Stress, self-efficacy and satisfaction with life on cyclists and drivers in Ireland

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Abstract

Introduction: An analysis of cyclists and drivers in Ireland using self-report methods to provide insight into stress, self-efficacy and satisfaction with life.

Method: All instruments used in this study were self-administered online questionnaires. These included demographic questions on age, gender, commute type and commute time to work. Stress questions were used from the Depression Anxiety Stress Scale, the General Self-Efficacy Scale and the 5 Item Satisfaction with Life Measure.

Results: A significant difference was found in satisfaction with life levels of female cyclists who were found to have higher levels compared with males. Females were also found to have a negative correlation with self-efficacy and stress in both the cycling and driving group. Male drivers were found to have a negative correlation between satisfaction with life and stress and a positive correlation with satisfaction with life and self-efficacy.

Discussion: Female uptake of cycling could be improved by increasing self-efficacy and reducing stress through appropriate cycling facilities, infrastructure and traffic management. Car commuting for males had an impact on stress which affected their life satisfaction, a finding that was not seen when they cycled, which could indicate a more stable mode of transport in psychological terms.
1. **Introduction**

“Lack of activity destroys the good condition of every human being while movement and methodical physical exercise save it and preserve it” Plato.

1.1 **Impact of active travel on mental health**

The health benefits of active travel are widely recognised and supported. The global recommendations for physical activity in 18-64 year olds, as outlined by the World Health Organisation (WHO), are at least 150 minutes of moderate intensity exercise in a week. Moderate intensity activities include cycling and walking. Approximately 23% of adults globally have an insufficient activity level, which is partly on the increase as a result of “passive” modes of transport (WHO, 2015). In 2013, WHO targeted the area of physical inactivity to have a reduction of 10% by 2025 and included the area of active travel and a means to achieve this goal. By cycling a distance of 7.5 kilometres daily this activity level would be met (Ginty, 2012).

The British Medical Association (2012) released the Healthy Transport = Healthy Lives document, highlighting the impact of psychological benefits from an active commute, including improvements in self-esteem and mood, reduced anger, depression and anxiety. This is being used as a driving force to encourage cycling and active travel to work. The risks associated with cycling such as injury and air pollution were taken into consideration and the benefits of an active commute, both physically and mentally, still outweighed the potential harm. The cyclic form of movement derived from cycling has been proven to have a relaxing effect and reduce stress. Over half an hour of cycling releases endorphins into the bloodstream...
and positively impacts mood and brain function, even post the cycling journey (Ginty, 2012).

According to the Office for National Statistics in England, it was found that life satisfaction, happiness and having a sense that one’s activities are worthwhile decline with each minute of the work commute (Roxby, 2014). This was found to be compounded with a lengthy commute of over 30 minutes.

Roberts (2009) found that the effect of commute on women was much greater than on men, resulting in high stress levels. The reasons that can contribute to this included traffic jams and unpredictable weather.

1.2 Irish Government Policy

In 2009, the Irish government released the “Smarter Travel Policy”, aiming to reduce car commuting from 65 % to 45 % by 2020 and increase public transport, walking or cycling from 35 % to 55 %. The reasons behind this are not only for environmental and physical wellbeing of the population but also to improve mental health though exercise. The “National Cycle Policy Framework (NCPF)” outlines the details of how this will be achieved. Among these are the integration of cycling and public transport and the creation of municipal bike systems to complement the public transport system.

The Cycle to Work scheme started on 01 January 2009 and provides a tax incentive to employees to pay for bicycles through their employer via salary sacrifice arrangements whereby the repayment is exempt from all tax (Revenue, Irish Tax and Customs, NA). The purpose of it is to encourage cycling as a form of commute to
lower carbon emissions, lower traffic congestion and improve health and fitness. Caulfield and Leahy (2011) found that the Cycle to Work scheme has led to the encouragement of individuals to purchase a bicycle for the first time in many years.

The Dublin bikes scheme / Coca-Cola Zero Bikes was launched 2009, 450 bikes initially in Dublin, which was increased to 550 by 2011. The scheme has been introduced in Cork, Limerick and Galway. In April 2015 the amount of journeys taken stood at 10,568,398 (Coca Cola Zero Dublin Bikes, 2015). Following the 2011 census in Ireland, the Central Statistics Office (2012) published that 69 % of Irish commuters drove to work in 2011. 2.4 % of commuters cycled to work (up 9.6 % on 2006). This study will specifically deal with the bicycle and car commute as it is at the forefront of the Irish transport policy, incorporating the benefits of an active commute on mental health to the Irish public.

1.3 Stress

Stress is defined as ‘a negative emotional experience accompanied by predictable biochemical, physiological, cognitive and behavioural changes that are directed towards altering the stressful event or accommodating to its effects’ (Baum, Fisher & Solomon, 1990). Stress is the result of a stressor, which are both physical and psychological events that affect behaviour (Sarafino and Smith, 2012, p.29).

The response of the body to stress involves the interaction of the nervous and endocrine system culminating in the release of effector hormones – cortisol, epinephrine and non-epinephrine (Klein, 2013). This is a tightly regulated process that involves two main mechanisms – the Hypothalamic Pituitary Adrenalin Axis
(HPA) and the Sympathetic Adreno Medullary (SAM) system – resulting in the release of the three major stress hormones – cortisol, epinephrine and non-epinephrine (Klein, 2013). On the HPA Axis side, prolonged stress leads to elevated cortisol levels, which has a number of negative effects including immune system suppression, increased blood pressure and blood sugar levels and increased obesity (Talbot, 2007).

The SAM system is responsible for the release of the other two major stress hormones – epinephrine and non-epinephrine. Increases in these hormones results in increased heart rate, hypertension, increased metabolic rate, vasoconstriction, dilated bronchioles, inhibition of non-essential processes (Kvetansky et al, 2009).

Prolonged and over activation of these hormones will result in decreased immune response, lack of energy, inability to concentrate and depression (Talbot, 2007). Kiecolt-Glaser et al (1984) found that decreased white blood cell levels during periods of high stress correlates with depression and loneliness.

1.4 Stress and commuting

Much research has been conducted in the area of the driving commute linking long work commutes in heavy traffic to stress at work. Novaco and Gonzalez (2009) explained that “driver stress” is more than a negative mood or inclination but involves anxiety, depressions and demoralization. Using quasi-experimental methods, Novaco, Stokols and Milanesi (1990) investigated physiology, task performance, mood states, subjective distress and health issues incorporating questionnaires and daily travel logs. The research uncovered that physically driver stress was
associated with higher blood pressure, lower tolerance of frustration, increased negative moods and work absenteeism and lower job satisfaction.

