



**MONEY DOES NOT BUY HAPPINESS... OR DOES IT?
AN INVESTIGATION OF THE RELATIONSHIP
BETWEEN INDIVIDUAL INCOME AND LIFE SATISFACTION
IN THE NATIONAL INCOME DYNAMICS STUDY**

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COMPULSORY DECLARATION:

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ABSTRACT

On 1 January 2019, South Africa introduced a national minimum wage of R20 per hour. Minimum wages have been said to merely satisfy basic needs and not allow individuals to thrive; thus, not allowing for a decent life. Past research has argued for the importance of living wages, which are defined as a wage level that allows an individual's life satisfaction (or quality of life) to move from negative to positive. Studies exploring the relationship between individual income and life satisfaction have typically assumed a linear relationship between the two variables. However, there is evidence that the relationship may be more complex, following the discovery of non-linear relations (e.g. an S-shaped curve). The purpose of this dissertation was to explore the nature of the relationship between income and life satisfaction in the National Income Dynamics Study (NIDS), a South African household panel study which gathers various wellbeing related information from a nationally representative sample of citizens. This was done by exploring three research objectives. The first was to assess the nature of the relationship between individual income and life satisfaction. The second was to determine an approximate living wage amount based on individuals' subjective experiences; and the third to determine the longitudinal relationship between income and life satisfaction. For this dissertation, data collected in 2008 (wave 1), 2010 (wave 2), 2012 (wave 3) and 2014 (wave 4) was used to determine the short- and long-term relationship between individual income and life satisfaction. This study did not find the expected S-shaped relationship, nor any other shape of relationship; however, the variance in life satisfaction decreased at greater income levels: There were individuals who were highly satisfied with their lives at each income level, but no individuals were extremely dissatisfied with life from a certain income level onward. Thus, severe life dissatisfaction disappears with higher income, but higher income does not lead to higher life satisfaction. A repeated measures design was utilised to ascertain the longitudinal relationship between income and life satisfaction. No clear systematic pattern emerged in the relationship between income and life satisfaction over time, thus supporting Easterlin's Happiness-Income paradox, which suggests no association between income and life satisfaction over longer periods of time. The dissertation concludes by providing recommendations, limitations and implications of the results for research and practice. For example, the dissertation suggests that policy makers should consider and continue discussions on implementing wage thresholds above the national MW.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	i
ABSTRACT.....	ii
1. INTRODUCTION	1
1.1 Research Background	1
1.2 Study Objectives	3
1.3 Contribution of the Study to Theory and Practice	3
<i>1.3.1 Contribution to Theory</i>	<i>3</i>
<i>1.3.2 Practical Contributions</i>	<i>4</i>
<i>1.3.3 Relevance to Organisational Psychology</i>	<i>4</i>
1.4 Chapter Overview	5
2. LITERATURE REVIEW	6
2.1 Introduction	6
2.2 Subjective Wellbeing and Life Satisfaction	6
<i>2.2.1 Definition of Subjective Wellbeing</i>	<i>6</i>
<i>2.2.2 Life Satisfaction: Its Conceptualisation</i>	<i>7</i>
2.3 Theoretical Approaches to Life Satisfaction	8
<i>2.3.1 Bottom-up and Top-down Approaches to Life Satisfaction</i>	<i>8</i>
<i>2.3.2 Top-down Approaches</i>	<i>9</i>
2.3.2.1 Personality, Heredity and the Environment	9
2.3.2.2 Equilibrium Theory	10
<i>2.3.3 Bottom-up Approaches</i>	<i>11</i>
2.3.3.1 Needs Theory	11
2.3.3.2 Social-cognitive Approaches to Life Satisfaction	12
2.4 The Importance of Income	13
<i>2.4.1 Living Wages and Minimum Wages</i>	<i>14</i>
<i>2.4.2 An Argument for the Particular Relevance of Living Wages in South Africa</i>	<i>15</i>
2.5 The Relationship Between Income and Life Satisfaction	18
<i>2.5.1 The Relationship Between Income and Life Satisfaction at One Point in Time</i>	<i>18</i>
<i>2.5.2 The Relationship Between Income and Life Satisfaction Over Time</i>	<i>21</i>
2.6 Conclusion	22
3. METHODS	24
3.1 Introduction	24
3.2 Background to the NIDS	25

3.3	Sampling for the NIDS	26
3.4	Demographic Variables	26
3.5	Procedure	27
3.6	Measures	30
3.6.1	<i>Self-perceived Life Satisfaction</i>	30
3.6.2	<i>Individual Income</i>	30
3.7	Data Analysis	31
3.7.1	<i>Cross-sectional Analyses</i>	31
3.7.2	<i>Longitudinal Analysis</i>	32
3.8	Conclusion	32
4.	RESULTS	33
4.1	Introduction	33
4.2	RO1: To assess whether or not the same relationship between income and LS found in studies using smaller samples (Carr et al., 2018) is seen in a large representative South African sample	33
4.2.1	<i>Curve Estimation: LOESS</i>	33
4.2.2	<i>Descriptive Statistics for Income Groups</i>	35
4.2.3	<i>Significance of Differences in Life Satisfaction between Income Groups</i>	36
4.2.4	<i>The Relationship between Income and Life Satisfaction within Income Groups</i>	42
4.2.4.1	Income Group 1.....	42
4.2.4.2	Income Group 2.....	43
4.2.4.3	Income Group 3.....	43
4.2.4.4	Income group 4	43
4.3	RO2: To determine whether a particular pivot point in the curve can be identified for an income level (or income range) at which South Africans' perceptions about their LS move from negative (not decent) to positive (decent).	44
4.3.1	<i>Living Wage Method 1</i>	45
4.3.2	<i>Living Wage Method 2</i>	45
4.4	RO3: To assess the effects income has on self-perceived LS over time	45
4.4.1	<i>Factorial Repeated-Measures ANOVA</i>	46
4.4.2	<i>Changes in Income against Changes in Life Satisfaction</i>	48
4.4.3	<i>The Relationship between Changes in Income against Changes in Life Satisfaction</i> .	52
4.5	Conclusion	53
5.	DISCUSSION	54
5.1	Introduction	54

5.2 RO1: To assess whether or not the same relationship between income and LS found in Carr et al.'s (2018) studies using smaller samples could be seen in a large representative South African sample.	54
5.2.1 <i>Life Satisfaction and Income</i>	55
5.2.2 <i>Life dissatisfaction and income</i>	57
5.2.3 <i>Money does not buy happiness... Or does it?</i>	58
5.3 RO2: To assess whether or not a particular income level or income range pivot point could be identified at which South Africans' perceptions about their LS move from negative (i.e. not decent) to positive (i.e. decent).	58
5.3.1 <i>Living Wage Estimate: Method 1</i>	59
5.3.2 <i>Living Wage Estimate: Method 2</i>	59
5.4 RO3: To assess the effects income has on LS longitudinally.	60
5.5 Limitations and Recommendations	62
5.6 Contribution to Research	62
5.7 Conclusion	64
REFERENCES	66
APPENDICES	79
Appendix A	79
Appendix B	83
Appendix C	85
Appendix D	91

LIST OF TABLES

Table 1.	Basic Human Needs.....	11
Table 2.	OECD Countries' Life Satisfaction Rating (0-10) and Social Inequality score (the greater than 1, the more unequal).....	17
Table 3.	Descriptive statistics for age, gender, race and marital status.....	27
Table 4.	Showing the number and percentage of individuals earning more than R30,000 in waves 1, 2, 3 and 4.....	29
Table 5.	Income ranges and descriptive statistics for LS providing the number of individuals, minimum (Min) and maximum (Max) LS scores, means and standard deviations (SD) per income group in wave 1, 2, 3 and 4.....	35
Table 6.	Levene's Test for equality of variances per wave as well as ANOVA statistics testing whether LS is different in each income group for wave 1, 2, 3 and 4.....	37
Table 7.	Games-Howell post-hoc test results showing the mean differences between individual income groups and the significant levels of these differences per income group for waves 1, 2, 3 and 4.....	37
Table 8.	F-test results of changes in LS and interaction effects between income group in 2008 and LS across the four assessment periods (Wave 1: 2008 - Wave 4: 2014).....	47
Table 9.	F-tests for differences in LS between income groups determined in 2008 in each of the four waves of data collection (Wave 1: 2008 - Wave 4: 2014).....	47
Table 10.	Crosstabulation results showing the number of participants in each quadrant for the change in income against the change in LS between wave x and y.....	49
Table 11.	Pearson Chi-squared results indicating that a change in income is not statistically related to a change in LS for the specified time periods.....	52

LIST OF FIGURES

Figure 1.	Quality of work (life) and income.....	19
Figure 2.	LOESS curves for waves 1, 2, 3 and 4 showing income groups for each wave.....	34
Figure 3A.	Showing the dispersion of LS scores for income group 1 wave 1.....	38
Figure 3B.	Showing the dispersion of LS scores for income group 1 wave 2.....	38
Figure 3C.	Showing the dispersion of LS scores for income group 1 wave 3.....	38
Figure 3D.	Showing the dispersion of LS scores for income group 1 wave 4.....	38
Figure 4A.	Showing the dispersion of LS scores for income group 2 wave 1.....	39
Figure 4B.	Showing the dispersion of LS scores for income group 2 wave 2.....	39
Figure 4C.	Showing the dispersion of LS scores for income group 2 wave 3.....	39
Figure 4D.	Showing the dispersion of LS scores for income group 2 wave 4.....	39
Figure 5A.	Showing the dispersion of LS scores for income group 3 wave 1.....	40
Figure 5B.	Showing the dispersion of LS scores for income group 3 wave 2.....	40
Figure 5C.	Showing the dispersion of LS scores for income group 3 wave 3.....	40
Figure 5D.	Showing the dispersion of LS scores for income group 3 wave 4.....	40
Figure 6A.	Showing the dispersion of LS scores for income group 4 wave 1.....	41
Figure 6B.	Showing the dispersion of LS scores for income group 4 wave 3.....	41
Figure 6C.	Showing the dispersion of LS scores for income group 4 wave 4.....	41
Figure 7A.	Difference in LS (wave 2) and LS (wave 1) against the difference in income (wave 2) and income (wave 1).....	50
Figure 7B.	Difference in LS (wave 3) and LS (wave 1) against the difference in income (wave 3) and income (wave 1).....	50
Figure 7C.	Difference in LS (wave 4) and LS (wave 1) against the difference in income (wave 4) and income (wave 1).....	50

Figure 7D. Difference in LS (wave 3) and LS (wave 2) against the difference in income (wave 3) and income (wave 2).....	50
Figure 7E. Difference in LS (wave 4) and LS (wave 2) against the difference in income (wave 4) and (income wave 2).....	51
Figure 7F. Difference in LS (wave 4) and LS (wave 3) against the difference in income (wave 4) and (income wave 3).....	51

1. INTRODUCTION

The purpose of this dissertation was to explore the nature of the relationship between individual income and self-perceived life satisfaction (LS) in a large representative South African sample. More specifically, there were three objectives to the study. The first was to ascertain whether earning more money would result in greater subjective LS; as well as what the nature of the relationship would look like. The second was to determine whether there is a specific income range from which onwards individuals move from no LS to experiencing LS. The third was to discern the long-term relationship between income and LS.

This chapter provides the background and rationale for the research. Thereafter, the study objectives are presented. Next, the contribution of this research to the research community, practice as well as the relevance to the field of organisational psychology is explained. Lastly, a brief synopsis of what is to be expected in the chapters to follow is given.

1.1 Research Background

In February 2017, then deputy president Cyril Ramaphosa announced a national minimum wage (MW) amount. Discussions between Ramaphosa and the National Economic Development and Labour Council (NEDLAC) had led to the agreement on a national MW of R20 per hour (Mail & Guardian, 2017). Thus, workers would be due at least R3,200 or R3,600 per month for 40- and 45-hour working weeks respectively starting from 1 January 2019 (National Minimum Wage Act, 2018). However, the expectation for domestic workers (earning R15 per hour) and agricultural workers (earning R18 per hour) is that this change will occur gradually (Fin24, 2019; National Minimum Wage Act, 2018). According to the president's spokesperson, Mr Khusela Diko, the introduction of this MW would roughly equate to 47% of South Africans active in the labour force receiving higher incomes (Eyewitness News, 2018).

The MW amount has created concern, suggesting that the enforcement of this wage level would lead to job losses in a country already marred by high unemployment rates (Fin24, 2017). On the other end of the debate, the argument is that such a low wage level may be detrimental rather than helpful as it does not allow people to move out of poverty. This phenomenon has been termed 'poverty trap' in economic theory (e.g. Sachs et al., 2004). A poverty trap arises when individuals or nations are unable to escape their current poverty to the extent that it becomes a continuous pattern (Gore, 2003). This is the basis for discussions about a living wage (LW) (Neumark & Adams, 2003). LW campaigners argue that income should be at a

level that would allow for individual development and flourishing (Carr, Parker, Arrowsmith, Watters & Jones, 2016). In the United States, for example, an estimate of more than 140 countries between 1994 and 2006 implemented LW ordinances (Swarts & Vasi, 2011). Currently, South Africa does not have a LW law. However, in his speech at the African National Congress (ANC) May Day rally on 1 May 2018, Ramaphosa himself, now president, admitted that the national MW level was not a LW, but was reported to state that “work is underway to ensure that a LW is achieved.” (IOL, 2018, para. 1).

It is thus important to distinguish clearly between minimum and LWs. A MW is a wage floor which conveys that employers are not allowed to offer wages below it (Parkin et al., 2010). It could thus be viewed as a buffer for those who earn an income below the poverty line (Carr et al., 2016). This wage is regarded as insufficient to sustain lives, however, as it is generally below the cost of living (Carr et al., 2018). Contrary to this, a LW would be considered an adequate amount of money to comfortably aid one’s family (Neumark & Adams, 2003). Thus, crudely, a MW allows for survival, a LW could enable a decent life (Carr et al., 2018; Yao, Parker, Arrowsmith & Carr, 2017). A LW is thus higher than a MW (Neumark & Adams, 2003). Typically, LWs are defined econometrically by determining what monetary value is required for an individual to purchase the necessary goods for a decent life. Accordingly, Trading Economics (2018) has stipulated the current LW for South Africa as of December 2018 as R6,570 per individual. The figure is based on previously determined estimates of a typical basket of food, traveling costs and room for expenses occurring due to unforeseen circumstances. It has been argued, though, that a LW should not solely be about the monetary component, but needs to consider the satisfaction individuals experience once they are able to meet their basic needs: According to Carr et al. (2018) purchasing power is thus but one facet necessary for a positive quality of life (QoL), or a decent life. Dreyer, Hauschild and Schierbeck (2006) argue that the root requirements for a decent life comprise experiencing health, dignity, a sense of belonging to a society as well as the ability to meet basic needs. The remuneration required to live a decent life should thus be based on individuals’ perceptions rather than objective indicators, such as the cost of items. This study thus seeks to determine at which wage level individuals’ self-perceived LS moves from negative to positive in a nationally representative sample. The resulting wage level is proposed to be considered and promoted as a LW.

1.2 Study Objectives

Based on the research background outlined above, the following three study objectives were identified:

- To assess whether or not the same relationship between income and LS found in Carr et al.'s (2018) studies using smaller samples could be seen in a large representative South African sample.
- To assess whether or not a particular income level or income range pivot point could be identified at which South Africans' perceptions about their LS move from negative (i.e. not decent) to positive (i.e. decent).
- To assess the effects income has on LS longitudinally.

1.3 Contribution of the Study to Theory and Practice

The contribution this particular study offers to the research community, practice as well as the field of organisational psychology are outlined below.

1.3.1 Contribution to Theory

Firstly, this study makes a direct theoretical contribution to the research conducted in the fields of income and wellbeing. It extends on the research conducted by Carr et al. (2018) who had found an S-shaped curve for the relationship between individual income and subjective QoL in New Zealand and South Africa (Carr et al., 2018). This means that as income increased from the lowest levels to high levels, a 'trap, rise, pause, rise' pattern was observed in QoL, suggesting that at extremely low levels of income, people are 'trapped' in poverty. Exceeding a certain wage level (approximately USD2,000 determined using Purchasing Power Parity (PPP)), individuals were able to experience a positive QoL. Thereafter, a pause in QoL was observed, possibly due to changes in individuals' ambitions. Lastly, QoL once again increased with income but at a decreasing rate. This relationship was found in a small South African sample (n = 491) but it was not yet known whether this result could be generalised. It was thus important to assess if the same result would emerge in a large representative sample, as done in this study, as it adds insights into the nature of the relationship between income and LS as a proxy for QoL due to the high external validity of results found in representative samples. Moreover, studies using cross-sectional designs cannot determine cause and effect relationships. Thus, an additional contribution of this study is the use of longitudinal data (as

per the third research objective), which allowed for establishing if increases in income increased individuals' LS in the long-run.

1.3.2 Practical Contributions

The study can provide implications for policy in that a LW (as opposed to a MW) determined via self-perceived LS indicators could be an effective way to improve social conditions (Carr et al., 2016; 2018).

Possible practical contributions of this study are thus to:

- Highlight the psychological consequence of low wages to employers through empirical data;
- Assist policy makers in legislating appropriate wage levels;
- Provide information to companies on appropriate wage levels;
- Provide a new way of conceptualising LWs and show its relevance (by looking at perceptions/self-assessment rather than cost of items to determine wages).

1.3.3 Relevance to Organisational Psychology

This study is embedded in Project GLOW (Global Living Organisational Wage). GLOW is an initiative headquartered at Massey University in New Zealand (Massey University, 2018). The project aims to encourage researchers to participate in advocating for a LW and stresses the importance of individuals living decent and sustainable lives. This multidisciplinary and international project suggests that organisational psychologists get involved in LW research due to their aspiration to better work-life conditions, and as they have the required skills to conduct research in work-related aspects that could lower poverty levels.

While not addressing a research question typical in Organisational Psychology, this dissertation presents an opportunity for organisational psychologists to evaluate their role in the world of work. Should we restrict our practice to the traditional setting (i.e. organisations) or should we develop and grow our practice? In an increasingly connected world issues of societal and global sustainability become relevant for organisational sustainability, too. Large poverty and inequality levels in society, for example, can trigger social unrest and crime, which in turn have a negative effect on organisations - and through this all members in said society. Thus, as individuals who understand human behaviour, organisational psychologists should place themselves in non-traditional work settings where our skillsets could prove valuable. This study

is motivated by the thinking that to continue its relevance in a changing world of work, and to be ethical, the discipline of Organisational Psychology may need to broaden its view.

1.4 Chapter Overview

In order to address the three research objectives, the second chapter provides a review of literature which has considered the link between income and LS. Chapter 3 is the methods chapter in which the process carried out to conduct the research is outlined. In order to address the three study objectives, secondary data from the National Income Dynamics Study (NIDS) was analysed. The researcher elected to use this data as it allowed for the analysis of a large representative South African sample. Thus, the process used by NIDS is described in the methods chapter as well as the data cleaning and analysis process the researcher followed when working with this data. The results of the analyses conducted are reported in Chapter 4. A non-linear technique known as Locally Estimated Scatterplot Smoothing (LOESS) was carried out across the first four waves of NIDS data to address the first two study objectives (i.e. cross-sectional analyses of each of the four waves). To address the longitudinal study objective, a Factorial Repeated-Measures Design was carried out. Furthermore, scatterplots and chi-squared analyses investigating the association between changes in income and changes in LS over time were conducted. The implications of the results for each research objective are discussed in Chapter 5. A final conclusion, limitations and recommendations are explored in the last chapter of this dissertation.

2. LITERATURE REVIEW

2.1 Introduction

This chapter serves to provide an overview of the academic literature on self-perceived LS and income. To this end, theoretical approaches related to LS and income are presented. Moreover, empirical findings indicating the short- and long-run relationship between LS and income are supplied. As this is an exploratory dissertation with the aim of answering the three research objectives mentioned in the Introduction Chapter, the literature review provides the theoretical basis for the study's objectives.

2.2 Subjective Wellbeing and Life Satisfaction

This section aims to conceptualise the LS construct. Generally, LS is seen as forming part of subjective wellbeing (SWB). For this reason, the concept of SWB is introduced first, followed by a conceptualisation of the LS construct. In Section 2.3, theoretical approaches to LS are provided. Income is said to be one of the determinants of LS. As such, a discussion on the importance of income follows in Section 2.4. Finally, the literature on the relationship between individual income and LS is utilised to specify the likely nature of the association between the two constructs in Section 2.5.

2.2.1 Definition of Subjective Wellbeing

As LS is considered a constituent of SWB (Veenhoven, 1996) it is not possible to study LS without considering SWB first. Even the term SWB, however, is sometimes used interchangeably with a number of other concepts. Terms such as 'LS', 'QoL', 'happiness' and 'SWB' are related and often used interchangeably (e.g. Diener, Suh, Lucas & Smith, 1999; Posel, 2012; Medvedev & Landhuis, 2018). However, differences between these constructs exist.

SWB can be viewed as a comprehensive term (Moksnes & Espnes, 2013) which include various aspects of individual wellbeing, including LS. As early as 1984, for example, Diener defined SWB as comprising of happiness, positive affect and satisfaction with life. It thus constitutes being satisfied with life, a lack of negative emotions and the existence of positive emotions (Andrews & Withey, 1976; Myers & Diener, 1995). Individuals who find themselves on the high end of the wellbeing spectrum typically exhibit positive predispositions, such as positive emotions in a variety of domains such as their work-life, family life, relationships as well as pecuniary matters (Myers & Diener, 1995). Later, Diener (2000) refined his definition

by referring to SWB as consisting of the following four components: (i) the satisfaction with one's life in general, (ii) contentment with critical aspects in one's life, (iii) the degree to which one maximises pleasure and (iv) the degree to which one minimises pain.

Kahneman and Deaton (2010) pointed out that the aspects included in the definition of SWB fall under two broad components, namely (1) emotional wellbeing and (2) life evaluation. *Emotional wellbeing* describes the magnitude and regularity of an individual's positive or negative affect experienced daily. It encompasses everyday feelings such as jubilation, sadness, anger and stress. Thus, it constitutes what Myers and Diener (1995) had described as the *affective* level of SWB. It describes an individual's tendency to consider occurrences in their life to be positive or negative. The second component, *Life evaluation*, measures what an individual think about their life as a whole. It is what Myers and Diener (1995) had referred to as the *cognitive* level of SWB. The cognitive aspect of SWB is often seen as synonymous to LS and thus the focus of the current study.

2.2.2 *Life Satisfaction: Its Conceptualisation*

The previous section demonstrated that LS is but one part of SWB, which refers to a 'cognitive judgment' about one's life (Myers & Diener, 1995; Prasoorn & Chaturvedi, 2016; Veenhoven, 1996). However, as pointed out by Prasoorn and Chaturvedi (2016), there are differences in the definitions provided in literature which could make it difficult to comprehend. For example, unlike Myers and Diener (1995) who saw it as the cognitive component of SWB, Veenhoven (1996) described LS to have both, cognitive and affective elements. This implies that when an individual offers a LS rating, the rating consists of what they *think* about their life in its entirety as well as how they *feel* about it. Important is, however, that LS arises from the personal judgment an individual makes about the state of their lives in general, which could be based on how they feel and/or how they think about their life. As it is based on judgement, it is a cognitive component (Diener, Emmons, Larsen & Griffin, 1985; Myers & Diener, 1995). Specifically, it requires: 1) a cognitive judgement, 2) during which an individual utilises their own measure or guidelines, 3) to rate their QoL (Pavot & Diener, 1993). As it is an individual's self-perceived judgement, it is entirely dependent on what the person deems to be the requisite for a satisfied life. Therefore, it could be thought of as judging the distance between the desired and present self. The general pattern seems to be that satisfied individuals are closer to their desired selves. LS is thus studied to determine whether it is possible to provide individuals with satisfactory lives that are close to their ideal (Veenhoven, 1996). It needs to be noted, though,

that some research suggests that LS judgements are not merely based on a comparison between the current and ideal state, but on comparing the own circumstances to those of others, i.e. LS is relative (Veenhoven, 1996). As relative positions are constantly altering so should LS judgements.

The analyses to the question of whether or not it is possible to increase individuals' LS in the long-term, thus depends on whether LS is assumed to be based on one's relative position in comparison to others (and thus as variable) or in relation to a personal ideal and thus more enduring. Moreover, some theoretical approaches hold LS is dependent on genes and personality, suggesting that it is difficult to influence LS through external factors (Røysamb, Nes, Czajkowski & Vassend, 2018; also see Section 2.3.2.1). The next section provides an overview of the different theoretical views on LS.

2.3 Theoretical Approaches to Life Satisfaction

In this section, theoretical approaches related to LS will be discussed. Some of these are broader wellbeing approaches which have been included here as LS forms part of SWB as outlined in the previous section. The different theories can be categorised depending on whether LS is seen as 1) variable or 2) stable. Theories which consider LS as variable include 'need theory' and 'social cognitive theories'. Theoretical approaches which see LS as stable include theories on 'personality', 'heredity' and 'equilibrium' theories. Broadly, the theoretical approaches can be categorised into bottom-up and top-down approaches (Diener, 1984; Headey, 2014; Rodríguez, Látková & Sun, 2008).

2.3.1 Bottom-up and Top-down Approaches to Life Satisfaction

Diener (1984) argued that wellbeing theories either followed a bottom-up or top-down approach. Top-down approaches assume that an individual's overall LS affects their satisfaction in different domains (e.g. friendships, marital satisfaction, and work satisfaction). Moreover, the top-down approach implies that SWB is stable as it considers variables such as genes and personality (Headey, 2014). In bottom-up approaches, an individual's satisfaction with specific domains affects their overall LS. In this way, the combined effect of each domain equals overall LS (Headey, 2014). As such, bottom-up implies an individual's SWB can be altered.

Initially LS researchers tended to follow bottom-up assumptions. Top-down approaches became recognised only later (Headey, 2014). Whether LS is a result of a bottom-up or top-

down approach was described as a ‘chicken and egg’ problem (Headey, Veenhoven & Wearing, 2005) in that it raises the question of whether overall LS precedes domain satisfaction or domain satisfaction overall LS. Headey et al. (2005) sought out to address this question. They utilised four waves of the Australian Quality of Life Panel Study. The sample size for the first wave was 942 and had decreased to 649 by the last wave. The authors used Andrews and Withey's (1976) Life as a whole Index to measure LS. The 9-point scale required participants to provide their evaluation on their life as a whole twice, with the second assessment provided 20 minutes after the first. Domain satisfaction was measured with regards to participants' satisfaction with “marriage, work, leisure, standard of living, friendship and health” (Headey et al., 2005, 1). Their results revealed different causal directions depending on the LS domain considered. Satisfaction with one's marriage, for example, was both a cause and effect of overall LS (i.e. bottom-up and top-down). On the other hand, overall LS affected job satisfaction (i.e. a top-down effect). The authors, however, cautioned against using their results as conclusive evidence on the causal relationship between domain specific satisfaction and LS as the findings were obtained based on the specific assumptions associated with using structural equation modelling. The sections to follow provide specific theoretical approaches which imply either a bottom-up or top-down view of LS.

