelligent transport system for urban areas. They explained in their cycling and smart cities concept that both could provide a sustainable transportation system in Ireland and across Europe. Smart cities concept is always based on Artificial intelligence and Internet of things (IoT). This can use technology as the major element to upgrade cycling to work scheme in Ireland. These smart cities concept can help the Irish government to tackle the issue with the advanced transportation system. Karanikola et al. (2018) give a concept of "Green mode of Transportation through cycling", they argued that cycling is low-cost transportation system with numerous ecological benefits such as zero pollution (noise, air and water), no congestion. Their concept also discussed that cycling carries numerous health benefits as well. To relate this concept with the research topic, it can be argued that cycling can help the Irish government to preserve their environment and decrease the health-related issue by increasing cycling culture through this cycling to work scheme. Once the cycling to work scheme starts effective work, then consequences will automatically transform Irish people to adopt transportation as the major mode of transportation. Polse (2018) give the concept of "Urban Bicycling" in his research. His research explained that cycling in urban cities has many environmental and social benefits. He argued that increased cycling urban cities would decrease traffic congestion and noise pollution. To link the "Urban Bicycling" concept with the research question, it can be justified that the excessive use of cycling to work scheme in Ireland will also decrease the traffic congestion issue in many populated cities such as Dublin, Belfast, Cork and Derry. Lin and Liao (2016) have presented "Bikeway Network design" for Bicycling in many scenic cities.

The basic aim behind his concept was to develop a network-based system that can provide different cycling stations for the maximizing service and coverage of routes. To relate this concept with the research question, it can argue that such concepts can help the Irish cycling

scheme to create a network for cycling routes. The Irish people can use alternate routes to avoid traffic accidents, traffic pollution and congestion. This can help the cycling to work scheme improve infrastructure development in Ireland. Pojani et al. (2017) give the concept of "Cycling mindset". Their research explained that cycling is based on the people mindset if they believe that cycling has many ecological and health benefits than they will use cycle as a major mode of transportation. Likewise, suppose the concept is linked to the research question. In that case, it can be argued that Irish people mindset about cycling can be considered as one of the barriers.

Literature gap and shortcomings

The above literature has discussed the impact of cycling on health and the environment in general. Consequently, the literature has also discussed certain barriers for cycling to work scheme in Ireland. Further, the study also explained the importance of cycling in Ireland. Certain identified barriers in the literature are very crucial for Ireland sustainable transport system. However, the above literature has forgotten to discuss important elements "Culture and Time management" of Irish people in the context of the cycling to work scheme. Both of these factors have a dual effect on cycling to work scheme in Ireland. Both of these are barriers and also has its importance in Ireland cycling projects. To understand the literature gap, it is important to explain these two elements in both cases.

First, it is important to discuss "Culture and Time management" as barriers in Ireland cycling to work scheme. It has been proved from many works of literature that culture plays a significant role in any model, study, project and business idea. It is because the culture is comprised of many things, such as norms and values. The culture also varies from country to country and region to region. Likewise, the Ireland culture has its values and norms; for instance, the Irish people are more religious and littler conservative among all European countries. Therefore, for most of the people, especially women, it is relatively hard to ride a cycle rather than drive a car. Furthermore, there is no evidence to prove the role of cycling in Irish culture in the past. They are not used to this type of transportation system. In the past, they were not thought about cycling in schools and academies. Most of the people have this perception that cycling degrades their standard of living and makes them second class citizens. Secondly, time management is another barrier in Irish cycling to work scheme. The increased industrialization and technological development have turned the Ireland people to work and accomplish certain tasks in less time. Time management for the Irish people is a big challenge. This is the reason that most of the people are using fast transportation system to reach their

destinations. They know that cycling is a cheap but slow mode of transportation, and it consumes so much time.

Furthermore, to cross-examine and discuss the importance of cycling in the context of culture and time management. It can argue that cycling can play an important role in transforming the Irish culture. For instance, the Irish are meat-loving people, and they consume a large amount of meat every year. Therefore, cycling can be an important factor in decreasing health-related issues. Secondly, the use of cycle can also help the people to minimize their transportation cost. Hence, it can be argued that cycling can play a role as "agent of change" it can change the cultural perception of Irish people. The intrusion of cycling can increase the role of sustainable transportation system once the culture accepts its role and importance. Likewise, when we talk about time management, cycling can help the Irish people divide anticipate and divide time for different tasks. It is because cycling is the more predictable mode of transportation than vehicles and bikes. The mechanism is relatively easy and reliable than other transportation systems. Another importance of cycling is that it is a relatively easy way to ride than biking.

Hence, these two elements "Culture and Time management" are two important findings for the research purpose. Both of these has its own importance in Ireland cycling to work scheme. These two findings can help the Ireland government to use them as an important factor in their cycling to work-related policies.