Novaco et al (1991) found that stress was higher in female solo drivers with a high impedance commute. Hennessy et al (2000), however, did not find any gender differences in driver stress. Active commuting such as walking and cycling was associated with an overall 11% reduction in cardiovascular risk, especially in females (Hamer and Chida, 2007).

The unpredictability of car travel time also led to increased stress as commuter traffic can vary greatly from day to day. Costa et al (1988) found that travel time uncertainty could be linked with anxiety. Gatersleben and Uzzell (2007) found that car drivers have the most stressful commutes compared to public transport users, cyclists and walkers. Commuters were surveyed on their feelings towards their commute taking into consideration their journey time and distance and their attitude towards their mode of transport. Kahneman et al (2004) used the Day Reconstruct Method (DRM) to assess how people use and are affected by their experiences during the day and found that the work commutes belonged to episodes that were mostly negative during the day.

O’ Regan and Buckley (2003) found that 79% who commute daily feel that this trip encourages stress. Using a self-report questionnaire that examined perceived stress, perceived control and mood, the modes of transport that were examined were car, bus, train-DART and walking. High stress levels were linked with the car commute use due to traffic congestion, rule breaking motorists and the amount of traffic lights. The active commute had significantly lower levels of stress.
While the data provided interesting results in terms of stress, the sample size of car commuters (23 people) was small, providing a limited view on this type of commute.

Stress linked with the car commute is well documented but it remains the preferred mode of transport for commuters. Hiscock, Macintyre, Kearns and Ellaway (2003) found that private car users yielded psycho-social benefits of prestige, autonomy and protection. This study was performed in Scotland, where society is geared towards car use and places a high value in this mode of transport – lending it to become part of the individual’s self-actualisation. The car also provides the user with reliability, convenience and shelter from the often wet climate of Scotland (Anable and Gatersleben (2004). The values, infrastructure and climate of Scotland would be similar to that of Ireland, which could have an impact on the results of commuter stress in this study.

1.5 Satisfaction with life and the work commute

According to the CSO in 2011, the average amount of time spent commuting to work is 26.6 minutes. Over the average working year that equates to 4.8 days, which is a significant amount of time and must have some impact on perceived satisfaction with life. In Sweden, Olsson et al (2012) found that satisfaction with the work commute is a factor for overall happiness. Using the 5-item satisfaction with life scale as an online self-report tool, the results from this study found that overall commuters were happy with their work commute, which led to mostly positive feelings at work, contrasting with the research of Novaco and Gonzales (2009). Sweden has a high uptake of commuting via bicycle whereas the predominant mode of transport in the US is by car – the base for the research of Novaco and Gonzales. The length of
commute time had a significant impact on the satisfaction with life results. Shorter commutes in particular were appreciated as a necessary go between for work and private life. In general, those that walk or cycle tended to commute for shorter amounts of time. As the commute time increased, the satisfaction with the work commute decreased, which has been found in the research of Novaco and Gonzales.

The infrastructure of Sweden is geared to accommodate an active commute with appropriate cycle lanes and biking facilities. In Ireland, while there is an increase in the amount of bicycle commuters, the car continues to be the preferential commute method. Ireland’s infrastructure for the bicycle commute is not as developed as that of Sweden’s, which may have a bearing on this study.

1.6 Self-efficacy

Bandura explained the concept of self-efficacy as “… people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives.” (Bandura, 1994). This is turn has an impact on how the individual feels and thinks and their motivation. A high sense of self-efficacy empowers the individual to accomplish goals and embrace challenges. In stressful situations, a high sense of self-efficacy can be viewed as a challenge to overcome rather than an insurmountable obstacle. Those with a low sense of self-efficacy can shy away from situations they perceive as difficult. Success is a means to boost self-efficacy. As a person achieves a goal, they become more confident and can become accustomed to the requirements of perseverance to achieve a task. In the result of failure, self-efficacy can take a hit leading to demoralization (Bandura, 1994).
Luszczynska et al (2005) found that workers that had high levels of social life satisfaction and higher job satisfaction had higher self-efficacy scores.

1.7 Self-efficacy and physical activity

Self-efficacy and exercise are intertwined with each other. A person who exercises regularly tends to positively correlate with self-efficacy. Those who need significant encouragement to exercise often have low self-efficacy (Jackson, 2010). Research into self-efficacy has shown its connection with adopting physical activity and furthermore, maintaining it (Sallis, Hover and Hofstetter, 1992; Darker, French, Eves and Sniehotta, 2010). Rimal (2001) conducted a longitudinal study and found that people with low self-efficacy improved their self-efficacy over time and this correlated with greater exercise behaviour. In this study it was found that those with higher self-efficacy were more likely to make use of health information. Increased self-efficacy can help in the promotion of physical activity behaviour (Ashford, Edmunds and French, 2010). The current Irish transport policy is encouraging active transport in part to improve the health of the nation. The area of self-efficacy in terms of a car and bicycle commute has not been investigated to date, but will be a variable in this study.

1.8 Rationale for this study

The WHO has identified passive transport as an area that must be reduced to help promote health through physical activity globally. Currently, the Irish government are encouraging an active commute, specifically cycling through incentive schemes to
help safe guard both the physical and mental health of the population. The work commute is an area of research that has been well documented largely for its negative impact on stress; however, this is more prominent in a passive commute than an active commute. Research has shown that commuters who travel shorter distances or have an active commute have increased satisfaction with life levels. Higher self-efficacy has been shown to correlate with increased activity; therefore, the question can be posed whether an active commuter has higher levels of self-efficacy than the passive commuter.

This study will investigate commuters who travel to work using a car or a bicycle in terms of self-efficacy, satisfaction with life and stress. Gender differences and length of commute will be reviewed in relation to these variables to investigate significant findings.
1.9 Hypotheses

Hypothesis 1:
Cyclists will have significantly higher levels of self-efficacy than car commuters.

Hypothesis 2:
Cyclists will have significantly higher levels of satisfaction with life than car commuters.

Hypothesis 3:
Cyclists will have significantly lower levels of stress than car commuters.

Hypothesis 4:
Males and female commuters will have significant differences in stress, self-efficacy and satisfaction with life when compared against each other for car and bicycle travel.

Hypothesis 5:
A longer commute time will have significant differences in stress, self-efficacy and satisfaction with life compared to a shorter commute time for both car and bicycle.

Hypothesis 6:
There will be a negative correlation between self-efficacy and satisfaction with life against stress for car users and cyclists.

2. Methodology

2.1 Materials

This study was conducted using self-administered online questionnaire. Stress, satisfaction with life and self-efficacy were measured using existing structured psychological questionnaires.

2.2 Measures

Demographic Questions

At the beginning of the survey, each participant was asked to state their age and gender, select their commute type from a list and state their length of commute.

