(UN)HEALTHY LIFESTYLES OF SHEFFIELD'S RESIDENTS: SOCIO-ECONOMIC AND PSYCHOSOCIAL DEPRIVATION

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Health is a right, not a privilege.

Tedros Adhanom Ghebreyesus,

the Director-General of the World Health Organization

CANDIDATE'S DECLARATION

I hereby declare that:

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2. None of the material contained in the thesis has been used in any other submission for an academic award.

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4. The work undertaken towards the thesis has been conducted in accordance with the SHU Principles of Integrity in Research and the SHU Research Ethics Policy.

5. The word count of the thesis is 68,602.

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ABSTRACT

This study investigated the pathway of inequality, linking socio-economic, psychological and lifestyle factors, in the context of the health and wellbeing of the urban population of Sheffield, UK. In order to identify the pathway of inequality, the study adopted a quantitative methodology using structural equation modelling. The research contributes to knowledge by combining Bourdieu's (2010) social theory with the psychological theory of trait self-control (Tangney et al., 2004, Baumeister et al., 2019) and Sen's (2009; 2010) economic theory to identify the pathway of multidimensional and perpetual inequalities in health and healthy lifestyles. The thesis presents structural models of both healthy and unhealthy lifestyles. The proposed healthy lifestyle model demonstrates the intertwined nature of higher socio-economic background, higher levels of trait self-control and healthy lifestyles (i.e. healthy diet, higher levels of physical activity, and smoking abstention). By comparison, the unhealthy lifestyle model demonstrates the interlinkages between lower socio-economic background, lower levels of trait self-control and unhealthy lifestyles (i.e. unhealthy diet, lower levels of physical activity, binge drinking and smoking). The study makes several conceptual contributions in the context of Bourdieu's social theory and Baumeister's psychological theory of trait self-control and willpower. Equally, the findings highlight both general and specific factors of multidimensional and perpetual inequalities in health which have a number of practical implications relating to health-related interventions and policies.

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1. INTRODUCTION

1.1 RESEARCH PROBLEM

Behaviour pursued for the purpose of protecting and maintaining physical and mental health is understood as a *healthy lifestyle* (Pender, Murdaugh & Parsons, 2014; Ping, Cao, Tan, Guo, Dou & Yang, 2018; WHO, 1998). In this regard, regular physical activity, a healthy diet, limited smoking and alcohol consumption have been frequently associated with the prevention of chronic diseases or illnesses linked to an overall healthy lifestyle (Cockerham; 2005; Cockerham, 2014; Marteau, Dieppe, Foy, Kinmonth & Schneiderman, 2006).

Empirical evidence shows that people from a less favourable socio-economic background are less likely to follow a healthy lifestyle with fewer chances of staying in good health (Connolly, Baker & Fellows, 2017; Phelan, Link & Tehranifar, 2010; Wiltshire, Fullagar & Stevinson, 2018). Here, a person's lower levels of economic and cultural capital as proxy measures of one's socio-economic circumstance have been linked to an unhealthy lifestyle (Veenstra & Burnett, 2017; Pinxten & Lievens, 2014). In this respect, the concept of economic capital refers to the financial and monetary stocks, whereas the concept of cultural capital refers to the educational stocks, equipment and dispositions (Bourdieu, 1986). Accordingly, healthy lifestyle interventions through an increase of economic and cultural capital in order to reduce health-related inequalities are part of urban health policies (cf. Abel, 2007; Veenstra & Abel, 2015; Connolly, Baker & Fellows, 2017; Connolly & Jaipaul, 2018).

In contrast to this, the evidence also shows that empowered people who value and choose a healthy lifestyle are the ones autonomously motivated to pursue healthy lifestyle choices. People with higher levels of self-control are more likely to follow a healthy lifestyle in contrast to people with lower levels of self-

control (Briki, 2018; Ferrari, Stevens, Legler & Jason, 2012; Forestier, Sarrazin, Allenet, Gauchet, Heuzé & Chalabaev, 2018; Tangney, Baumeister & Boone, 2004). Here, the concept of self-control is a psycho-behavioural learned regulatory mechanism of delayed conscious reaction instead of an impulsive and immediate response to different types of stimuli which may result in health risk (e.g. eating chocolate when feeling overwhelmed, drinking alcohol when feeling down) (Baumeister & Tierney, 2011; Carlson, Johnson & Jacobs, 2010; Tangney et al., 2004). Previous research established that interventions in a healthy lifestyle are more effective in cases where people's level of dispositional self-control is higher and vice-versa (Cresconi et al., 2011). In line with this reasoning, interventions focused on empowering and strengthening a person's level of self-control by persuading and educating him/her to change an unhealthy lifestyle and pursue healthy practice are part of this intervention paradigm (cf. Rosenbaum, 1993). Health 2020: a European policy framework (WHO, 2013), tackling health issues and health inequalities currently uses a mix of different strategies.

Such a mix of strategies in the context of health inequalities is usually focused on a combination of biomedical, lifestyle, behavioural, environmental, social and economic factors (WHO, 2013), i.e., health resources. Here, biomedical factors refer to one's genetic background, predisposition towards certain diseases, epigenetic and protein-level information, disabilities and family medical history. Lifestyle and behavioural factors include diet, physical activity, smoking, alcohol consumption and motivation, while environmental factors include resilient and supportive communities. Social and economic factors refer to home, work and social life. In the context of psycho-behavioural factors, the concept of self-control is mostly featured in relation to an isolated package of interventions (Baumeister, Wright & Carreon, 2019; Vohs, 2013). Only recently it was suggested that the concept of self-control should be included in such

complex interventions, especially in combination with lifestyle and socio-economic factors (ibid.).

In relation to this, scholars interested in the concept of inequality have suggested that in order to comprehend persisting inequalities, the concept needs to be understood from a multidimensional perspective (Manstead, 2018; Piff, Kraus & Keltner, 2017). Here, material (i.e., external, objective) and psychological (i.e., internal, subjective) resources *together* represent two separate but essentially intertwined dimensions of inequality where material deprivation is often linked to cognitive, non-cognitive and behavioural deprivation and vice-versa (Kraus et al., 2012; Manstead, 2018; Piff, Kraus & Keltner, 2018).

Following these recent discussions on multidimensional inequalities, joining socio-economic, psychological and behavioural perspectives of health and healthy lifestyle could offer additional insights. These could support arguments for joining paradigms of interventionism in health and a healthy lifestyle and contribute to more effective policy design.

Finally, in the context of this research it should be recognised that terms and concepts like 'healthy' and 'unhealthy' have an ideological and moralising discourse associated with them. In this regard, Elias and Scotson (1994) discussed the idea of 'stigmatisation' attached to the discourse among the 'established' and affluent group towards an inferior group of 'outsiders'. Thus, terms like 'healthy' and 'unhealthy', to some extent, reflect the symbolic power relationships between a healthy affluent population and an unhealthy less affluent population (e.g. Burnett & Veenstra, 2017; Veenstra, 2017). In this respect, it should be noted that in the context of this research, the terms 'healthy' and 'unhealthy' are specifically referring to the lifestyle and socio-economic circumstances, whereby medical circumstances and any disabilities

that might allude to the discrimination between people of 'lesser' and of 'better' health are excluded from the discourse.

1.2 RESEARCH GAP

In the context of critical social theories, Bourdieu's approach is useful for studying multidimensional and enduring social inequalities in health and healthy lifestyles (Abel, 2007, 2008; Blue, Shove, Carmona & Kelly, 2016; Cockerham & Hinote, 2009; Øversveen et al., 2017; Pinxten & Lievens, 2014). From Bourdieu's perspective, the external social structures and individual's objective standard of living (i.e., material resources of living like income, education and occupation) can be depicted by the interplay between different types of capital. Here, the notion of capital as an external resource with its own mode of accumulation, distribution and generation of profits is useful for the understanding of persisting inequalities over time. This is because the accumulation or depletion of capital stocks in one generation influences the opportunities and well-being of the next (cf. OECD, 2013; Rifkin, 2001).