To conclude my studies, it can be argued that cycling has a significant impact on health, cycling decrease all the health associated diseases and boosts physical activities such as muscles strengthening Cardiorespiratory, metabolic and psychological outcomes. There is a positive relation between cycling and health. Besides this, cycling also has a significant impact on the environment. Excessive cycling can reduce Carbon emission and noise pollution. It also reduces water pollution because of the small industrial system.

Consequently, talking about cycling to work in Ireland, there are certain barriers. These barriers have a major impact on cycling culture in Ireland. The barriers include poor infrastructure, departmental coordination, gender and age, training and low funding. Besides this, cycling in Ireland has its own importance; the importance can be understood through the following elements such as it provides Irish people to maintain physical fitness; it provides cheap and costless transportation system. Further cycling can play a significant role in boosting tourism in Ireland. Likewise, the critical evaluation of literature has identified important elements that dual effect on cycling to work scheme in Ireland. Both of these factors are barriers as well as the element of consideration in Ireland cycling to work scheme.

Research question

The research question for the study is as follows:

What factors contribute to the level of cycling to work in Ireland for males and females in the middle-aged group?

The study fo Martens (2014) have argued that two major reasons behind the sue of the cycle are education and work. To explained it further, the stress on professional working is acknowledged in this research study. Consequently, to achieve the goals and objectives associated with cycling schemes, it is mandatory to highlight all the limitations and obstacles related to cycling schemes. Further, all these issues can be easily understood because all of these are very communal in public, and they are interrelated in the use of cycling to work scheme. To derive data, it is important to classify it into different classes such as age, income level, gender and existing mode of transport.

The desired questionnaire will consider the below-mentioned factors:

1. Social influence
2. Commute distance
3. Cycling facilities and amenities provided by the organisation.
4. External factors: climate and road hazards.
5. Cycling infrastructure: road and tracks.

Aims and Objective

The government of Ireland has provided cycling to work scheme to the employees to promote this mode of transportation. However, the doubts still exist over its performance and effectiveness. There are two main reasons behind the relevance of this research with this cycle to works scheme.

1. To evaluate the employees' awareness in this cycling to work scheme in Ireland.
2. To promote the employees' community in Ireland for leading a healthier lifestyle and support cycling for diminishing the environment degradation; it can be only possible encouraging the people and understanding the obstacles. Also, ways that can provide assistance in diminishing those obstacles.

For achieving the research aims and objectives, the quantitative approach has been finalized. The study is using a survey questionnaire as a primary data collection tool.

Methodology

The literature review has a certain influence on methodology. For instance, all the related researcher such as Foley et al. (2019), Rérat (2019), Russell-Edwards (2019) and Dhakal and Chevalier, 2017, have all used quantitative methodology because these associated works are based on "what? and why?". Further, they have used qualitative methodology because qualitative methodology mostly relies on mathematical expressions such as statistics and graphs. Therefore, this research is focusing on using a quantitative methodology for valid results. Also, the research topic is based on analysis, and quantitative is the best technique to analyze any analysis.

Research design (Philosophy and Approach)

The nature of the knowledge and development of knowledge is called the research philosophy (Saunders, Thornhill, Lewis, 2009). There are different types of research philosophy which include ontology, positivism, realism, axiology, ontology and interpretivism. Axiology refers to judgements, ethics and aesthetics. This approach involves social enquiry and the axiological skill. In positivism, data collection and hypothesis development is carried out, which is then tested and confirmed. A highly structured methodology is followed for the hypothesis. Realism, on the other hand, relates to scientific inquiry. The truth of reality is disclosed in realism. There are mainly two types of realism, i.e. critical realism and direct realism (Altinay and Paraskevas, 2007). Direct realism refers to the experience of our senses and that what we see is what we get.

On the other hand, critical realism is the experience by our sensations which refers to the real world. The critical relists argue that at times the senses of a human being deceive us. A scientific approach is used for the purpose of development of knowledge. Interpretivism is the opposite of positivism which states that the social world can be understood based on defined principles and that it needs to be understood in a subjective manner. Interpretivism refers to people as being social actors. Interpretivism is derived from phenomenology and symbolic interactionism. The manner in which we sense the world refers to phenomenology and the process through which the social world is interpreted is known as the symbolic interactionism. The researcher adopts a stance that is empathetic in interpretivism (Altinay and Paraskevas, 2008).

Another philosophy is on ontology. This deals with the nature of reality. This philosophy has questions regarding the manner in which the world operates and the commitment towards some particular views.

Therefore, as our study relies on obtaining results based on objective principles, so the research philosophy adopted in the study is positivism. Positivism philosophy believes that quantitative data is more reliable than qualitative research.

There are mainly two types of approaches for the research works, i.e. deductive and inductive. In the deductive approach, a theory is tested, observations are made in terms of collecting data and analyzing them and final confirmation regarding the discussed phenomenon is provided. On the other hand, in the inductive approach, the first observation is done on the basis of which a pattern is made, and the hypothesis is tested, which leads to the development of a theory. Since in this research work, we are testing the hypothesis and defined relationships; therefore, a deductive approach has been adopted in the study (Stephens et al., 2020).