The General Self-Efficacy Scale

Schwarzer and Jerusalem (1995) developed the General Self-Efficacy Scale to assess how an individual would respond to situations dealing with daily hassles. A
10-item scale is used to assess self-efficacy based on personality disposition and can be used for the general adult population (see appendix A). Each of the ten questions refers to successful coping and implies an internal-stable attribution of success. Participants were asked to respond by indicating their extent of agreement with each of the statements using a four point Likert scale of 1 (not at all true), 2 (hardly true), 3 (moderately true) to 4 (exactly true). Examples of items on the scale include “I can always manage to solve difficult problems if I try hard enough.” The scores for each of the ten questions were summed up to give a total score, ranging from 10 to 40. The higher the score, the higher the level of self-efficacy. This scale has demonstrated high internal consistencies with Chronbach’s Alpha (ranging from .76 to .90) and has been deemed reliable (Schwarzer and Jerusalem, 1995). Criterion-related validity has been well documented across correlation studies where positive coefficients were found with favourable emotions, dispositional optimism, and work satisfaction. Negative coefficients were found with depression, anxiety, stress, burnout, and health complaints (Gutierrez-Dona et al, 2009).

*The 5 item Satisfaction with Life Measure (SWLS)*

Pavot and Diener (1991) created the SWLS as a measure of subjective well-being and has been shown to correlate with measures of health psychology. The questionnaire involves 5 statements that the participant may agree or disagree with such as “so far I have gotten the important things I want in life.” (see appendix B) The participant rates each statement between 1-7, 1 being strongly disagree and 7 being strongly agree. This 7-point Likert scale can give a possible result ranging from 5-35. Scores between 31 - 35 range indicate the respondent is extremely satisfied,
25 – 29 is a high score, 20 – 24 is an average score, 15 – 19 is slightly below average, 10 – 15 is dissatisfied and 5 - 9 indicate the participant is extremely dissatisfied. This scale has demonstrated high internal consistency with Cronbach’s Alpha (ranging from .79 - .89) (Pavot and Diener, 2008).

**Stress Questions from the Depression Anxiety Stress Scale 21 (DASS 21)**

Lovibond and Lovibond (1995) looked at the assessment of depression, anxiety and stress, developing the DASS 21 for the purpose of research and treatment by concentrating on the core aspects of these factors (see appendix C). The stress items from this questionnaire were used for the purpose of this research, which include 7 questions such as “Over the past week, I tended to over-react to situations”. The scoring went from 0 (Did not apply to me at all) to 3 (applied to me very much, or most of the time). The participant selected the appropriate score for each item. The total score was made by adding each item, with a score of 0-7 indicating normal stress levels, 8-9 indicating mild stress, 10-12 at moderate stress, 13-16 severe stress and 17+ indicating extremely severe stress levels (Gomez, NA). The stress subscale demonstrated a high internal consistency with Cronbach’s Alpha (.78 - .82) (Nilges and Essau, 2015).

2.3 **Participants**

Participants were both purposively and randomly selected through the use of social media (shared though Facebook, Dublin Cycling Campaign Facebook page), distribution of flyers to cyclists at busy junctions in Dublin on their morning commute.
and placing flyers in bicycle shops (see appendix E). Cyclists were targeted as this study required a large enough sample of bicycle commuters for meaningful data. Dublin was used as it has the largest volume of cyclists in Ireland. An online self-report questionnaire was designed using Survey Monkey, at www.surveymonkey.com (see Appendix D).

346 surveys were filled, 283 or 82% were completed correctly. 59 participants did not click “Complete Survey” and were automatically excluded from the results and a further 4 participants had incomplete questionnaires. 32 (9%) of the respondents used commuter means other than car or bicycle and were excluded as the sample size were too small to yield significant findings. These included walking, bus, tram and train. A sample size of 251 remained for the study’s hypothesis.

2.4 Design

This study is a quantitative correlational design. The measured variables include age and gender of the participants, their mode of transport and their commute time. The independent variables include the commute type – by car or by bicycle. The dependent variables are self-efficacy, satisfaction with life and stress, as well as gender, age and commuter time.

2.5 Procedure

Ethical approval to conduct this study was received by the Dublin Business School Ethics Committee. Participants were invited to complete the study by clicking on a link to enter the online questionnaire. This link was hosted by survey monkey at
https://www.surveymonkey.com/r/2Q992T8 and could be accessed through Facebook, The Dublin Cycling Campaign or by typing in the link that was advertised on a flyer.

The opening page introduced the survey and gave a general overview of the author, study type and the school that this study was run in conjunction with. The participant was advised that their details would remain anonymous and of their right to withdraw at any stage up until the survey was fully completed. They were advised that participation was voluntary and the length of time this survey would take to complete (approximately 10 minutes). To access the survey, the participant clicked on “Next”.

The participant went on to complete 4 demographic questions (page 2), 10 questions from The General Self-Efficacy Scale (pages 3 and 4), 5 questions from The Satisfaction with Life Scale (page 5) and 7 questions from the Stress section of the DASS (pages 6 and 7). The survey consisted of 26 questions in total.

Page 8 was a debriefing page that gave further detail of what the study was about. It also gave contact details for The Samaritans should the questions have raised any negative feelings. Finally, the participant was asked to click on “Complete Survey” if they wanted their details to become part of the study and were advised that once this was clicked their data could not be withdrawn. If the participant wished to withdraw at this stage they were advised to close the internet tab instead of clicking “Complete Survey”.

All participants were over 18 therefore informed consent was not necessary.
2.6 Data Analysis

The data was analysed using the SSPS-22 programme. Initially, descriptive analysis was performed on the data. Inferential analysis was conducted using Independent T-Test for parametric data and Mann-Whitney U for non-parametric data within groups for measures of self-efficacy, satisfaction with life and stress. A p value of less than 0.05 was considered significant. Spearman’s-Rho was conducted to look at the correlation between the variables as data was both parametric and non-parametric. An r-value greater than 0.300 was considered to show mild-moderate correlation.
3. Results

3.1 Descriptive Statistics

Demographics

In the overall survey group, the average age of the participants was 39 years, with a range of 51 years – the minimum at 18 years and the maximum at 69 years. The sample was higher in males at 53.4%.

The sample was subdivided into 2 main groups based on mode of commute – cars and bicycles. Preliminary analysis of the data was completed based on gender, age and commute time as shown in Table 1.