In line with Bourdieu's theory (1986; 2010), economic and cultural capital are intertwined, thus creating even greater accumulation of socio-economic advantages, disadvantages and inequalities. Such interplay between both types of capital converts into an intimate psychological scheme of an individual that Bourdieu identifies as habitus. The concept of habitus is understood as a socially defined and structured, intimate disposition of an individual's psyche (cf. Elias & Dunning, 1986) that further generates an unequal and distinctive lifestyle and crucially contributes to perpetual self-reproduction of structural inequalities (Bourdieu, 2010; Fogle & Theiner, 2017).

Typically, a Bourdieusian pathway of inequality is directed from an externally identified higher level of economic and cultural capital, converting into an

internal disposition of sophisticated habitus. Thus, the affluent social class lifestyle is typically identified by eating healthier food, consuming selected alcohol, smoking cigars and more physical activity. Equally, the pathway of inequality is directed from an externally identified lower level of economic and cultural capital, converting into an internal disposition of unsophisticated, simple habitus. Thus, the less affluent social class lifestyle is typically identified by eating unhealthy food, consuming cheap alcohol, smoking cheap cigarettes and less physical activity. In line with this reasoning, previous research established clear causal links between capital, habitus and lifestyle (Burnett & Veenstra, 2017; McGovern & Nazroo, 2015; Oncini & Guetto, 2017 and 2018; Pampel, 2012; Veenstra & Abel, 2015).

However, in previous studies operationalising Bourdieu's' approach to depict the causal relations of health inequalities, the concept of habitus is either abstract or absent (Veenstra & Burnett, 2014). Habitus is rarely an independent tool for investigation, despite being presented as an autonomous concept (cf. Wacquant, 2014). Instead it 'expresses itself' through aesthetic preferences, decision-making processes, health-related practices and lifestyle choices (Pinxten & Lievens, 2014, p:1096) or 'translates itself' into generated practices (Veenstra & Burnett, 2014: p: 193), mostly limited to taste (Burnett & Veenstra, 2017). Often, capitals represent habitual dispositions, aforementioned expressions and translations, generally pertinent to habitus (Oncini & Guetto, 2017; Pinxten & Lievens, 2014). Such a ‘theoretical pudding’ therefore contributes to the ambiguity in the anatomy of habitus in general (Wacquant, 2016, p: 70), but particularly in the context of health and healthy lifestyle.

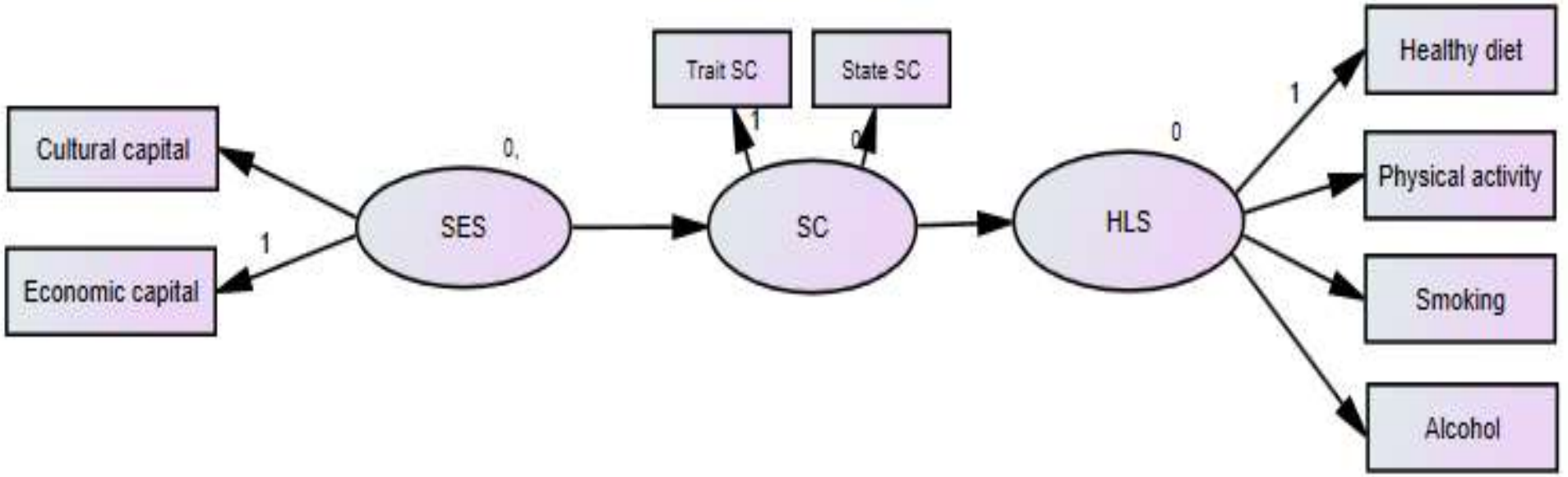
This study argues that psychological theory, particularly Tangney et al.'s (2004) self-control concept, can complement the idea of habitus in the context of health and healthy lifestyle. Previous literature linked lower levels of self-control to lack of will-power and psychosocial deprivation, resulting in an unhealthy

lifestyle. Equally, higher levels of self-control have been linked to psychosocial will-power and healthy lifestyle (Briki, 2018; Cresconi et al., 2011; Forestier et al., 2018; Luehrig, Jones, Tahaney & Palfay, 2018). Therefore, self-control has been previously recognised as a psychosocial classifier, differentiating people in accordance with their levels of self-control (Tangney et al., 2004; Vohs, 2013). In line with this reasoning, social deprivation and daily struggle contributes to impaired self-control because it drains people's mental capacity and reserve, resulting in lower self-control, lack of will-power and their overall psychological deprivation (Baumeister, Wright & Carreon, 2019; Vohs, 2013). However, within existing research on self-control, there is a lack of understanding of how it accrues in the natural socio-economic context, because hitherto the theory has been predominantly tested in controlled laboratory environments or on a sample of students. Thus, testing the theory within a real socio-economic environment e.g. the general urban population would expand the theory of trait self-control (cf. Baumeister, Tice & Vohs, 2018; Baumeister, Wright & Carreon, 2019; Vohs, 2013).

1.3 CURRENT RESEARCH

The basic theoretical framework of this research (Figure 1) is guided by the question of how a person's socio-economic conditions, expressed in the level and structure of economic and cultural capital, are transformed (i.e., internalized) into the habitual psychological disposition of self-control and mutually impact his/her health-protective behaviour and healthy lifestyle. More specifically, this research contributes to the expanding body of research in urban public health policies of interventionism. It contributes to understanding of persisting and enduring inequalities by examining the causal relations among socio-economic, psychological and behavioural factors constituting a person's healthy or unhealthy lifestyle.

FIGURE 1.1: GENERAL PATHWAY OF INEQUALITIES IN HEALTH AND HEALTHY LIFESTYLE



(SES = socio-economic standard of living depicted by the level and structure of economic and cultural capital; SC = internal psychological disposition of self-control; HLS = healthy lifestyle, i.e., healthy diet, physical activity, smoking and alcohol consumption)

The research is located in Sheffield's socially diverse urban community. There are two main reasons for this. First, there is clear evidence of multidimensional inequality in the city. While it is one of the least deprived major cities in England (Making Sheffield Fairer, 2017), there are deeply rooted and persisting divisions between its affluent western and deprived eastern neighbourhoods. Second, the city has a long-established commitment to a healthy lifestyle policy and continues to promote and monitor healthy lifestyles among its residents. However, recent city council public health reports (A Matter of Life and Healthy Lifestyle, 2016; Health and Wealth Report, 2018) show that health inequalities are not improving, and that they are perpetual and multidimensional. As such, this study represents an important step in 1) understanding the key issues between structural and psychological deprivation and their influence on healthy lifestyle, and 2) informing future interventions to improve the health of Sheffield's residents.

Study aim and objectives

Aim

The aim of the study is to contribute to an understanding of how socio-economic factors (i.e., level of economic and cultural capital) and psychological factors (i.e., level of self-control) collectively influence health-related inequalities, forming the pathway of perpetual multidimensional inequality.

Objectives

There are three specific objectives.