2.3.2 *Top-down Approaches*

2.3.2.1 Personality, Heredity and the Environment

Both, personality and genes, have been said to predetermine LS. A study by Røysamb et al. (2018) sought out to determine the relationship between personality and LS. This was done by utilising a sample of 1,516 Norwegian same-sex twins. The sample included both identical (N = 746 all male/female pairs) and fraternal twins (N = 770 all male/female pairs). All were between the ages of 50 and 65 years. Their findings identified neuroticism and extraversion as the two traits among the Big Five personality traits that affect LS (Røysamb et al., 2018). More specifically, for the neurotic trait, anxiety and depression were identified as important for LS in that people who are less anxious and depressed are satisfied. Equally important, satisfied individuals tend to have greater levels of ‘activity’ and positive affect. Schimmack, Oishi, Furr and Funder (2004) identified depression as the most crucial neurotic factor to affect LS and cheerfulness as the most crucial extraversion factor to predict LS. Røysamb et al. (2018) found personality to account for a total of 24% of the variation in LS.

A study by Bartels and Boomsma (2009) evaluated the relationship between genes and SWB. The sample included twins and their singleton sibling. Both same-sex and opposite sex twins were included. A total of 5,024 (4,052 = twin-pairs, 972 = their singleton siblings) between the ages of 13 and 28 were included in the study. Results revealed that SWB is affected by both, genes and the environment. Between 36 and 50% of the variance in SWB was explained by genes, and the outstanding percentage is explained by an individual's environment. A meta-analysis by Bartels (2015) indicated that genetic influence on SWB has been estimated to be between 0 - 64% in different studies. Their meta-analysis revealed that approximately 35% of the variation in SWB can be explained by genetic factors, thus suggesting that environment factors play a substantial role in shaping LS.

2.3.2.2 Equilibrium Theory

Brickman and Campbell (1971) were amongst the first to demonstrate that there is a happiness set-point around which individuals fluctuate. Headey and Wearing (1989) then used the term dynamic equilibrium theory to explain how an individual's personality and life events interact to determine the set-point and fluctuate around it (Headey, 2006). Equilibrium theory is at times referred to as 'set-point theory' and at others as 'dynamic theory of wellbeing' (Dodge et al., 2012). Its central idea is that each individual experience steady levels of wellbeing throughout their lives, which are determined by personal characteristics. Life events can change this level temporarily. In simple terms, every individual has a wellbeing level which they return to regardless of their experiences in life. Dodge et al. (2012), for example, found that individuals returned to their equilibrium level of wellbeing as soon as three months after a significant life event had occurred.

One such equilibrium theory is the hedonic treadmill (cited in Diener, Lucas and Scollon, 2009). It assumes that positive and negative life events briefly lead to happiness or unhappiness but that individuals quickly return to a neutral state. Based on their empirical findings, Diener et al. proposed five revisions to the theory in 2009. Firstly, individuals' point of equilibrium is generally not neutral but positive as people are, on average, happy. Secondly individuals differ in their set-points as they all differ in their genetic makeup and personality. Thirdly, they argued that happiness is determined through pleasant emotions, unpleasant emotions and LS. For each of these three elements, an individual's set-point can be different and thus each element should be considered separately. Fourthly, research has shown that it is possible for individuals' set-points to change over the course of their lives (Lucas, Clark, Georgellis & Diener, 2004). Life

events can thus have lasting impacts on individuals' general level of LS. Lastly, everyone adjusts differently to life events. For some individuals, a life event may lead to a temporary change in LS, for others the same event could change the actual set-point. The criticism suggests that it is more complicated to account for individuals' levels of LS than equilibrium theory suggests.

2.3.3 *Bottom-up Approaches*

2.3.3.1 Needs Theory

Needs theory assumes that LS is determined by whether or not a person's needs are satisfied, based on the assumption that humans have specific universal needs (Diener & Lucas 2000). When an individual's needs are met, individuals benefit in terms of greater wellbeing (or, at the very least, wellbeing remains at the same level). Tay and Diener (2011) conducted a study on needs and SWB. The authors utilised a sample of 123 countries and used the Gallup World Poll to assess the six needs provided in Table 1 and their relationship with SWB. The three components of SWB (life evaluation, positive affect and negative affect) were considered separately. Tay and Diener (2011) were able to show that need fulfilment, especially the fulfilment of basic needs for food and shelter, is linked to LS even though the correlation coefficients were small. Needs fulfilment explained about 6% of the variation in LS scores. They also attempted to determine whether there would be a difference in the SWB levels of those whose needs were met compared to those whose needs were not satisfied. Their results indicated that not having one's needs met did not result in high negative feelings. When an individual's needs were being met, however, it decreased the amount of negative feelings experienced.

Table 1

Basic Human Needs

Basic human needs	
Basic needs for food and shelter	Feeling respected and pride in activities
Safety and security	Mastery
Social support and love	Self-direction and autonomy

Note. Adapted from Tay and Diener (2011).

2.3.3.2 Social-cognitive Approaches to Life Satisfaction

As outlined in section 2.3.2.1, there is the view that wellbeing and LS arise out of an individual's genetic makeup (Bartels, 2015; Bartels & Boomsma, 2009) and their personality (Schimmack et al., 2004). Social-cognitive factors, however, assume that social and cognitive factors influence how satisfied individuals are with their lives. Heredity factors and social cognitive factors could be complementary and not mutually exclusive. For example, Lent et al. (2005) found that domain specific social-cognitive variables (e.g. perceived goal progress, environmental resources and self-efficacy) predicted domain specific (e.g. family, friends and work) satisfaction. The level of satisfaction in life domains an individual saw as important also predicted their overall LS even after controlling for personality. Being highly satisfied in a domain that is not highly valued, however, may not result in positive overall LS.

Research in the field of socio-cognitive factors and LS has identified three particular social-cognitive factors which seem to influence individuals' LS, namely self-esteem, self-efficacy and goal attainment. Self-esteem has been defined as an individual's judgment on how valuable or significant they are (Rosenberg, 1965). In their sample of adolescents, Moksnes and Espnes (2013) found that 24% of the variation in LS could be explained by self-esteem. Moksnes and Espnes (2013) had also predicted that alternative factors, such as age and gender, could serve as moderators in the self-esteem – LS relationship in adolescents. Their findings, however, refuted this prediction.

It is important to note that the self-esteem and LS association could also be culturally dependent. A study by Diener and Diener (1995) sought to determine the cultural dependence of the self-esteem – SWB relationship in individualistic and collectivistic cultures. Emphasising the 'self' or personal perceptions of oneself is more prominent in individualistic cultures (Darwish & Huber, 2003). The focal area in collectivistic cultures is centred on others/community. As such, self-esteem may not be an important factor into an individual's LS in collectivistic cultures as with individualistic cultures. Diener and Diener's (1995) results supported this assumption. Thus, the relationship between an individual's self-esteem and LS seems dependent on socio-cultural factors.

Another social-cognitive factor said to influence LS is self-efficacy. The term was first coined by Bandura (1982). It can be defined as an individual's belief in their ability to achieve certain goals (Bandura, 1982). Thus, to be self-efficacious, one needs to believe that one possesses a certain level of control to achieve a desired result. Experiencing self-efficacy may result in

positive feelings such as a sense of fulfilment. Vecchio, Gerbino, Pastorelli, Bover and Caprara (2007) studied academic, social and self-regulatory self-efficacy in adolescents to observe their effect on LS. They utilised a longitudinal research design set over five years. Participants who were self-efficacious were more likely to be satisfied with life five years later, suggesting that self-efficacy interventions are important for young people to encourage healthy maturing (see also Damon, 2004).

Goal attainment is another social cognitive factor that has been theorised to affect LS. Those who achieve their goals are generally more satisfied than those who do not (Lent et al., 2005). Goals that are achieved slower than the rate at which aspirations grow could also result in decreased LS (Campbell et al., 1976). However, Mason and Faulkenberry (1978) did not find this occurring in their study. For certain LS domains, they did however find that when one's desires were constantly growing at a slower rate than the rate at which goals were achieved, LS could increase. It has also been said that self-concordance goals are important for an individual's wellbeing (Sheldon & Elliot, 1999). These are goals that are in line with the activities an individual is currently enjoying as well as with their beliefs. Individuals are typically much more likely to achieve these types of goals. This is because these goals are personal to them and therefore prompts them to strive to achieve these more.

The theoretical and empirical findings thus suggest that while LS is relatively stable, it can be influenced by social cognitive factors such as self-esteem, self-efficacy and goal attainment. It may therefore either be influenced by certain variables or influence certain variables or both.

2.4 The Importance of Income

In section 2.2.2 LS was conceptualised. In section 2.3, theoretical approaches were provided to identify determinants of an individual's level of LS. The question that remains is why LS levels should be of concern to researchers, employers and policy makers. The answer is that LS matters because it gives an indication of a person's QoL and thus an indication of whether or not an individual has a decent life. To indicate what a decent life means, Rao and Min (2018) proposed a decent living standard comprising of a set of universal and essential material conditions required to attain human wellbeing (see also: Abbott, Wallace & Sapsford, 2016; Adema, 2006; Anker, 2011). Every individual, for example, needs certain tangible objects to survive (refer to Section 2.3.3.1). Amongst these are food, housing, apparel, transport and medical care, but also educational development (Anker, 2011; Rao & Min, 2018). Rao and Min (2018) argued that an individual living a decent life would not be concerned about the future

or how they would acquire the necessary funds to feed themselves or their family. This suggests that in order to have a decent life – indicated through self-perceived LS – an individual requires access to adequate capital to satisfy basic needs.

Many member countries of the Organisation for Economic Co-operation and Development (OECD) have a government support system in place that offers coverage for everyday expenses, housing and family costs. This can even include coverage for parenthood and funeral arrangements. In Switzerland, for example, activities that encourage social inclusion (e.g. belonging to a sports club or cultural societies) are also supported (Adema, 2006). In South Africa, this is not the case. While there are grants available (e.g. for childcare, disability and pension) they are not sufficient to fulfil basic needs. In this environment, for most people, a sufficiently high income generated through work is the only means to guarantee needs fulfilment. An income which allows for this is termed a LW. In the following sections the LW concept will be explained and differentiated from MWs, followed by an overview on why LWs are of particular relevance in the South African context.

2.4.1 Living Wages and Minimum Wages

As stipulated in Section 1.1 of the Introduction, a MW is a wage floor which conveys that employers are not allowed to offer wages below it (Parkin et al., 2010). Many countries legislate MW amounts. In South Africa, for example, MW legislation came into effect on 1 January 2019 (National Minimum Wage Act, 2018). It has been known for a while, however, that MWs usually do not allow individuals to adequately cover their basic needs (for example, Stevans & Sessions, 2001).

A LW is positioned above a MW, as it includes an adequate amount of money to comfortably aid one's family (Neumark & Adams, 2003). It is sufficiently high to cover basic needs so that it enables the coverage of emergency expenses and expenses due to ill-health or involuntary unemployment (Rao & Min, 2018). A LW thus allows for a decent life because it allows an individual to thrive by offering an income above subsistence level (ILO, 2013). It thus aligns with the International Labour Organisation's (ILO) definition of decent work which includes a fair income (ILO, 2019). There is, however, no one universal definition of what constitutes a LW as what is seen to constitute basic needs varies (Seattle, 2015).

The purpose of a LW is to remove an individual from the hardships of poverty. It is based on the social economics view which holds that wages should provide basic needs and human

dignity, irrespective of what work one does (Figart, 2001). Thus, the social economics view is that wages should provide for human needs regardless of individuals' level of productivity. It is thus contrary to the currently prevalent neoclassical view that wages should be determined by how much an individual is perceived to contribute to an organisation.

2.4.2 An Argument for the Particular Relevance of Living Wages in South Africa

South Africa has high levels of income inequality and poverty (The World Bank, 2018). Poverty can be defined based on 1) the Extreme poverty line (whether individuals can afford the daily food necessary), 2) the Lower-bound-poverty-line (individuals who forgo food to purchase non-food items) and 3) the Upper-bound-poverty-line (individuals afford basic food and non-food items and do not have to forgo food for non-food items). By 2015, the number of those living below the lower-bound-poverty-line in South Africa had risen by about 3.1 million people compared to 2011.

Job creation is one tool that can aid in reducing poverty and is a tool promoted by the South African government. In the 2019 State of the Nation Address President Cyril Ramaphosa, for example, stated that 'economic transformation and job creation' would be one amongst seven prime concerns (Mail & Guardian, 2019). However, job creation alone is not sufficient to move people out of poverty. According to poverty trap theory, jobs only alleviate poverty if the payment offered is enough. Poverty trap theorists argue that very low wage levels keep people in poverty. Poverty trap arises when nations or individuals are unable to escape impoverished conditions (Gore, 2003). For example, individuals experiencing extreme poverty might resort to acquiring loans to meet basic needs which result in them getting deeper into poverty (Kraay & McKenzie, 2014) based on high interest rates and inability to repay what they owe. Without adequate pay levels, eradicating poverty by 2030 may not be a possibility in South Africa (The World Bank, 2018).

Receiving a MW may thus trap people in poverty as they are insufficient to fulfil basic needs. LWs, on the other hand, serve to enable decent lives (Carr et al., 2018). Typically, LWs are determined econometrically (refer to Section 1.1). Carr et al. (2018) argued that subjective experience should be considered when determining a LW level. In that way a LW equals the amount from which an individual's LS moves from negative to positive.

Studies by the OECD determined the LS rating for each of the OECD and partner countries based on data collected as part of the Gallup World Poll. The Gallup World Poll survey gathers information from approximately 1,000 people per country per annum (OECD, 2017). On 11-

point scales respondents indicate whether they think they are living their ‘worst possible life’ (indicated by 0) or ‘best possible life (indicated by 10). The latest OECD LS results are shown in Table 2 below.

The average LS for OECD nations was 6.5 out of 10. The OECD studies show that LS at national level is related to levels of social inequality. Countries with higher LS scores tend to have lower social inequality ratings (see Table 2). South Africa has a LS rating of 4.7 and is well below the LS average with the lowest satisfaction rating. This is a drop from the initial 5.1 rating in 2005 (OECD, 2017). Its below average LS score is in line with its levels of inequality: According to The World Bank (2018), South Africa is considered to be the most unequal society in the world. In 2015, the Gini Coefficient was reported to be .63, indicating extremely high levels of inequality. The Gini coefficient is an assessment of income inequality measured on a ratio from zero to one. Zero represents perfect equality where all receive equivalent earnings; whilst one represents perfect income inequality where one individual possesses all of society’s income (Atkinson, 1975; De Maio, 2007). Increasing the lower wage floor through the introduction of LWs may thus be of benefit to all members of society if it decreases inequality and creates greater LS at a national level.

Table 2

OECD Countries' LS Rating (0-10) and Social Inequality score (the greater than 1, the more unequal)

OECD Country	OECD LS index rate	Social Inequality (1 = equal)
Australia	7.3	
Austria	7.1	
Belgium	6.9	
Brazil	6.4	
Canada	7.4	
Chile	6.5	1.26
Czech Republic	6.7	1.12
Denmark	7.6	
Estonia	5.7	1.17
Finland	7.6	1.13
France	6.5	1.24
Germany	7	
Greece	5.4	1.40
Hungary	5.6	1.28
Iceland	7.5	1.08
Ireland	7	
Israel	7.2	
Italy	6	1.20
Japan	5.9	1.18
Korea	5.9	1.21
Latvia	5.9	1.21
Luxembourg	6.9	1.09
Mexico	6.5	1.18
Netherlands	7.4	
New Zealand	7.3	1.03
Norway	7.6	1.05
Poland	6.1	1.23
Portugal	5.4	1.36
Russian Federation	5.8	1.08
Slovak Republic	6.2	
Slovenia	5.9	Infinity
South Africa	4.7	1.45
Spain	6.3	Infinity
Sweden	7.3	
Switzerland	7.5	1.10
Turkey	5.5	1.14
United Kingdom	6.8	1.05
United States	6.9	

Note. Adapted from Better Life Index (2019); empty cells indicate information not provided in the Better Life Index.

2.5 The Relationship Between Income and Life Satisfaction

This section reports the results found in literature in terms of the relationship between income and LS, which has been explored by a number of researchers. In cross-sectional studies, some reported linear relationships, others nonlinear results (see Section 2.5.1 below). Some researchers also sought out to investigate the association between the variables longitudinally, and some viewed the longitudinal relationship to differ from the cross-sectional relationship as outlined in Section 2.5.2.

2.5.1 The Relationship Between Income and Life Satisfaction at One Point in Time

A number of authors have investigated the cross-sectional relationship between income and LS in South Africa. Cramm, Møller and Nieboer (2010) exploring the relationship between individual income and SWB (using the Satisfaction with Life Scale) (Diener et al., 1985) reported a positive linear relationship. Similarly, Posel (2012) using National Income Dynamics Study wave 1 (2008) and 2 (2010) data, reported notable positive linear associations between absolute income and LS. Like Cramm et al. (2010), the author used the term SWB, but utilised a LS scale to measure SWB. Equally so, Ebrahim, Botha and Snowball (2013) found a positive relationship between absolute income and LS. This relationship was especially present for black and Indian South Africans. This was because income among those population groups, especially among black South Africans, are often low. Accordingly, in data collected through the Durban Quality of Life surveys, Hinks and Gruen (2007) found that happiness increased with income but diminishing returns set in from a particular income level. As households' income increased, happiness increased by a lesser and lesser amount thus suggesting a non-linear relationship. This contrasts with Mahadea and Rawat's (2008) view that individuals always aspire to having more than they already have, and aligns with a common finding in international literature that an increase in income leads to an increase in happiness (Blaauw & Pretorius, 2013; Judge, Piccolo, Podsakoff, Shaw & Rich, 2010). The explanation is seen in the many benefits money can provide. It, for example, has positive effects on an individual's life expectancy and reduces the likelihood of malnourishment (Howell & Howell, 2008). Furthermore, due to the purchasing power money provides, individuals are able to acquire what they need and through this experience find greater levels of wellbeing.

Similar to Hinks and Gruen's (2007) research Kahneman and Deaton (2010), however, found that individuals' happiness did not increase beyond an income level of 75,000 US dollars annually. Their results showed that earning large sums of money was associated with greater

levels of LS but it did not have the same effect on happiness. This suggests that differing results for the relationship between LS and income reported in literature may have to do with how wellbeing had been measured. This assumption is supported by Diener and Diener’s (1995) study in which they measured the association between national income and average QoL in society in 101 countries. Their results splayed into a linear association when LS and happiness were used as indicators of QoL. They, however, found quadratic relations when exploring alternative QoL variables. Based on their findings and similar to the assumptions of needs theory, they concluded that individuals are only able to flourish once basic needs are met (see also Møller, 2013). This conclusion is supported by Kahnemann and Deaton’s (2010) finding that when an individual had inadequate financial resources, it resulted in both, reduced happiness and LS.

Assuming a linear relationship between income and QoL may thus conceal the complex relationship between the two variables. This was corroborated by Carr et al.’s (2016, 2018) recent studies exploring the variables in the context of South Africa and New Zealand. They found the relationship between these variables to be best described through a sigmoidal, not linear, relationship. The authors had obtained household income values for individuals in South Africa and New Zealand and individual income values for New Zealand. Quality of work life was measured as well as QoL (LS, physical wellbeing, mental stress) (Carr et al., 2018).

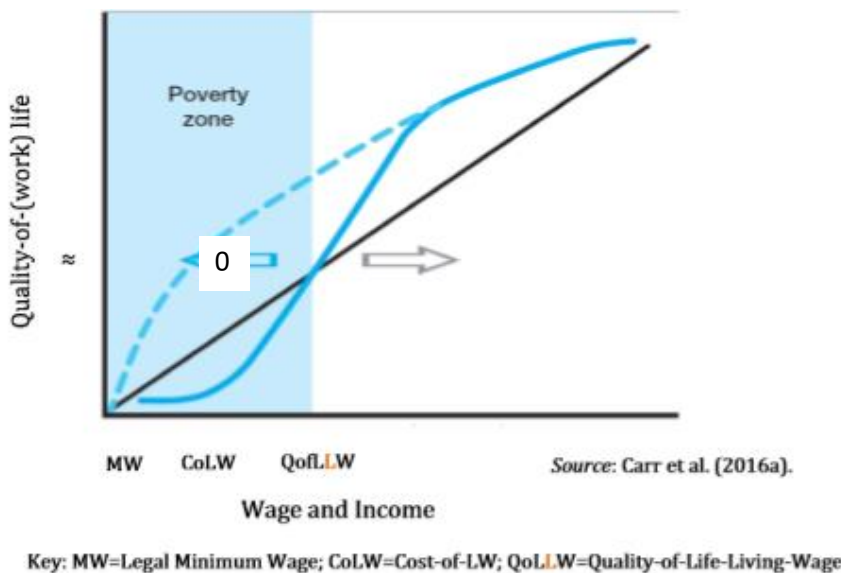


Figure 1. Quality of work (life) and income. Source: Carr et al. (2018).

Figure 1 shows Carr et al.'s (2016, 2018) results graphically. The black line represents a linear relationship which indicates an increase in quality of (work) life as income increases as reflected in Cramm et al.'s (2010) findings.

The dotted line in Figure 1 presents the relationship as it would be predicted by the law of diminishing marginal returns. It assumes that any improvement in income would add value, but especially at the lowest income levels (Carr et al., 2015). This is in line with findings in developed countries indicating that after a certain point returns to income (happiness) will increase but at a decreasing rate as Hinks and Gruen (2007) had found to be the case.

The S-shaped graph (bold blue) assumes that at lower income levels, poverty trap exists, meaning that individuals are stuck in undesired circumstances which ultimately results in restrictions to individual development (Carr et al., 2016; 2018). Consequently, individuals could fall deeper into poverty by working, for example, by being able to acquire loans in order to meet basic needs and thus incurring debt (Kraay & McKenzie, 2014). This means an increase in income at the very low ends of the income distribution would not increase QoL. In theory, at the first pivot point, increases in income should start resulting in increased QoL (Carr, et al., 2018). The midpoint of the y-axis (indicated as 0 in Figure 1) represents the point at which QoL is neither negative nor positive. The income associated with this point (shown on the x-axis) indicates what Carr et al. (2018) define as a LW. This point serves as a divide between being in poverty (below the point) and having the opportunity to flourish (above the point). From this income level onwards, individuals should hypothetically be able to live a decent life which extends beyond simply meeting basic needs (Carr et al., 2018).

A possible explanation for there being no increase in QoL above a certain wage rate is revealed in two studies conducted by Quoidbach, Dunn, Petrides and Mikolajczak (2010). Kurtz (2008) had found that scarcity can result in greater savouring: Individuals who were considered affluent treasured everyday small joys less and consequently savoured moments less. Before her study, the idea that money could reduce one's ability to savour had not been tested. Consequently, Quoidbach et al. (2010) had assumed that income might be less strongly related to happiness in wealthy countries because money results in an individual savouring everyday pleasures less. In line with this hypothesis, their first study revealed that the relationship between money and happiness was stronger when savouring ability was kept constant. Their second study revealed that merely thinking about prosperity and riches had the ability to diminish an individual's ability to savour.

In summary, within the Carr et al. (2018) study, both principles, poverty trap and diminishing returns, explained the results in a South African sample: poverty trap theory at the lower end of the wage range and diminishing returns at higher income levels. However, the South African sample in the study was a small purposive sample (N = 491). To substantiate if these results can be generalised to the broader SA population, it is important to establish the relationship between income and LS in a more representative sample.

Following on from Carr et al.'s (2018) study, this study thus served the following purposes:

- To assess whether or not the same relationship between income and LS found in Carr et al.'s (2018) studies using smaller samples could be seen in a large representative South African sample.
- To assess whether or not a particular income level or income range pivot point could be identified at which South Africans' perceptions about their LS move from negative (i.e. not decent) to positive (i.e. decent).

2.5.2 The Relationship Between Income and Life Satisfaction Over Time

Studies explaining the relationship between income and LS over time either assumed positive or no relationships. Easterlin, McVey, Switek, Sawangfa and Zweig (2010), for example, found no relationship in their longitudinal research of a diverse group of countries (developed, developing and transitioning countries) in which national average income and happiness levels were compared. The authors used a measure of SWB which encompassed LS and financial satisfaction, and found that the "Easterlin-paradox" occurred not just in developed countries, but in developing nations as well (Easterlin et al., 2010).

The Easterlin-paradox arises when both, the long and short-run relationships between income and happiness, are considered. According to this paradox, when assessing the relationship between income and happiness at one point in time (cross-sectional analysis) a positive relationship is generally observed. Thus, when a country goes through an economic expansion (or contraction), the effects could be seen in the increased (or decreased) happiness levels at a particular point in time. Conversely, when considering the longitudinal effect of income on happiness (through a regression for time series analysis), income has no effect on happiness.

Since the results of the happiness-income paradox were released, there have been a number of contradictory findings. Inglehart, Foa, Peterson and Welzel (2008), for example, showed that in 45 of the 52 countries (77% of all countries) included in their study, SWB (measured as

happiness + LS) increased over the period of their analyses (1981 to 2007). More specifically, the improvement was greater for happiness (improved by 87%) than for LS (improved by 63%). Similarly, Stevenson and Wolfer (2008) found an increase in happiness as a nation's economic status improved. Their results therefore suggest that wellbeing is increased when nations experience continuous increases in economic health, accompanied by an enhanced life.

There are also authors who studied the relationship between income and LS independently of the paradox. Frijters, Haisken-DeNew and Shields (2004), for example, found that LS would increase by half if real household income rose by one in the long-run. Following the studies that refuted the Easterlin-paradox, Easterlin et al. (2010) pointed out that these had made no clear distinction between the differences in short-run and long-run associations between the two variables.

Unlike Easterlin et al. (2010), Angeles (2011) stated that a possible reason why supporters of the paradox obtained nil longitudinal results might be because sample sizes are generally smaller than in cross-sectional samples. Thus, effects might be difficult to pick up in longitudinal studies. There should thus be a focus on effect size and not just significance level. If income has a small effect on happiness to begin with (perhaps other determinants affect it more), then statistical significance would not be detected in the long-run. Angeles (2011) had obtained significant results which indicated a long-term association between income and wellbeing, however, it needs to be noted that Angeles (2011) used a happiness scale whereas Easterlin et al. (2010) measured SWB (LS and financial satisfaction).

Many studies compare overall wellbeing of different societies to their GDP (Angeles, 2011; Easterlin et al, 2010; Frijters et al., 2004; Inglehart et al., 2008; Stevenson & Wolfer, 2008). This study presents an opportunity to consider the relationship at an individual level over time. Following from the above, the study's third objective was as follows:

- To assess the effects individual income has on perceived LS longitudinally.

2.6 Conclusion

This chapter aimed to provide an overview of the LS construct in the literature thus far. It was shown that LS is a constituent of SWB, and that it thus cannot be completely separated from SWB. Theoretical approaches explaining the possible nature of the relationship between LS and income were provided, as well as differences in the short- and long-term relationship. As current studies have provided inconclusive answers to the research objectives no specific

hypotheses to be tested were stipulated. Instead, the study used an exploratory design. The next chapter outlines the study methodology in detail.