Sample

Since there are thousands of employers and employees in Ireland, therefore, the sample size Table 1 of Krejcie and Morgan (1970) is taken into account for the estimation of sample size for this study.

Table 1. Sample size table

Table for Determining Sample Size from a Given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

Table 1. Table for determining sample size from a given population (Krejcie and Morgan, 1970).

Based, on the table above since the population of the study is more than 1000000, therefore, the sample size selected is 384. In order to reach the sample, simple random sampling has been carried out. Simple random sampling is carried out due to its simplicity and ability to avoid any kind of bias. Simple random sampling is a part of probability sampling, and every item in this technique has an equal chance of being selected. Non-probability sampling is not chosen for the study as it can involve bias in the sampling procedure.

Research instrument and data collection

The two ways of data collection include primary data collection and secondary data collection. Secondary data refers to using data that has been already collected before. However, this is not adequate for the current study as exact data required is not available in secondary data. Moreover, at times it may not be authentic and reliable. It might have plenty of irrelevant data that does not directly answer the research questions, aims and objectives.

Moreover, secondary data at times also have bias associated with it and tends to be outdated. Therefore, we need to collect the latest data, and the needs of the researcher are specific, which can be only collected through primary data. Primary data also ensures that the accurate data is collected and bias can be kept to the minimum. Moreover, through primary data collection, the researcher can decide the research design, method and analysis of data according to the needs of the study (Jha, 2008).

The research instrument selected for the current study is a closed-ended questionnaire. The closed-ended questionnaire is selected since the sample is large, and these tend to be more accessible and quick for the respondents to answer. Open-ended or semi-structured questionnaires have not been used as for the research question given, the answers can be challenging to analyze and its harder to compare the answers and analyze the data for testing of the relationships. Moreover, the responses can be compared and easily analyzed for the defined research questions. Moreover, the choices given in the questionnaire can clarify the meaning of the questions for the respondents as well (Jha, 2008). Questionnaires are distributed amongst the employers and employees in Ireland. Both online and offline method has been used in order to collect the data. LinkedIn is one of the main platforms through which the employers and employees are contacted for filling in the survey questionnaire. The questionnaire is based on 5-point Likert scale ranging from strongly agree to strongly disagree. Likert scale is used as it is easy to understand for the respondents and a range of options is given to respondents to choose from. This further increases the response rate from the sample. The questionnaire has been adopted from the research work of Dolton (2016). Dolton (2016) explored the social influences of cycling and the perspectives of gender. The reliability and validity of the questionnaire were checked by the author, and the questionnaire was given to experts for an expert review.

Data analysis

The analysis is carried out with the help of SPSS software. The research questions will be answered by carrying out correlation analysis and regression analysis. The strength and direction of the relation between dependent and independent variable are determined through correlation analysis. The relation between independent and dependent variables is also measured through regression analysis and the variability of the dependent variable due to the independent variables is determined with the help of regression analysis.

Pilot

Whitehead et al. (2015) recommended taking a sample size of 20 for the pilot study. Therefore the current study makes use of 20 sample size. Reliability analysis has been carried out in the pilot study to ensure that the questionnaire and the variables are reliable. Value of Cronbach, which is between 0.6 and 0.8, is considered to be good for the questionnaire as recommended by Hair et al. (2003). The table shows the value or reliability of the variables in the study:

Table 2. Cronbach alpha

Cronbach alpha

Item	Cronbach's Alpha	N of items
Social Influence	.624	4
Commute distance	.635	4
Cycling facilities and amenities provided by organization	.654	4
External factors: climate and road hazards	.610	4
Cycling infrastructure: road and tracks	.611	5
Cycle to work scheme	.703	4

Ethical Considerations

The purpose and aim of the study are conveyed well to the respondents before handing them out the questionnaire. Informed consent from the participants has been taken. The participants have been told how the data collected will be used. The research intent, the type of data being collected, how the data is being collected, how the data will be used, and any risks associated are conveyed to the participants as recommended by Fleming and Zegwaard (2018). The

information sheet is clear and robust. The informed consent also contains information regarding how the confidentiality of all the participants is maintained. The information given is clear, precise and understandable for the sample (Perez et al., 2017). The data obtained is encoded to ensure that the confidentiality of the participants and anonymity is maintained in all manner. The anonymity is also maintained for all participants when publishing the results of the research work. The documents of the respondents are also stored at a safe place to keep them out of reach of others (Perez et al., 2017).

Furthermore, it is ensured that distributive justice is applied and no incentives have been offered to the participants in order to encourage anyone to participate. In order to avoid any kind of risks in the research work, it is also ensured that if there are any risks involved, they are conveyed to the participants. Too further minimize any risks, and by keeping ethical considerations in mind, the identity of all the respondents is kept confidential and not shared with anyone. The participants are informed that their identity shall remain confidential.