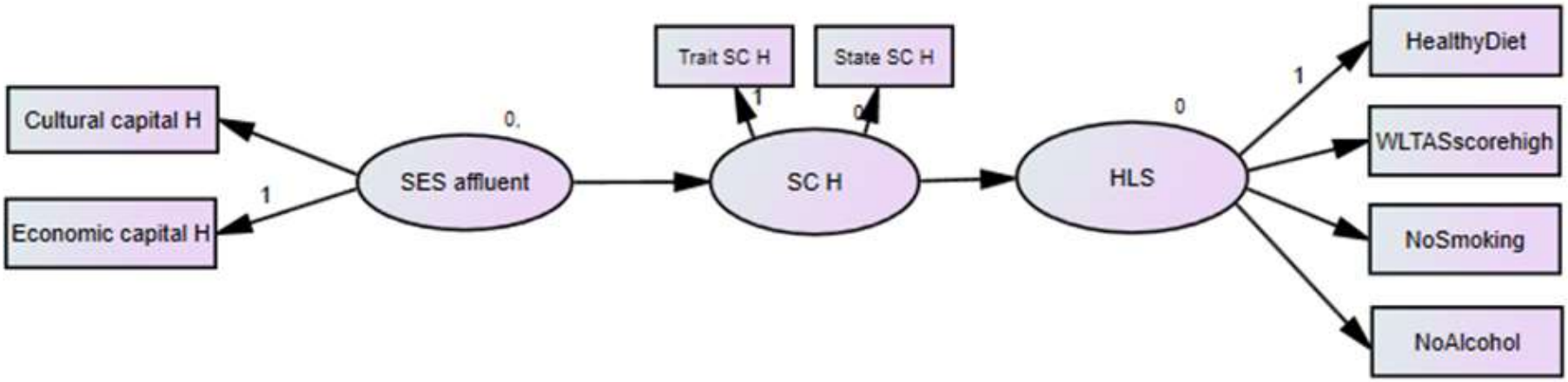
1. To examine the relationship between socio-economic and psychological factors and their individual and combined impacts on lifestyles and health in the urban environment of Sheffield.

2. To develop and empirically evaluate structural models of healthy and unhealthy lifestyle linking socio-economic and psychological inequalities with residents' lifestyles, health and wellbeing.

3. To make theoretical and methodological contributions and strategic recommendations for healthy lifestyle interventions based on the research findings.

Proposed theoretical frameworks of healthy and unhealthy lifestyle and hypotheses

FIGURE 1.2: PROPOSED RESEARCH MODEL OF HEALTHY LIFESTYLE



(SES affluent = higher socio-economic standard of living; H = high level of capital; SC H = high level of self-control; HLS = healthy lifestyle, i.e., healthy diet, high physical activity[1], no smoking and no alcohol consumption)

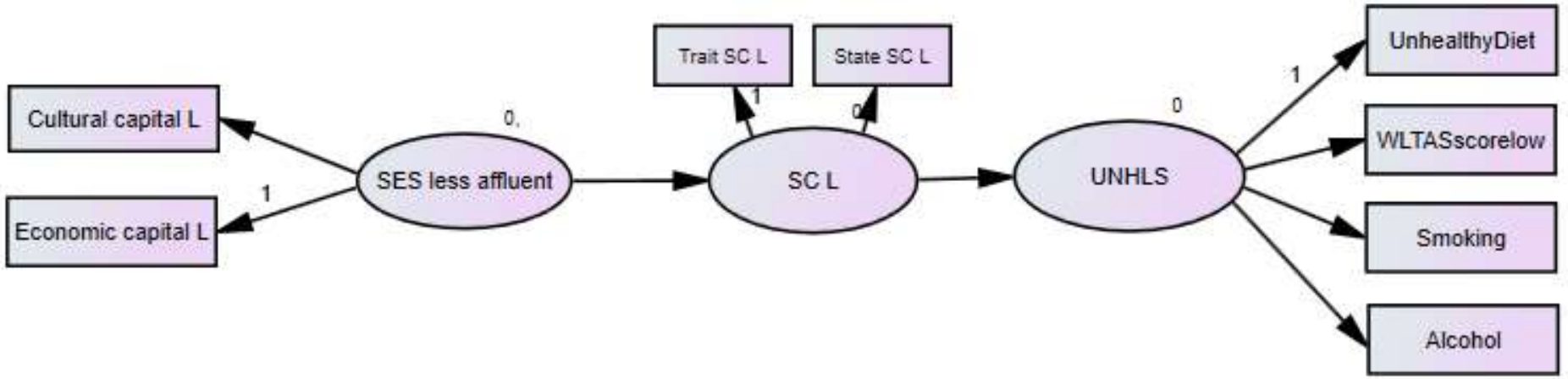
[1] WLTAS is an abbreviation of weekly leisure activity score, used by Godin (2011). Godin (2011) differentiates between vigorous and moderate levels of activity. The International Physical Activity Questionnaire, reflecting Godin's levels of weekly phisycal activity, provides a straightforward scale of the level of physical activity and the final score of one's physical activity (i.e., WLTAS score - for a detailed measure of the score see Table 2.5). The high WLTAS score includes vigorous levels of activity.

Based on the proposed conceptual framework, the following hypotheses were tested:

H_1: High economic capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

H_2: High cultural capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

FIGURE 1.3: PROPOSED RESEARCH MODEL OF UNHEALTHY LIFESTYLE



(SES less affluent = lower socio-economic standard of living; L = low level of capital; SC L = low level of self-control; UNHLS = unhealthy lifestyle, i.e., unhealthy diet, low physical activity[2], smoking and alcohol consumption)

[2] The low WLTAS score includes cases with no physical activity.

Based on the framework of unhealthy lifestyle, the following hypotheses were tested:

H_3: Low economic capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

H_4: Low cultural capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

1.4 ONTOLOGICAL, EPISTEMOLOGICAL AND METHODOLOGICAL POSITION

The ontological argument of the present work is founded on three main assumptions:

1) The assumption that inequalities in health are essentially a structural problem and, as such, included in the socio-political agenda of interventionism (WTO, 2013).

2) The assumption of the intertwined nature and causal regularities between habitat (i.e., a person's socioeconomic environment) and habitus of self-control (i.e., a person's internal matrix of thought, emotion, impulses and performance regulation).

3) The assumption that the causal association between habitat and habitus influences the direction i.e. pathway of inequality, starting from a person's socio-economic background, converting into his/her level of control over the outcomes of his/her life, that further, influences the adoption of a healthy lifestyle and health maintenance.

Following these ontological premises, the epistemological stance of this research is based on the link between the traditional internal-external juxtapositions, structure-agency dichotomies and the traditional separation of academic disciplines (Dewey, 1922, 1929; Pappas, 2017). Here, an attempt to unify hypothetic-deductive causal logic and the structure of economic, social, behavioural and psychological science offers a framework to 'go beyond' such traditional abstract divisions in order to achieve the pragmatistic purpose of the research (cf. Dewey, 2018; Morgan, 2014, p: 1046). This need for action, as in the context of interventionism is the *epistemological purpose* of the present investigation, assuring progress and evolution of knowledge (cf. Dewey, 1929; Morgan, 2014). The idea of purposefully joining separate, condensed and distinctive species of thought into one logically and pragmatically conceivable new genus, Dewey calls tertium quid (i.e., third way, middle course) (Lovejoy, 1922). Dewey (op.cit.) suggests that in cases where neither one nor the other theory is bringing new knowledge and views, the third way 'tertium quid' should be adopted in order to purposefully contribute to knowledge and develop it accordingly.

This pragmatic ontological and epistemological need for action and realistic attempt to unify hypothetic-deductive causal logic and the structure of social, behavioural and psychological science therefore finally defines and determines the methodology of the present work. In order to identify the causal pathway of inequality, this present inquiry is following the assumption about explaining the general causal regularities behind perpetual inequalities in health and therefore applies a quantitative approach which allows the causal determination of the model (i.e., pathway) of perpetual structural inequalities in health and healthy lifestyles of an urban population.

1.5 CONTRIBUTIONS OF THE RESEARCH

To the author's knowledge at the time of writing, this is the first study to make the following theoretical, methodological and practical contributions.

Theoretical contributions:

1) The first study to combine Bourdieu's social theory of inequality with Baumeister's self-control psychological theory of individual differences in order to identify the perpetual pathway of inequality in health and healthy lifestyles. As such, this study combines two ontologically different paradigms (i.e., social and psychological theory) to provide a multidisciplinarity perspective on inequality.