Table 1. Descriptive Statistics of Demographics

<table>
<thead>
<tr>
<th></th>
<th>Car</th>
<th>Bicycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Commute (n)</td>
<td>165 (65.7%)</td>
<td>86 (34.3%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males (n)</td>
<td>81 (49.1%)</td>
<td>53 (61.6%)</td>
</tr>
<tr>
<td>Females (n)</td>
<td>84 (50.9%)</td>
<td>33 (38.4%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>40.7yrs</td>
<td>36.4yrs</td>
</tr>
<tr>
<td>Minimum</td>
<td>18yrs</td>
<td>19yrs</td>
</tr>
<tr>
<td>Maximum</td>
<td>69yrs</td>
<td>60yrs</td>
</tr>
<tr>
<td>Range</td>
<td>51yrs</td>
<td>41yrs</td>
</tr>
<tr>
<td>Commute Time</td>
<td>Short: &lt;20 mins (n)</td>
<td>38 (23.2%)</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>Medium: 20-35 mins (n)</td>
<td>71 (43.3%)</td>
</tr>
<tr>
<td></td>
<td>Long: &gt;35 mins (n)</td>
<td>53 (32.3%)</td>
</tr>
</tbody>
</table>

This sample had a higher number of car participants (n=165, 65.7%) than cyclists (n = 86, 34.3%). Cyclists had a higher number of male participants (n=53, 61.6%) compared to the car group who had a more even gender split, as illustrated in figure 1.

![Mode of transport gender split](image)

*Figure 1. Mode of transport gender split.*

The average age of cyclists was just over 4 years younger ($\bar{x} = 36.4$ years) than their car counterparts ($\bar{x} = 40.7$ years). 86.1% of cyclists had a commute of 35 minutes or under compared to 66.5% of drivers. Figure 2 illustrates the number of drivers and cyclists in each length of commute category.
Figure 2. Mode of transport and length of commute.

Independent Variables

The independent variables were split between the 2 modes of commute. These results are displayed in Tables 2 and 3.

Table 2. Summary Results of Independent Variables of the Car Group

<table>
<thead>
<tr>
<th>Cars</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>S*</th>
<th>K**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>165</td>
<td>22.2</td>
<td>3.59</td>
<td>0.241</td>
<td>-0.651</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>165</td>
<td>27.3</td>
<td>4.79</td>
<td>-1.103</td>
<td>1.286</td>
</tr>
<tr>
<td>Stress</td>
<td>165</td>
<td>5.7</td>
<td>4.09</td>
<td>0.835</td>
<td>0.751</td>
</tr>
</tbody>
</table>

*Skeewness  **Kurtosis

The normality checks on the data for the independent variables in the car group found that self-efficacy had normal distribution showing the data is parametric. The distribution of Satisfaction with Life and Stress data was found to be non-parametric.
Table 3. Summary Results of Independent Variables of the Bicycle Group

<table>
<thead>
<tr>
<th>Bicycles</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>S*</th>
<th>K**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>86</td>
<td>22.5</td>
<td>3.19</td>
<td>-0.414</td>
<td>0.219</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>86</td>
<td>27.1</td>
<td>4.84</td>
<td>-1.157</td>
<td>1.365</td>
</tr>
<tr>
<td>Stress</td>
<td>86</td>
<td>5.2</td>
<td>3.35</td>
<td>1.528</td>
<td>4.403</td>
</tr>
</tbody>
</table>

*Skewness  **Kurtosis

The normality checks on the data for the independent variables in the bicycle group found that self-efficacy had normal distribution showing the data is parametric. The distribution of Satisfaction with Life and Stress data was found to be non-parametric.

3.2 Inferential Statistics

Hypothesis 1: Cyclists will have significantly higher levels of self-efficacy than car commuters.

An independent samples t-test found that there was no statistical significant difference between self-efficacy of car commuters (M = 22.2, SD = 3.59) and cyclists (M = 22.5, SD = 3.19) (t (249) = -0.63, p = .530, CI (95%) -1.2 - .62). Therefore, the null can be accepted, as shown in Table 4.

Hypothesis 2: Cyclists will have significantly higher levels of satisfaction with life than car commuters.
A Mann-Whitney U test revealed that the car commuters (mean rank = 126.8) and the cyclists (mean rank = 124.6) did not differ significantly \((z = -.23, p = .818)\) for satisfaction with life levels, as shown in Table 4.

**Hypothesis 3:** Cyclists will have significantly lower levels of stress than car commuters.

A Mann-Whitney U test revealed that the car commuters (mean rank = 128.1) and the cyclists (mean rank = 122) did not differ significantly \((z = -.63, p = .53)\) for stress levels, as shown in Table 4.

**Table 4.** Independent variables analysis for mode of commute

<table>
<thead>
<tr>
<th>Variables</th>
<th>Car n=165</th>
<th>Bicycle n=86</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>22.2</td>
<td>3.59</td>
<td>22.5</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>27.3</td>
<td>4.79</td>
<td>27.1</td>
</tr>
<tr>
<td>Stress</td>
<td>5.7</td>
<td>4.09</td>
<td>5.2</td>
</tr>
</tbody>
</table>

**Hypothesis 4:** Males and female commuters will have significant differences in stress, self-efficacy and satisfaction with life when compared against each other for car and bicycle travel.

An independent samples t-test found that there was a statistical significant difference between self-efficacy of car commuters for males \((M = 21.2, SD = 3.41)\) and females
(M = 23.2, SD = 3.53) (t (163) = 3.58, p = <0.001), CI (95%) .87 - 3.00). Therefore, the null can be rejected, as shown in Table 5.

An independent samples t-test found that there was no statistical significant difference between self-efficacy of cyclists for males (M = 22.5, SD = 3.21) and females (M = 22.5, SD = 3.2 (t (84) = .02, p = .981), CI (95%) -1.4 – 1.43). Therefore, the null can be accepted, as shown in Table 5.

A Mann-Whitney U test revealed that male (mean rank = 85.6) and female car commuters (mean rank = 80.5) did not differ significantly (z = -.69, p = .492) for satisfaction with life levels, as shown in Table 5.

A Mann-Whitney U test revealed that the male (mean rank = 38.6) and female cyclists (mean rank = 51.3) differed significantly (z = -2.31, p = .021) for satisfaction with life levels, as shown in Table 5.

A Mann-Whitney U test revealed that male (mean rank = 77.91) and female car commuters (mean rank = 87.91) did not differ significantly (z = -1.35, p = .177) for stress levels, as shown in Table 5.

A Mann-Whitney U test revealed that the male cyclists (mean rank = 40.22) and the female cyclists (mean rank = 48.77) did not differ significantly (z = -1.56, p = .120) for stress levels, as shown in Table 5.

Table 5. Independent variable analysis of gender differences for car and bicycle

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males (n=81)</th>
<th>Females (n=84)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
</tbody>
</table>
Female cyclists and drivers were compared to see if there were any significant differences against the independent variables, however no significant results were found. Male commuter modes were also tested and found no significant results.