Limitations

The limitation of the current study is that the researcher is not able to control the environment in which the respondents fills in the survey forms. Responses usually depend on the time in which the data is collected and conditions during that specific time are not in the control of the researcher. Another limitation of the quantitative study is that there can be some errors during calculations. Moreover, some of the questionnaires might not be accurately filled up by the respondents and some questions might be left out and not filled or filled up in a hurry. Moreover, at times the quantitative research can be time-consuming and costly for the researcher. Specific details might not be achieved through quantitative research method as new themes are not discovered and only limited options are provided to the respondents to choose from. Therefore, new insights that might be relevant to the research study might not be obtained in this manner.

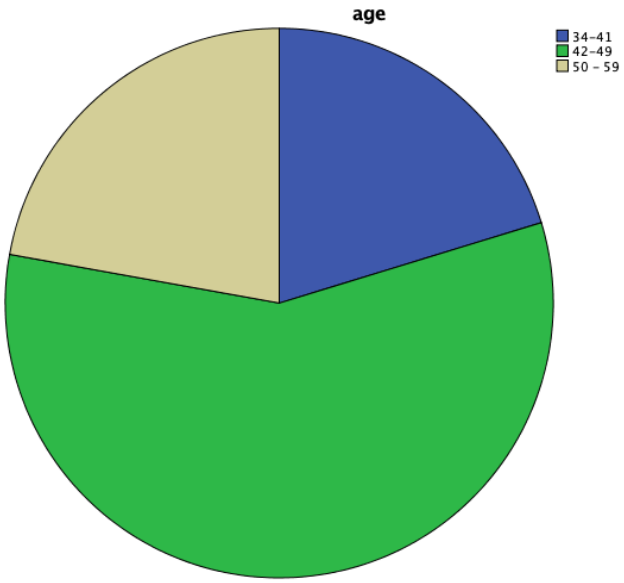
ANALYSIS

SPSS is used in order to analyze the data. Out of the 384 samples size, a total of 350 questionnaires responses were collected. 20 pilot study data was collected prior so the total sample size of the study was 370.

Table 3. Age of respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	34-41	75	20.3	20.3	20.3
	42-49	213	57.6	57.6	77.8
	50 - 59	82	22.2	22.2	100.0
	Total	370	100.0	100.0	

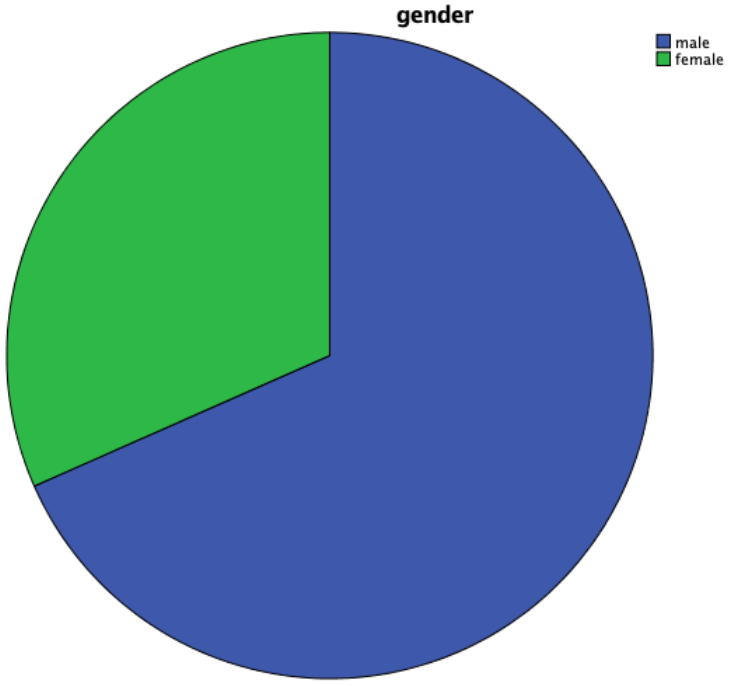


The table reflects that all the respondents were middle aged. 20.3% of the respondents were aged 34-41, 57.6% of the respondents were aged between 42-49, and 22.2% of the respondents were aged between 50-59.

Table 4. Gender of respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	253	68.4	68.4	68.4
	female	117	31.6	31.6	100.0
	Total	370	100.0	100.0	