2) The first study to complement Bourdieu's concept of habitus with the idea of Baumeister's self-control by identifying three distinctive faculties of habitus, namely, non-cognitive faculties (i.e. impulsivity), cognitive faculties (i.e. restraint) and motivational faculties (i.e. performance) of habitus that are collectively contributing to perpetual inequalities in health and healthy lifestyle. In this way, Bourdieu's vaguely presented idea of socially learned habitus has been explored and complemented with self-control theory in order to investigate the anatomy of habitus in the context of health and healthy lifestyle.

Methodological contributions:

1) The first study to identify performance as the third factor underpinning Tangney et al.'s (2004) trait self-control scale.
   This study's contribution to the measurement instrument lies also in the lower and higher levels of trait self-control linked to unhealthy or

healthy lifestyles, respectively. Previous studies have not specifically operationalised low and high levels of trait self-control, even though they have theoretically and empirically discussed two distinctive levels of self-control in relation to healthy and unhealthy lifestyles.

2) The first study adopting a Bourdieusian framework of intertwined external and internal factors with lifestyle, applying SEM.

3) One of the first studies identifying the distinctive nature of economic capital directly contributing to the perpetuation of socio-economic inequalities.

4) One of the first studies to examine the concept of trait self-control in its natural urban environment, outside the laboratory.

Practical contribution:

1) The study follows the Health 2020: a European policy framework (WHO, 2013) requirements for implementing a mix of different strategies when tackling health issues and health inequalities (cf. Øversveen et al., 2017). As such, the study demonstrates the potential for designing more effective, interdisciplinary interventions in the context of health and healthy lifestyles.

2) The study indicates that in order to be effective, interventions needs to consider Marmot's (2010, 2015, 2020) idea of proportionate universalism, where, based on the economic factors, intervention is designed in order to strengthen individuals' different levels of self-control.

3) The study indicates that interventions in healthy lifestyle should link healthy diet, physical activity and smoking cessation. However, interventions in lowering alcohol input should be individually designed. Here, the results confirm the findings from some previous research, indicating that alcohol consumption has distinctive patterns of economic and cultural factors, different than physical activity, smoking and diet.

1.6 THESIS STRUCTURE

The thesis consists of six chapters, organised in a conventional order as follows (see Figure 1.4).

Chapter One (Introduction): Chapter One presents the research problem, general theories that have been adopted, the aims and objectives of the research and its theoretical, methodological and practical contributions.

Chapter Two (Theoretical Background): Chapter Two presents the theoretical background of the research problem with particular focus on three intertwined theories, namely Marmot's theory (2010, 2015) of perpetual pathway of inequalities in health and healthy lifestyle, Bourdieu's social theory (1986; 1990; 2010) of capital, habitus and practice and Baumeister's (2004) psychological theory of self-control and willpower. The final part of the chapter presents the proposed theoretical framework of the research, combining the three intertwined theories.

Chapter Three (Research Methodology): Chapter Three presents the adopted philosophical stance, methodology and method of the study. Following the main aim of the study to identify the pathway of inequality in order to present more complex and effective interventions, a pragmatic philosophical stance has

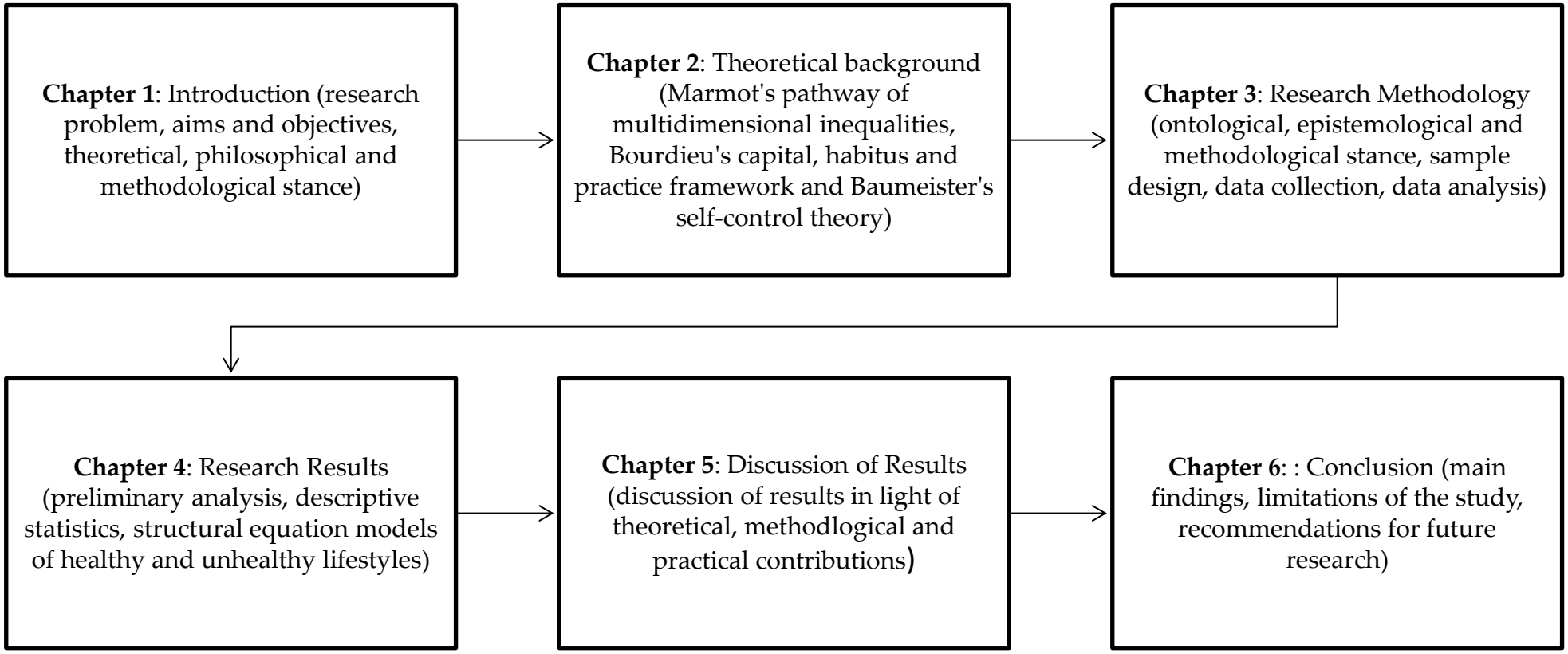
been adopted. The latter guided the rigorous study design and quantitative method.

Chapter Four (Research Results): Chapter Four presents the results of the preliminary analysis, descriptive statistics and multivariate analysis. The identified models of healthy and unhealthy lifestyle are presented.

Chapter Five (Discussion of Findings): In Chapter Five the main findings of the study are discussed considering its theoretical, methodological and practical contributions. The material resources of inequality and individuals' socio-economic backgrounds are discussed in light of Bourdieu's theoretical framework whereby economic and cultural capital are presented as environmental factors of individuals' socially defined psyche and habitus. Further to that, Baumeister's self-control theory only recently first tested in a 'real' social environment outside laboratory, has been discussed from the perspective of inequality theories relevant for health and healthy lifestyles. At this point, the methodological contributions are discussed. Further to that, the practical contributions of the research, impacting the complex and more effective design of interventions in health and healthy lifestyles are also discussed.

Chapter Six (Conclusion): Finally, in Chapter Six the conclusion of the thesis the main contributions of the research are highlighted and discussed in light of recommendations for future research.

FIGURE 1.4: THESIS STRUCTURE



2. THEORETICAL BACKGROUND

2.1 INTRODUCTION

The chapter outlines the key theories that have been used to identify the pathway of inequality in health and healthy lifestyle. These are Marmot's theory of multidimensional inequalities in health, Bourdieu's social theory and Baumeister's self-control theory.

Firstly, the concept of multidimensional inequality is presented as an overarching concept, causally linking individuals' socio-economic, psychological and behavioural components. The concept of multidimensional inequality is linked to Marmot's health-to-wealth pathway of inequality (Marmot, 2004; 2015; Marmot et al., 2010), a prominent theory of inequality in health which connects the socio-economic environment with the internal perception of control and health-related behaviours.