**Hypothesis 5:** A longer commute time will have significant differences in stress, self-efficacy and satisfaction with life compared to a shorter commute time for both car and bicycle.

There were no significant differences found from the analysis of commuter time and commuter mode of transport across the variables of self-efficacy, satisfaction with life and stress, as can be seen in Table 6.

**Table 6.** Independent variables and length of commute

<table>
<thead>
<tr>
<th>Variable</th>
<th>Short Vs Medium</th>
<th>Vs Short Long</th>
<th>Vs Medium Long</th>
<th>vs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>23.2</td>
<td>3.53</td>
<td>21.2</td>
<td>3.41</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>27.7</td>
<td>4.12</td>
<td>26.7</td>
<td>5.34</td>
</tr>
<tr>
<td>Stress</td>
<td>5.3</td>
<td>4.11</td>
<td>6.0</td>
<td>4.06</td>
</tr>
<tr>
<td><strong>BICYCLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males (n=53)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>22.5</td>
<td>3.21</td>
<td>22.5</td>
<td>3.20</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>26.8</td>
<td>5.27</td>
<td>28.7</td>
<td>3.62</td>
</tr>
<tr>
<td>Stress</td>
<td>5.0</td>
<td>3.65</td>
<td>5.7</td>
<td>2.78</td>
</tr>
</tbody>
</table>

Female cyclists and drivers were compared to see if there were any significant differences against the independent variables, however no significant results were found. Male commuter modes were also tested and found no significant results.

**Hypothesis 5:** A longer commute time will have significant differences in stress, self-efficacy and satisfaction with life compared to a shorter commute time for both car and bicycle.

There were no significant differences found from the analysis of commuter time and commuter mode of transport across the variables of self-efficacy, satisfaction with life and stress, as can be seen in Table 6.

**Table 6.** Independent variables and length of commute

<table>
<thead>
<tr>
<th>Variable</th>
<th>p-Values</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short Vs Medium</td>
<td>Vs Short Long</td>
<td>Vs Medium Long</td>
<td>vs</td>
</tr>
</tbody>
</table>

28
Hypothesis 6: There will be a negative correlation between self-efficacy and satisfaction with life against stress for car users and cyclists.

Evaluation of correlation between the independent variable in the two groups was assessed using Spearman’s rho as the data in both groups was found to be non-parametric (Table 7.).

In the car group a negative correlation was found between self-efficacy and stress (rs (251) = -0.304, p <0.001). A weak positive correlation was also found between self-efficacy and satisfaction with life (rs (251) = 0.283, p <0.001) and a weak negative correlation between satisfaction with life and stress (rs (251) = 0.290, p <0.001). No significant correlation was found between the three independent variables in the bicycle group (Table 7.).

Table 7. Correlation of independent variables in car and bicycle.
The data was then analysed to evaluate correlations between the independent variable between males and females in the two groups using Spearman’s rho. A significant negative correlation was found between satisfaction with life and stress in male driver (rs (81) = -0.400, p <0.001). However, this was not observed in female drivers (rs (84) = -0.203, p 0.064). In addition to this, a negative correlation was found between self-efficacy and stress in female drivers (rs (84) = -0.347, p 0.001) which was not observed in male drivers (Table 8.).

**Table 8. Correlation of independent variable between males and females in cars.**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>r value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male Drivers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy Vs Satisfaction with Life</td>
<td>0.340</td>
<td>0.002</td>
</tr>
<tr>
<td>Self-Efficacy Vs Stress</td>
<td>-0.236</td>
<td>0.034</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Car</th>
<th>r value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy Vs Satisfaction with Life</td>
<td>0.283</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-Efficacy Vs Stress</td>
<td>-0.304</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Satisfaction with Life Vs Stress</td>
<td>-0.290</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bicycle</th>
<th>r value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy Vs Satisfaction with Life</td>
<td>0.153</td>
<td>0.159</td>
</tr>
<tr>
<td>Self-Efficacy Vs Stress</td>
<td>-0.214</td>
<td>0.048</td>
</tr>
<tr>
<td>Satisfaction with Life Vs Stress</td>
<td>-0.141</td>
<td>0.196</td>
</tr>
</tbody>
</table>
The data was then analysed to evaluate correlations between the independent variable between males and female cyclists. No significant negative correlation was found between the independent variable in male cyclist. However, a negative correlation was found between self-efficacy and stress in female cyclist (rs (33) = -0.394, p 0.023) which was also observed in female drivers (Table 9).

Table 9. Correlation of independent variable between males and females in cyclists.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>r value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male Cyclists</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy Vs Satisfaction with Life</td>
<td>0.192</td>
<td>0.168</td>
</tr>
<tr>
<td>Self-Efficacy Vs Stress</td>
<td>-0.133</td>
<td>0.343</td>
</tr>
<tr>
<td>Satisfaction with Life Vs Stress</td>
<td>-0.200</td>
<td>0.151</td>
</tr>
<tr>
<td><strong>Female Cyclists</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy Vs Satisfaction with Life</td>
<td>0.097</td>
<td>0.596</td>
</tr>
<tr>
<td>Self-Efficacy Vs Stress</td>
<td>-0.394</td>
<td>0.023</td>
</tr>
<tr>
<td>Satisfaction with Life Vs Stress</td>
<td>-0.177</td>
<td>0.325</td>
</tr>
</tbody>
</table>
4. Discussion

4.1 Interpretation of demographics

Survey Population

In total, 283 questionnaires were completed fully by commuters. This broke down into 165 car users, 86 cyclists and 32 that used other modes of transport. These were excluded from this study as the sample size was too small to yield significant findings.

Through social media recruitment that was dispersed to the general population there was a high participation level that was almost all car users. Purposive selection had to be done to recruit cyclists, involving the distribution of flyers (see Appendix E) during peak commute times of 7 to 9am in early February 2016. The Dublin Cycling Campaign also advertised the study on its Facebook page leading to a high uptake
of cyclists. The CSO (2012) identified that 2.4% of the general population cycled. This study was not designed to look at the proportion of people that commute through these means but to look at the effects of commute time on the psychological variables of self-efficacy, satisfaction with life and stress. As such recruitment focused on targeting an equal number of both groups resulting in a 2:1 split in favour of cars.

**Gender Bias:**

Car commuters had an almost even split of gender with slightly higher females than males at 50.9%. This is in line with the CSO (2011) figures identifying that 51.7% of car commuters are female. Cyclists have a strong male gender bias. The 2011 census found that 73% of cyclists were male in Ireland. In Dublin, where the majority of the cyclists in this study were recruited the CSO found that 69% were male. This study found a gender bias of 62% males. Similarly, in the UK 27 % of cycle journeys were made by females, however, the Netherlands and Denmark had an uptake of 55% female cyclists (Pucher and Buehler, 2007). The reasons highlighted for this gender imbalance are the hostile environment for cyclists with a lack of facilities and fast traffic lanes. This would be a similar situation in Ireland where cycling infrastructure is in early stages of development, following the guidelines from the National Cycle Policy Framework 2009.