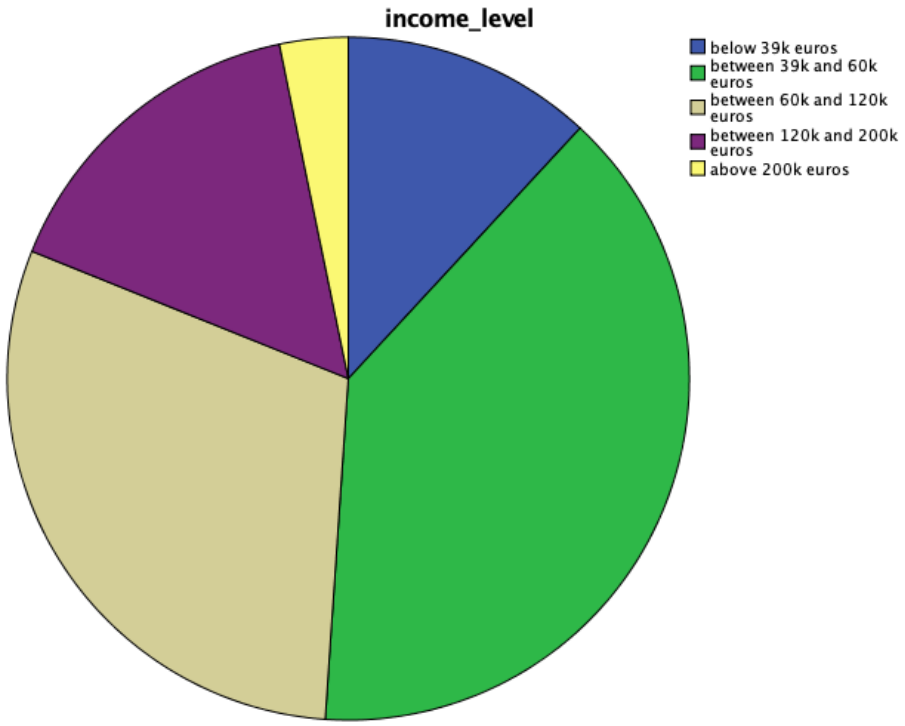


The table reflects that 68.4% of the respondents were males and 31.6% of the respondents were females.

Table 5. Income level of the respondents

Income level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 39k euros	44	11.9	11.9	11.9
	between 39k and 60k euros	145	39.2	39.2	51.1
	between 60k and 120k euros	111	30.0	30.0	81.1
	between 120k and 200k euros	58	15.7	15.7	96.8
	above 200k euros	12	3.2	3.2	100.0
	Total	370	100.0	100.0	

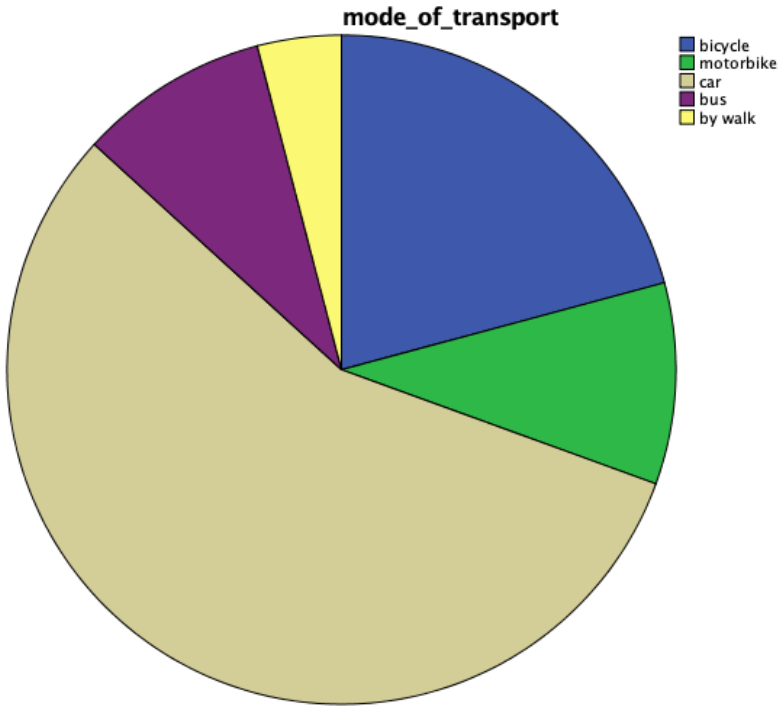


The income level of 11.9% of the respondents was below 39,000 Euros, the income level of 39.2% of the respondents was between 39,000 and 60,000 Euros, 30% of the respondents had income level between 60,000 and 120,000 Euros, 15.7% of the respondents had income level between 120,000 and 200,000 Euros, whereas 3.2% of the respondents had income level above 200,000 Euros.

Table 6. Mode of trasnport of the respondents

Mode of transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	bicycle	77	20.8	20.8	20.8
	motorbike	36	9.7	9.7	30.5
	car	208	56.2	56.2	86.8
	bus	34	9.2	9.2	95.9
	by walk	15	4.1	4.1	100.0
	Total	370	100.0	100.0	



20.8% of the respondents used bicycle to work, 9.7% used motorbike to work, 56.2% of the respondents used a car to work, 9.2% used a bus to travel to work and 4.1% travelled by walk.

Reliability

Table 7. Reliability

Item	Cronbach's Alpha	N of items
Social Influence	.779	4

Commute distance	.639	4
Cycling facilities and amenities provided by organization	.979	4
External factors: climate and road hazards	.674	4
Cycling infrastructure: road and tracks	.642	5
Cycle to work scheme	.985	4

The reliability analysis show that the value of Cronbach alpha for all the variables is more than 0.6 which reflects that the questionnaire is reliable.