3. METHODS

3.1 Introduction

The analyses conducted for this study were performed on secondary data collected for the National Income Dynamics Study (NIDS). Secondary data makes use of data that has previously been collected by someone other than the researcher (Trzesniewski, Donnellan & Lucas, 2011). There are several reasons why this dataset was chosen. Firstly, the NIDS data stems from a large, nationally representative sample which has been carefully collected. Secondly, it utilises panel data which thirdly is publicly available. It would not have been possible for the researcher to obtain a representative sample of this size alone. The NIDS sample was thus ideal as it addressed the shortcoming of the small sample sizes in Carr et al.'s 2016 and 2018 studies. An integral component for any researcher wishing to utilise secondary data is, to be able to determine the quality of the dataset (Hox & Boeije, 2005). It would, therefore, be necessary to utilise secondary data where supplementary details are provided. These could include aspects of how the data was collected, where the data was collected, who collected the data and what cleaning process was followed. The sections to follow provide evidence that sufficient supplementary information was provided by the NIDS studies in the manuals prepared for each wave. A possible disadvantage of secondary data is ethical concern. An ethical concern with secondary data could be that participants may not specifically have agreed to participate in a particular study (Tripathy, 2013). This was, however, not an issue in this case as before providing consent participants had been informed that the data may be used to address a variety of research questions, and that it would be made available to researchers on request. In addition, participants' anonymity was ensured. While the secure NIDS dataset includes individuals' names, the NIDS data being made available to researchers used code identifiers instead (Chinhema et al., 2016). The NIDS data is described in further detail in the next section.

The purpose of this third chapter is to describe the secondary dataset, as well as to explain the process that was followed in collecting the data. Moreover, this chapter also describes how the dependent variable (self-perceived LS) and the independent variable (individual income) were measured in the NIDS dataset. In addition, information regarding how the researcher prepared and analysed the data is provided.

3.2 Background to the NIDS

The NIDS project was established as a panel study with the primary aim of collecting essential income and other data needed to trail the wellbeing of South African citizens (Leibbrandt, Woolard & de Villiers, 2009). As poverty is a continuous and intricate plight in South Africa, the need for panel studies assessing important socio-economic conditions was exigent (De Villiers, Brown, Woolard, Daniels & Leibbrandt, 2013). The Southern African Labour and Development Research Unit (SALDRU) had been commissioned by the National Department of Planning, Monitoring and Evaluation to lead the study. SALDRU is situated within the School of Economics at the University of Cape Town. Issues related to the “income, expenditures, assets, access to services, education, health and other dimensions of well-being” (Leibbrandt et al., 2009, p. 1) were of interest to the project. The initial wave of the study occurred in 2008. A total of 28,000 South Africans within 7,305 households were selected to be studied longitudinally every two years. According to Biau, Kernéis and Porcher (2008), using a large sample holds benefits in the form of a much greater accuracy rate when determining the significance of a test. Furthermore, generalisability is increased. There are, however, also disadvantages associated with using a large sample size. Having a large sample does not always ensure valuable inferences will be drawn. If a sample is not representative of its broader population, the probability of error relating to the study’s design or its sampling processes could expand (Kaplan, Chambers & Glasgow, 2014). This was not of concern in this study as the NIDS data was drawn from a sample representative of the South African population (Leibbrandt et al., 2009).

To date, five waves of data have been made available (Brophy et al., 2018). The current study only used the first four waves in the analyses. These are wave 1 (2008), 2 (2010), 3 (2012) and 4 (2014) as the fifth wave data only became available after the data had already been requested. As the NIDS study follows the same members used in the initial wave, it is possible to assess trends over the four waves. Collecting such a large dataset over a six-year period is costly and time consuming and thus the NIDS data provides a rare research opportunity. In longitudinal data common threats to a study’s internal validity are minimised compared to if a cross-sectional study was conducted as common method variance is lowered, predictive accuracy increased, and it becomes possible to draw causal inferences. The use of longitudinal data does, however, imply the sample size could reduce significantly due to participant drop-outs (Rindfleisch et al., 2008).

3.3 Sampling for the NIDS

The NIDS includes a variety of surveys: an ‘adult’, ‘household’, ‘child’ and ‘individual proxy’ questionnaire (Brown, Daniels, De Villiers, Leibbrandt & Woolard, 2012). This study made use of the adult questionnaire as the research objective was to follow the changes in individual adult income and the effect on their perceived LS. An adult is characterised as a study member who is 15 years or older (Brown et al., 2012).

The sampling process followed was stratified, two-stage clustering (Leibbrandt et al., 2009). The NIDS master sample consisting of 3,000 primary sampling units, i.e. households, was obtained from Statistics South Africa (Leibbrandt et al., 2009). This master sample was divided into different strata. This was done by sectioning it into 53 master sample district councils. Random sampling was utilised to choose 400 primary units from these 53 district councils. Fieldworkers were required to visit each selected household to collect data. A household became part of the study when a member of the household consented to participate in the study. Fieldworkers were required to return to 48 sampling units who had not consented to participate in the study after the first wave of the study fell short of its target number of 8,000 households. They also included 24 additional addresses to their quest. The outcome was data from 28,255 individuals in 7,305 households (Leibbrandt et al., 2009). From wave 2 (2010) onwards, Computer Assisted Personal Interviewing (CAPI) was employed in the data collection process (Brown et al., 2012). This made it possible to track individuals if they were no longer residents in the household in which they had resided previously.

3.4 Demographic Variables

The demographic variables this study considers are age, gender, race and marital status. The table below provides the descriptive statistics for the demographic variables in each of the four waves.

Table 3

Descriptive statistics for age, gender, race and marital status in the NIDS data for waves 1 to 4 (after removal of unemployed individuals)

		WAVE 1 (N = 2,857)	WAVE 2 (N = 3,240)	WAVE 3 (N = 4,398)	WAVE 4 (N = 6,099)
Gender	Male	1,523	1,619	2,151	3,005
	Female	1,334	1,621	2,247	3,094
Race	African	1,954	2,413	3,228	4,699
	Coloured	591	661	937	1,170
	Asian/Indian	41	37	59	1,170
	White	262	127	174	62
	Missing	9	2	0	0
Marital Status	Married	1,038	1,117	1,440	125
	Widow/Widower	139	148	169	42
	Divorced/ separated	131	109	139	201
	Don't know/missing/refused	9	7	5	1
	Living with partner	408	376	496	/
	Never married	1,132	1,483	2,149	/

Note. “/” indicates no data was collected on *living with partner* or *never married*.

3.5 Procedure

The NIDS team had received ethical approval for the NIDS by the Commerce Faculty Ethics in Research Committee at the University of Cape Town (Leibbrandt et al., 2009). Initially, the research team had requested ethical approval for a pre-test (aimed to detect and rectify any problems with the questionnaires and interview process), consent forms as well as their procedural plans. After conditional approval had been obtained and the pre-test been carried out, the polished questionnaires were submitted, and ethics approval granted for the main study (De Villiers et al., 2013). An incentive was presented to each household fieldworkers visited; however, the study manuals did not indicate the type of incentive provided. Households who refused to participate received an incentive as well (Leibbrandt et al., 2009).

All data was collected at participants' homes. Questionnaires in Wave 1 were administered as paper questionnaires (Leibbrandt et al., 2009). Each questionnaire was estimated to take 45 minutes to complete. For waves 2 to 4, a novice data collection platform was introduced (Chinhema et al., 2016). It is known as Computer Assisted Personal Interviewing (CAPI) which is a digital platform utilised to control the survey and data collection procedure (Brown et al., 2012). Thus, when visiting the homes of participants, interviewers entered the results obtained

from participants into ultra-mobile personal computers (De Villiers et al., 2013). Although this new system was introduced, the aim was for there to be a high level of similarities to the previous paper-based questionnaires (Brown et al., 2012). The benefit of this system over paper-based techniques is that irregularities can be flagged (Brown et al., 2012). An example of an irregularity could be a participant offering different answers on stable factors across waves 1, 2, 3 and 4 (e.g. different answers for date of birth or from which institution they received their education).

Prior to fieldworkers engaging in the interview process with an individual, individuals were required to offer their consent. It was necessary for them to sign two consent forms, one to keep for themselves and one for SALDRU (Brown et al., 2012). The same process was followed across all four waves (Brown, et al., 2012; Chinhema, et al., 2016; De Villiers et al., 2013; Leibbrandt et al., 2009). Individuals could receive the consent form in whichever language they preferred.

In order to access the NIDS data, the researcher applied for access on the NIDS DataFirst website. The researcher provided a brief outline describing why access was required. This description included the purpose of the research, research objectives, and the methodology as well as what the researcher intended to discover. It was also a requirement to disclose any members working with the researcher (the researcher's supervisor in this case). Once completed, the researcher needed to agree to the terms and conditions set out before submitting the application. Amongst these were: (1) not using the data in an illegal manner (e.g. selling the data), (2) not using the data for researching a specific individual or institution and (3) citing each dataset used. The researcher then had access to the raw data of all four waves of the NIDS data. No additional ethical approval was required as the ethics approval provided to NIDS covered all analyses run on the data. When working with the data the researcher strictly adhered to the ethical guidelines provided by the American Psychological Association (APA), namely, to present what was found in the data accurately and truthfully and to reference the data and user manuals (APA, 2017).

In order to prepare the data for analysis, the researcher used the three-step process set out by Trzesniewski et al. (2011) as a guide, as Trzesniewski et al.'s (2011) study had also dealt with longitudinal data of considerable size and secondary data analysis. The initial step was to create a base dataset. For this, the four waves of NIDS data were imported into separate data files in SPSS version 25. The 2008 adult data initially consisted of $N = 16,871$ participants, the 2010

data had $N = 21,880$ participants, in 2012 there were $N = 22,466$ and in 2014 $N = 26,819$ participants. Thereafter, all string variables were changed to numerical variables to allow them to be included in statistical analyses. The second step included ‘creating tall skinny files’ (Trzesniewski et al., 2011). This is where variables must be recoded, renamed, changed into either scale or dichotomous variables and missing data addressed. In this step all variables not relevant to the study were removed from the datasets. Participants’ data were removed if answers to the primary income or LS items was a) missing, b) if participants had refused to answer the items, c) if participants had no knowledge of the answer to provide, d) had indicated that the question was not applicable to them or e) had indicated not earning an income. Those who earned no income were removed because the analyses required an income value to measure the effects of income on LS.

Table 4

Number and percentage of individuals earning more than R30,000 in waves 1, 2, 3 and 4

	Sample (before excluding > R30,000)	Earned more than R30,000	%
Wave 1	2868	11	0.38%
Wave 2	3256	16	0.49%
Wave 3	4416	18	0.41%
Wave 4	6136	37	0.6%

Moreover, individuals who had indicated earning more than R30,000 per month were also removed (refer to Table 4 above). This was because these individuals represented less than .6% of individuals in each wave (and therefore not well represented). This is supported by Trading Economics₂ (2018) who indicated that during the third quarter, an average monthly income for a South African was R20,860. Thus, individuals earning above R30,000 is above the average South African monthly wage. Therefore, for individuals earning greater than R30,000, no trend analysis could be provided as there were too few data points. It was therefore decided that only those individuals earning a primary monthly wage of less than and equal to R30,000 would be included. The final number of participants was as follows: wave 1: $N = 2,857$, wave 2: $N = 3,240$, wave 3: $N = 4,398$ and wave 4: $N = 6,099$. Although many cases were removed due to missing values, the samples are still representative of the population and substantial in size. Appendix A (Figure A2-A4) provides the histograms for the income distribution in waves 1, 2, 3 and 4. The histogram of the sample datasets (after deleting cases) is representative of the original datasets (before deleting any cases). This was, however, not the case for wave 2 (refer to Figure A2 in the Appendix). The above represent the final samples for each wave which were used for the required cross-sectional analyses. In order to conduct longitudinal analyses,

it was necessary to construct a dataset which combined the data from all four waves. There were $N = 545$ participants in the combined dataset.

3.6 Measures

For this study two variables employed in the NIDS were of central interest, self-perceived LS and individual income.

3.6.1 *Self-perceived Life Satisfaction*

One item was used to assess individuals' self-perceived LS. It was included in the 'well-being and social cohesion' section of the NIDS questionnaire in all four waves and required participants to indicate their level of current LS. A 10-point Likert scale was used to record responses. The scale ranged from 1 = *Very dissatisfied* to 10 = *Very satisfied*. More specifically, participants were asked: "Using a scale of 1 to 10 where 1 means "Very dissatisfied" and 10 means "Very satisfied", how do you feel about your life as a whole right now?". Additional answer options were coded as follows: -9 to indicate 'don't know', -8 to indicate 'refused', -5 as 'not applicable' and -3 for missing values (Brown et al., 2012). Where any of these codes had been employed the data was set as missing.

A shortcoming of assessing LS in this way is that participants may base their responses on recent events (e.g. a recent death of a family or finding a job after a period of unemployment) rather than their general or average LS over a period of time (as discussed in Section 5.2.1). However, as this study made use of already existing datasets this could not be altered. It was, however, considered in interpreting the results. In addition, LS was assessed through a single-item measure. Typically, multi-item measures are deemed to adequately assess psychological constructs in order to ensure all aspects of the construct are measured (Gardner, Cummings, Dunham & Pierce, 1998). A one-item measure of LS may thus not give a valid measurement. However, one-item measures may include benefits such as increased enjoyment on the part of participants, minimised chances of mistakes due to participants tiring and is less time consuming to develop (Gardner et al., 1998).

3.6.2 *Individual Income*

Individual income is captured in the 'Labour market participation' section of the NIDS adult questionnaires. While a range of income types are assessed in the NIDS (e.g. money from grants and spousal support), take home pay from primary job (based on their earnings in the month before data collection) was chosen as indicator of income in this study. This is because

the study sought to find answers to adequate levels of pay for work, i.e. a psychologically determined LW level. Where participants did not provide an income value the answers were scored as follows: -9 equals 'don't know', -8 equals 'refused', -5 equals 'not applicable' and -3 equals 'missing' (Brown et al., 2012). These answers were set as missing values.

3.7 Data Analysis

This section is guided by the three study objectives mentioned in Section 1.2 in the Introduction Chapter and Section 2.5 in the Literature Review. The data analysis process for each objective is outlined below. The process followed for objective 1 and 2 is discussed together because both include the same cross-sectional analyses. Thereafter, the process for the third objective is outlined. IBM SPSS, version 25 was used to analyse the data. It should be noted that this study follows a positivist paradigm and consequently assumes the researcher to be an objective observer that is independent of the research process. A true reality exists and in line with the positivist paradigm, a quantitative approach was employed.

3.7.1 Cross-sectional Analyses

This section describes the process followed in analysing objectives 1 and 2. The first objective was to discover the nature of the relationship between income and LS. Objective 2 was to determine a wage level at which LS changes from negative to positive. An exploratory descriptive approach was used to address the two objectives. To begin, descriptive statistics were determined for LS and individual income in all four waves separately in order to better understand the data. Thus, information about average income and its extreme points and average LS and its extreme points were calculated. As the NIDS dataset is large, descriptive statistics allow to view the dataset in a summarised manner (Sandelowski, 2000). This process also allowed the researcher to detect potential outliers in the data (Field, 2016).

Next, a curve of best fit was determined to describe the relationship between income and LS in each wave. Local polynomial regression (LOESS curve smoothing) was used to do so. The procedure is non-parametric and thus does not strictly abide by the laws of linearity (Statsdirect Limited, 2018). The focus is on fitting the best curve to the data instead of fitting the data to a pre-defined linear or curved shape (Opsomer & Ruppert, 1997). The preselected option for span in SPSS was used for the analysis. Span influences the distance between a specific weighted point (e.g. point x) and the data points closest to x . It would not be desired to have a span that is too small or too large. If too small, there would be an inadequate amount of data

points close to the weighted \bar{x} ; and if too big it could result in over smoothing (Statsdirect Limited, 2018).

Next, income groups were determined. All participants within an income range with similar variation in LS were allocated to a distinct income group. Income group 1, for example, represented those who earned the lowest amount per month, but had the highest variation in LS, whereas income group 4 represented those who earned the highest salary per month and had the lowest variation in LS. The researcher also used ANOVA to test the significance of LS between income groups.

3.7.2 Longitudinal Analysis

In order to conduct the longitudinal analysis, a factorial repeated-measures design was used. The purpose was to discover the effects of income on LS over time. The within subjects effects, between subjects effects and the within subjects contrasts (interaction effects) were assessed. The researcher was interested in 1) whether average LS as a whole had changed significantly over the four waves (i.e. whether it changed or remained constant), 2) whether the average LS was different in the four income groups and 3) If LS changed differently over time in the different income groups. To confirm the results of the factorial-repeated measures design, scatterplots plotting the change in income between the waves against the change in LS between the waves were computed. In addition, chi-squared tests were executed to determine whether differences exist between the change in income for an individual over a certain time period and the change in their LS over that same time period.

3.8 Conclusion

The purpose of this chapter was to provide the relevant information regarding how the data used to obtain the empirical results reported on in the next chapter was gathered and analysed. The background and process followed in the NIDS was outlined. Moreover, the demographic sample characteristics were reported, and the procedure followed to prepare the datasets for analyses was outlined. This chapter also specified how individual income and LS were measured. Lastly, the data analysis process was provided. The chapter to follow provides the results.

4. RESULTS

4.1 Introduction

The purpose of this chapter is to report on the results related to the three research objectives (Section 1.2). First, the results addressing objective 1 will be communicated in Section 4.2. Section 4.3 presents the findings in relation to the second research objective. Lastly, the third objective is addressed in Section 4.4.

4.2 RO1: To assess whether or not the same relationship between income and LS found in studies using smaller samples (Carr et al., 2018) is seen in a large representative South African sample.

For each of the four waves the scatterplot between income ($> R0$ and $\leq R30,000$ per month) and LS was determined, and the LOESS curve estimated.

4.2.1 Curve Estimation: LOESS

In order to summarise the pattern between income and LS observed within each wave, Local Polynomial Regression (locally estimated scatterplot smoothing or LOESS) was used (see also Section 3.7.1). Contrasting to linear regression, LOESS determines the relationship between variables point by point and not across the entire range of data-points (Statsdirect Limited, 2018). The result is a curve which best represents the data dispersion in a scatterplot at each combination of data-points for the two variables considered. LOESS curve smoothing thus detects the complexities in the relationship between two variables that could be missed in linear regression analysis.

The resulting curves in Figure 2 show the scatterplots for income and LS in each of the four waves. The vertical lines indicate when a change in the dispersion of data-points for LS along the income-axis occurred. In this way, income groups were created within which the dispersion of data-points was similar. Purple, red, green and yellow lines indicate at which income the dispersion in LS scores changed, thus creating four income groups (also refer to Table 5 for income groups). What is also notable in Figure 2 is that the dispersion of LS scores varies across incomes. Broadly, income group 1 indicated that at low income levels, individuals' LS scores varied widely from highly satisfied to highly dissatisfied. Extreme LS started reducing in income group 2 until finally, in group 4, there were no more individuals who were extremely dissatisfied. Section 4.2.4 describes the trends of each income group in detail.

Figure 2. LOESS curves for waves 1, 2, 3 and 4 showing income groups for each wave.

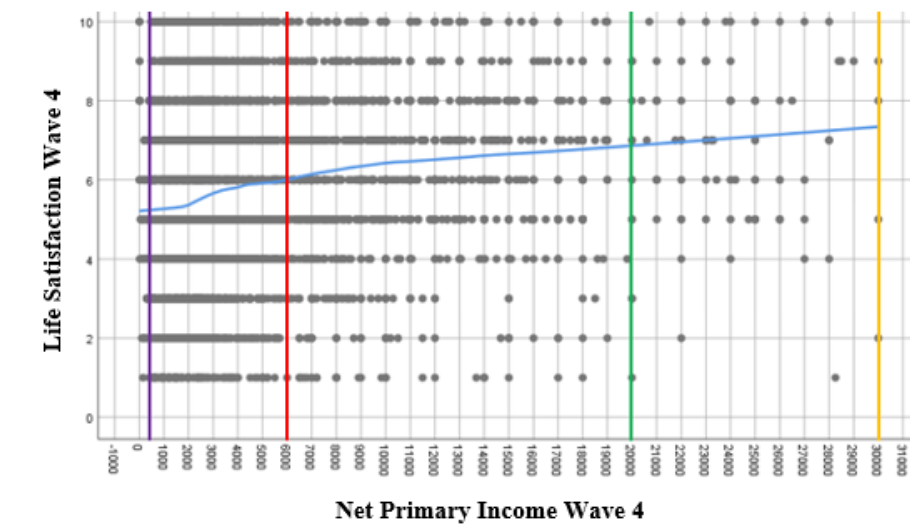
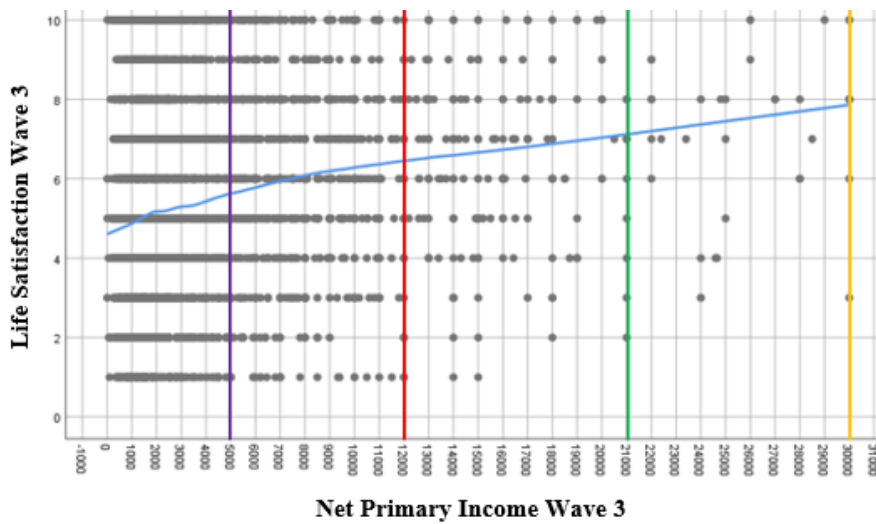
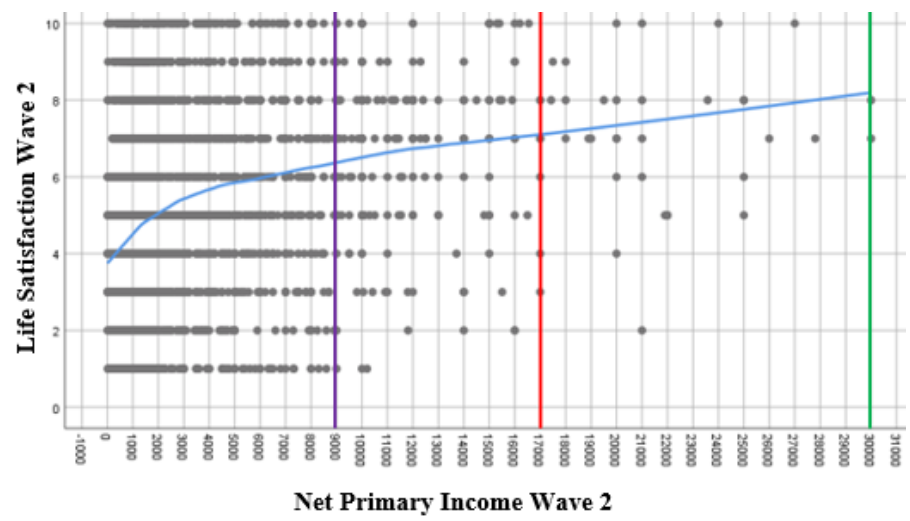
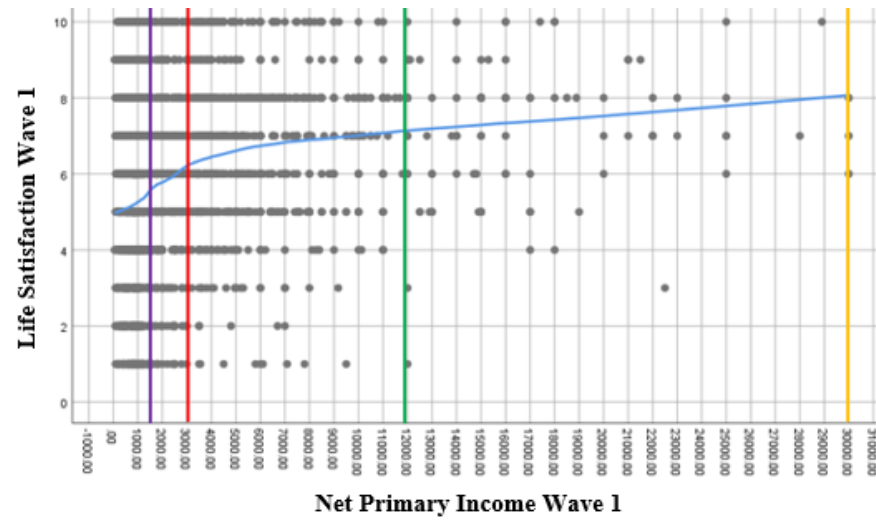


Table 5

Income ranges and descriptive statistics for LS providing the number of individuals, minimum (Min) and maximum (Max) LS scores, means and standard deviations (SD) per income group in waves 1, 2, 3 and 4

Wave	Income group	Income range	N	LS			
				Min	Max	Mean	SD
Wave 1	1	≤ 1,500	1,471	1	10	5.34	2.35
	2	1,501-3,000	558	1	10	5.91	2.14
	3	3,001-12,000	745	1	10	6.65	1.97
	4	12,001-30,000	83	3	10	7.24	1.64
Wave 2	1	≤ 9,000	3,036	1	10	5.12	2.41
	2	9,001-17,000	171	1	10	6.72	2.15
	3	17,001-30,000	33	2	10	7.18	1.81
Wave 3	1	≤ 5,000	3,391	1	10	5.20	2.42
	2	5,001-12,000	792	1	10	6.10	2.27
	3	12,001-21,000	179	1	10	6.60	2.10
	4	21,001-30,000	36	3	10	7.31	1.95
Wave 4	1	≤ 500	162	1	10	5.21	2.13
	2	501-6,000	4,557	1	10	5.61	2.29
	3	6,001-20,000	1,298	1	10	6.31	2.07
	4	20,001-30,000	82	1	10	6.94	2.02

4.2.2 Descriptive Statistics for Income Groups

Table 5 above provides the descriptive statistics for each of the four waves per income group. On average, participants' LS scores were close to or above the mid-score of 5.5, indicating average or above average satisfaction levels. Briefly, the average satisfaction level increased for all waves from income group 1 to income group 4 as indicated by the mean LS score in each group. In line with the reducing dispersion of scores at the lower end of the LS measure observed in the scatterplots (see Figure 2), the standard deviation decreased from the lower to the higher income groups. The minimum LS value was higher in the last income group in all waves except for wave 4 (minWave1 = 3, minWave2 = 2, minWave3 = 3, minWave4 = 1). Income group 1 generally had the largest number of people (except in wave 4 where this group ended at a monthly income of R500). This reflects that most individuals in South Africa receive low levels of income. Accordingly, income group 4 (or income group 3 in wave 2) had the smallest number of individuals. The section to follow will report on the significance of differences in LS between income groups.