### 4.2 Interpretation of hypotheses
Hypothesis 1: Cyclists will have significantly higher levels of self-efficacy than car commuters.

Hypothesis 2: Cyclists will have significantly higher levels of satisfaction with life than car commuters.

Hypothesis 3: Cyclists will have significantly lower levels of stress than car commuters.

From the analysis of the data using an Independent T–test for parametric data and Mann Whitney for non-parametric data, there were no significant findings for the hypothesis 1, 2 and 3. The mean results for self-efficacy, satisfaction with life and stress for cars and bicycles were very similar - self-efficacy car (mean = 22.2) and bicycle (mean = 22.5); satisfaction with life car (mean = 27.3) and bicycle (27.1); stress car (mean = 5.7) and bicycle (mean = 5.2).

On reviewing the numerical data, there were points of note regarding a variance in the scales for stress and self-efficacy between cars and bicycles. Satisfaction with life scores were similar in both groups.

Satisfaction with life

The satisfaction with life scores between 31 - 35 range indicate the respondent is extremely satisfied, 25 – 29 is a high score, 20 – 24 is an average score, 15 – 19 is slightly below average, 10 – 15 is dissatisfied and 5 - 9 indicate the participant is extremely dissatisfied. 77% (n = 127) of car commuters had a high score or were
highly satisfied whereas 23% (n = 38) had an average or below rating on this scale. Cyclists had a score of 78% (n = 67) in the high or highly satisfied range and 22% (n = 19) in the average or below range. The similarity of these results could indicate that both groups are relatively satisfied with their particular chosen mode of transport. For those that cycle, the impact of the commute led to mostly positive feelings towards their life could be from the health benefits of an active commute. In Ireland, using a car is an enabled mode of transport with most work places offering parking. The cars themselves hold status for the driver and may give the driver psycho-social benefits of prestige and autonomy as found by Hiscock et al (2003) in Scotland.

**Self-efficacy**

The self-efficacy scores are rated between 10 and 40 with the higher the score indicating the higher the level of self-efficacy. 59% (n=98) of car commuters had a moderate to high level of self-efficacy with a score of between 21 to 40. 41% (n = 67) had a score of 10 – 20. For cyclists, 69% (n = 59) were in the moderate to high range and 31% (n = 27) were in the lower range. Rimal (2001) highlighted that maintaining a level of exercise keeps self-efficacy at a higher level and those with a higher level of self-efficacy would make use of health information therefore choosing an active over a passive commute, which could be inferred by these figures.

**Stress**
The DASS scores for stress identify a score of normal as 0-7; mild as 8-9; moderate as 10-12; severe as 13-16 and extremely severe as 17+. When breaking down the results numerically there were interesting findings in terms of levels of stress between the 2 modes of commute. 71% (n = 117) of car commuters and 85% (n = 73) of cyclists were in the normal range. 15% (n = 25) of drivers were mildly stressed, while 7% (n = 6) of cyclists were in this category. 14% (n = 23) of drivers scored moderately stressed or higher, in comparison to 8% (n = 7) of cyclists. This result is in line with the research of Gatersleben and Uzzell (2007) who found that car commuters have the most stressful commutes compared to public transport users, cyclists and walkers. This is an interesting comment, however the numbers in the group are too low to report a significant finding.

_Hypothesis 4:_ Male and female commuters will have significant differences in stress, self-efficacy and satisfaction with life when compared against each other for car and bicycle travel.

Male car commuters (mean = 23.2) showed significant higher levels of self-efficacy compared to their female (mean = 21.2) counterparts (p = <.001). In the measures of satisfaction with life and stress there were no significant findings between genders of drivers. Novaco et al (1991) found that female drivers tended to be the gender most negatively affected by a car commute. The reasons were due to the extra roles and responsibilities that female commuters tended to be faced with such as dropping children to childcare. Male car commuters may, for the most part, drive straight from the home to work whereas females may have multiple stops along the way. This may impact negatively on self-efficacy.
In the cycling group, females showed a significantly higher level of satisfaction with life than males ($p = 0.021$). The measures of self-efficacy and stress did not show significant findings in this group. In Ireland, the disparity of gender in this mode of travel is high in favour of males. Females that do choose to cycle may do so due to health reasons or as it is a preferred mode of transport, however these are theoretical insights as very little studies to my knowledge have been done on gender differences on this specific area.

**Hypothesis 5:** A longer commute time will have significant differences in stress, self-efficacy and satisfaction with life compared to a shorter commute time for both car and bicycle.

Novaco et al (1991) has documented the finding that a longer work commute has a negative impact on stress and psychological well-being. Olsson et al (2012) also found longer work commutes lead to less satisfaction at work. This study compared each mode of commute against short (< 20 minutes), medium (20 – 35 minutes) and long (> 35 minutes) commute times. There were no significant results found between mode of commute against the independent variables when compared with the commute time in this study.

**Hypothesis 6:** There will be a negative correlation between self-efficacy and satisfaction with life against stress for car users and cyclists.

A significant negative correlation was found in the car group between self-efficacy and stress ($r = -0.304$, $p <0.001$). Male drivers did not have a significant negative
result within this correlation, however, female drivers were identified as having a significant negative correlation between self-efficacy and stress ($r = -0.347, p = 0.001$). Thus, the general finding may be skewed in favour of the female data. As Bandura explained in terms of high levels of self-efficacy, stress can be seen as a challenge as opposed to an obstacle in turn negating the negative impact of a stressful situation. Female cyclists were also found to have a significant negative correlation between self-efficacy and stress ($r = -0.394, p = 0.023$). Male cyclists did not show significant results here. From this research, gender plays an important role in the negative correlation of self-efficacy and stress. The area of gender difference and self-efficacy and stress in an active commute is not well researched. In terms of promoting a health behaviour, such as an active commute in females, the link between self-efficacy and stress should not be ignored and should perhaps be an area for further research.