ANOVA

Table 8. ANOVA

Cycle to work scheme

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.456	1	.456	1.267	.261
Within Groups	132.343	368	.360		
Total	132.799	369			

One-way ANOVA has been carried out in order to determine if gender impacts the variables under study. The value is insignificant (.261) which reflects there is not a difference in the means of male and female, therefore, it can be concluded that gender does not affect the level of cycling in Ireland.

Table 9. Correlation analysis

Correlation

	Social influence	**Commute distance**	**Cycling facilities**	**External factors**	**Cycling infrastructure**

Cycle to work scheme Correlation	.238	.108	.338	.452	.218
N	.005	.875	.021	.000	.000

The correlation analysis tells us that the relation between cycle to work scheme and social influence, cycling facilities, external factors, cycling infrastructure is significant. The relation between the commute distance and cycle to work scheme was found to be insignificant. The relation between cycle to work and social influence is weak positive (.238). The relation between cycle to work and cycling facilities is weak positive (.338). The relation between cycle to work and external factors is moderate positive (.458). The relation between cycle to work and cycling infrastructure is weak positive (.218).

Regression analysis

Table 10. Regression analysis

R	R square	Adjusted R square
.273	.074	.062

Variable	B
Social influence	.026
Cycling facilities	.021
External factors	.043
Cycling infrastructure	.022

The value of regression (R square) shows that the independent variables impact 7.4% of the dependent variable (cycle to work). The analysis also reflects that one-unit change in social industries impacts 2.6% of the cycle to work, one-unit change in cycling facilities impact 2.1% of the cycle to work, one-unit change in external factors impact 4.3% of cycle to work and cycling infrastructure impacts 2.2% of the cycle to work.

KEY FINDINGS

It is found that social influence, cycling facilities, external factors and cycling infrastructure impacts the level of cycling the most in Ireland in the cycle to work scheme. Amongst these independent variables, external factors impact the level of cycling the most. On the other hand, it was also found that commute distance does not impact the level of cycling amongst the people. Moreover, it also found that gender does not impact the level of cycling. All the respondents were middle-aged with the majority of them aged between 42-49. Majority of the respondents in the study were males with a percentage of 68.4%.

Furthermore, majority of the respondents had an income level between 39k and 60k euros. The majority of the respondents currently made use of a car for the commute to work and back. The results reflect that it is essential that people around encourage to cycle to work. Suppose there are peers or relative or friends that cycle to and back from work that it encourages others as well. Moreover, the environment tends to be safe for cyclists. The companies and organizations must also provide the cycling facilities to the employees to encourage them to opt for cycling rather than the car. The organizations need to ensure that the employees are supported for cycling and delays in the provision of facilities should be avoided. The climate, at times, can be the factor that prevents employees from opting for cycling. The roads for the employees are suitable for cycling as they are not broken or do not have any major barriers for cyclists. The roads tend to be smooth, and the traffic does not impact the route of cyclists much.

DISCUSSION

In the discussion section, the thesis is focusing on the similarities and differences of the issues associated with the cycle to work scheme in Ireland. The purpose behind highlights these differences and similarities are that it will clear the reader understanding about the research findings and literature. These identified issues are very communal in this cycle to work scheme. Further, the discussion section is also focusing on the research limitations, research implications and research recommendations. All the discussion elements are explained below.

Issues that were common in Literature and Findings

- The first commonality between the research findings and the literature is the "Gender" role in Cycling. The previous literature of Pucher and Dijkstra (2003) and Moudon et al (2005) has explained the role of gender in cycling to work scheme in Ireland. They have argued that the ratio of cycling between males and females has major differences. They argued that the ratio of male cycling is very high compared to females in Ireland. Murphy and Usher (2015) has also supported the argument and explained that males cycling is twice to females. However, these research findings have concluded that gender does not have any significant impact on cycling in Ireland despite the effective sampling.
- "Cycling Infrastructure" is another similar issue between the previous literature and the research findings. The previous study of O'Connor et al., (2016) research has concluded that poor cycling in Ireland, especially in Dublin, has a major role in Cycling. The poor infrastructure of cycling routes and parking are negatively effecting cycling to work scheme in Ireland. Similarly, these research findings have also highlighted the impact of cycling infrastructure on cycling to work scheme in Ireland. The research findings have concluded that poor cycling infrastructure in many areas of Ireland has an impact on cycling to work scheme.
- "Climate and Environment" is another similar issue between the research findings and the previous literature. For instance, the previous study of Woodcock et al., (2018) and Rerat (2019) has concluded that extreme weather condition does effects cycling because of the increase in health issues. Bad climate changes the overall mood of the people to ride a cycle when its raining or intense cold. Consequently, the research findings have also concluded that sometimes a climate has a major impact on cycling and restricts employees from cycling in Ireland.