4.2.3 *Significance of Differences in Life Satisfaction between Income Groups*

Section 4.2.1 demonstrated how income groups were determined using the scatterplots for each wave. For waves 1, 3 and 4, ANOVA was conducted to test the difference in LS between income groups. An ANOVA was appropriate because it was necessary to test a difference in the means between four income groups (Field, 2016). The dependent variable tested was LS and the independent variable was individual income (divided into the four income groups). This therefore tested whether there was a difference in the LS between the four income groups. The same was done for wave 2 with individual income, independent variable, being divided into three groups. As witnessed in Table 5, income group 4 (or 3 in the case of wave 2) typically displayed the highest LS means whereas income group 1 typically displayed the lowest LS means.

The above suggests that the higher the income, the greater individuals' LS which is essentially a characteristic of a linear relationship. However, a linear relationship requires equal variance of error scores at each point of the independent variable (Field, 2016). It can be seen in Figure 1 and Table 5 that this was not the case in this dataset, as there was larger variation at lower income levels than at higher income levels. In alignment with this finding, Levene's test for equality of error variances indicated that the error variances in LS in the different income groups differed significantly for all waves (refer to Table 6 for Levene's results). This therefore means that the assumption of homogeneity of error variances has been violated (Field, 2016). Thus, the F-test used in standard ANOVA had to be adjusted to account for unequal error variances. The Welch test was thus employed. The ANOVA showed significant results in all waves indicating that the satisfaction amongst income groups differed significantly (i.e. the average LS in income Group X is not synonymous to the average LS in income Group Z).

To explore which income groups differed from each other, a post-hoc test accounting for unequal variances (Games-Howell) was used (refer to Table 7 below for results). Income group sizes in this study differ from the next (refer to Table 1 for sample sizes), however, this is not a concern when using Games-Howell. The procedure is capable of returning rigorous and meticulous results whether sample groups are equal or not (Field, 2016). Referring to Table 7 below, the p-values for wave 1 indicates that all income groups differ significantly from each other. In the remaining waves there was always one insignificant difference between two adjacent income groups. These differences are indicated in bold in Table 7. Section 4.2.4 outlines the relationship between income and LS for each income group separately.

Table 6

Table providing Levene's Test for equality of error variances per wave as well as ANOVA statistics testing whether LS is different in each income group for wave 1, 2, 3 and 4

	Levene's Test			ANOVA (Welch test)		
	F	d _{1,2}	p	F	d _{1,2}	p
Wave 1	10.094	3,2853	< .001	80.829	3,385.060	< .001
Wave 2	4.208	2,3237	< .05	62.816	2,75.551	< .001
Wave 3	3.680	3,4394	< .05	62.097	3,148.046	< .001
Wave 4	8.459	3,6095	< .001	49.188	3,273.830	< .001

Table 7

Games-Howell post-hoc test results showing the mean differences between individual income groups and the significance levels of these differences per income group for waves 1, 2, 3 and 4

	(Income GroupX – Income GroupZ)	Mean Difference (X-Z)	Sig.
Wave 1	X ₁ – X ₂	.571	p < .001
	X ₁ – X ₃	1.306	p < .001
	X ₁ – X ₄	1.898	p < .001
	X ₂ – X ₃	.734	p < .001
	X ₂ – X ₄	1.327	p < .001
	X ₃ – X ₄	.593	p < .05
Wave 2	X ₁ – X ₂	1.604	p < .001
	X ₁ – X ₃	2.066	p < .001
	X ₂ – X ₃	.463	p = .401
Wave 3	X ₁ – X ₂	.902	p < .001
	X ₁ – X ₃	1.406	p < .001
	X ₁ – X ₄	2.108	p < .001
	X ₂ – X ₃	.504	p < .05
	X ₂ – X ₄	1.206	p < .05
	X ₃ – X ₄	.702	p = .223
Wave 4	X ₁ – X ₂	.398	p = .095
	X ₁ – X ₃	1.098	p < .001
	X ₁ – X ₄	1.729	p < .001
	X ₂ – X ₃	.699	p < .001
	X ₂ – X ₄	1.331	p < .001
	X ₃ – X ₄	.632	p < .05

Note. All p-values emphasised in bold are insignificant at the .05 level.

Figure 3. Scatterplots showing how LS changes with income for individuals in income group 1 for waves 1, 2, 3 and 4.

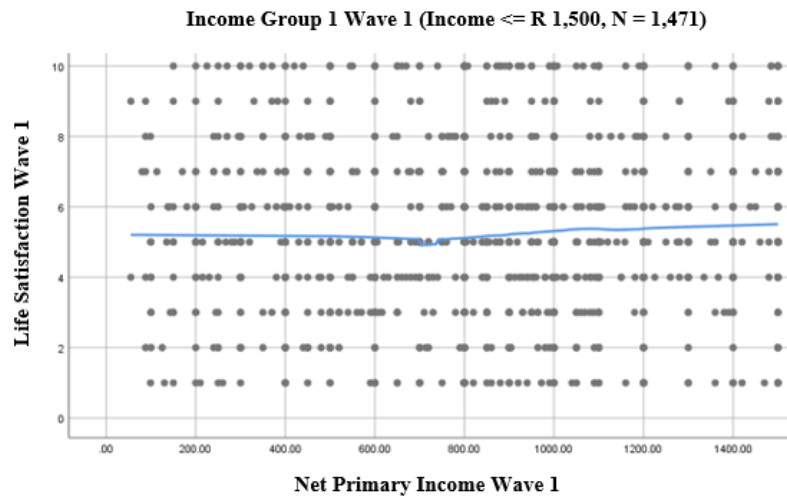


Figure 3A. Showing the dispersion of LS scores for income group 1 wave 1

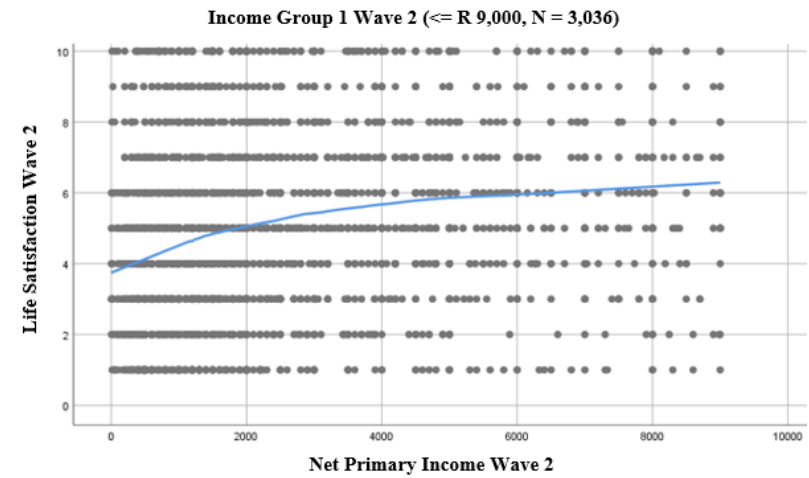


Figure 3B. Showing the dispersion of LS scores for income group 1 wave 2

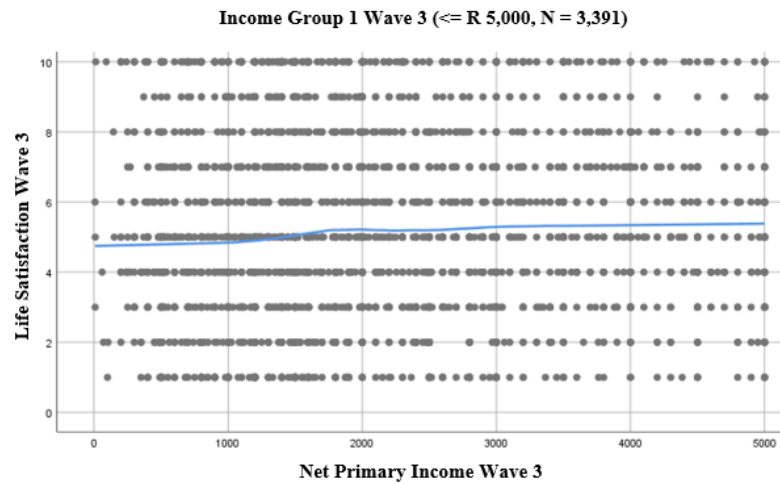


Figure 3C. Showing the dispersion of LS scores for income group 1 wave 3

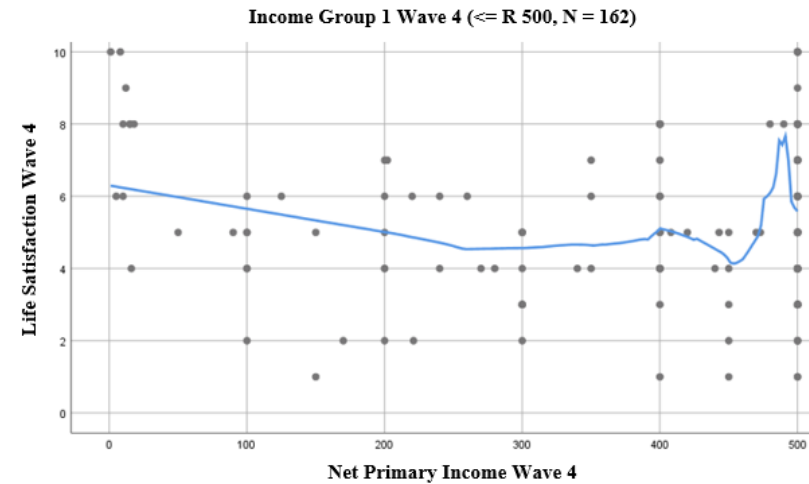


Figure 3D. Showing the dispersion of LS scores for income group 1 wave 4

Figure 4. Scatterplots showing how LS changes with income for individuals in income group 2 for waves 1, 2, 3 and 4.

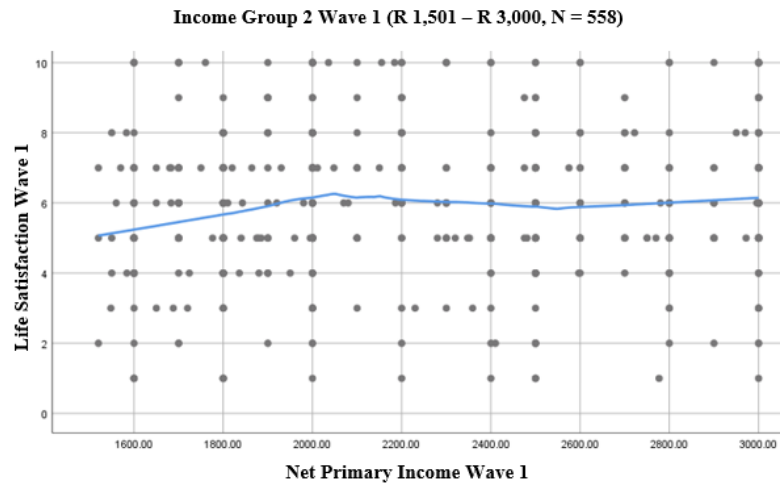


Figure 4A. Showing the dispersion of LS scores for income group 2 wave 1

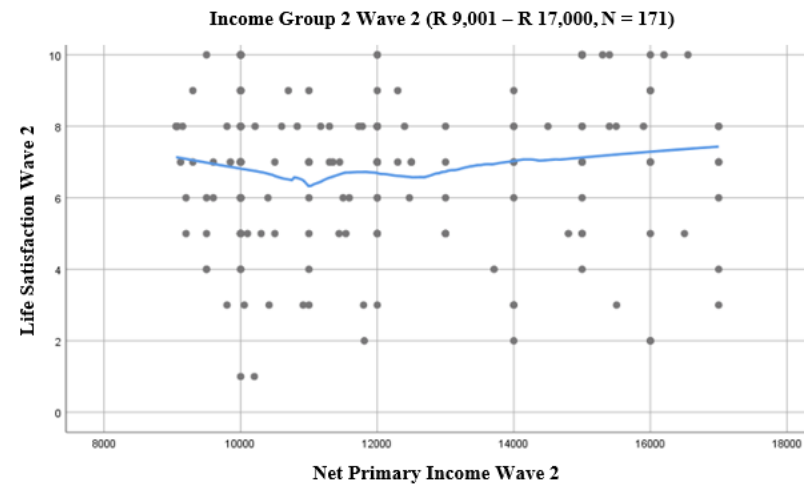


Figure 4B. Showing the dispersion of LS scores for income group 2 wave 2

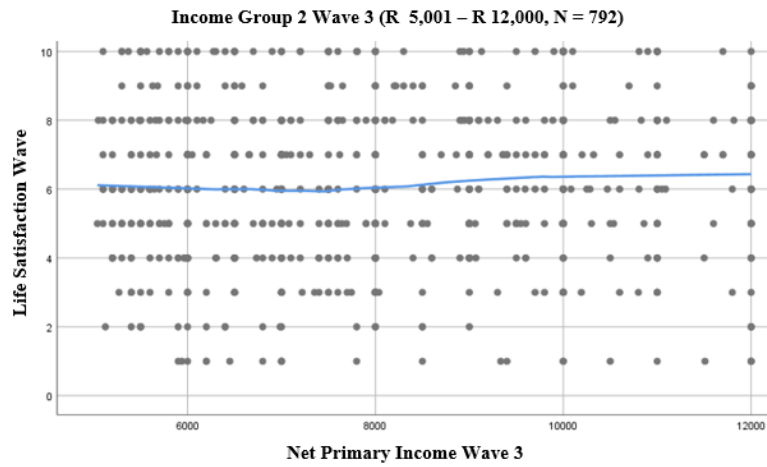


Figure 4C. Showing the dispersion of LS scores for income group 2 wave 3

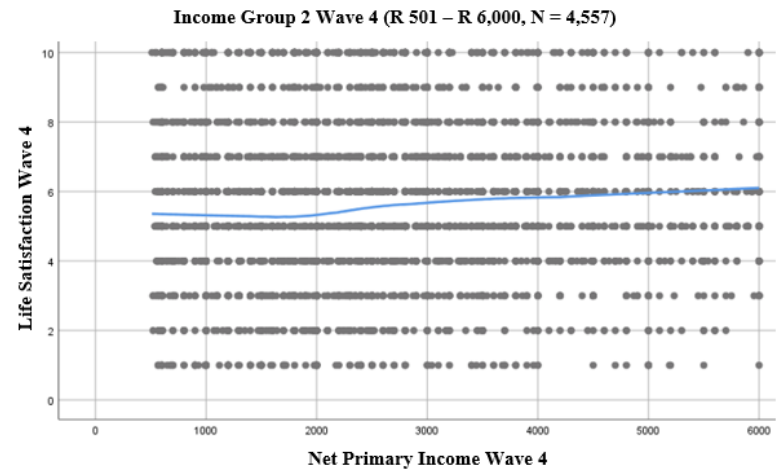


Figure 4D. Showing the dispersion of LS scores for income group 2 wave 4

Figure 5. Scatterplots showing how LS changes with income for individuals in income group 3 for waves 1, 2, 3 and 4.

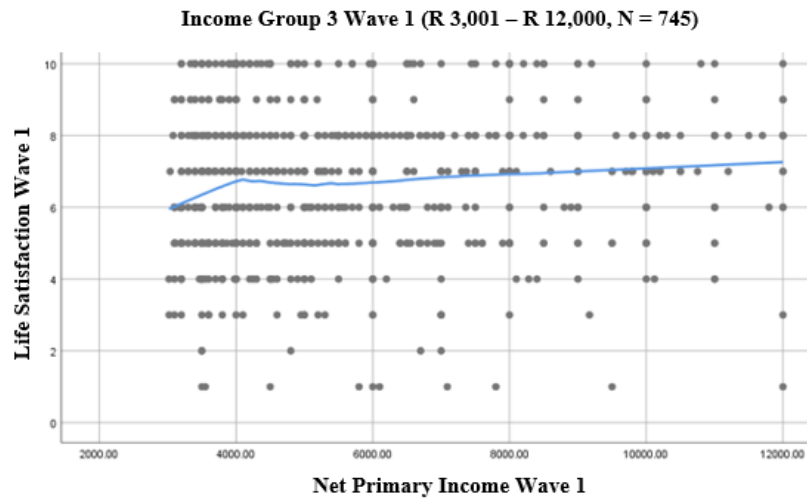


Figure 5A. Showing the dispersion of LS scores for income group 3 wave 1

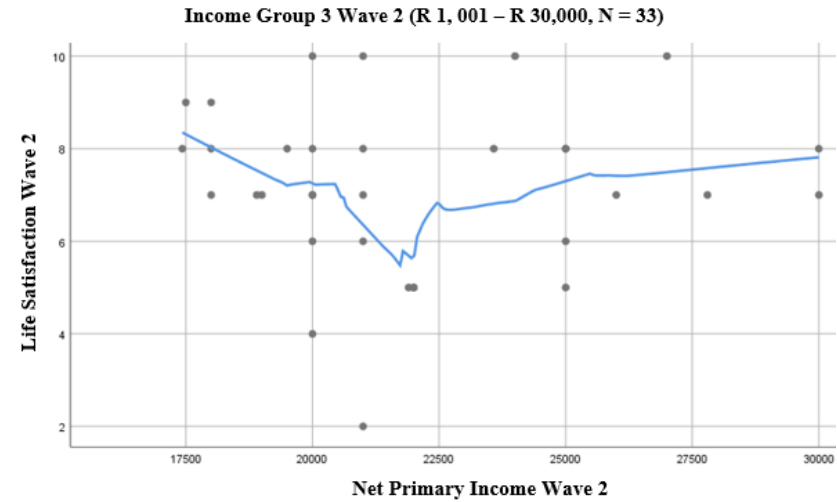


Figure 5B. Showing the dispersion of LS scores for income group 3 wave 2

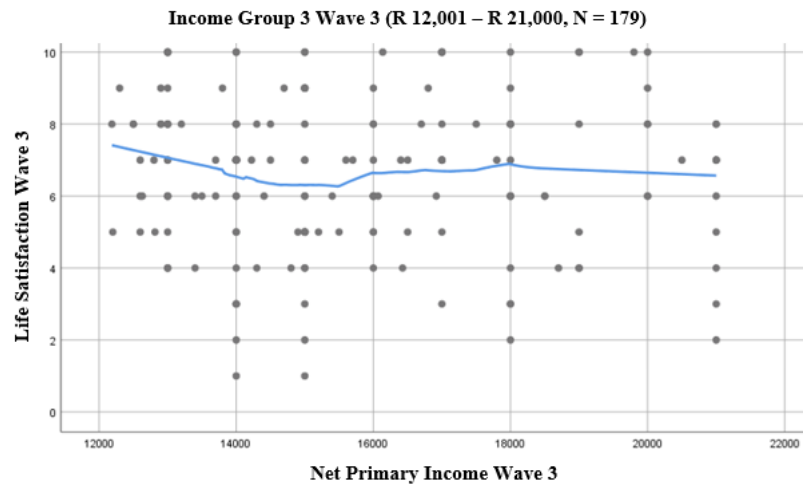


Figure 5C. Showing the dispersion of LS scores for income group 3 wave 3

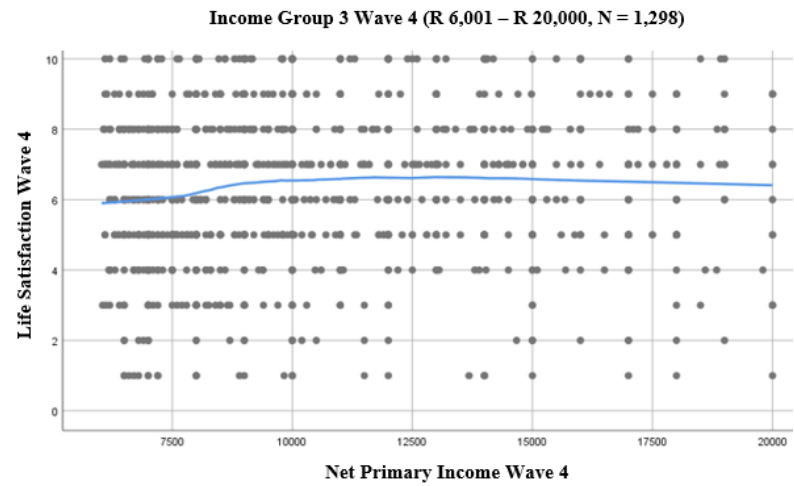


Figure 5D. Showing the dispersion of LS scores for income group 3 wave 4

Figure 6. Scatterplots showing how LS changes with income for individuals in income group 4 for waves 1, 3 and 4.

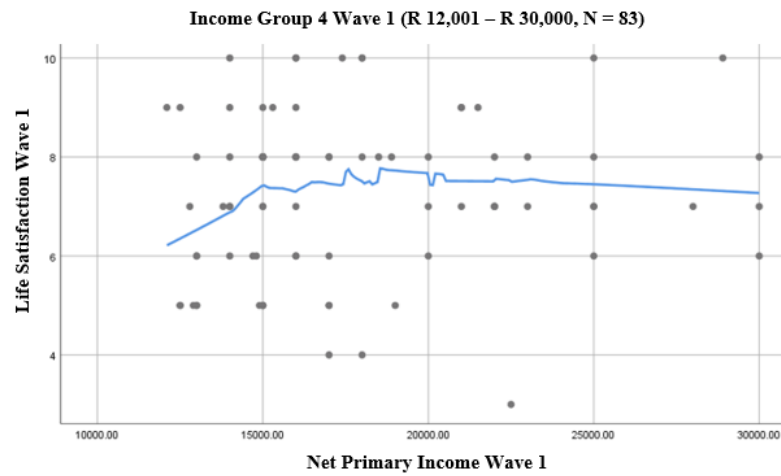


Figure 6A. Showing the dispersion of LS scores for income group 4 wave 1

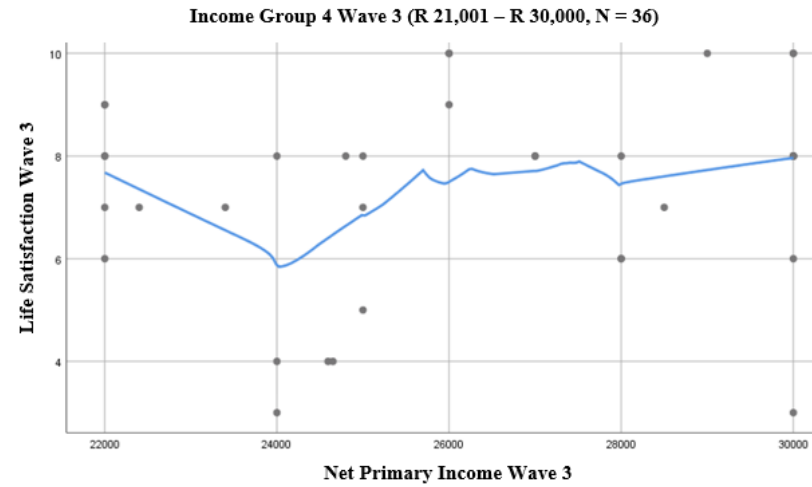


Figure 6B. Showing the dispersion of LS scores for income group 4 wave 3

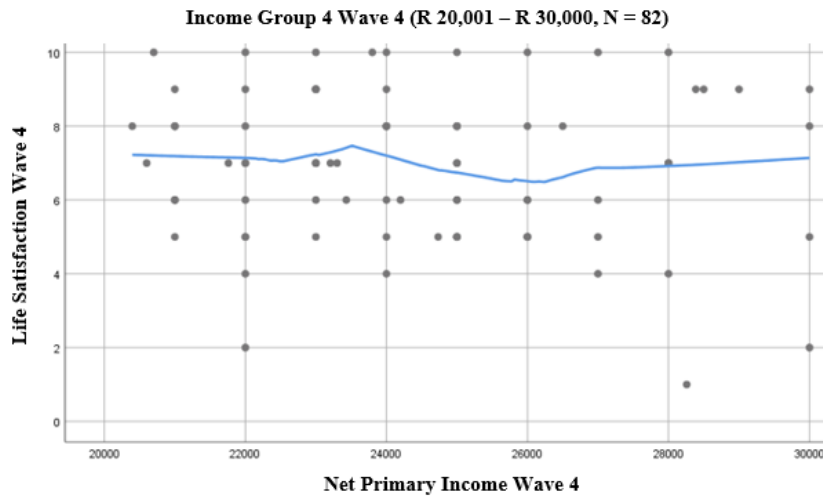


Figure 6C. Showing the dispersion of LS scores for income group 4 wave 4

4.2.4 *The Relationship between Income and Life Satisfaction within Income Groups*

The purpose of this section is to report on the relationship between individual income and LS per income group. The scatterplots in Figure 2 were used to derive different income groups for each wave. The scatterplots in figures 3 to 6 above, shows the relationship between LS and income per wave for each of the income groups separately.

4.2.4.1 Income Group 1

As previously mentioned, specific patterns emerged when looking at the scatterplot between income and LS for each individual wave. In wave 1, for example, four patterns emerged (refer to Figure 2 and Table 5 above). Individuals making up a specific pattern were grouped into the same income group. Figure 3 shows the four graphs that represents income group 1 in each of the four waves. The splits in income groups were done to allow the researcher to zoom into smaller sections of what is displayed in Figure 2. Looking at wave 1 (Figure 3A above), an even dispersion of LS scores can be observed in income group 1. Whether individuals receive the lowest amount possible (e.g. R55 in wave 1, R1 in wave 2 and 4, and R7 in wave 3) as their monthly primary income or R1,500 (maximum income), there was no apparent pattern indicating a difference in their LS. Thus, there were individuals who were highly satisfied and individuals who were highly dissatisfied with their lives at low levels of income as the spread of LS scores was even for income ranging up to R1,500 per month. For wave 2, the income range of participants in the first income group (\leq R9,000) was much larger than that of the first income group in wave 1 (\leq R1,500). Despite this, the distribution of income and LS scores in the scatterplot (Figure 3B) in wave 2 was similar to the one observed for income group 1 in wave 1: There is an even dispersion of LS across income in this group. Thus, equal numbers of individuals appear to have indicated extremely low, average and high levels of LS.

While the income ranges of individuals clustered in the lowest income group (labelled as income group 1) were different (Wave 1: \leq R1,500; Wave 2: \leq R9,000; Wave 3: \leq R5,000 and Wave 4: \leq R500), the scatterplots between individual income and LS were highly similar in all waves (refer to Figure 3A-3C). For each income level within this group there were even numbers of individuals who were satisfied and dissatisfied with life. An exception formed in income group 1 in wave 4 (Figure 3D) as not many individuals seemed to exhibit extremely high levels of satisfaction. This may due to income group 1 wave 4 having a smaller income range (up to R500).