Secondly, material resources of inequality are examined through the lens of Bourdieu's approach. The level and structure of economic and cultural capital represent the relevant set of material resources of living. Moreover, this set of external factors converts into the person's internal disposition that Bourdieu presents as habitus. The concept of habitus is discussed through the lens of one's self-control.

Thirdly, the psychological concept of self-control is presented as one's internal stable disposition representing a general repertoire of internal resourcefulness and ability to regulate thoughts, emotions, impulses, performance and habits (Tangney et al., 2004). It is argued that this appropriately complements the idea of Bourdieu's vaguely defined concept of habitus (cf. Veenstra & Burnett, 2014) and general pathway of inequalities in health and healthy lifestyle (cf. Marmot,

2004; 2015; Marmot et al., 2010). Tangney et al.'s (2004) theory of self-control remains widely untested in an actual socioeconomic environment and urban setting (Baumeister, Tice & Vohs, 2018; Baumeister, Wright & Carreon, 2019). To address this gap in knowledge, the conceptual framework therefore combines both theories.

2.2 INEQUALITIES IN RESIDENTS' HEALTH

2.2.1 THE CONCEPT OF MULTIDIMENSIONAL INEQUALITY

Generally, equality is understood as the *"state of being equal, especially in status, rights, and opportunities"* (adapted from Hornby, 1995; cf. UN, 2015:1). In line with Abbott (2016), social equality is assumed to be an outcome where coefficients of independent variables like material and psychological indicators are necessarily equal to zero. Social equality therefore means, that resources and opportunities in one's living environment are exactly equally available and accessible to everyone (Sen, 1999 and 2010). In contrast, inequality is understood as an outcome where coefficients of the same variables are different to zero and have a positive value on a continuum to infinity.

Advances in theory of equality differentiate between material i.e., external, objective and cognitive i.e., internal, subjective resources of equality. Here, material resources relate to objective standard of living and material comfort in everyday life (Bourdieu, 2010; Kraus, Piff, Mendoza-Denton, Rheinschmidt & Keltner, 2012; Sen, 2010). Subjective resources relate to one's psychological and behavioural performance in everyday life (Bourdieu, 2010; Kraus et al., 2012; Sen, 2010).

The idea of multidimensional inequality can be traced back to Marx's idea of material labour-focused perspective on well-being (Mirowsky & Ross, 2012).

Marx's theory on inequality treats economic resources, based on capital and accessibility to the material means as the base of all unequal relations in society, including cognitive and behavioural relations (Smith, 2010). In general, capital for Marx is the time-accumulated material capacity to produce and reproduce social profits i.e., unequal social relations and economic profits *ad infinitum* (Luxemburg, 2003; Marx, 2010). Therefore, capital is the external source and representation of material inequality. Because capital is accumulated particularly within bourgeoisie (i.e., affluent social class) this affluent class internalises, on a sub-conscious level, the perception of powerfulness, mastery and self-orientation in life in general. Marx argues that such internal psychological perspectives on life are reflected within the working process. As such, the bourgeoisie *is controlling* the working process, therefore, they exercise personal independence and autonomy, i.e., an ability to self-direct, self-realize and self-regulate their personal life (Elster, 1985; Wood, 2004). Similarly, the working class (i.e., less affluent, deprived social class) internalise the perception of powerlessness, purposelessness and disorientation. As such, the working class within the working process *is being controlled* and therefore is generally unable to exercise the same autonomy also in their private lives. Accordingly, the process of social and cognitive *alienation* (i.e., detachment and estrangement) of the working class, for Marx, is a result of the absence of the worker's self-realization, self-regulation and autonomy within the working process (Elster, 1985; Marx, 2010; Wood, 2004). Such a *deterministic* perspective on a person and his/her social class is rooted in Marx critical analysis of capitalism, class conflict and inequality, where capital and material inequality is the true cause of perpetual socio-economic inequality (Elster, 1985; Kraus at al., 2012; Wood, 2004).

Over the last few decades, the perspective on social inequality has been extended from a typical capital-focused understanding of a person's being and doing to one which is more complex, flexible and less deterministic by nature

(Musto, 2013). For example, Amartya Sen expanded Marx's theory and proposed an ontological model of multidimensional inequality linking objective and subjective dimensions more contextually, focused on a person's set of externally and internally available resources (Martins, 2012, 2014). According to Sen, relative to a set of available resources and pertinent opportunities i.e., capabilities - means, people convert externally available resources into valuable internal beings and doings i.e., functionings - ends. Thus, the transformation process is directed from external resources, converting into an internal set of capabilities that further impact individuals' functioning (see Figure 2.1).

Here, capabilities are understood as opportunities and freedoms to achieve well-being, whereby functionings are achieved: 'beings and doings'. Understanding of Sen's capability approach, the concepts of capabilities and functionings and the proces of conversion from one to another can be explained with the analogy of a bike and cycling that he introduced himself (Sen, 1984: 334). Generally, a bike is a resource that provides the means for cycling. A bike's characteristics give a person (i.e. cyclist) the *capability* of transport and to ride around. Here, one's ability to ride around means a capability of utilising a resource, whereby actual riding around is an achieved 'doing' – functioning. However, such *capability is conditional* i.e. depends on several conditions. Firstly, a person has to be physically able to ride. An individual's physiology (e.g. age or disability) can be a condition determining one's ability to cycle (Sen, 1999: 70-71). Secondly, a person's socio-economic conditions (i.e. income and skill) further determine their *capability* of transport. Income enables a person to purchase a bike, then they have to learn how to ride it and cycle. One without the other has less value than having both joined together. Posessing a bike together with the capability of cycling further gives a person the *freedom* to *utilize* i.e. appropriate the pleasures and benefits of cycling and thus, enhance their well-being. However, if socio-economic circumstances (e.g. leisure time) allow the cyclist to attach several other characterstics to the bike and thus,

expand his capabilities and functioning, e.g. *exercise*, the capability of *cycling* would enable the cyclist to appropriate and identify other benefits of cycling. The latter might be linked to *physical and psychological health* and the individual's well-being (better physical condition, stress-relief etc.). If the additional characteristic of *socialising* is attached to the bike, the latter enables other benefits e.g *family bonding* and *sharing the same interest with friends* (cycling clubs, cycling tours, vacations). Thus, functionings are also an expression of what a person values, prefers and has a freedom and means to pursue.

Hence, available resources provide actual (social, economic and political) opportunities that give people the *freedom* to pursue their chosen lifestyle, which enables social development (Sen, 1999 and 2000; UN, 2015). Sen defines this as *decisional autonomy* (Sen, 2010). Thus, for Sen, the objective *and* subjective availability of means in the socioeconomic environment are essential in order to identify the level of equality and standard of living in society (Sen, 1999 and 2010). For Sen, in society with a higher standard of living, means are objectively available because they are within people's physical reach (e.g. education available for everyone) which further produces a subjective perspective of resource availability i.e., subjective reach and higher levels of equality in society.

FIGURE 2.1: SEN'S TRANSFORMATION PROCESS FROM RESOURCES TO FUNCTIONINGS

Source: adapted from Sen (1999, 2010)

In line with Sen (2009, 2010), equality and/or inequality is necessarily multidimensional, encompassing its material, objective form and subjective, cognitive form. Material resources are an objective representation of one's

standard of living, linked to one's subjective ability or disability to pursue opportunities in life, reflecting lifestyle. Cognitive resources are a subjective perception of one's autonomous performance in everyday life, encompassing performance and perception of decisional autonomy (ibid.). Such a multidimensional perspective of inequality is useful in order to comprehend persisting inequalities and to design more effective interventions across different dimensions of life (Manstead, 2018; Piff, Kraus & Keltner, 2018). Here, people from more affluent upper strata generally enjoy more resource- and opportunity-rich environments, whereas people from less affluent lower strata face more resource- and opportunity-impoverished environments, enabling persisting inequalities (Kraus, Piff & Keltner, 2009). More affluent upper strata are generally healthier, more educated, have stable income and housing situation and vice-versa (cf. Marmot, 2004). It can be argued that unhealthy forms of behaviour do not occur in isolation, 'they occur as part of the system' of behaviour, linked to one's lifestyle (Michie, Atkins & West, 2014: 35). Hence, inequality is necessarily a multidimensional issue, encompassing material and cognitive resources on the one side and a particular lifestyle on the other. Consequentially, different dimensions of lifestyle inequalities (i.e., political inequality, educational opportunity, gender inequality, digital inequality), including health-related inequalities and related differences in life expectancy, are essentially derived from economic inequality (Bourdieu, 2010; Sen, 2010; WHO, 2011, 2013).