- "External factors" such as climate and road condition are another unique factor that has an impact on cycling to work scheme in Ireland. The previous study of Rerat (2019) has concluded that cycling increases the chances of road accidents and it is more vulnerable because people are mostly exposed to the impact. The research has also found that external factors such as road accidents have an impact on cycling in Ireland.
- "Income-level" is another common issue in the research findings and previous literature. The previous study of Murphy and Usher (2015) has concluded that income level does not determine the use of cycling because rich people are also using cycles for certain reasons. This study has found and concluded that income level has an impact because those who have moderate-income level are preferring car over cycles.

Issues that were not similar in literature and Findings

- Further, "Social influence" is a unique finding in the research. The use of cycles from different people has an impact on cycling.
- Another unique finding is "Cycling facilities", the research findings have concluded that all the facilities and amenities related to cycling such as rewards, cycling allowances by the organizations have an impact on cycling to work scheme in Ireland.
- "External factors" such as climate and road condition are another unique factor that has an impact on cycling to work scheme in Ireland.
- The research findings have concluded that "Commute distance" does not any significant impact on cycling to work scheme in Ireland. The people in Ireland has shown that cycling cannot restrain them from a distance if the cycling infrastructure is effectively developed.
- "Lack of coordination" is among the governmental organizations and the cycling to work scheme but the issue has not been identified in the research findings. The previous study of Hayes et al., (2019) has highlighted and explained that effective coordination among altered departments can increase the chances of cycling to work scheme in Ireland. However, this research has not found any impact of effective coordination over this cycling to work scheme in Ireland.

Research Limitations

During the research, several limitations have been experienced, which are explained below.

- One of the main limitations that have been experienced was the sampling selection for

the research topic. The selected sample has been finalized after several consultations with research expertise. The recommendations have helped the research to select relevant sample group that can bring reliability in the research findings.

- Another limitation during the research was the lack of relevant research data. It was very hectic to find relevant information from the previous studies. Numerous research sources have been scrutinized for collecting relevant data. Secondly, the topic is unique and has limited research information. So, data collection from the previous literature was a mammoth task.
- Research time was another limitation during the research process. It can be argued that the research topic is highlighting a crucial topic in Ireland. Too increase the research effectiveness, it was mandatory to use the maximum time for each section. Further, the data collection required additional time to collect data for the analysis. However, being a researcher, the given time has been effectively utilized.
- Culture awareness was another major limitation during the research because Ireland has a distinct culture and different lifestyle. It was mandatory to understand the cultural norms and values of Irish people during the sampling and data collection stage. During the research, the cultural norms was a significant consideration because it defines the research ethics.
- Research methodology selection was also a major considering factor in research limitation. However, the selected methodology was the most effective method for this research question.
- Lack of financial support made it the research process very difficult because the research aimed to increase the sample size and provide altered refreshing commodities to the participants. However, the lack of financial support limited the research sample size reward for the participants.

Research Implications

The research has certain implications that are essential to explain because these implications will provide different directions to the research stakeholders.

- The major implication of this research is that this research can help the Irish government in policy-making regarding different cycling projects in the future. Also, the research can provide necessary information about the cycling projects issues and challenges. The Irish government can use the research as a major tool for identifying different loopholes

in cycling to work scheme and can overcome all those loopholes.

- The cycling to work scheme will help the Ireland environmental agencies in minimizing the excessive use of CO2 emitting vehicles and provide sustainable green consumption pattern in the country.
- This research will also help the (NTA) National Transport Authority of Ireland to gain collect different information for effective management in transportation. Likewise, the National Transport Authority can provide a roadmap to the government to overcome all the highlighted issues. Similarly, the NTA can use this research to find an alternative solution for the populated areas such as Dublin, Galway and Cork.
- This research can provide academic assistance to all the students and researchers. The students can use this research to understand the importance of cycling in Ireland. Also, this research will help the researchers to use the information as secondary data for their research. Universities can use this research publication as for the institute appreciation at different forums. Further, health-conscious people can get information about the health benefits of cycling from the research. They can use major research mode of transportation.
- The cycling to work scheme project stakeholders can also use this research as a project charter. They can derive relevant information for improving project performance. They can use these identified issues as major risk factors for effective risk management in the project.
- The (RAS) Road safety authority of Ireland can use this study to form a special road safety mechanism for the cycling routes in many cities of Ireland. They can contribute to the infrastructure development programs in Ireland.
- The (DTT) Department of Transport and Tourism Ireland can also get benefits from this research, they can increase the use of cycling and can coordinate with different departments such as National Transport Authority to improve road safety and cycling routes for boosting local tourism.
- This research can provide the Health Research Board (HRB) of Ireland with substantial evidence about the inclusion of bicycles in health and nutrition recommendation book. So, people can become aware of the health benefits of cycling.

Research Recommendations

Too improve cycling to work scheme in Ireland, this research has also explained certain recommendations.