4.2.4.2 Income Group 2

In income group 2 in wave 1 (R1,501 – R3,000), there were still individuals who experienced extremely low and extremely high levels of LS, but LS scores tended to cluster closer to the scale-midpoint, i.e. most individuals were neither dissatisfied nor satisfied with their lives. Alternatively, this may be due to the number of individuals in group 2 being less than those in group 1. Figure 4A shows the distribution of income and LS scores for this group. Thus, the trend changed from equal dispersion of LS in income group 1 waves 1-3 to LS clustering closer to the midpoint in income group 2 wave 1.

A different pattern occurred in income group 2 wave 2 (R9,001 – R17,000) where extremely low levels of LS began to reduce (see Figure 4B). A similar trend was observed in income group 2 in the third wave (R3,001 – R12,000) (see Figure 4C). The dispersion is still fairly equal; however, the variability reduced and those at the lower end of the satisfaction scale were beginning to reduce. In the last wave, individuals in income group 2 (R501 – R6,000), scattered in a similar way to income group 1 in waves 1, 2 and 3 (refer to Figure 4D above for scatterplot). On average, an even spread of the LS scores can be observed.

4.2.4.3 Income Group 3

In income group 3 in wave 1 (R3,001 – R12,000) the spread in LS scores decreased (see Figure 5A). There were no longer individuals who were extremely dissatisfied with their lives. Income group 3 is the last income group in wave 2 (Figure 5B). Similar to income group 4 in wave 1, the lower LS scores began falling away. This can be seen in the minimum LS scores in Table 5, which in wave 2 increased from 1 to 2 for income group 3. This, again, indicates that the increase in individuals' average LS between income groups was driven by a decrease in the proportion of individuals who were extremely dissatisfied. In income group 3 in the third wave (R12,001 – R21,000) an even smaller percentage than in income group 2 were extremely dissatisfied (refer to Figure 5C). In income group 3 in the last wave (R6,001 – R20,000) (see Figure 5D), the lower levels of satisfaction were also beginning to reduce, although there were still many who were extremely dissatisfied.

4.2.4.4 Income group 4

The dispersion of income and LS scores for income group 4 in wave 1 (monthly income range: R12,001 – R30,000) can be found in Figure 6A. In this income group there is an even smaller

proportion of dissatisfied individuals than there had been in income group 3, with the minimum LS score now being 3 (refer to Table 5).

The same was the case for the highest income group in wave 2 (income group 3) and income group 4 in wave 3, which included participants with monthly primary incomes between R12,001 and R30,000 (see Figure 6B for the scatterplot). In these groups there were no participants who indicated being highly dissatisfied with their lives.

In wave 4 (R20,001 – R30,000) (Figure 6C), there were three individuals in the highest income group, however, who expressed high dissatisfaction with their lives, though the general trend in the data resembled that of the highest income groups in the other three waves. These three individuals are viewed as outliers and were excluded, the trend for income group 4 in the last wave is similar to that observed in the highest income group in the other three data waves.

In conclusion, the results show that LS does not increase steadily. Instead, the increase in average LS with increasing income is brought about by a reduction in variance in LS, which in turn is due to fewer individuals being extremely dissatisfied as income increases. In other words, higher income takes away extreme dissatisfaction with one's life, but does not necessarily increase LS. Assuming a linear relationship would thus indeed hide the more complex mechanism which underlies the apparent increase in LS with increasing income. An S-shaped relationship between income and LS which had been surfaced in Carr et al.'s (2018) smaller samples was not found, however.

4.3 RO2: To determine whether a particular pivot point in the curve can be identified for an income level (or income range) at which South Africans' perceptions about their LS move from negative (not decent) to positive (decent).

This section aims to address the second research objective by determining a LW. To address this objective, two ways of determining a LW were considered: Firstly, by considering the income level at which LS is equal to 6. This number was chosen because it is above the LS scale midpoint of 5 and a decent life should allow individuals to thrive and therefore be above average. Thus, the 'turning point' would be where the LOESS curve in Figure 1 passes through 6. Secondly, a LW could be assumed at an income level at which no-one experiences extreme dissatisfaction with life. The results relating to both methods are provided below.

4.3.1 Living Wage Method 1

This method considered a LW to be at an income level from which onwards, on average, individuals exhibit positive rather than negative LS. This would occur at an income level at which the LOESS curve passes through above the midpoint of the LS scale (i.e. at a LS level of 6). This value is, at least, above average satisfaction. The respective LW approximations were R2,500 (2008), R6,000 (2010), R7,000 (2012) and R6,000 (2014).

4.3.2 Living Wage Method 2

The second method considered an income level from which onward no-one experienced extreme dissatisfaction with life (i.e. where the minimum satisfaction level was greater than 1) (refer to Table 5 and Figure 2). This would be at the lower boundary for income group 4 for waves 1 (approximately R 12,000), 3 (approximately R21,000) and 4 (approximately R20,000), and income group 3 in wave 2 (approximately R 17,000). These amounts would not necessarily equate to an individual's LS increasing with higher income; however, it would suggest that the number of extremely dissatisfied individuals may decrease.

To conclude, the purpose of this section was two-fold. The first was to offer suggestions on determining a LW using subjective indicators. Second, was to define the characteristics of a LW in the current study. In line with method 1, a LW is an income which allows for experiencing a decent life (i.e. the individual is able to thrive above previous undesired financial circumstances). This definition aligns with Carr et al.'s (2018) work. The second method presented in this study offers an additional, or perhaps different, component of a LW. Results suggest that if more individuals receive an income that allows for decent living, then extreme dissatisfaction in society could potentially be minimised.

4.4 RO3: To assess the effects income has on self-perceived LS over time.

The purpose of this section is to address the third research objective, namely, to determine how LS and income covary over time. Based on the findings provided in the literature review (Section 2.5.2), it was suspected that income would have no effect on LS in the long-run. Consequently, the prediction was that individuals' LS levels would not fluctuate systematically with changes in income over the six year period considered. The sections below provide the longitudinal results.

4.4.1 Factorial Repeated-Measures ANOVA

A factorial repeated measures ANOVA was used to determine the effect of individual income on LS over time (i.e. over the six years between the four waves). LS over the four waves was the repeated measures variable. The independent variable was the income group participants were allocated based on their self-reported income in 2008. It had three levels.

In order for repeated-measures ANOVA to be appropriate, the data needed to fulfil certain assumptions. Before commencing with the analysis potential bias in the data should be removed (Field, 2016). One method of reducing bias is to trim the data. This could involve removing outliers or extreme cases from the sample (Field, 2016). The researcher removed individuals who earned more than R30,000 before conducting the cross-sectional analyses, as there were not enough individuals earning income greater than this amount. The data thus had already been trimmed.

Another assumption is that of sphericity which determines whether the error variances are approximately the same in each group making up the independent variable. It is said to be similar to the homogeneity of variances required when carrying out an ANOVA to test the difference between two groups (Field, 2016). To test this assumption, Mauchly's test of sphericity is used (Field, 2016). It is, however, not obligatory to meet this assumption in order to conduct a repeated-measures ANOVA. The data fulfilled this assumption, however, as the test was non-significant (Mauchly's $W = .981$, $df = 5$, $p = .175$). Furthermore, to check for normality, skewness and kurtosis was utilised. The skewness and kurtosis figures are not that far from zero (refer to table D1-D4 in Appendix D) indicating a normal distribution (Field, 2016). The normal Q-Q plots for all waves show data points along a straight line which further indicates a normal distribution (refer to figures D1-D4c Appendix D). It was thus concluded that the data met the assumptions for the ANOVA to be conducted.

The within-subjects effects (refer to Table 8) indicated that the average LS in the overall sample did not change over the four waves. Thus, the average LS remained fairly similar over the years. Table 8 also shows that the interaction result between income group in 2008 and wave was insignificant, indicating that the pattern of average LS is not different across the four times in the three different income groups. Equally so, the between-subjects effects are all insignificant (see Table 9). Therefore, this means that LS is not different in the three income groups in any of the four waves.

Table 8

F-test results of changes in LS and interaction effects between income group in 2008 and LS across the four assessment periods (Wave 1: 2008 - Wave 4: 2014)

Source	Wave	Type III Sum of Squares	Df	Mean Square	F	Sig.
Wave	Linear	2.453	1	2.453	.600	.439
	Quadratic	13.985	1	13.985	3.060	.081
	Cubic	1.627	1	1.627	.327	.568
Wave x 2008 Income Group	Linear	13.553	2	6.776	1.658	.192
	Quadratic	6.475	2	3.238	.708	.493
	Cubic	10.251	2	5.126	1.029	.358
Error (Wave)	Linear	1684.279	412	4.088		
	Quadratic	1882.979	412	4.570		
	Cubic	2051.446	412	4.979		

Table 9

F-tests for differences in LS between income groups determined in 2008 in each of the four waves of data collection (Wave 1: 2008 - Wave 4: 2014)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	6678.040	1	6678.040	900.328	.000
2008 Income Groups in Wave 1	25.865	2	12.933	1.744	.176
2008 Income Groups in Wave 2	.759	2	.379	.051	.950
2008 Income Groups in Wave 3	36.618	2	18.309	2.468	.086
2008 Income Groups in Wave 4	39.461	2	19.731	2.660	.071
Error	3055.945	412	7.417		

At neither income level are there significant changes in LS over the period of six years. Regardless, of whether individuals earned low or high income in 2008, their LS levels remained relatively constant from 2008 to 2014. However, this analysis did not consider whether income levels had changed over this period. An individual in the lowest income group in 2008 could have stayed in the same low income group, moved up in income or moved up and declined again at a later point during the six year time period. It is possible that differences in LS would vary with changes in income levels. For this reason, the relationship between change in income and change in LS regardless of income group was also considered. The associated results are presented in the next section.

4.4.2 *Changes in Income against Changes in Life Satisfaction*

To further explore the data, scatterplots were utilised to ascertain whether any significant patterns exist between the two variables of interest, namely changes in income against changes in LS. Figures 7A-7F plot the differences in income over two time periods against differences in LS over those same time periods. The differences between income in wave 1 and wave 2, wave 1 and wave 3, wave 1 and wave 4, wave 2 and wave 3 and wave 3 and 4 (dependent variable) were calculated. The same was done for LS (independent variable).

Figure 7A plots the difference in individuals' income in 2010 (wave 2) compared to 2008 (wave 1) against the difference in LS over the same period. The scatterplot was divided into four quadrants (indicated by the blue lines). The expectation would be that for those whose income decreased (points to the left of the vertical blue line), more people would have experienced a decrease in LS (individuals in the left bottom quadrant) than an increase in LS (individuals in the top left quadrant). However, this was not the case. When income decreased, there was no clear difference between those whose LS increased (top left quadrant) and those whose LS decreased (bottom left quadrant). Similarly, one would expect more individuals' LS increased when income increased than decreased. However, when income increased (points to the right of the vertical blue line), there was minimal difference in the number of individuals whose LS increased (top right quadrant) and whose LS decreased (bottom right quadrant) (refer to Table 10 below). Equivalent observations were made for changes in income and LS between wave 1 and wave 3 (see Figure 7B), wave 1 and wave 4 (Figure 7C), wave 2 and 3 (Figure 7D), wave 2 and wave 4 (Figure 7E) as well as for the differences in income and LS between wave 3 and 4 (presented in Figure 7F).

As no clear systematic pattern between the changes in income and the changes in LS occurred, the results provided a similar conclusion as Section 4.4.1: increases or decreases in income do not appear to determine increases or decreases in LS.

Table 10

Crosstabulation results showing the number of participants in each quadrant for the change in income against the change in LS between wave x and y

		Change in LS		
		Decrease	Increase	
Between wave 2 and 1	Change in Income	Decrease	95	51
		Increase	260	139
Between wave 3 and 1		Decrease	67	26
		Increase	280	172
Between wave 4 and 1		Decrease	21	19
		Increase	285	220
Between wave 3 and 2		Decrease	91	72
		Increase	226	156
Between wave 4 and 2		Decrease	34	33
		Increase	250	228
Between wave 4 and 3		Decrease	66	56
		Increase	212	211

Figure 7. Difference in individual income against the difference in life satisfaction over the same period.

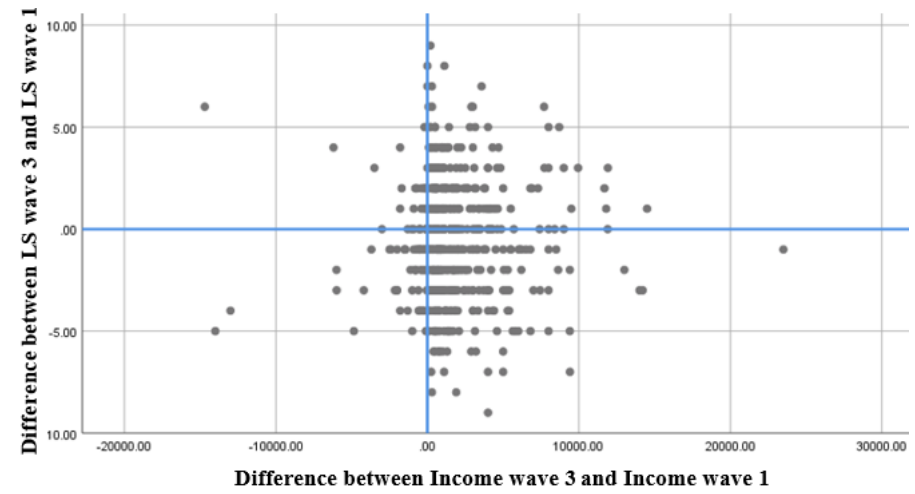
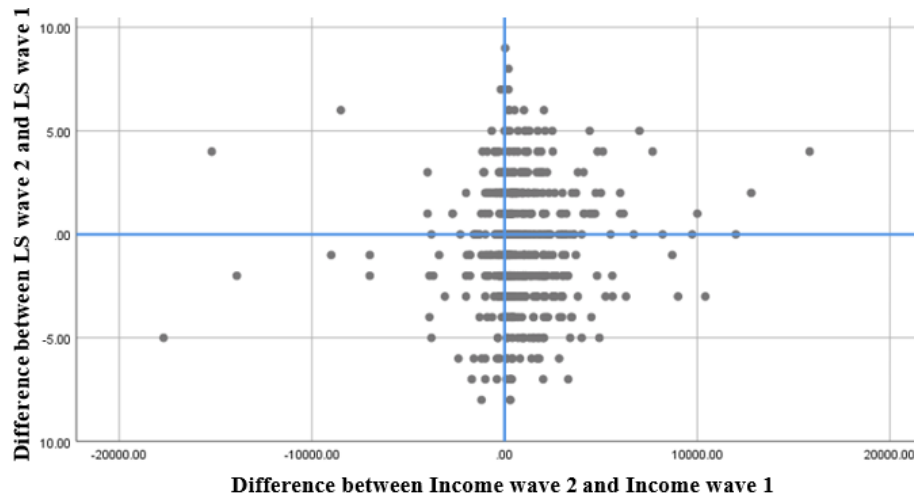


Figure 7A. Difference in LS_{wave2} and LS_{wave1} against the difference in $income_{wave2}$ and $income_{wave1}$

Figure 7B. Difference in LS_{wave3} and LS_{wave1} against the difference in $income_{wave3}$ and $income_{wave1}$

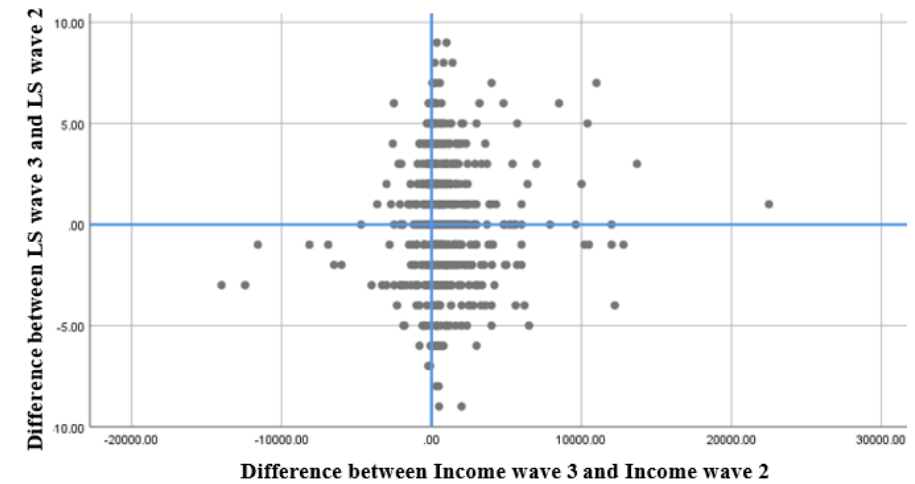
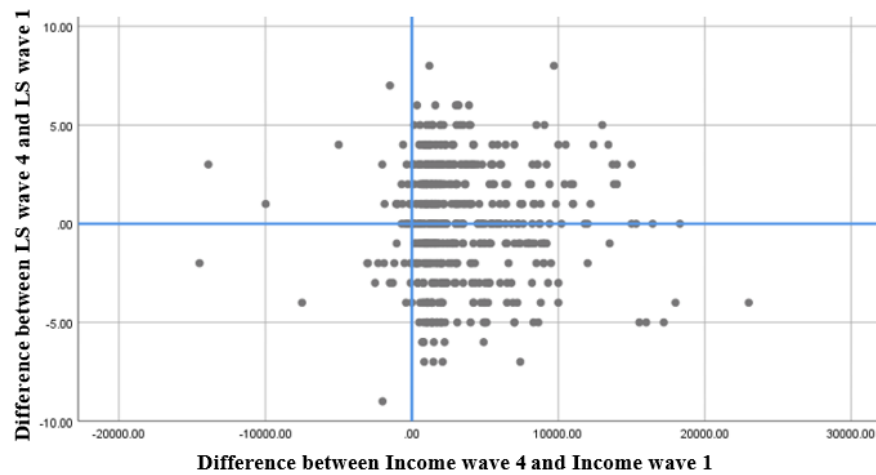


Figure 7C. Difference in LS_{wave4} and LS_{wave1} against the difference in $income_{wave4}$ and $income_{wave1}$

Figure 7D. Difference in LS_{wave3} and LS_{wave2} against the difference in $income_{wave3}$ and $income_{wave2}$

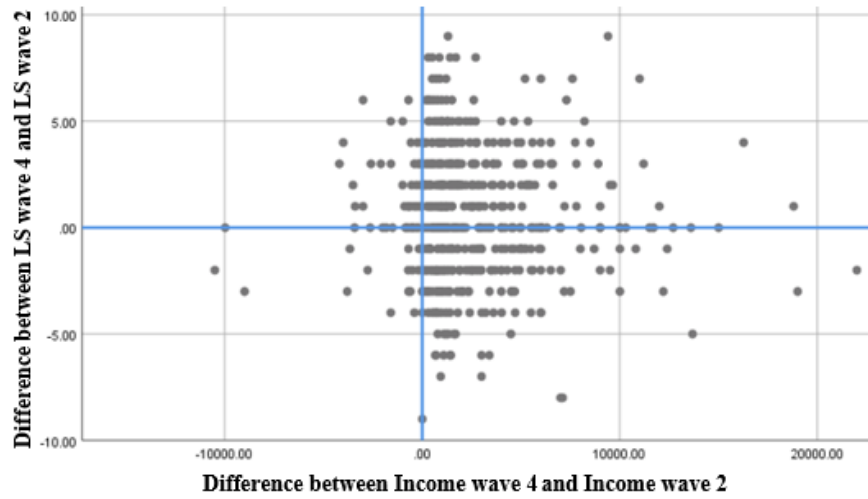


Figure 7E. Difference in LS_{wave4} and LS_{wave2} against the difference in $income_{wave4}$ and $income_{wave2}$

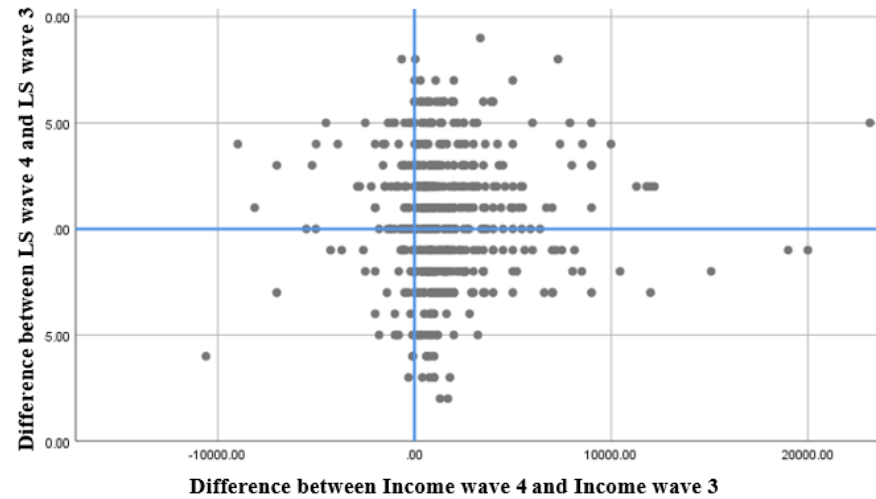


Figure 7F. Difference in LS_{wave4} and LS_{wave3} against the difference in $income_{wave4}$ and $income_{wave3}$

4.4.3 The Relationship between Changes in Income against Changes in Life Satisfaction

To corroborate the scatterplot results in Section 4.4.2, Pearson’s chi-square tests were utilised. Chi-square tests determine the association between categorical variables (Field, 2016). The changes in income and LS variables over their respective time periods were each divided into two groups. Thus a 2 by 2 matrix emerged. Individuals either decreased in income (group 1) or increased in income (group 2). Similarly, their LS either lessened (group 1) or improved (group 2) over the years.

The chi-square assumption of independence was met. This assumption prohibits an individual from occupying more than one of the four quadrants shown in the scatterplots in Section 4.4.2. For the difference in income and LS between wave 1 and 2, for example, an individual either increased or decreased in income (or LS). An additional chi-square test assumption states that the expected frequencies should be above 5 in order to ensure an adequate sample size (Field, 2016). The minimum expected frequencies are 50.9, 68.2, 59.8, 33.8 and 17.5 respectively, for the chi-squared analyses (refer to Table C1 to C6 in Appendix to view crosstabulation results). Pearson chi-square tests showed insignificant results (refer to Table 11 below). Thus, there is no significant association between the changes in income and the changes in LS. Therefore, a change in income is not related to a change in LS. These results support those found in the scatterplots in Section 4.4.2.

Table 11

Pearson Chi-squared results showing indicating that a change in income is not statistically related to a change in LS for the specified time periods

Change in Income by Change in LS	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
Between Wave 1 and 2	.000 ^a	1	.984
Between Wave 1 and 3	3.399 ^a	1	.065
Between Wave 1 and 4	.233 ^a	1	.629
Between Wave 2 and 3	.522 ^a	1	.470
Between Wave 2 and 4	.057 ^a	1	.811
Between Wave 3 and 4	.600 ^a	1	.438

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 50.90, 68.19, 59.77, 33.79 and 17.54 respectively.

b. Computed only for a 2x2 table

4.5 Conclusion

The purpose of this section was to investigate the effects of income on LS in the short and long-run. The cross-sectional results revealed that extreme dissatisfaction decreases with higher income. Moreover, two methods for determining a LW were suggested. Results from the factorial repeated measures design showed that in the long-run, there was no systematic shift in LS as income changes over the four waves regardless of movements between income groups. Furthermore, the scatterplots of changes in income against changes LS for specific time periods showed no clear difference between those who increased in income as well as increased in LS and those who increased in income but decreased in LS. Similarly, no clear difference was observed for those who decreased in income and decreased in LS and those who decreased in income and increased in LS. Comparably, the Pearson chi-squared analysis indicated no significant difference in the change in LS as income changes over specific time periods. Thus, a change in income may not be connected to a change in LS over time. The section to follow provides a discussion on these results.

5. DISCUSSION

5.1 Introduction

The purpose of this study was to investigate the relationship between individual income and LS through cross-sectional as well as longitudinal analyses to extend on the research conducted by Carr et al. (2018). Carr et al. (2018) had found an S-shaped relationship between income and LS in cross-sectional South African data.

This chapter examines the findings in relation to the three objectives outlined in Section 1.2. In relation to the first objective and contrary to expectation, no S-shaped relationship was found between income and LS at either of the times of data collection. Instead, a complex relationship that required zooming in on separate income groups per wave was found. Findings suggest that at low levels of income, individuals' LS varies across the full spectrum, from highly dissatisfied to highly satisfied. At higher levels of income, however, individuals no longer experienced extreme dissatisfaction.

With regards to the second objective, the results showed that it was possible to identify an estimated LW value based on individuals' LS. The value increased from 2008 (R2,500) to 2010 (R6,000) but remained at similar levels in 2012 and 2014 (R7,000 and R6,000) when a LW value was determined as the value at which individuals' average LS moves from negative to positive. When determining the LW as the value from which onwards nobody experienced extreme dissatisfaction with their lives, the amounts were R12,000, R17,000, R21,000 and R20,000 in 2008, 2010, 2012 and 2014, respectively.

In line with the finding that higher income was not related to higher LS in either of the waves, the results also revealed that in the long-run, shifts in individual income do not influence LS. The results showed no systematic pattern between shifts in income and LS.

In this chapter, possible reasons for these findings are discussed. This is followed by a discussion of the study's limitations, contribution to research, practical implications and recommendations.

5.2 RO1: To assess whether or not the same relationship between income and LS found in Carr et al.'s (2018) studies using smaller samples could be seen in a large representative South African sample.

Varying results had been obtained from previous literature relating to the relationship between individual income and LS. Based on these, two expectations were derived. Firstly, that the

relationship between income and LS would be non-linear, though it was not clear what shape exactly the curve of best fit would look like. This is as Diener and Diener (1995) found that across countries and thus at national aggregate level, certain SWB variables hold a quadratic relationship with national income levels. Their results thus demonstrated that at lower levels of income, wellbeing would increase at a high rate and at high levels of income it would be stable. However, the unit of analysis were countries, not individuals. Others had found cubic (Maleka, 2017) and S-shaped results (Carr et al., 2018) for the relationship between individual income and LS. These results indicated that the relationship between the two constructs might be more intricate than what a linear relationship could explain. Yet, in this study, no relationship between LS and income was found except that extreme dissatisfaction with life falls away at higher income levels. The following sections first consider why there was no consistent relationship and then proceeds to examine why extreme dissatisfaction disappears once income reaches a certain level.

5.2.1 Life Satisfaction and Income

This section discusses why there seems to be no relationship between income and LS, which thus evinces that LS is less dependent on income than on other factors. Such factors may be personality and hereditary characteristics as suggested by equilibrium theory (Headey & Wearing, 1989) and empirical findings (Blaauw & Pretorius, 2012; Bjørnskov, Dreher & Fischer, 2008; Diener, 2000; Ebrahim, Botha & Snowball, 2013). Beyond personality differences, individuals may experience different wellbeing levels depending on what their goals and aspirations are and whether these are being met as argued by socio-cognitive theories (see Section 2.3.3.2). Individuals whose personal goals were met, may experience greater satisfaction than those whose goals were not met (Diener, 2000). Equally so, certain life events which occurred close to the time of data collection may have influenced participants' perceptions of their general LS. This means that even though participants were asked to rate their LS as a whole, recency bias may have influenced their ratings. Recency bias occurs when individuals place a higher weighting on recent events or information to make decisions despite their wide range of previously acquired knowledge (Fudenberg & Levine, 2014). Lunenburg (2012), for example, indicated that when evaluating an employee's performance, a manager may consider more recent events instead of the employee's performance over a six-month period, thus resulting in errors. The same would be likely to apply when individuals are asked to provide a self-assessment which covers longer time periods.