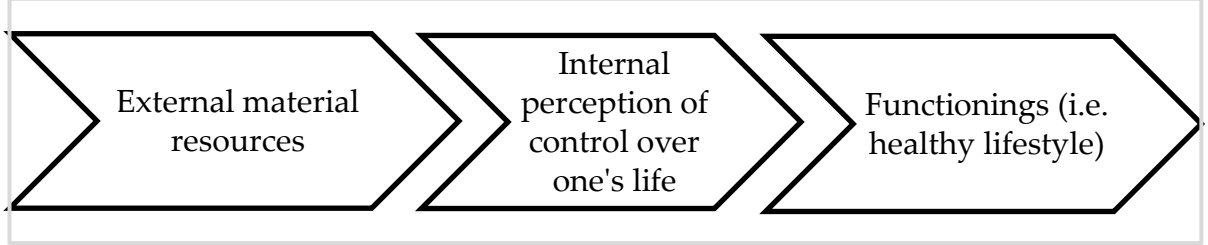
2.2.2 MARMOT'S MULTIDIMENSIONAL WEALTH-TO-HEALTH PATHWAY

The prominent theory of a multidimensional pathway of inequalities, in the context of health, has been developed by Marmot (2004, 2015). Marmot, himself a medical practitioner, argued that there is a causal association that influences the direction of the causality of inequality. The latter starts from a person's socio-economic background and converts into his/her perception of control over his life and the level of decisional autonomy over the outcomes of his/her life. That further causally influences the implementation of a healthy lifestyle and health maintenance. As such people who live in a poorer socio-economic environment full of daily stress and disorder will be more likely to internalise the disposition of less control. Consequentially, they will be more likely to adopt an unhealthy lifestyle which will increase the potential for the development of lifestyle-related illnesses such as diabetes, high blood pressure and psychological disorders such as anxiety. Conversely, people who live in a more affluent socio-economic environment where they are not constantly exposed to stress and disorder will be more likely to internalise the disposition of more control. Consequently, they will be more likely to control their diet, level of exercise and other lifestyle-related habits and adopt a healthy lifestyle in general which will decrease the potential for the development of lifestyle-related illnesses. Thus, Marmot's health-related persisting inequalities are multidimensional, causally linking the external socio-economic status and conditions of living with internal psychosocial dispositions that further impacts lifestyle. This intertwining of the socio-economic environment and a person's perception of control over their life and their impact on health is defined by Marmot as a wealth-to-health pathway (Marmot, 2004, 2015). The pathway of inequality in health is directed from the person's socio-economic background towards health, where a lower socio-economic position results in an unhealthy lifestyle and finally, in worse health (Marmot et al., 2010). By contrast, higher

socio-economic position results in a healthy lifestyle and finally, in better health (ibid.). Thus, for Marmot there is a *social gradient* in health, where poorer health follows lower socioeconomic status and better health follows higher socioeconomic status (cf. Carpiano, Link & Phelan, 2008; Pinxten & Lievens, 2014). Change (for better and for worse) in the persons' socioeconomic status is therefore associated with a change in health (Pinxten & Lievens, 2014).

Marmot adopted Sen's capability approach to explain the pathway of health-inequalities. He argued that external material resources like income, education and occupation are an objective representation of one's standard of living and convert into one's internal capability and perception of control (i.e., autonomy) that is reflected in a healthy lifestyle, creating perpetual wealth-to-health pathway (Marmot, 2015; Whitehead, Pennington, Orton, Nayak, Petticrew, Sowden & White, 2016) (see Figure 2.2). The psychological theory on perception of control argues that people with a higher perception of control believe that they are 'effective agents' in their life and that they 'master, control and effectively alter the environment', thus generally have a 'mastery orientation' towards life (Mirowsky & Ross, 2013: 174). On the other hand, a sense of powerlessness is linked to the idea that one's own actions and efforts do not impact the desired outcome/reward. Therefore, people with a lower sense of control believe that luck, fate or chance control their lives and generally have a 'helpless orientation' in life (Lachman & Weaver, 1998).

FIGURE 2.2: MARMOT'S PATHWAY OF INEQUALITY



Source: adapted from Marmot (2010, 2015)

Marmot's theory and his ideas have been included in national and global strategies tackling the problem of health-related inequalities (Health Scotland, 2014; WHO, 2013). Also, Marmot's Review (2010:18) stressed the 'central ambition of creating external conditions for people to take internal control over their own lives' (cf. Marmot's Review, 2020). The concept of autonomy and power over the choices in daily life has been identified as an important factor in relation to the pathway of inequalities in health and a healthy lifestyle. Thus, in order to reduce the social gradient in health, he suggests that an intervention in health-inequalities needs to be universal (across all social classes) and proportionate to the level of socio-economic disadvantage, i.e., proportionate universalism (Health Scotland, 2014; Marmot et al., 2010; WHO, 2013). Thus, interventions in the health of most deprived groups should be more intensive and interventions in the health of the least deprived, less intensive.

For Marmot, the operationalisation of Sen's capabilities is represented through the concept of control over one's life, perceiving psychological vulnerability as a dimension of general structural vulnerability. Here, the idea of perception of control is too general and the concept does not necessarily reflect the essence of interventions and inequalities in the context of health and a healthy lifestyle, because internal and external perception of control is not inherently linked to healthy and unhealthy lifestyle and related interventions. However, the concept is ontologically useful and has been continuously applied in several contexts to explain the persisting inequalities. Kraus, Piff and Keltner (2009) modelled socioeconomic status and objective social class with lower sense of control and intimately lower perception of social class. Mirowsky and Ross (2013) similarly modelled persisting inequalities in anxiety and depression to lower perception of control and Manstead (2018) modelled persisting inequalities in university and workplace environments with sense of control. Generally, a higher sense of control over one's life is linked to higher socioeconomic status (Manstead, 2018; Kraus, Piff & Keltner, 2009) and more positive outcomes, like lower levels of

anxiety and depression (Mirowsky & Ross, 2013) and higher education (Manstead, 2018). However, the concept of control is too general, and it does not necessary reflect the *essence* of the distinctive paradigms and interventionism in the context of health and healthy lifestyles in an urban environment.

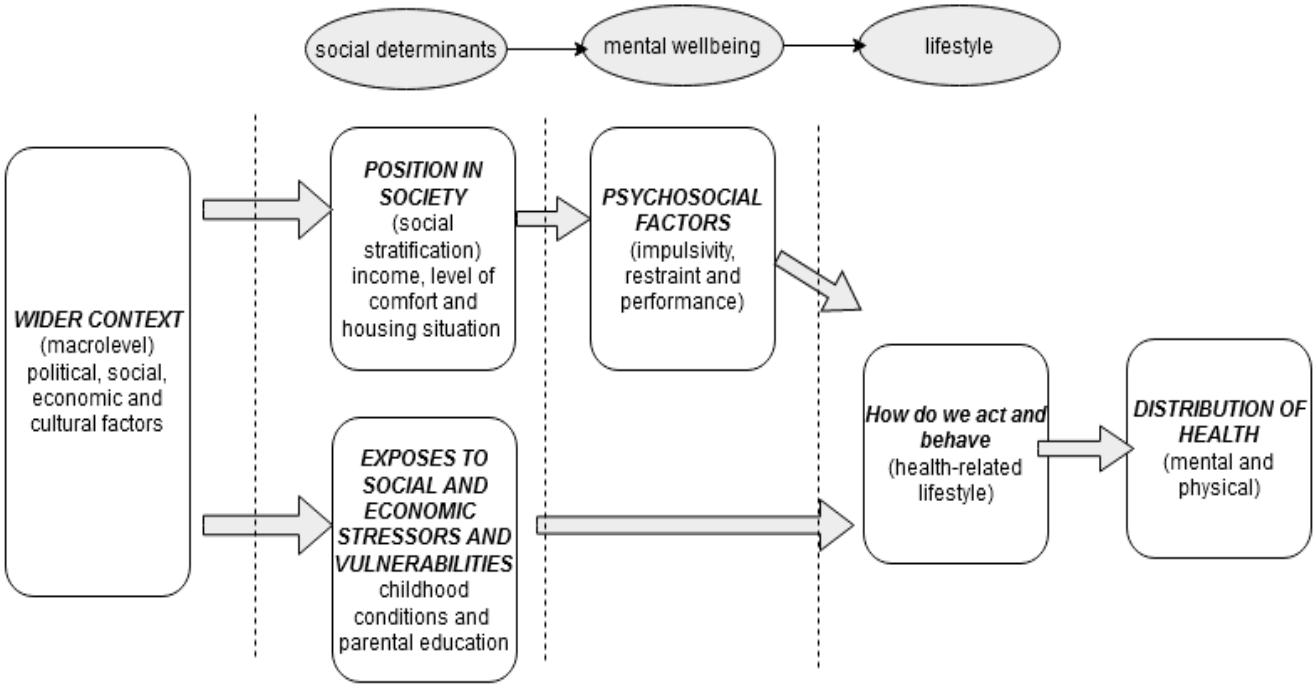
2.2.3 PSYCHOSOCIAL PATHWAYS AND HEALTH OUTCOMES: INFORMING ACTION ON HEALTH INEQUALITIES