Male drivers were found to have a significant negative correlation with satisfaction with life and stress ($r = -0.400, p = 0.001$). For male drivers a stressful commute can negatively impact their daily life, while a satisfactory commute can have a positive influence on their daily lives. This study highlighted that driving has a much greater influence in terms of stress on the outcome of a male’s satisfaction levels than if they chose a cycling commute. Interestingly, male drivers also have a significant positive correlation between self-efficacy and satisfaction with life ($r = 0.340, p = 0.002$). The satisfaction with life variable for male drivers seems to be connected to a driving commute. This could be due to the prestige that is placed on car ownership that has been found by Hiscock et al (2003) in Scotland. No significant results were found between these variables and male cyclists.
4.3 Limitations

*Time of year the questionnaire was administered:*

This questionnaire was administered at the start of February 2016. That time was a particularly stormy period in Irish weather. Ahmed et al (2010) identified that rain significantly decreased commuting in cycling volumes and strong wind reduced the volume of commuter cyclist between 11 and 23%. By recruiting at this time the strongest representative sample of this group may have been compromised. Future research in this area may look at recruitment at different times of the year such as winter and summer to give a fuller view of the cyclist group.

*Self-administered tests:*

Using self-administered questionnaires gives a subjective view in the areas of self-efficacy, satisfaction with life and stress. To counteract this issue, a baseline before the commute in these areas could be found by performing a questionnaire prior to the commute and then completing these questionnaires post commute to see if the cause and effect of the commute.

*Ireland’s infrastructure for cycling:*

The National Cycling Policy Framework has outlined that Ireland will have a much improved cycling infrastructure by 2020 by introducing the following measures: reducing volumes of through-traffic, especially HGVs, in city and town centres; making junctions safe for cyclists and removing the cyclist-unfriendly multi-lane one-way street systems; ensure that all surfaces used by cyclists are maintained to a high standard, are well lit and the cycling networks are well sign-posted; support the
provision of secure cycling parking at all important destinations. These are all measures that are adopted in high cycling countries such as Sweden and should make a difference in Irish number of cyclists in the future. However, progress is slow in cities but, in particular, in rural areas.

*High rate of bike theft:*

There has been a 167% increase in bike theft since the Bike to Work Scheme was introduced in 2009 (Flaherty, 2015). While this scheme has been highly successful in its uptake, the rate of cyclists commuting will cease if the issue of theft is not addressed.

*Ireland enables the car commute:*

Ireland is the second highest country in Europe to choose cars as the preferred mode of transport. The reasons were based on speed and convenience. Ireland’s emissions policy does not deter car usage (Donohoe, 2015). Anable and Gatersleben (2004) found that in the wet climate of Scotland the car provides the user with reliability, convenience and shelter, which is similar to that of Ireland. Hiscock et al (2003) found that cars can provide psycho-social benefits of prestige, autonomy and protection in Scotland, where society is geared towards car use and places a high value in this mode of transport, which can be true of Ireland.

### 4.4 Conclusion
This study highlighted the fact that driving is, by far, the preferred mode of commute in Ireland. The introduction of the Bike to Work scheme has helped improve cycling as a means of travel to work, but this still stands at only 2.4% of total commuting trips according to the last census. Within this group the disparity between males and females is high in favour of males.

A significant difference was found in satisfaction with life levels of female cyclists; whereby they were found to have higher levels of this variable compared with males. Females were also found to have a negative correlation with self-efficacy and stress in both the cycling and driving group. Male drivers were found to have a negative correlation between satisfaction with life and stress and a positive correlation with satisfaction with life and self-efficacy.

The aim of the Irish government to reduce car commuting from 65 % to 45 % by 2020 and increase public transport, walking or cycling from 35 % to 55 % should take into consideration the gender differences that have been found in this study to help achieve this very ambitious aim. Female uptake of cycling could be improved by increasing self-efficacy and reducing stress through appropriate cycling facilities, infrastructure and traffic management. Car commuting for males had an impact on stress which affected their life satisfaction, a finding that was not seen when they cycled, which could indicate a more stable mode of transport in psychological terms.

The benefits of an active commute are many – physically, psychologically, economically and environmentally. Research in this area is not extensive but the findings from this study indicate a number of key areas that could be focused on in the future.
References


Anable, J., Gatersleben, B., (2004). All work no play. The Centre for Transport Policy,


Dublin, Ireland.


Gomez, F., A Guide to the Depression, Anxiety and Stress Scale (DASS 21).

Retrieved from:


Appendices
### A. The General Self-Efficacy Scale

Please read the sentences below and select an answer for each statement which indicates how much the statement applies to yourself.

0 = Not at all true   1 = Hardly true   2 = Moderately true   3 = Exactly true

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I can always manage to solve difficult problems if I try hard enough.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>If someone opposes me, I can find the means and ways to get what I want.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>It is easy for me to stick to my aims and accomplish my goals.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>I am confident that I could deal efficiently with unexpected events.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Thanks to my resourcefulness, I know how to handle unforeseen situations.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>I can solve most problems if I invest the necessary effort.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>I can remain calm when facing difficulties because I can rely on my coping abilities.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>When I am confronted with a problem, I can usually find several solutions.</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>If I am in trouble, I can usually think of a solution.</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
I can usually handle whatever comes my way.

| 10 | I can usually handle whatever comes my way. | 0 | 1 | 2 | 3 |

**Scoring**
Add the scores together from all 10 items. The higher the total the greater the person’s generalized sense of self-efficacy.
B  The 5 Item Satisfaction with Life Scale

Instructions: Below are five statements that you may agree or disagree with.

Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

7 - Strongly agree
6 - Agree
5 - Slightly agree
4 - Neither agree nor disagree
3 - Slightly disagree
2 - Disagree
1 - Strongly disagree

1  In most ways my life is close to my ideal  1 2 3 4 5 6 7
2  The conditions of my life are excellent  1 2 3 4 5 6 7
3  I am satisfied with my life  1 2 3 4 5 6 7
4  So far I have gotten the important things I want in life.  1 2 3 4 5 6 7
5  If I could live my life over, I would change almost nothing  1 2 3 4 5 6 7

Scoring:

Though scoring should be kept continuous (sum up scores on each item), here are some cut-offs to be used as benchmarks.

- 31 - 35  Extremely satisfied
- 26 - 30  Satisfied
- 21 - 25  Slightly satisfied
- 20  Neutral
- 15 - 19  Slightly dissatisfied
- 10 - 14  Dissatisfied
- 5 - 9  Extremely dissatisfied
C Depression Anxiety and Stress Survey (Stress Questions ONLY)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th></th>
<th>I found it hard to wind down</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I tended to over-react to situations</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I felt that I was using a lot of nervous energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I found myself getting agitated</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I found it difficult to relax</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I felt that I was rather touchy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

The total score is made by adding each item.

0-7 indicating normal stress levels,
8-9 indicating mild stress,
10-12 at moderate stress,
13-16 severe stress
17+ indicating extremely severe stress levels.
**Survey Monkey Questionnaire**

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**Commuting in Ireland**

**Introduction**

My name is Laura Dennehy and I am conducting research in the Department of Psychology of the Dublin Business School that is looking at commuting in Ireland. This research is being conducted as part of my studies and will be submitted for examination.