The question that remains is why Carr et al. (2018) found an S-shaped relationship between income and wellbeing. It is possible that the answer lies in how wellbeing was conceptualised and measured. This study measured LS in one item whereas Carr et al. (2018) used a slightly more differentiated measure which they deemed to indicate QoL. It included LS, physical wellbeing and mental stress. This QoL measure may provide a more holistic indication of an individual's wellbeing. Measuring LS in isolation provides information on the cognitive judgement awarded to an individual's general perception and feeling on life (Myers & Diener, 1995; Prasoorn & Chaturvedi, 2016; Veenhoven, 1996). Carr et al. (2018), on the other hand, tap into the cognitive, physical and emotional aspects of QoL. Thus, Carr et al.'s (2018) measure might have resulted in an S-shaped relationship because it considered additional aspects of wellbeing not considered in this study as this study's focus was the cognitive component. Future researchers should conduct large scale studies on income and LS to ascertain whether an S-shaped relationship would emerge if the cognitive component of SWB constitutes the sole independent variable considered.

In both cases, the NIDS and Carr et al.'s (2018) research, LS and QoL were assessed using one or a very limited number of items. The discipline of psychology has engaged with how best to assess psychological constructs almost since its inception in the late 1800s. Today it is generally accepted that single-item measures are insufficient to adequately capture abstract constructs, such as LS (Gardner et al., 1998). Thus, the norm for testing any psychological construct is to use multiple items. *Ceteris paribus*, the 'more is better' approach is used in psychology as, if constructed appropriately, more items equal more precision. However, Gardner et al. (1998) posit that in certain instances, one-item measures may be sufficient. Abdel-Khalek (2006), for example, examined 'happiness' with a single item measure. The author obtained a test-retest reliability score of .86 and convergent and divergent validity. A benefit of one-item measures is that they provide a more enjoyable experience for participants (Gardner et al., 1998). It may thus decrease the risk of untruthful answers due to survey fatigue. This is especially important when surveys assess a large number of different constructs as was the case in both the NIDS and Carr et al.'s (2018) research. Weighing up the measurement concerns against practical constraints, it seems justified that short measures were used in both cases. It would, however, still be recommended to at least tap into different aspects of wellbeing as done in Carr et al.'s (2018) research, than to reduce wellbeing into a one-item measure. Gardner et al. (1998), however, specified that when assessing a single-item versus a multi-

scale, no scale was superior to the other. Thus, a suggestion is to utilise both, one-item and multi-item measures to ascertain if one is preferred to the other.

A second measurement related reason for the differing results between Carr et al.'s (2018) and this research might be the items' response format. While participants in the NIDS provided their LS assessment on a 10-point scale ranging from very dissatisfied to very satisfied, Carr et al.'s (2018) study required participants to choose between a frowning, neutral and smiley emoticon to indicate their answer. It is possible that individuals completing the NIDS questionnaire may have demonstrated a conceptual misunderstanding of 10-point scales. Individuals with low literacy levels, for example, may have struggled to comprehend what each number in a rating system represented. Consequently, responses to rating scales may not be a true reflection of personal judgements in such cases, but rather, a reflection of what participants incorrectly assumed the numbers denoted. It was suggested that pictorial scales such as the ones used by Carr et al. (2018) may be beneficial in helping individuals with limited literacy skills and children as it may aid in understanding and questionnaire completion time (Reynolds-Keefer, Johnson, Dickenson & McFadden, 2009; Stange, Barry, Smyth & Olson, 2018). It is, however, not very well-researched if the shorter completion time for pictorial scales is indeed due to improved understanding (Strange et al., 2018). Nevertheless, Reynolds-Keefer et al. (2009) indicated that there was a significant (although small) interaction between using pictorial scales and the grade an individual was in.

None of the above reasons can explain, however, why with higher income extreme dissatisfaction falls away. A discussion of this result follows in the next section.

5.2.2 Life dissatisfaction and income

This study's findings suggest that at higher income levels, participants no longer experienced extreme dissatisfaction. Thus, higher income was associated with reduced dissatisfaction levels. It could be due to individuals earning above a certain threshold being able to satisfy their basic needs. As according to Herzberg's (1959) two factor theory of motivation income is a hygiene factor, it is required for individuals to be able to satisfy their basic needs. Having a sufficient income to meet one's basic needs may thus be the safety net required to avoid severe dissatisfaction. As stated in Chapter 2, SWB consists of life evaluation and positive and negative affect. Needs fulfilment is directly linked to an individual's life evaluation as well as their negative affect. Tay and Diener's (2011) study supports this argument. They found that when individuals' needs are not met, it could result in a negative life evaluation, but if all of an

individual's needs are met, it does not necessarily mean their assessment of life will be highly positive.

Studies who reported similar results include Sachau's (2007) and Boes and Winkelmann (2010). Sachau's (2007) analysis of literature indicated that income does not motivate but reduces the possibility of experiencing negative feelings and situations. Thus, although income does not motivate individuals, it does minimise their chances of experiencing negative circumstances, expressed as extreme dissatisfaction in the current study's case. Similarly, Boes and Winkelmann (2010) measured general LS using a one-item measure and found that although greater earnings may not increase an individual's LS, it may relax the experience of dissatisfaction. They found that this was especially true for males earning larger incomes.

5.2.3 Money does not buy happiness... Or does it?

This study found no S-shaped relationships between income and LS during the first four waves of the NIDS. Does this mean that money does not buy happiness? The results also show that this question is not as easily answered, as with higher income extreme dissatisfaction does disappear. This is important because individuals who are extremely dissatisfied with themselves can bring about negative implications at individual and societal levels. For example, it has been found that long-term life dissatisfaction may negatively affect an individual's health-related quality of life (HRQL) (Saharinen et al., 2014). This matters because HRQL is said to affect an individual's mental health as well as aid in lessening negative effects of diseases. Consequently, at societal level high levels of life dissatisfaction may result in a burden on the health system.

In sum, the findings thus align with Herzberg's (1959) two-factor theory (Herzberg, Mausner, & Snyderman, 1959) – having money does not equal greater satisfaction but not having money can coincide with extreme dissatisfaction. The findings of the current study suggest that money does not 'buy happiness' (or specifically LS) but it may 'buy' the benefit of not experiencing extreme dissatisfaction.

5.3 RO2: To assess whether or not a particular income level or income range pivot point could be identified at which South Africans' perceptions about their LS move from negative (i.e. not decent) to positive (i.e. decent).

The purpose of this section is to discuss the recommendations for a LW level which the findings of the current study suggest, as well as to draw a link to LW levels or ranges suggested in past

literature. The expectation was that the LW recommended based on the current study's results – determined through self-perceived psychological indicators (in this case LS) – would be above South Africa's current MW. This was due to LWs enabling more than just satisfying basic human needs. This study's findings were in line with the above expectation regardless of which of the two methods utilised to estimate LWs for South African citizens were employed.

5.3.1 Living Wage Estimate: Method 1

Method 1 considered a LW to be the wage level from which onwards individuals, on average, were satisfied instead of dissatisfied with their lives (see Section 4.3.1). This method indicated the following monthly LW thresholds: R2,500 in 2008, R6,000 in 2010, R7,000 in 2012 and R6,000 in 2014. The 2010, 2012 and 2014 LW estimate were similar to the estimate of 530 EUR provided by Guzi (2015) based on the cost of certain goods in 2012 when taking the South African Rand – Euro exchange rate at the time. He estimated LWs using food prices, transportation costs and residential expenses for various countries, including South Africa. Thus, although his estimate was calculated econometrically, it was similar to the 2010, 2012 and 2014 estimates obtained in this study using a subjective indicator of wellbeing.

Macro-economic factors may explain the comparatively large increase in the LW estimate between 2008 and 2010. Between 2008 and 2009 the country's GDP had declined by 2.3% (StatsSA, 2015). As a result, in 2009, approximately 900 000 less people were actively employed than in 2008 (Verick & Islam, 2010). Consequently, individuals who were employed may have required larger salaries to support those dependent on their income.

5.3.2 Living Wage Estimate: Method 2

The second method (refer to Section 4.3.2) which considered the LW as the wage level where individuals may avoid experiencing extreme dissatisfaction with their lives, resulted in LW estimates of approximately R12,000, R17,000, R21,000 and R20,000 for 2008, 2010, 2012 and 2014 respectively. Again, the largest increase was between 2008 and 2010 but using this method, the estimate increased further at a similar amount between 2010 and 2012.

The approximate income amounts required for a LW which is high enough to eradicate extreme dissatisfaction appears closer to wage demands placed on employers by trade unions than the econometrically determined LW estimates. In 2012, a LW of R12,500 per month, for example, was demanded by platinum miners (Alexander, Lekgowa, Mmope, Sinwell & Xezwi, 2013),

while Guzi's (2015) econometric LW estimate had been approximately R6,000. Furthermore, Carr et al. (2018) identified an approximate LW as R10,000 for South African citizens.

Regardless of method, the results showed that South Africa's national MW of R20 per hour and econometrically determined LWs (e.g. as outlined annually on Trading Economics (Trading Economics, 2018)) seem too low to allow most individuals to thrive. As stated in Section 2.4.1, the heterodox economic view known as the social economic approach, suggests that improving an individual's economic position, may result in improving an individual's social conditions (Mood & Jonsson, 2016). Thus, it is important that a LW level is set high enough so that it can create an environment in which individuals can thrive. This might, of course, not be the case for all individuals earning at least such a LW, as other determinants factor into the equation as well. For example, Ebrahim et al. (2013) identified health and fitness, employment status, absolute income, relative income and religion as determinants impacting the LS of South African citizens. Due to the challenges that comes with being highly dissatisfied (see Section 5.2.3), a LW level defined as the wage level from which onwards individuals are no longer extremely dissatisfied likely holds the greatest benefit to society. The purpose of a LW could thus be twofold: to increase an individual's satisfaction, but also society's wellbeing.

As seen in Chapter 2, South Africa was reported to have the lowest LS amongst the OECD countries. Thus, efforts towards improving the nation's LS (whether the only possible outcome may be reducing extreme dissatisfaction and not increasing LS) is necessary in the short-run. The next section explores the longitudinal relationship between income and LS.

5.4 RO3: To assess the effects income has on LS longitudinally.

The purpose of this section is to discuss the longitudinal findings of the current study. Similar to the cross-sectional findings, the longitudinal findings suggest no clear systematic pattern in the relationship between income and LS. These findings are in line with Eaterlin's (1959) longitudinal results suggesting that income does not seem to have an effect on LS in the long run.

As was argued in relation to the cross-sectional findings, the effects of genes and personality may be a possible reason (Bartels & Boomsma, 2009; Røysamb et al., 2018; Shimmack, Oishi, Furr & Funder, 2004). Personality may play a moderating role in the income-LS relationship, for example, with the LS of individuals with different personality characteristics being

influenced differently by income levels. Thus, an individual's LS over time may be influenced by their personality and heredity determined set-point (see Section 2.3.2).

Related to the concept of a set-point is the idea of regressing to the mean. This implies that adjustment towards a baseline will always occur (Barnett, Van Der Pols & Dobson, 2004; De Villiers & Frank, 2015). Thus, no individual would indefinitely remain in an extremely satisfied state or extremely dissatisfied state – an adjustment towards the mean is likely to occur. Similarly, satisfaction levels resulting from an individual's income may no longer illicit the same level of gratification it did when the individual first received it. This may be due to the individual having gained greater responsibility (housing or family support) over the years whilst earning the same level of absolute income and thus experienced a decrease in the real value of their income. Alternatively, even if their income increased in absolute and real terms, gratification may still decrease due to individuals no longer deriving the same satisfaction from obtaining an additional unit of income (Quoidbach et al., 2010). Thus, what previously provided joy and satisfaction, may no longer do so once wealth is obtained. Although money provides numerous other benefits (as mentioned in Section 2.5.1), the effect of the increase in funds is not reflected as much in LS due to the inability to appreciate life's small pleasures. Individuals may also desire money in the hope of experiencing more pleasures in life (Mencken & Yacht, 2010), even though the findings in the current study do not support that this mechanism would work: simply having more money, does not mean greater satisfaction. Logically, savouring could be linked to the idea of diminishing returns. Car et al., (2018) referred to it when describing their findings. Consuming an additional unit of something (after having consumed numerous units), is not as pleasurable/satisfying as when consuming the first unit (Parkin et al., 2010). Similarly, the effects of an 'additional unit' of money is not as pleasurable as the first unit.

This study's longitudinal findings suggest that pursuing money does not equate to general LS. Rather, due to individual's regressing to the mean (or towards their individual set-points), additional factors such as the determinants of LS identified by Ebrahim et al. (2013) (Section 5.3.2) should be considered. Furthermore, this study's findings may imply that individuals should not solely seek more money, but rather, engage in experiences that give them pleasure as more money might, in fact, undermine this (Quoidbach et al., 2010).

5.5 Limitations and Recommendations

While access to the NIDS data provided a great opportunity to work with large, nationally representative datasets, working with existing data also provided a number of limitations.

Firstly, it was not possible to choose which measures to include as the data had already been collected. The problem with the LS measure used in the NIDS was introduced in Section 3.6.1 and discussed in Section 5.2.1. In future, it is recommended that researchers across disciplines collaborate when developing measures for large scale research projects to ensure all variables of interest will be measured in reliable and valid ways and in this way provide trustworthy results. This is especially important when the data is used to inform policy decisions and thus likely to impact on people's lives. This means that when assessing psychological constructs, for example, discipline experts should be included in designing the measuring instrument. Of particular relevance would be the development of shorter multi-item scales that would not be excessively time consuming to complete. A recognition of the importance of multi-disciplinary efforts can be seen in social and behavioural sciences teams which employ individuals from multiple disciplines to advise government stakeholders on policy grounded in behavioural and social science research, such as the Behavioural Insights Team in the United Kingdom (Behavioural Insights Team, 2019), the Social and Behavioral Sciences Team under the Obama administration in the United States (SBST, 2017) and the Development Policy Research Unit at the University of Cape Town (DPRU, 2019).

Lastly, as not assessed in the NIDS surveys, this study did not consider determinants of LS other than income (e.g. social cognitive factors, personality, hereditary characteristics, life events and self-efficacy as outlined in Chapter 2). Thus, the recommendation is that future studies should consider additional determinants to discover how much of an impact each determinant (including income) has on LS. Ensuring that individuals consider the factors that most contribute to LS would require a shift in the dominant public mind-set that more money (and possessions) improve QoL, which is spurned by the advertising industry and appears a deeply ingrained fallacy. Moreover, as LS is a subjective variable, qualitative data may provide additional insights into the nature of the relationship between income and LS.

5.6 Contribution to Research

The largest contribution of this study lies in its longitudinal findings. Through this, it has heeded the calls for longitudinal research to explore the effect of income on LS over time (Carr et al., 2018).

The second contribution is support for the finding that the relationship between income and LS is much more complex than assumed by a linear relationship. As income increases, extreme dissatisfaction decreases, but LS does not increase with rising income. It is hoped that future researchers will seek to understand in more detail the differences between income and LS and income and life dissatisfaction which became apparent in this study. This could lead to a theoretical framework for which Herzberg's (1959) two factor model could serve as a starting point.

The third contribution of this study is the provision of two different ways in which to estimate a LW level using subjective indicators. Carr et al. (2018) advocated for the use of subjective indicators when estimating LWs, as they defined a LW as enabling an individual to move from negative to positive QoL. This definition is in line with the first method used to determine a LW in this study. An additional method, and thus definition, of a LW was offered in this study. It involved determining a LW as the income from which onwards extreme dissatisfaction disappears and provides a compelling and novel way of conceptualising what a LW should entail. This study recommends method 2 as numerical levels were similar to those previously reported and desired by studies (Alexander et al., 2013; Carr et al., 2018; Guzi, 2015). It therefore may potentially allow individuals to thrive (and not only survive); a wage requirement advocated by Carr et al. (2018).

5.4.1 Practical Implications

Many researchers consider job satisfaction or the effects of dissatisfied employees. This type of research outnumbers research conducted on how work-related factors, such as income, link to satisfaction and dissatisfaction in the broader life domain. It could be argued that the focus on job related constructs is to aid organisations with minimal concern on individual and societal wellbeing outside of the office. However, a consideration of life satisfaction among employees can result in favourable organisational outcomes, too. For example, individuals might be more productive if their general LS is higher.

The cross-sectional findings of this study suggest that with higher income fewer individuals feel extremely dissatisfied with their lives. Thus, the practical implication is that policy makers should consider and continue discussions on implementing wage thresholds above the national MW. There may not currently be sufficient buy-in to legislate LWs at a large scale, but this study's results provide an argument as to why it should be set as a future goal for which current policy decisions provide an enabling environment. Furthermore, through budget analyses,

individual organisations (medium to large) should consider whether it is possible for them to offer LWs to their employees due to the positive effects on the individual which are likely to create positive results for organisations (in terms of productivity) and society (in terms of societal wellbeing).

The second finding is that this study has shown the value of determining an appropriate income level using subjective experiences rather than econometric methods. This is as high income levels link to reduced extreme dissatisfaction. Thus, the findings supported income being a hygiene factor (i.e. having adequate income results in reduced dissatisfaction but not increased satisfaction). Thus, to create opportunities for individuals – and society - to thrive, subjective experience should be considered.

Professionals, such as organisational psychologists, have the necessary skills and knowledge to understand and merge the work and home life. An individual's LS also depends on their work environment. As such, organisational psychologists should be concerned about how work-life transcends into personal life and how home-life transcends into work-life.

5.7 Conclusion

This study attempted to answer the question of whether money buys happiness. It did so by addressing three research objectives. The first objective was to assess whether the same S-shaped curve found by Carr et al. (2018) would be found in the relationship between LS and income in a large representative South African sample. While the data could not be described using a linear relationship, it did not follow an S-shaped curve, either. However, what was found was that as income increases, extreme dissatisfaction with life decreases.

The second research objective attempted to assess whether a particular pivot point in the curve can be identified for an income level (or income range) at which South Africans' perceptions about their LS moves from negative (not decent) to positive (decent). Two methods were employed to attempt to find a LW. Findings of this study thus added to literature by providing potential wage approximations from which onwards an individual might experience less extreme dissatisfaction. The study's findings also emphasised the importance of considering subjective experiences in determining wage thresholds.

The third objective of this study was to assess the effects income has on self-perceived LS over time. Findings suggest that no clear pattern exist between shifts in income and LS over time. Thus, it supports the non-existent longitudinal relationship reported by Easterlin (1959). As

such, a focus on additional determinants of LS should be considered in future research. Knowledge on meaningful experiences and factors encouraging LS over time is necessary if there is a desire to create and reap the benefits of a satisfied society.

In response to the question of whether money buys happiness, this study's findings suggest that it does not. It does, however, buy the ability to reduce extreme dissatisfaction. If an individual was extremely dissatisfied, they may experience greater LS than they would have before they received a higher income. In this way, money is a hygiene factor as assumed by Herzberg et al.'s (1959) two factor theory of motivation. However, having money is not a guarantee for LS. Thus, with the exception of extreme dissatisfaction, it is likely that where an individual falls on the LS scale is dependent on an interplay of personality, genetics and other environmental influences rather than income.

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NIDS DATA

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APPENDICES

Appendix A

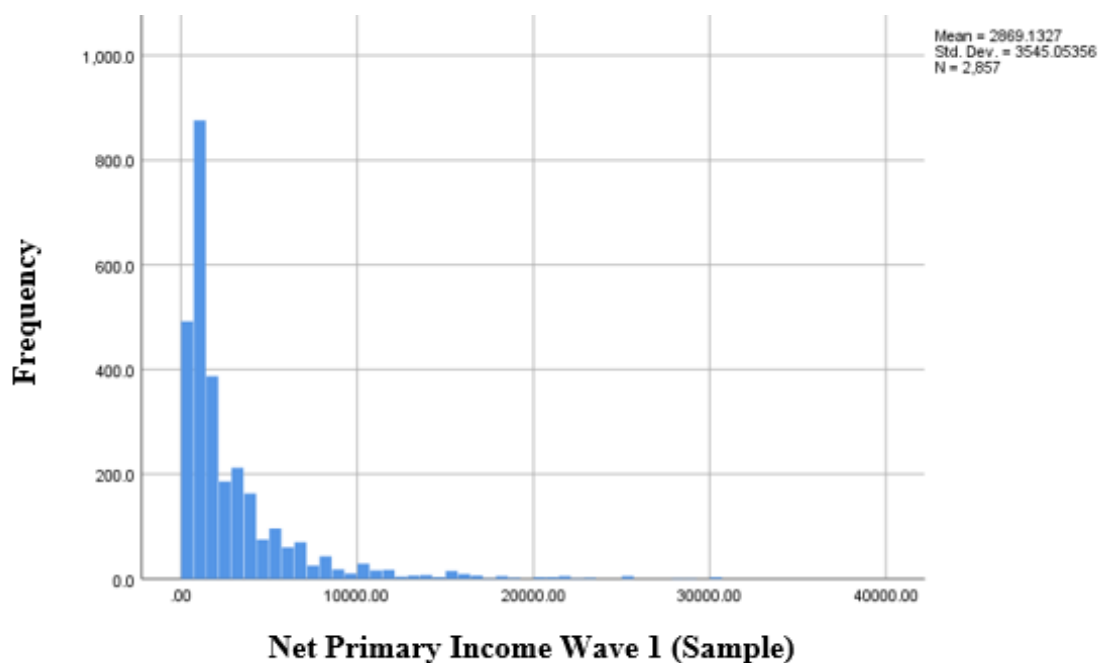
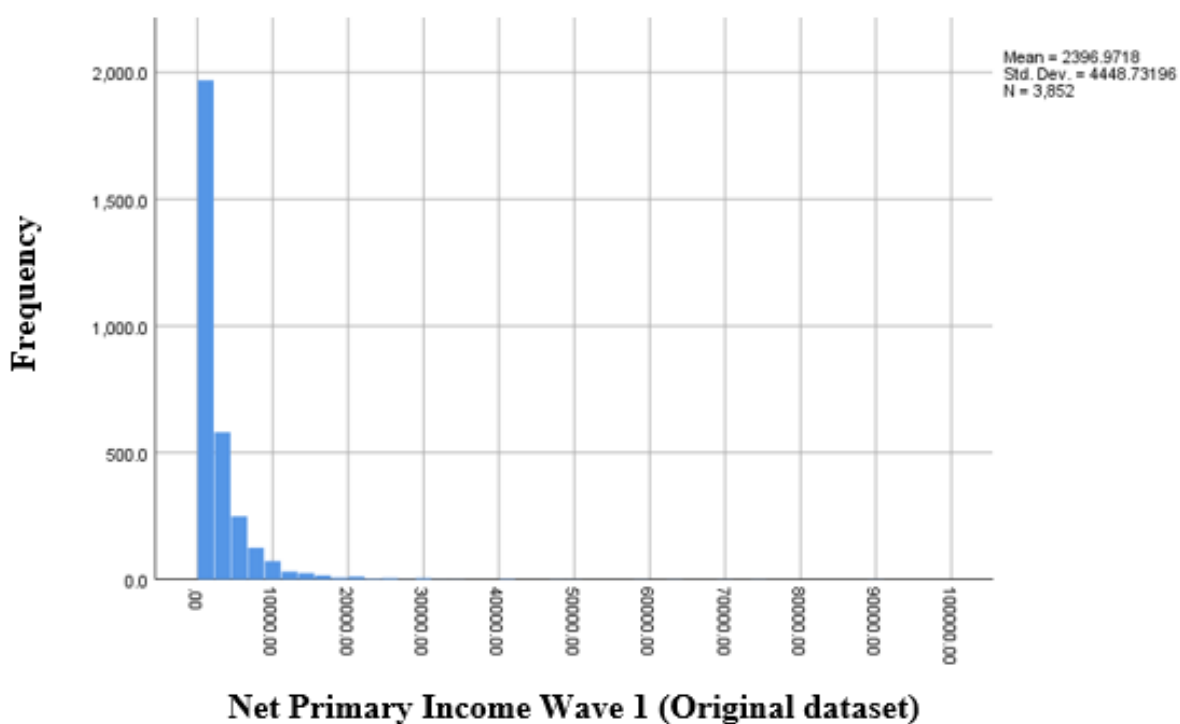
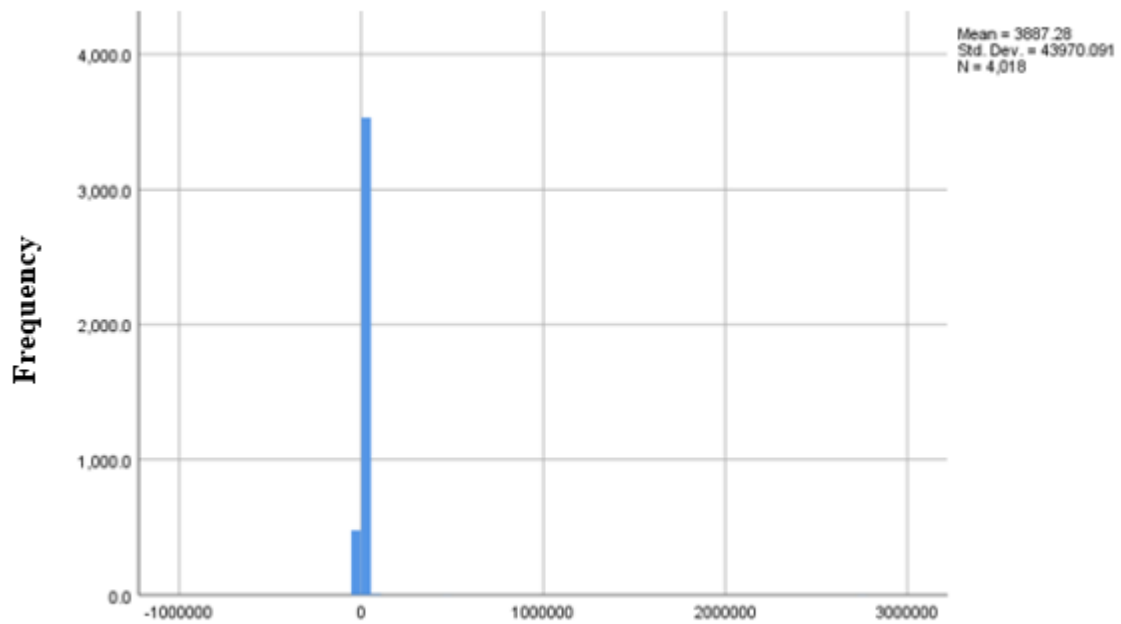
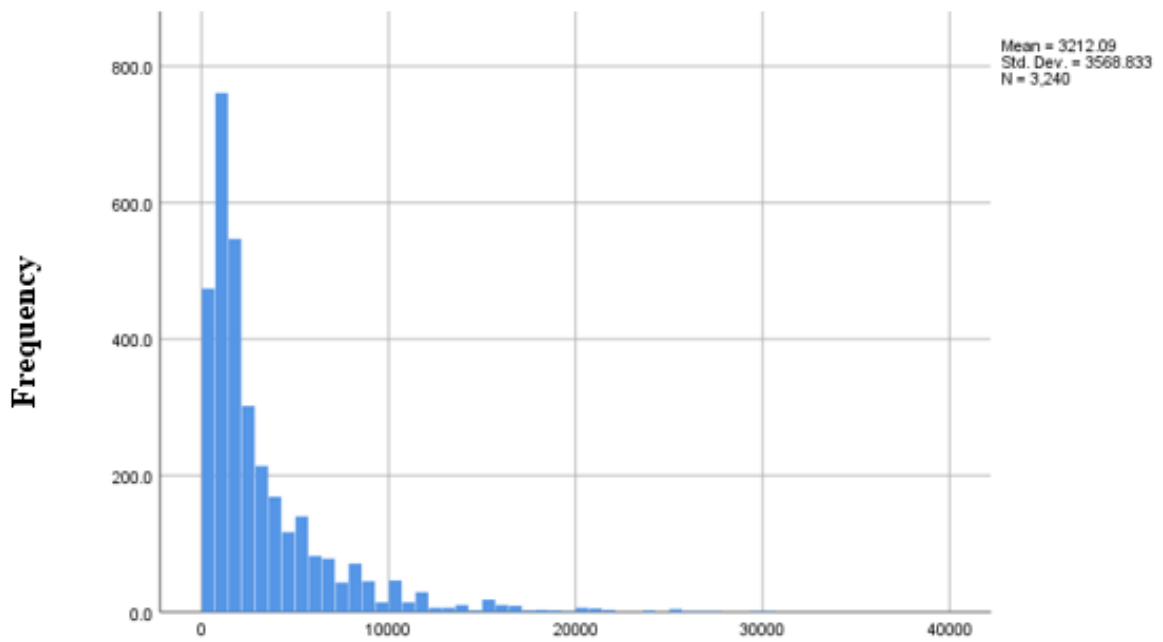


Figure A1: Graphs showing the distribution of income in the original NIDS dataset (top) and sample for this study (bottom) for wave 1, demonstrates that the sample is still representative of the original dataset.