To inform actions and interventions in the context of health inequalities, this research builds on the following: Marmot's identified wealth-to-health pathway; the research framework presented in 'Psychosocial pathways and health outcomes: Informing action on health inequalities' (Public Health England, 2017); 'Health 2020: a European policy framework' (WHO, 2013); and the 'Review of social determinants and the health divide in the WHO European Region' (WHO, 2014).

Here, of particular importance is a call for more explicit recognition of psychosocial pathways in reducing health inequalities, presented in 'Psychosocial pathways and health outcomes: Psychological pathways and health outcomes' (Public Health England, 2017). The document presents the synthesised evidence and the general theoretical framework showing the influence of the psychosocial pathway on health-related inequalities.

In general, the pathway which is presented is divided into four phases, starting with social and wider determinants (position in society and exposures to social, economic and environmental stressors), followed by psychological determinants (individual and neighbourhood level), lifestyle factors (smoking, unhealthy diet, physical activity) and distribution of health (see Figure 2.3).

FIGURE 2.3: PATHWAY OF (TRAIT) SELF-CONTROL AS A PSYCHOSOCIAL FACTOR OF PERPETUAL INEQUALITIES IN HEALTH



Source: adapted from Public Health England (2017)

2.2.4 CONCLUSION

Overall, from a theoretical perspective, it can be argued that the adaption of Amartya Sen's conceptual framework, as applied by Marmot including the concept of perception of control as the person's internal capability, is a more *causal*, *deterministic*, *fixed* and *stable* version of Sen's framework. Marmot in his wealth-to-health pathway causally links the perception of control with the person's environment and adopts a deterministic approach. As such, the person's internal regulatory mechanism i.e., perception of control over his/her life is not separate from the external environment, but instead, embedded in its socio-economic environment and dependent on it. In other words, the socio-economic environment directly determines one's perception of control and lifestyle and reproduces social divisions. The idea ontologically contradicts

Sen's concept of capabilities, where the latter are dynamic and an expression of an individuals' agency (Sen, 1999 and 2010). However, adapting Marmot's deterministic approach in the context of health-related inequalities seems reasonable. In contrast to Sen, Marmot operates and researches in the context of health-interventionism, where deterministic links between causes, critical behaviours and structural problems are needed for planning for interventions (Quesada, Hart & Bourgois, 2011).

Because health inequalities tackle the broader area of political, economic and social problems and interventions and policies, researching health and ill-health purely from a medical perspective is too narrow (Marmot, 2015). Recently, it has been suggested that social theories, in particular Bourdieu's critical theory, could fuel an understanding of the multidimensional pathway of inequality in health (Øversveen et al., 2017; Veenstra, 2018). Generally, Bourdieu, with his causal pathway demonstrates the conversion of external level of capital into internal disposition of habitus, which further impacts the person's lifestyle. The latter offers a promising tool for the investigation. Also, Bourdieu's (1986) concept of capital has recently been introduced as a complementary concept to Sen's capability approach (Bowman, 2010; Gokpinar & Reiss, 2016; Hart, 2013).

Previously, it has been suggested that Bourdieu's 'conceptualization of capital enriches the understanding of the body of commodities and resources that may be converted into what Sen categorises as capabilities' (Hart, 2013:49), creating the pathway of multidimensional inequalities. Further, Bourdieu's ideas on habitus are related with Sen's ideas on capabilities. In addition, Sen's concept of functionings is intertwined with Bourdieu's perspective on lifestyle. Although both frameworks are ontologically similar, from an epistemological perspective, Bourdieu's concept of capital in the context of urban areas has more operational value. From all the stated reasons Bourdieu’s approach has been loosely adopted in this study and will be discussed below.

2.3 MATERIAL RESOURCES OF RESIDENTS' HEALTH

2.3.1 ECONOMIC AND CULTURAL CAPITAL AS AN INDICATORS OF STANDARD OF LIVING

Bourdieu conceptually establishes his understanding of capital on Marx's idea of perpetual socio-economic inequalities (Field, 2008; Fowler, 2011; Joas & Knöbl, 2011). Bourdieu and Marx shared their interest in the concept of capital as a complex phenomenon with its own dynamic of accumulation, conversion and its unequal distribution in the world. Equally, they shared a critical stance against enduring patterns of social inequality, social power and class-based dominance rooted in unequal distribution of economic means in the society (Appelrouth & Edles, 2012; Field, 2008). However, Bourdieu's theoretical and empirical conceptualization of capital, is more profound and multidimensional. Compared to Marx, Bourdieu is focused on capital's complex material, immaterial and symbolic forms, and its transformation, accumulation and socio-economic capacity (Schmitz, Flemmen & Rosenlund, 2018).

Bourdieu's division and understanding of capital comes in three separate forms, namely economic, cultural and social capital (Bourdieu, 1986; Joas & Knöbl, 2011; Veenstra, 2018; Wacquant, 2008; cf. lisahunter, Smith & elke emerald, 2015). As such, all types of capital represent a set of economic, cultural and social resources that, on the one hand, enable formation and classification of social hierarchy and, on the other hand, become drivers of pertinent (health-related) lifestyle choices (Burnet & Veenstra, 2017; Oncini & Guetto, 2018; cf. de Morais, Dimitrov Ulian, Fernandez Unsain & Baeza Scagliusi, 2018).

Economic capital comprises of financial assets, such as level of income, property and savings that can be directly (and *naturally*) converted into cultural, social and financial profits (Bourdieu, 1986; Joas & Knöbl, 2013; Piketty, 2014, 2015;

Pinxten & Lievens, 2014; Savage, 2014). Thus, economic capital for Bourdieu is 'at the root of all other types of capital' (Bourdieu, 1986:54; cf. Piketty, 2014). In line with Pinxten and Lievens (2014), Bourdieu's understanding of economic capital in the context of health and healthy lifestyle, includes all kinds of material resources (i.e., level of income, savings and housing conditions) that can be easily converted into money and used to acquire and maintain a healthy lifestyle (cf. Abel 2007; Abel & Fröhlich, 2012; Burnett & Veenstra, 2017; Veenstra, 2018).

Cultural capital represents all the 'informational' assets of the person that can be converted into cultural and financial profits (Bourdieu, 1986). Abel (2007) defined cultural capital in the context of a healthy lifestyle as all culture-based resources (i.e., knowledge and skills) that are available to people in order to acquire and maintain a healthy lifestyle and better health (i.e., health knowledge and operational skills, health values and norms) (cf. Christensen & Carpiano, 2014). From this perspective, he identified cultural capital as a key element in the 'behavioural transformation' of social inequality into health inequality (Abel, 2007:2). Equally, Oncini and Guetto (2018, 2017), Pampel (2012) and Mackenbach (2012) consider cultural capital as a key element of persisting health-related inequalities and a good predictor of a healthy lifestyle, even better than economic capital and social class.