You are invited to take part in this study and participation involves completing the attached anonymous survey, which should take approximately 10 minutes to complete.

Participation is completely voluntary and you are not obliged to take part. You have the right to withdraw at any time during the survey up until it is completed.

The data and questionnaires will be securely stored in electronic format, on a password protected computer.

Should you require any further information about the research, please contact Laura Dennehy at 1162645@mydbs.ie. My supervisor can be contacted at jonathan.murphy@dbs.ie.

Thank you for taking the time to complete this survey.
1. Are you male or female?
   - Male
   - Female

2. What is your typical mode of transport on your commute to work?
   - Car
   - Bicycle
   - Walk
   - Train
   - Tram
   - Bus
   - Other (please specify)

3. Please state your age:

4. Please state the duration of your commute to work in minutes:
Please read the sentences below and select an answer for each statement which indicates how much the statement applies to yourself.

* 1. I can always manage to solve difficult problems if I try hard enough.
   - Not at all true
   - Hardly true
   - Moderately true
   - Exactly true

* 2. If someone opposes me, I can find the means and ways to get what I want.
   - Not at all true
   - Hardly true
   - Moderately true
   - Exactly true

* 3. It is easy for me to stick to my aims and accomplish my goals.
   - Not at all true
   - Hardly true
   - Moderately true
   - Exactly true

* 4. I am confident that I could deal efficiently with unexpected events.
   - Not at all true
   - Hardly true
   - Moderately true
   - Exactly true

* 5. Thanks to my resourcefulness, I know how to handle unforeseen situations.
   - Not at all true
   - Hardly true
   - Moderately true
   - Exactly true
Please read the sentences below and select an answer for each statement which indicates how much the statement applies to yourself.

* 1. I can solve most problems if I invest the necessary effort.
   - [ ] Not at all true
   - [ ] Hardly true
   - [x] Moderately true
   - [ ] Exactly true

* 2. I can remain calm when facing difficulties because I can rely on my coping abilities.
   - [ ] Not at all true
   - [ ] Hardly true
   - [ ] Moderately true
   - [x] Exactly true

* 3. When I am confronted with a problem, I can usually find several solutions.
   - [ ] Not at all true
   - [ ] Hardly true
   - [ ] Moderately true
   - [x] Exactly true

* 4. If I am in trouble, I can usually think of a solution.
   - [ ] Not at all true
   - [ ] Hardly true
   - [ ] Moderately true
   - [x] Exactly true

* 5. I can usually handle whatever comes my way.
   - [ ] Not at all true
   - [ ] Hardly true
   - [ ] Moderately true
   - [ ] Exactly true
Below are five statements that you may agree or disagree with. Please be open and honest in your responding.

* 1. In most ways my life is close to ideal

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<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree nor disagree</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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Please pick one

* 2. I am satisfied with my life

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<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree nor disagree</th>
<th>Slightly disagree</th>
<th>Disagree</th>
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Please pick one

* 3. The conditions of my life are excellent

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<th>Agree</th>
<th>Slightly agree nor disagree</th>
<th>Slightly disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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Please pick one

* 4. So far I have gotten the important things I want in life

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<th>Strongly agree nor disagree</th>
<th>Agree</th>
<th>Slightly disagree</th>
<th>Slightly disagree</th>
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<th>Strongly disagree</th>
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Please pick one
* 5. If I could live my life over, I would change almost nothing

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<th>Strongly agree</th>
<th>Agree</th>
<th>Slightly agree nor disagree</th>
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Please pick one
Please read each statement and select how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

* 1. Over the past week, I found it hard to wind down

☐ Did not apply to me at all
☐ Applied to me to some degree, or some of the time
☐ Applied to me to a considerable degree, or a good part of the time
☐ Applied to me very much or most of the time

* 2. Over the past week, I tended to over-react to situations

☐ Did not apply to me at all
☐ Applied to me to some degree, or some of the time
☐ Applied to me to a considerable degree, or a good part of the time
☐ Applied to me very much or most of the time

* 3. Over the past week, I felt that I was using a lot of nervous energy

☐ Did not apply to me at all
☐ Applied to me to some degree, or some of the time
☐ Applied to me to a considerable degree, or a good part of the time
☐ Applied to me very much or most of the time

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Please read each statement and select how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

* 1. Over the past week, I found myself getting agitated
   - Did not apply to me at all
   - Applied to me to some degree, or some of the time
   - Applied to me to a considerable degree, or a good part of the time
   - Applied to me very much, or most of the time

* 2. Over the past week, I found it difficult to relax
   - Did not apply to me at all
   - Applied to me to some degree, or some of the time
   - Applied to me to a considerable degree, or a good part of the time
   - Applied to me very much, or most of the time

* 3. Over the past week, I was intolerant of anything that kept me from getting on with what I was doing
   - Did not apply to me at all
   - Applied to me to some degree, or some of the time
   - Applied to me to a considerable degree, or a good part of the time
   - Applied to me very much, or most of the time

* 4. Over the past week, I felt that I was rather touchy
   - Did not apply to me at all
   - Applied to me to some degree, or some of the time
   - Applied to me to a considerable degree, or a good part of the time
   - Applied to me very much, or most of the time
The study that you are participating in aims to look at the relationship of your mode of transport to work with stress, self-efficacy and satisfaction with life levels.

In 2009, the Irish government released the “Smarter Travel Policy”, aiming to reduce car commuting from 65 % to 45 % by 2020 and increase public transport, walking or cycling from 35 % to 55 %. The reasons behind this is not only for environmental and physical well-being of the population but also to improve mental health through exercise.

The British Medical Association (2012) released the Healthy Travel = Healthy Lives document, highlighting the impact of psychological benefits from an active commute as a driving force to encourage cycling and active travel to work.

If any of these questions raised difficult feelings for you, please contact the following:

Contact Information for The Samaritans:
* National telephone: 116 123 (in ROI only)
* Email Samaritans: jo@samaritans.org (UK and ROI)
* Visit our branch: Samaritans Dublin,112 Marlborough Street, Dublin

* 1. Thank you for participating in the study.

By clicking COMPLETE SURVEY you are consenting to have your data included in this study. Once submitted, due to anonymity, the data cannot be withdrawn.

If you do not wish to submit, please close the internet tab.

If you are happy with the details you have entered please select COMPLETE SURVEY: ☐

COMPLETE SURVEY
Please participate in this study in conjunction with Dublin Business School that looks at commuting in Ireland by completing a short online survey. All further details are provided at this link:

www.surveymonkey.com/r/2Q992T8