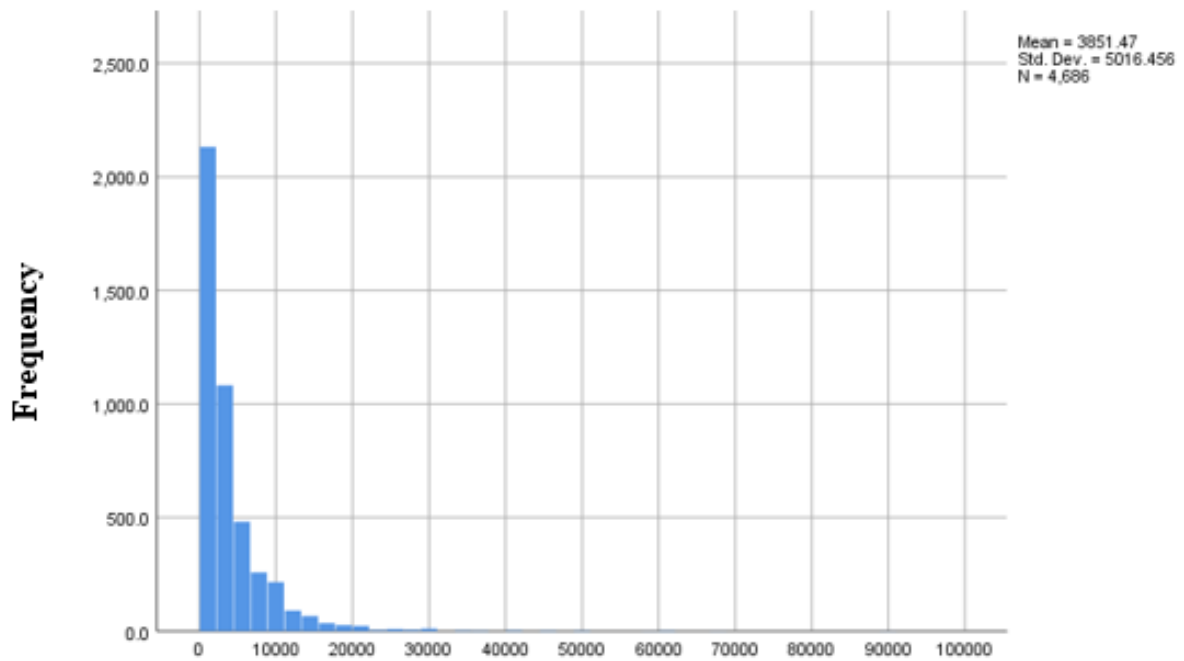


Net Primary Income Wave 2 (Original dataset)

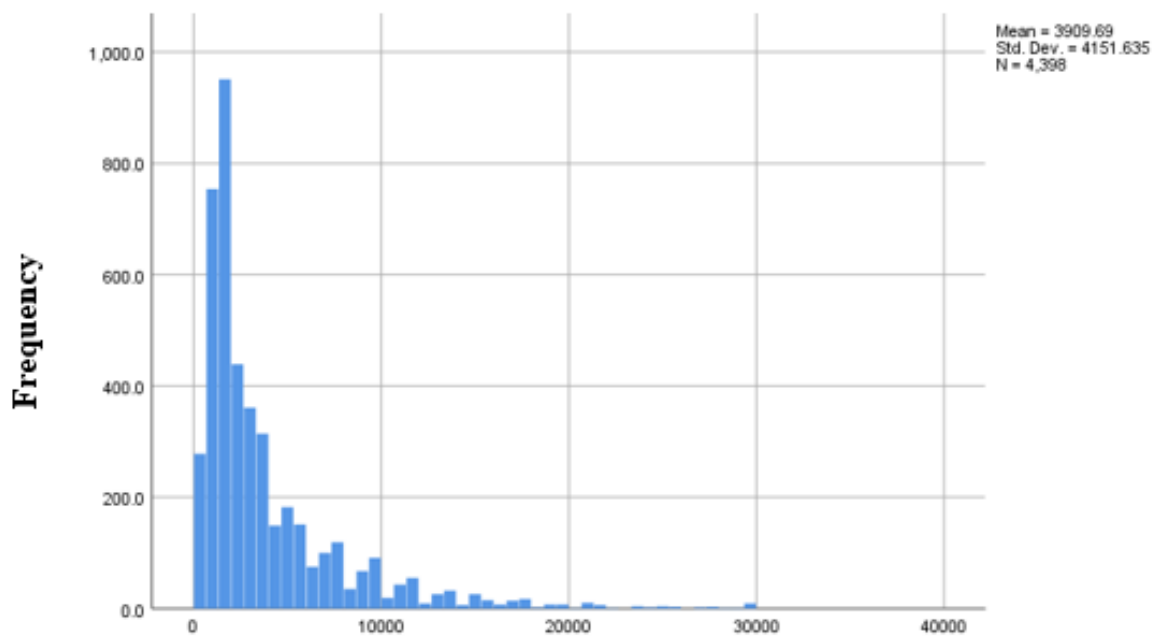


Net Primary Income Wave 2 (Sample)

Figure A2: Showing the distribution of income in the original NIDS dataset (top) and sample for this study (bottom) for wave 2. Note: When determining the histogram for wave 2 using the original SPSS spreadsheet (top figure), there appears to have been an error or bug in SPSS.



Net Primary Income Wave 3 (Original dataset)



Net Primary Income Wave 3 (Sample)

Figure A3: Showing the distribution of income in the original NIDS dataset (top) and sample for this study (bottom) for wave 3, demonstrates that the sample is still representative of the original dataset.

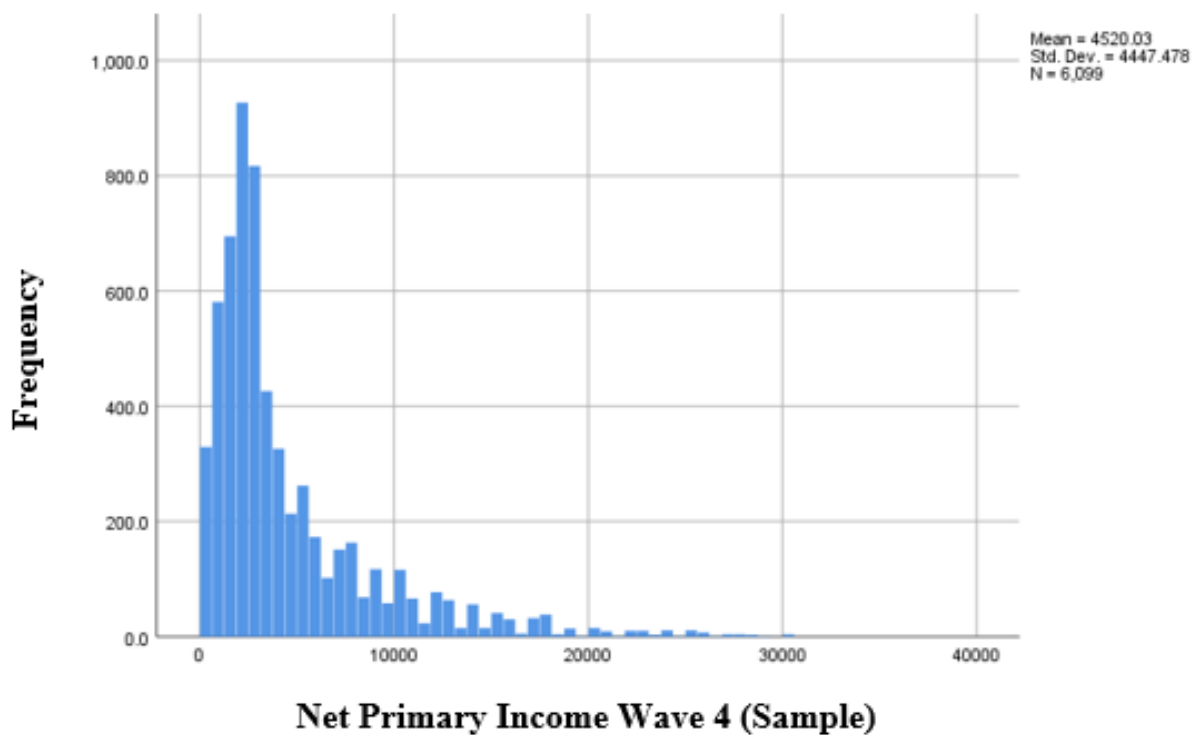
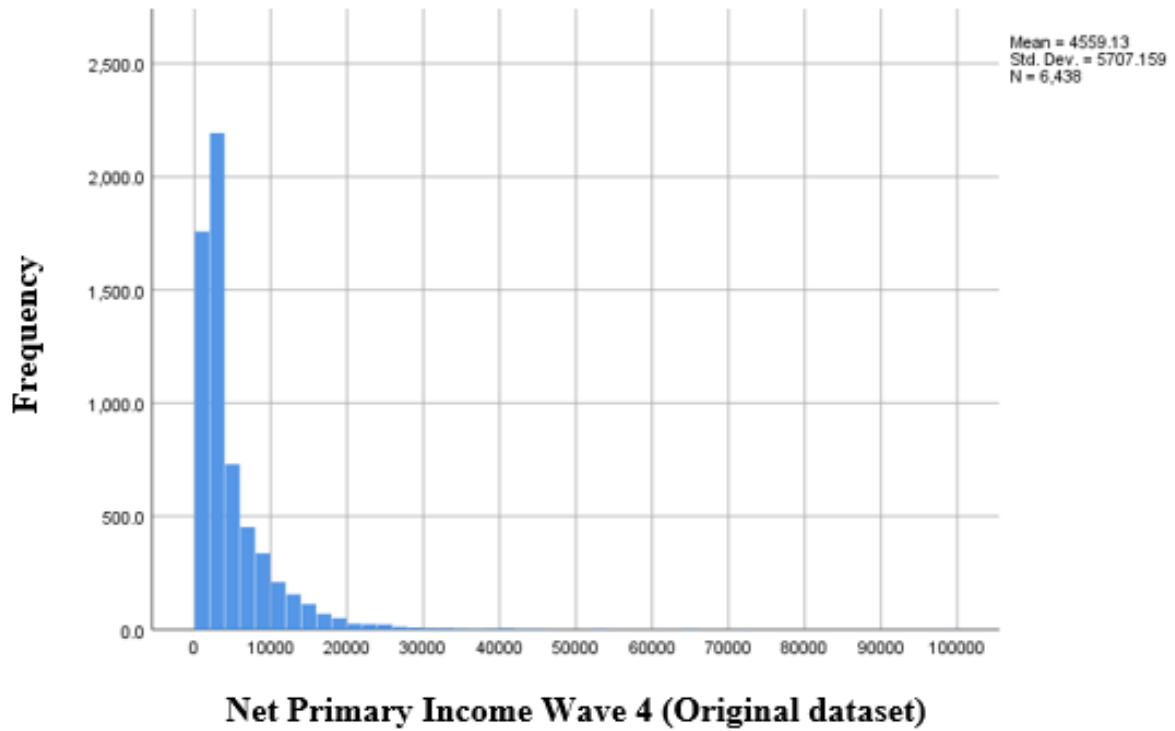


Figure A4: Showing the distribution of income in the original NIDS dataset (top) and sample for this study (bottom) for wave 4, demonstrates that the sample is still representative of the original dataset.

Appendix B

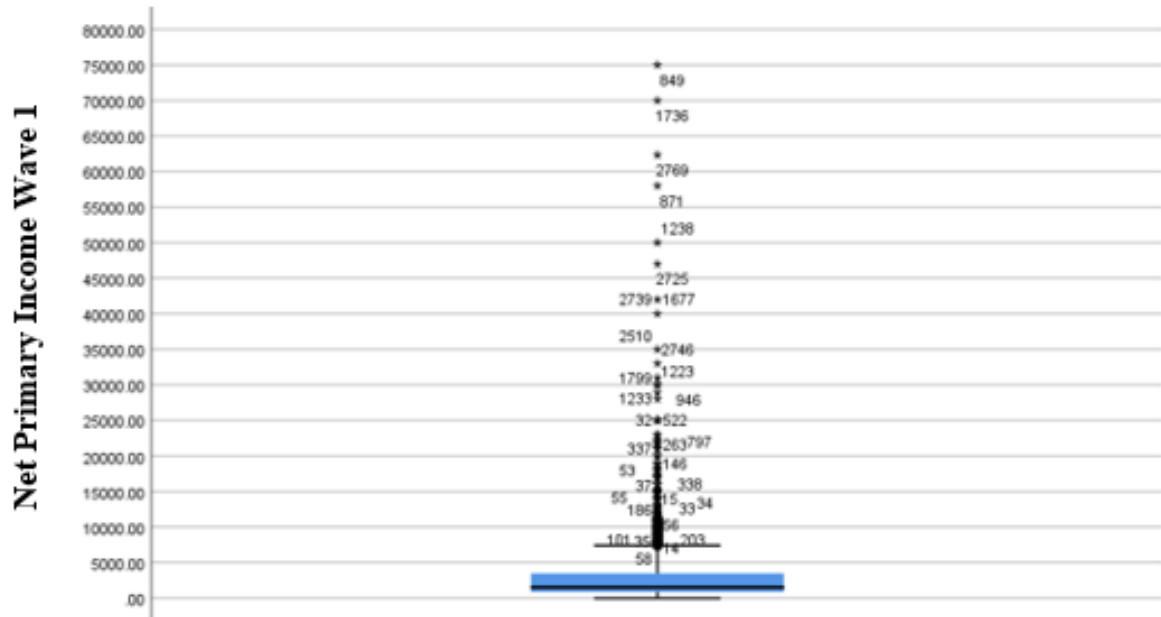


Figure B1: Showing outliers for wave 1 in the original NIDS data.

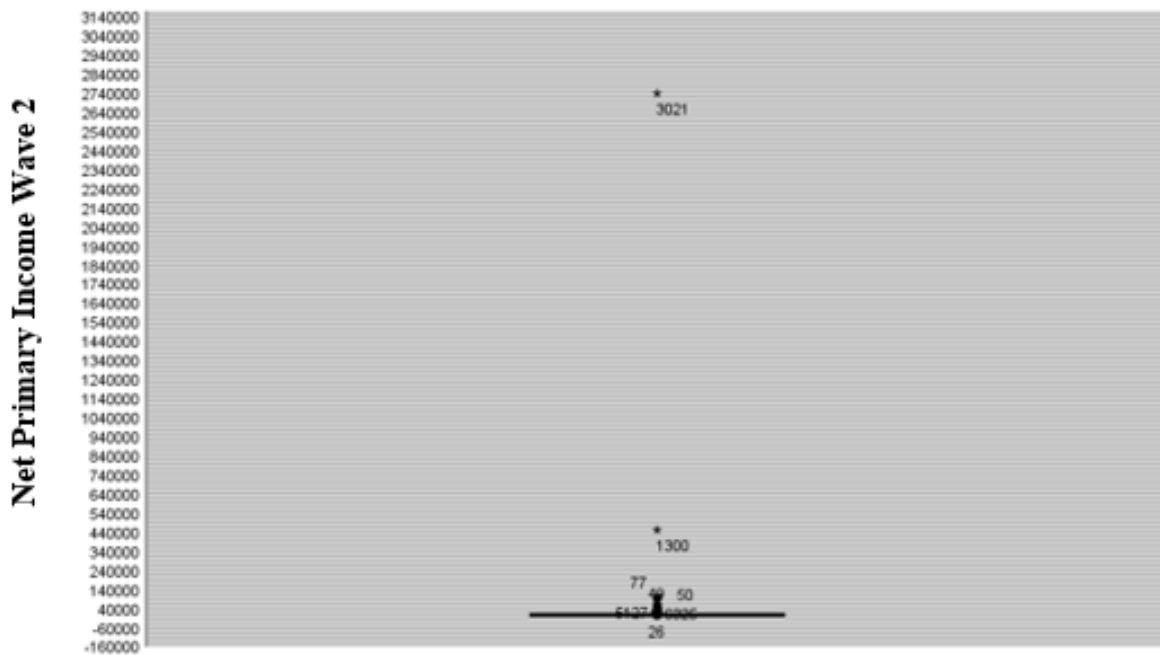


Figure B2: Showing outliers for wave 2 in the original NIDS data.

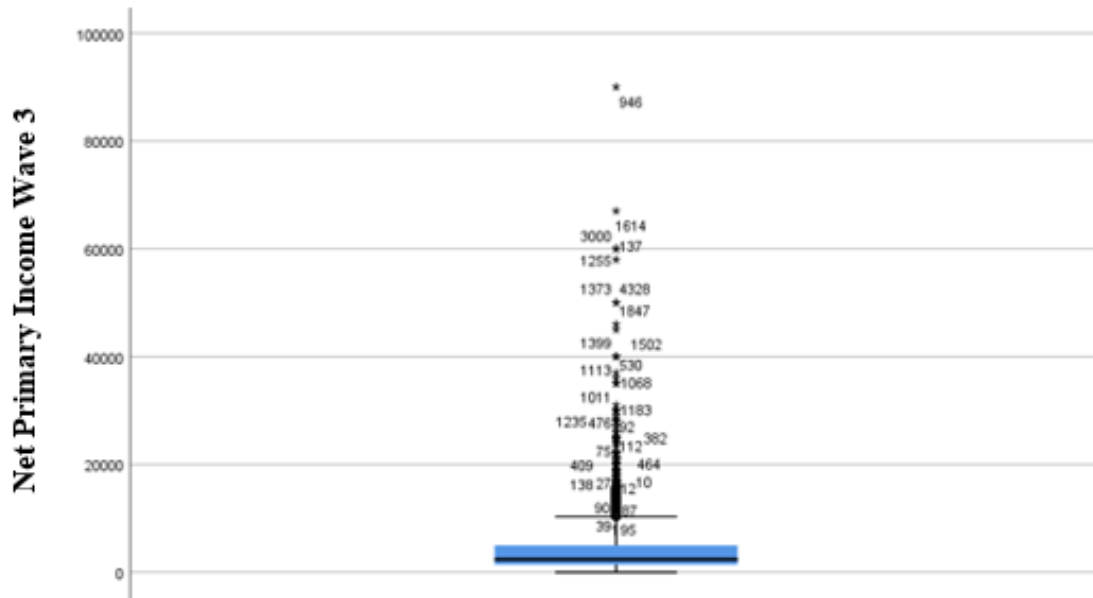


Figure B3: Showing outliers for wave 3 in the original NIDS data.

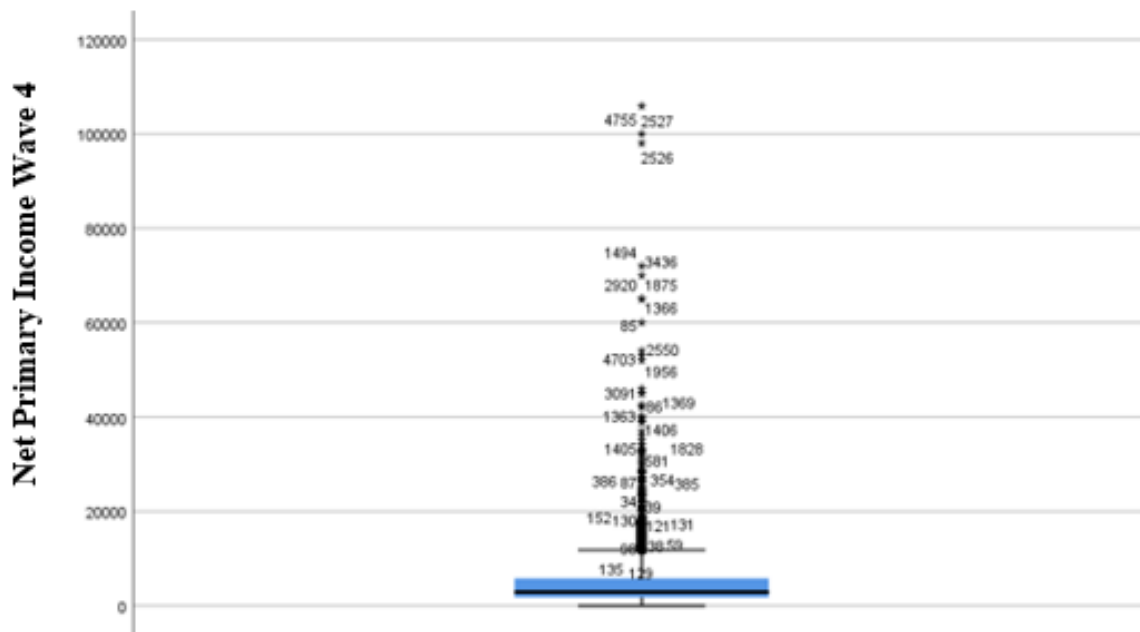


Figure B4: Showing outliers for wave 4 in the original NIDS data

Appendix C

Table C1

Crosstabulation showing the change in income against the change in life satisfaction between wave 1 and 2

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	95 _a	51 _a	146
		Expected Count	95.1	50.9	146.0
		% within Change in Income	65.1%	34.9%	100.0%
		% within Change in LS	26.8%	26.8%	26.8%
		% of Total	17.4%	9.4%	26.8%
		Standardized Residual	.0	.0	
		Increase	Count	260 _a	139 _a
		Expected Count	259.9	139.1	399.0
		% within Change in Income	65.2%	34.8%	100.0%
		% within Change in LS	73.2%	73.2%	73.2%
		% of Total	47.7%	25.5%	73.2%
		Standardized Residual	.0	.0	
Total		Count	355	190	545
		Expected Count	355.0	190.0	545.0
		% within Change in Income	65.1%	34.9%	100.0%
		% within Change in LS	100.0%	100.0%	100.0%
		% of Total	65.1%	34.9%	100.0%

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Table C2

Crosstabulation showing the change in income against the change in life satisfaction between wave 1 and 3

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	67 _a	26 _a	93
		Expected Count	59.2	33.8	93.0
		% within Change in Income	72.0%	28.0%	100.0%
		% within Change in LS	19.3%	13.1%	17.1%
		% of Total	12.3%	4.8%	17.1%
		Standardized Residual	1.0	-1.3	
		Increase	Count	280 _a	172 _a
		Expected Count	287.8	164.2	452.0
		% within Change in Income	61.9%	38.1%	100.0%
		% within Change in LS	80.7%	86.9%	82.9%
		% of Total	51.4%	31.6%	82.9%
		Standardized Residual	-.5	.6	
Total		Count	347	198	545
		Expected Count	347.0	198.0	545.0
		% within Change in Income	63.7%	36.3%	100.0%
		% within Change in LS	100.0%	100.0%	100.0%
		% of Total	63.7%	36.3%	100.0%

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Table C3

Crosstabulation showing the change in income against the change in life satisfaction between wave 1 and 4

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	21 _a	19 _a	40
		Expected Count	22.5	17.5	40.0
		% within Change in Income	52.5%	47.5%	100.0%
		% within Change in LS	6.9%	7.9%	7.3%
		% of Total	3.9%	3.5%	7.3%
		Standardized Residual	-.3	.3	
		Increase	Count	285 _a	220 _a
		Expected Count	283.5	221.5	505.0
		% within Change in Income	56.4%	43.6%	100.0%
		% within Change in LS	93.1%	92.1%	92.7%
		% of Total	52.3%	40.4%	92.7%
		Standardized Residual	.1	-.1	
Total		Count	306	239	545
		Expected Count	306.0	239.0	545.0
		% within Change in Income	56.1%	43.9%	100.0%
		% within Change in LS	100.0%	100.0%	100.0%
		% of Total	56.1%	43.9%	100.0%

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Table C4

Crosstabulation showing the change in income against the change in life satisfaction between wave 2 and 3

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	91 _a	72 _a	163
		Expected Count	94.8	68.2	163.0
		% within Change in Income	55.8%	44.2%	100.0%
		% within Change in LS	28.7%	31.6%	29.9%
		% of Total	16.7%	13.2%	29.9%
		Standardized Residual	-.4	.5	
		Increase	Count	226 _a	156 _a
		Expected Count	222.2	159.8	382.0
		% within Change in Income	59.2%	40.8%	100.0%
		% within Change in LS	71.3%	68.4%	70.1%
		% of Total	41.5%	28.6%	70.1%
		Standardized Residual	.3	-.3	
Total		Count	317	228	545
		Expected Count	317.0	228.0	545.0
		% within Change in Income	58.2%	41.8%	100.0%
		% within Change in LS	100.0%	100.0%	100.0%
		% of Total	58.2%	41.8%	100.0%

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Table C5

Crosstabulation showing the change in income against the change in life satisfaction between wave 2 and 4

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	34 _a	33 _a	67
		Expected Count	34.9	32.1	67.0
		% within Change in Income	50.7%	49.3%	100.0%
		% within Change in LS	12.0%	12.6%	12.3%
		% of Total	6.2%	6.1%	12.3%
		Standardized Residual	-.2	.2	
	Increase	Count	250 _a	228 _a	478
		Expected Count	249.1	228.9	478.0
		% within Change in Income	52.3%	47.7%	100.0%
		% within Change in LS	88.0%	87.4%	87.7%
% of Total		45.9%	41.8%	87.7%	
	Standardized Residual	.1	-.1		
Total	Count	284	261	545	
	Expected Count	284.0	261.0	545.0	
	% within Change in Income	52.1%	47.9%	100.0%	
	% within Change in LS	100.0%	100.0%	100.0%	
	% of Total	52.1%	47.9%	100.0%	

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Table C6

Crosstabulation showing the change in income against the change in life satisfaction between wave 3 and 4

		Change in LS			
		Decrease	Increase	Total	
Change in Income	Decrease	Count	66 _a	56 _a	122
		Expected Count	62.2	59.8	122.0
		% within Change in Income	54.1%	45.9%	100.0%
		% within Change in LS	23.7%	21.0%	22.4%
		% of Total	12.1%	10.3%	22.4%
		Standardized Residual	.5	-.5	
		Increase	Count	212 _a	211 _a
		Expected Count	215.8	207.2	423.0
		% within Change in Income	50.1%	49.9%	100.0%
		% within Change in LS	76.3%	79.0%	77.6%
		% of Total	38.9%	38.7%	77.6%
		Standardized Residual	-.3	.3	
Total		Count	278	267	545
		Expected Count	278.0	267.0	545.0
		% within Change in Income	51.0%	49.0%	100.0%
		% within Change in LS	100.0%	100.0%	100.0%
		% of Total	51.0%	49.0%	100.0%

Each subscript letter denotes a subset of Change in LS categories whose column proportions do not differ significantly from each other at the .05 level.