- The global pressure for increasing green transportation in the countries, the use of environment-friendly transportation has increased. Likewise, cycling is also one of the eco-friendly modes of transportation in Ireland. Too promote cycling more effectively, the Irish government needs to improve overall cycling infrastructure such as cycling parking, cycling routes without the steepness. The parking needs to be secured and more presentable.
- Likewise, the government can include the use of technology such as AI artificial intelligence in cycling projects. So, people can be more interested in cycling instead of automobiles. Advanced cycling can be a more effective way of completing cycling projects in Ireland because the use of technology in the present generation is very high.
- The cycling to work scheme and other cycling projects in Ireland needs to touch the cultural sentiments of the local people during the commercialization of the project. Culture plays a significant role in reshaping society. Therefore, it is mandatory to drive the people towards “social acceptance of cycling”.
- Too increase the use of cycles and increase the chances of cycling projects, the Irish government needs to provide different sort of governmental allowances for those who are using cycle as a major mode of transportation. Also, the government needs to provide different facilities to the cyclers. The facilities can increase the use of cycles because people will be more excited to ride instead of drive. Further, the same policy is mandatory for all private organizations to provide allowances and facilities to their employees who use a bicycle as a transportation source.
- It is also mandatory to form a collective coordination command and control system for cycling to work schemes. The CCC system will ensure efficacious planning and implementation of all cycling schemes in Ireland.

CONCLUSION

The research study was conducted to determine the factors that impact the level of cycling in Ireland. The study was conducted for people in the middle ages. Moreover, the research was conducted to find if gender has any relation to the factors that impact the level of cycling. It was concluded that the difference in gender does not impact the factors that affect the cycling level.

Based on the analysis, it is concluded that social influence, cycling facilities, external factors and cycling infrastructure impacts the level of cycling the most in Ireland in the cycle to work scheme. Amongst these independent variables, external factors impact the level of cycling the most. It has also been concluded that commute distance does not significantly impact the level of the cycle to work. It is concluded that social influences have a positive impact on the people, and it encourages them to cycle to work from home and back. If the cycling facilities are right, then the cyclists are encouraged to cycle and contribute positively towards the environment. External factors are not in the control of the cyclist and any impact on the external factors like the weather impact the decision of the cyclist to cycle.

Furthermore, a good infrastructure encourages the people living in Ireland to cycle. This reflects that the government needs to ensure that good and lucrative infrastructure is provided to the people for cycling so that they are encouraged to opt for cycling. It was concluded that most of the people in Ireland make use of cars rather than bikes or cycles. Still, more measures are required by the government to convert car travelers to bicycle usage.

In future work, a mixed research methodology can be adopted. Both qualitative and quantitative approach can be adopted, and interviews can also be conducted, which will provide new themes and emerging themes from the discussions. Moreover, the focus group discussion in this regard can also be carried out. Moreover, variables such as economic factors and social status can also be taken into account to determine the choice of cycling of the people. Solutions can be sought in detail to convert the extensive usage of cars and bike to bicycle.

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Annex A – Questionnaire

Age

- 18-25
- 26-33
- 34-41
- 42-49
- 50 and above

Gender

- Male
- Female

Income level

- Below €39,000
- Between €39,000 and €60,000
- Between €60,000 and €120,000
- Between €120,000 and €200,000
- Above €200,000

Existing mode of transport

- Bicycle
- Motorbike
- Car
- Bus
- By walk

Social Influence

Does anyone around you discourage you from cycling to work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

There are people around me who so cycle to and from work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

The environment is safe for me to cycle to work and back

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I see people cycling to work and that encourages me to cycle as well

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Commute distance

The trip distance is adequate for using bicycle to work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I am/ the staff is able to reach easily and on time to work via bicycle

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I have different route choice for cycle to work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I enjoy the distance and route from home to work and vice versa

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Cycling facilities and amenities provided by organization

My organization fully facilitates its employees for implementation of cycle to work scheme

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

The purpose of cycle to work scheme is explained by my organization to all employees

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

The employees who opt for cycle to work are supported by my organization

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

There is no delay in provision of cycle to work facilities by my organization

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

External factors: climate and road hazards

Barriers do not create any hindrance in cycling from office to work and back

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

There are no speed breakers or broken roads that hamper by cycling

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

The climate impacts my mode of transport to work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I have to check whether forecast to select my mode of transport to work

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Cycling infrastructure: road and tracks

There are enough signage on road for cyclists

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

There is suitable local facility for bicyclists available

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Even during high traffic volume, it does not impact me to bicycle as there is separate track for bicyclists

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

The road are smooth for cycling

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Bike parking is available at various stops

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Cycle to work scheme

I believe cycle to work scheme is valuable for saving cost and making environment greener

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I believe cycle to work scheme is a good initiative

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I believe cycle to work scheme has long-lasting benefits

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

I believe cycle to work scheme is a progressive step towards the society				
Strongly agree	Agree	Neutral	Disagree	Strongly disagree