Appendix D

Table D1

Table showing the skewness and kurtosis results for income in wave 1 and life satisfaction in wave 1

Wave 1 Income Groups		Statistic	Std. Error
Wave 1 Life Satisfaction	Mean	5.81	.043
	Skewness	.014	.046
	Kurtosis	-.436	.093

Table D2

Table showing the skewness and kurtosis results for income groups in wave 2 and life satisfaction in wave 2

Wave 2 Income Groups		Statistic	Std. Error	
Wave 2 Life Satisfaction	1.00	Mean	4.58	.064
		Skewness	.497	.066
		Kurtosis	-.379	.132
	2.00	Mean	5.24	.083
		Skewness	.200	.086
		Kurtosis	-.579	.172
	3.00	Mean	5.95	.074
		Skewness	-.103	.079
		Kurtosis	-.514	.157

Table D3

Table showing the skewness and kurtosis results for income groups in wave 3 and life satisfaction in wave 3

Wave 3 Income Groups		Statistic	Std. Error	
Wave 3 Life Satisfaction	1.00	Mean	4.97	.065
		Skewness	.436	.066
		Kurtosis	-.491	.131
	2.00	Mean	5.29	.067
		Skewness	.262	.068
		Kurtosis	-.666	.136
	3.00	Mean	5.81	.060
		Skewness	.029	.063
		Kurtosis	-.626	.127

Table D4

Table showing the skewness and kurtosis results for income groups in wave 4 and life satisfaction in wave 4

	Wave 4 Income Groups		Statistic	Std. Error
Wave 4 Life Satisfaction	1.00	Mean	5.33	.066
		Skewness	.247	.069
		Kurtosis	-.585	.137
	2.00	Mean	5.56	.051
		Skewness	.254	.054
		Kurtosis	-.625	.108
	3.00	Mean	6.02	.044
		Skewness	-.089	.050
		Kurtosis	-.443	.100

Figure D1

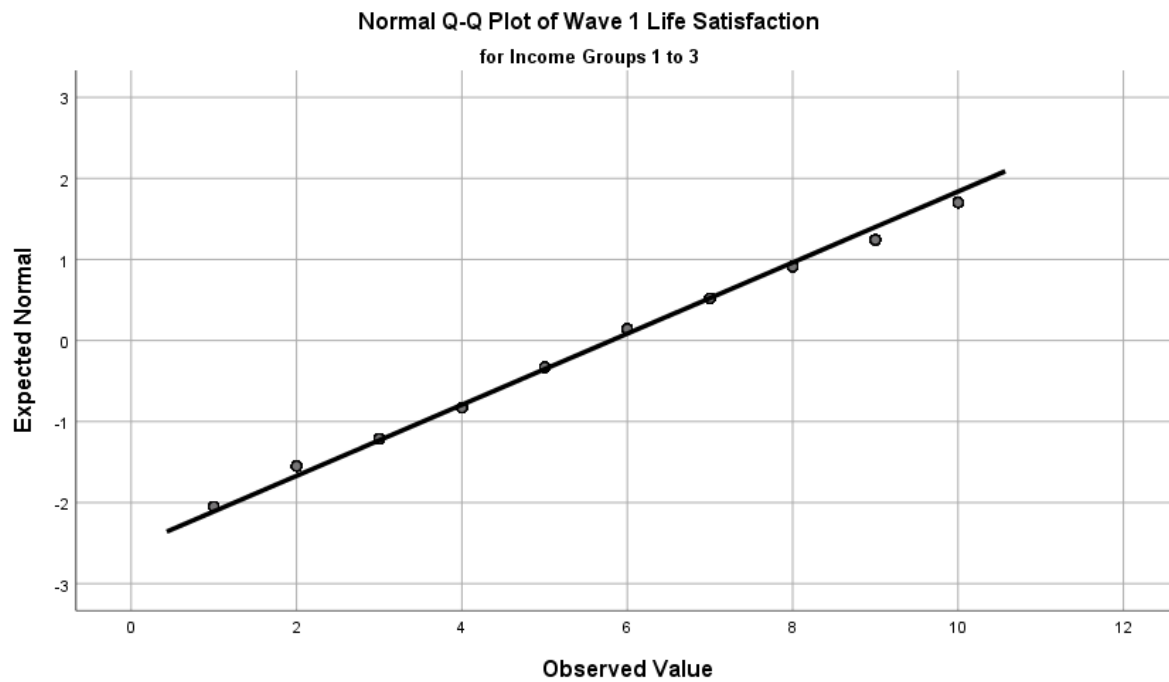


Figure D2(a)

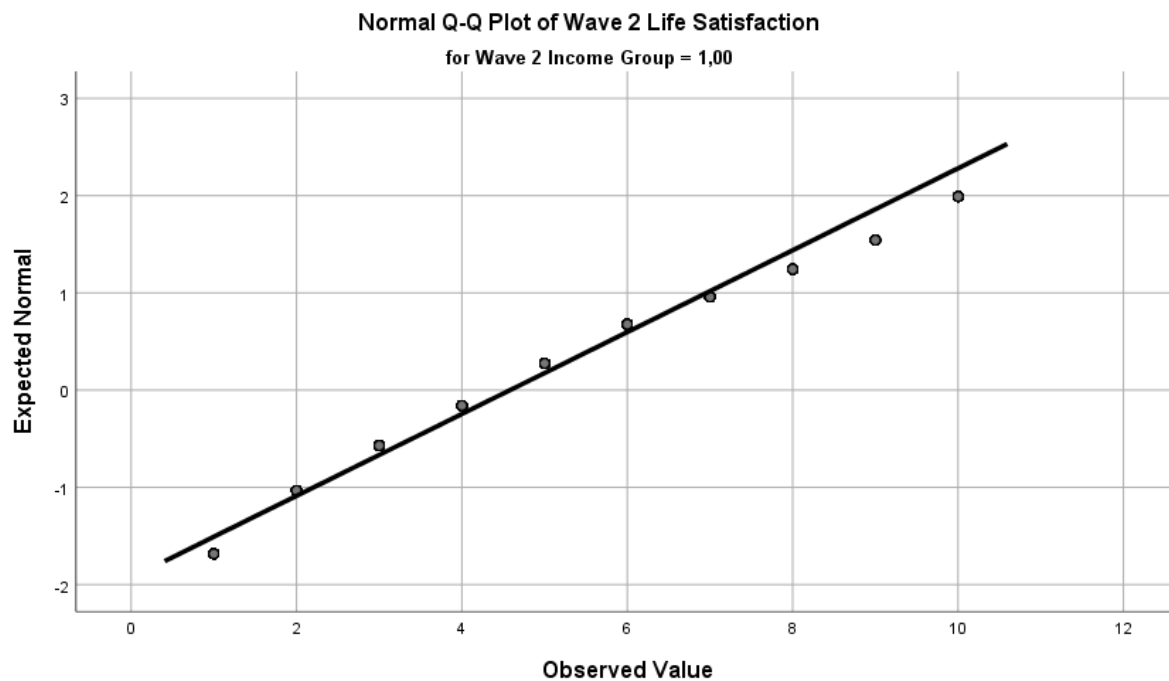


Figure D2(b)

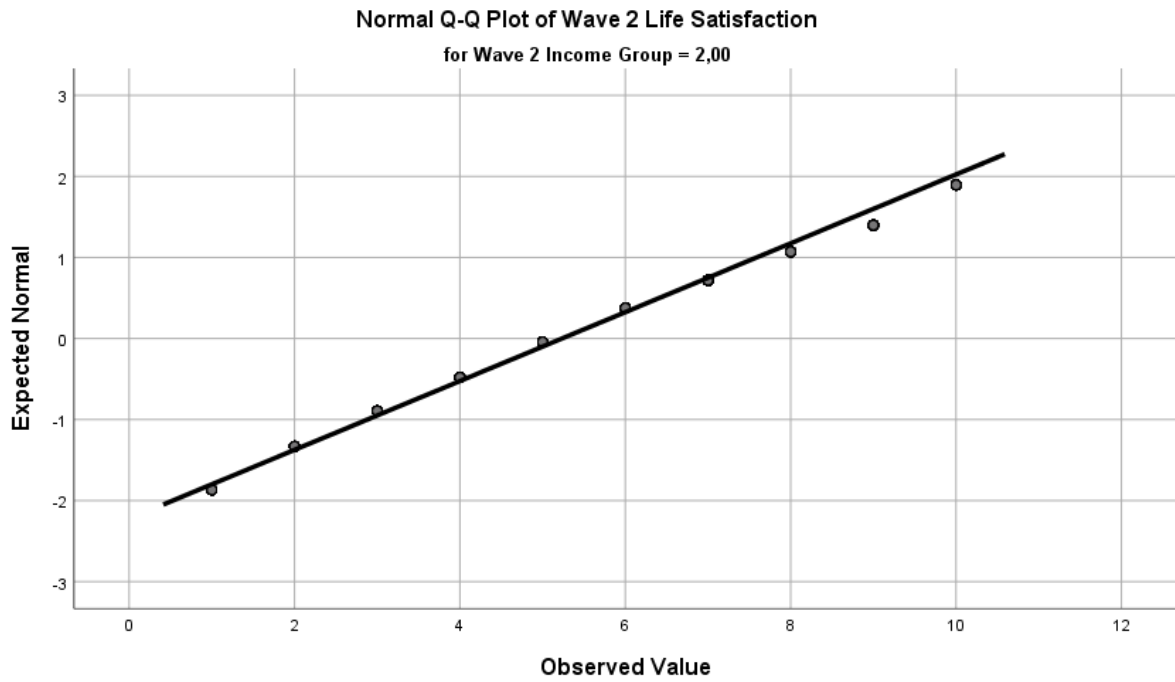


Figure D2(c)

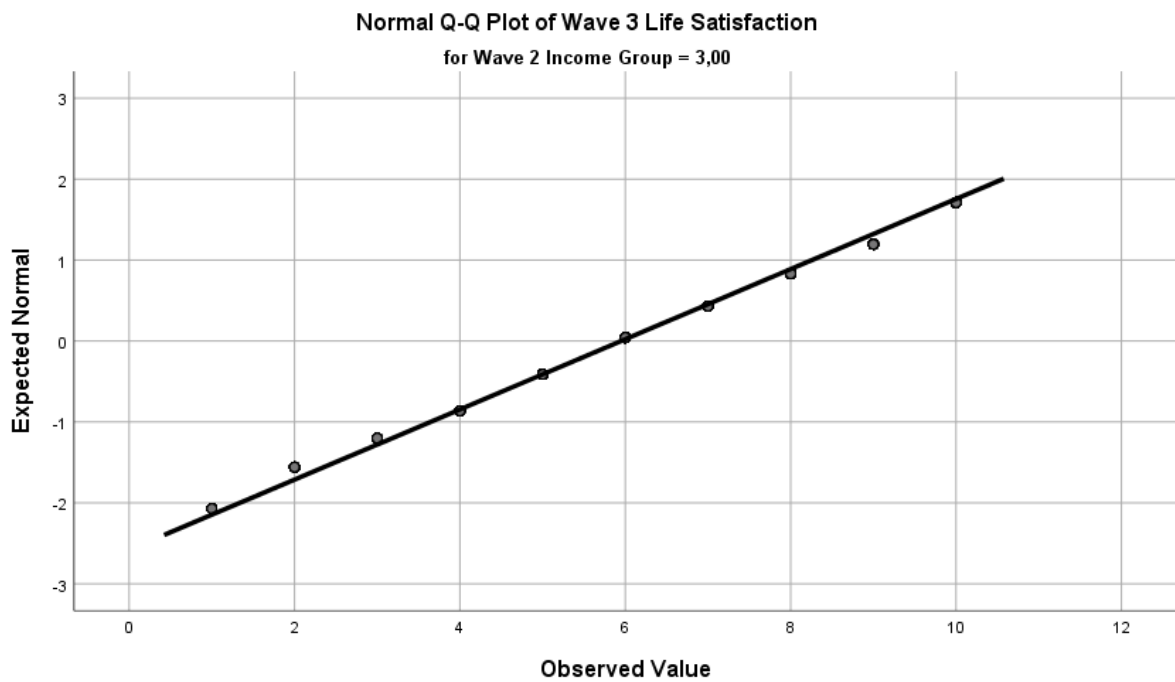


Figure D3(a)

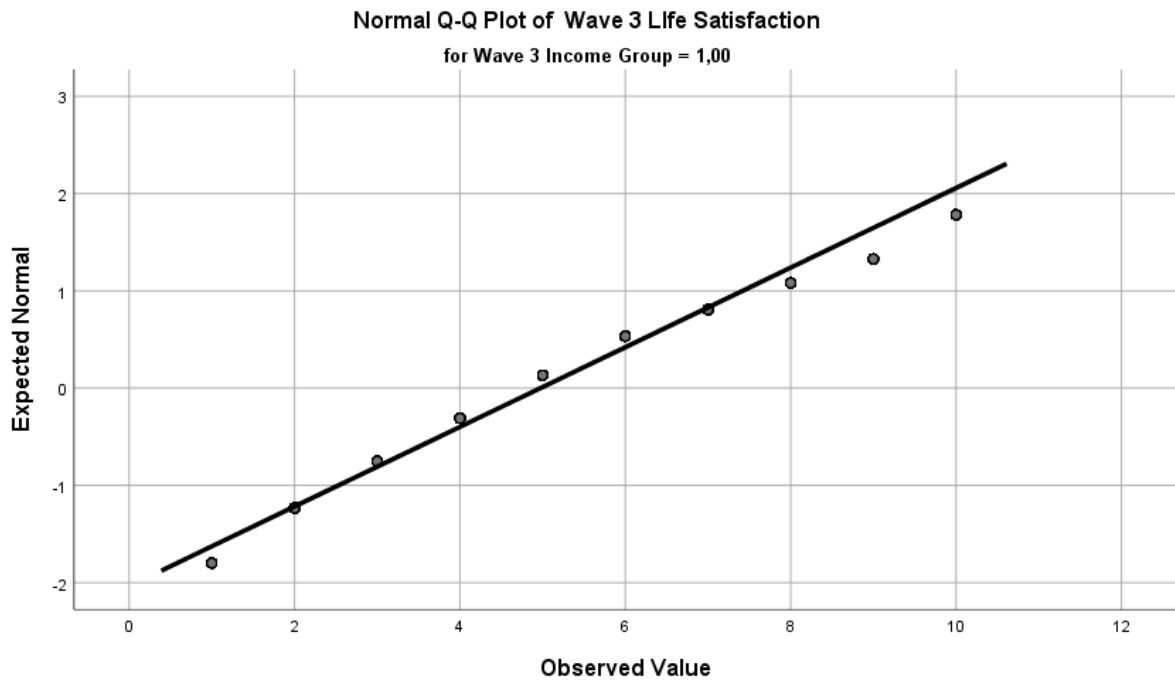


Figure D3(b)

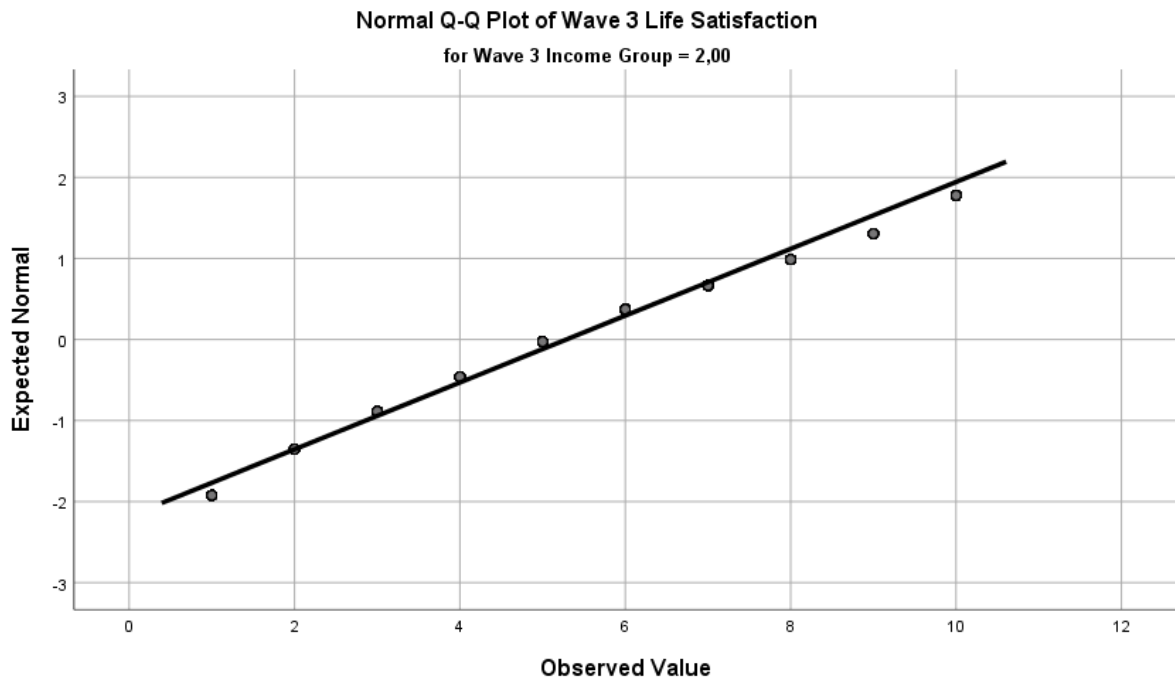


Figure D3(c)

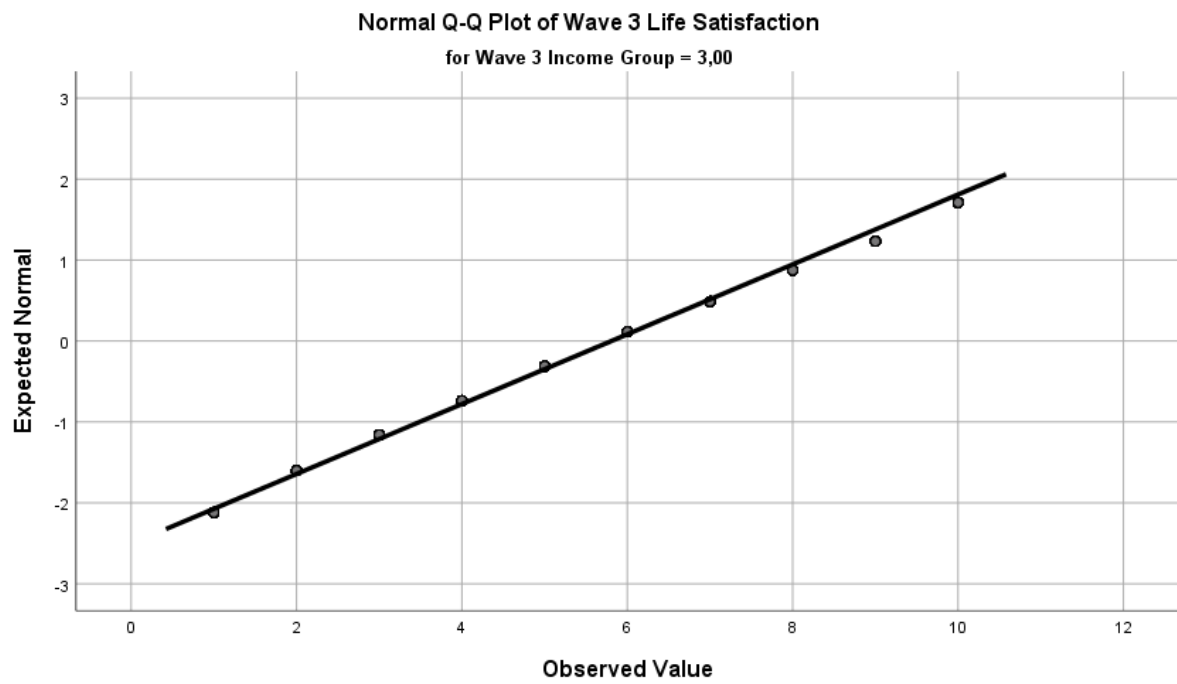


Figure D4(a)

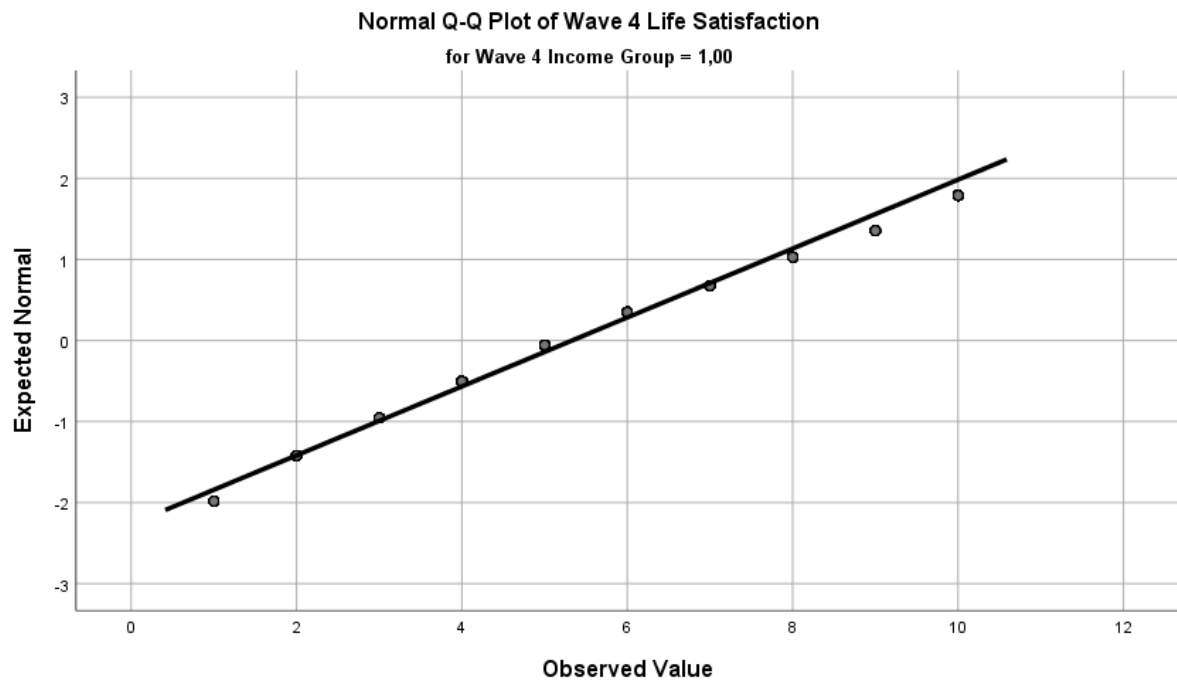


Figure D4(b)

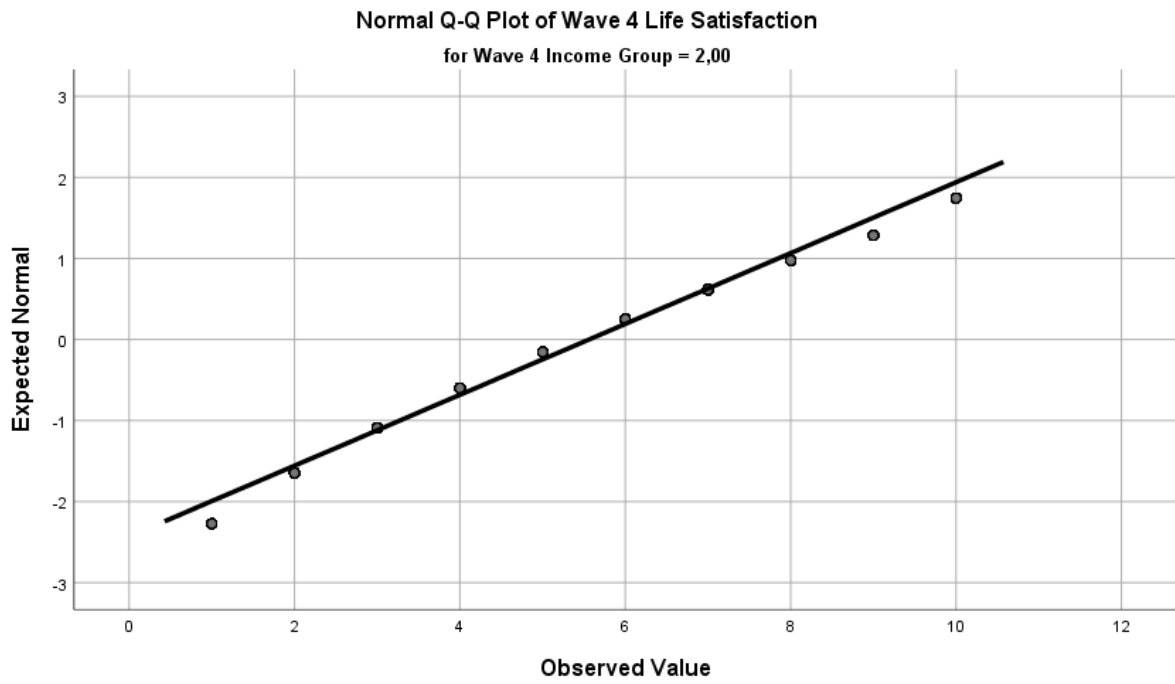


Figure D4(c)