Social capital for Bourdieu represents the social networks and social connections that can be converted into social and financial profits, help and/or protection of interests (Bourdieu, 1986; Savage, 2015). In line with Bourdieu's materialistic position that places economic capital at the core of social capital accumulation and transmutation, his understanding of social capital is distinguished from other conceptualizations of social capital, like Coleman's (1988) and Putnam's (1995) (Lee, Dunlap & Edwards, 2014; Savage, 2015). Putnam and Coleman understand the concept of social capital as the 'fabric' of

social life – a collective feature of society and its well-being operationalised by a general level of trust, cohesion and safety (Adler & Kwon, 2002). Here, despite recognising the theoretical distinction, Pinxten and Lievens (2014) adapt those types of social capital measure to understand health inequalities (i.e., social support from family and friends and neighbourhood social cohesion) and identify social support as a predictor of physical and mental health. However, McGovern and Nazroo (2015) measured social capital through volunteering and personal networks but have not identified any effect on mental health (i.e., depression).

Nevertheless, all three types of capital together represent the set of resources that constitutes a person's portfolio and which position him/her within social hierarchy (Veenstra, 2018). In line with the literature, among the three types of capital, economic and cultural capital are most consistently linked to health-related benefits such as a healthy lifestyle and good general health. Social capital (i.e. neighbourhood social cohesion, volunteering and personal networks) has not been identified as a significant predictor of inequalities in health (McGovern & Nazroo, 2015; Pinxten & Lievens, 2014). Also, Bourdieu found that only economic and cultural capital were significant in positioning a person in his/her social and geographical space (Bourdieu, 2010). Moreover, the theory of social capital, focusing on interpersonal relationships, cooperation, shared values, interpersonal trust and bonding presented by Coleman (1988) and Putnam (1995) is broad and would need to be researched separately.

In the initial stages of this study the concept of social capital, as presented by Bourdieu (2010), was included in this research. However, this concept was later discarded because it would have been unfeasible to address its complexity within the constraints imposed by the time limits of this study while also including economic and cultural capital, which have been found to be more relevant in this context. Nevertheless, two items from Section A in the

questionnaire: About Leisure Activities and the adopted scale on the embodied cultural capital (items no. 6 and 7; 'Get together with relatives' and 'Get together with friends') still partially encompass the relevant aspects of social capital, referring to the strength of social ties with relevant social groups. This highlights the complexity of cultural capital, including its institutionalised, embodied and objectified forms that are rarely researched together (Oncini & Guetto, 2017). Thus, defining each type of cultural capital and identifying their distinctive effects on particular health-related behaviours contributes to a broader understanding of the cumulative effect of cultural capital, including relevant aspects of social capital (i.e. get together with family and friends), on healthy lifestyle and perpetual health-related inequality.

Threefold dimensionality of cultural capital

Bourdieu dissected cultural capital into its three subordinate forms:

1. Institutionalized cultural capital (i.e., skills and knowledge gained through academic qualifications)

2. Embodied or incorporated cultural capital (i.e., skills and knowledge gained through cultural participation)

3. Objectified cultural capital, also known as informational capital (i.e., skills and knowledge gained through possession of collections of paintings, books and other cultural valuables).

Institutionalized cultural capital

Institutionalised cultural capital, a person's level of education (i.e., academic qualifications, educational credentials and certificates with the symbolic value of cultural competence) has often been used as a crucial determinant of a

person's healthy lifestyle in the literature (Fagerheim, 2016; Veenstra & Burnett, 2014; Veenstra & Burnett, 2017; Williams, 1995) and in the practice of health interventionism (WHO, 2013). Here, as previously argued, formal education helps to develop general cognitive skills and knowledge, particularly knowledge on potential risks, prediction of consequences and solving problems that are crucial for developing a healthy lifestyle (cf. Abel, 2007, 2008). In line with this argument, more educated people, with a broader spectrum of problem-solving skills and knowledge on risks will be able to apply this same set of skills in the context of health by adapting long-term healthy lifestyle. Thus, such differences in knowledge on health risks among people from different educational backgrounds are important in the context of a person's behaviour, lifestyle and finally health choices (Oncini & Guetto, 2018). However, Pinxten and Lievens' (2014) research challenges this argument and did not confirm the impact of education neither on physical nor on mental health. Nevertheless, in the same context of institutionalised cultural capital, the value of personal *and* parental education for a healthy lifestyle has been established as a dimension of inequality (Abel, Hofmann, Ackermann, Bucher & Sakarya, 2014; Huppatz, 2015; Oncini & Guetto, 2017; Pinxten & Lievens, 2014; Ross & Mirowsky, 2011; Veenstra & Abel, 2015). The idea of researching parental education as a determinant of health-related behaviour links with Bourdieu's' understanding of lifestyle appropriation (i.e., acculturation) as a form of informal education embedded in a person's family environment (Bourdieu, 2010; Holt, 1997). Abel et al. (2014) argued that people, irrespectively of the gender, with higher own and parental education generally had a higher healthy lifestyle score compared to people with lower own and parental education. In a similar manner, Burnett and Veenstra (2017) argued that both one's own and parental education are significant factors in predicting a person's healthy and unhealthy lifestyle. Thus, higher levels of a person *and* their parents' education can be understood as determinants of his/her healthy

lifestyle, helping to explain the persistence of inequalities and social gradient in health.

EMBODIED CULTURAL CAPITAL

Typically Bourdieusian understanding of the embodied form of cultural capital identifies differences in cultural participation (i.e., high-brow vs. low-brow culture) and promises to explain long-term persisting inequalities in health and a healthy lifestyle (Burnett & Veenstra, 2017; De Clercq, Abel, Moor, Elgar, Lievens, Sioen ... & Deforche, 2016; McGovern & Nazoo, 2015; Pampel, 2012; Pinxten & Lievens, 2014). In a similar manner as previously discussed in institutionalised cultural capital, in the context of embodied cultural capital, general skills, abilities and knowledge accrued through cultural participation impact on the development of a healthy lifestyle. To identify inequalities in the context of health, Burnett and Veenstra (2017) researched the domains of fashion, food, music and travel as dimensions of cultural capital (cf. Bourdieu, 2010). Oncini and Guetto (2017) researching embodied cultural capital in a sample of Italian children, used a different measure i.e., the frequency with which each parent had been to the theatre, museum, archaeological sites and classical concerts in the last year and found no significant links between cultural participation and healthy diet among children. In contrast, Oncini and Guetto (2018) operationalised the embodied state of cultural capital as the number of books read per year as one variable and cultural participation as another. In line with their argument, cultural participation significantly influences diet, smoking and alcohol consumption, whereby the number of books read has been a significant predictor of diet, and smoking but not alcohol consumption. Interestingly, cultural participation had a negative impact on alcohol consumption (not abusive practices such as binge drinking, but higher frequency), where higher socioeconomic resources are linked to higher alcohol intake. Nevertheless, cultural participation, cultural capital and alcohol consumption needs to be researched further from two distinctive perspectives -

binge drinking and per-occasion drinking, because the distinction might be useful for a more in-depth understanding of the links between alcohol consumption and cultural capital. Similarly, cultural participation (i.e., theatre/opera, museum and art gallery and cinema) as a measure of embodied cultural capital has been adopted by McGovern and Nazroo (2015). They identify a significant impact on health-related outcomes. However, Pinxten and Lievens (2014) could not confirm the links between cultural participation and physical health, although this had an impact on mental health. The results are interesting, because cultural participation has been previously linked to emotional control, self-expression and openness - indicators, naturally linked to better mental health. However, that was not the case here; thus, the links between embodied cultural capital and health inequalities remain unclear.

Pampel (2012) has been exploring the links between leisure activities and health, in particular obesity. She researched sedentary and less complex leisure activities i.e., socialising, handicrafts and watching TV/music and found them to be associated with greater BMI. By comparison, she found more engaging and more complex leisure activities, providing cultural opportunities for developing discipline and learning, to be associated with lower BMI and desire to lose weight. While for Pampel (2012), it is impossible to depict the direction of the inequality pathway and separate the causal and non-causal interpretation of embodied cultural capital, in similar research the direction is clearer and this dimension of cultural capital is understood as an input variable, and health an output variable (Burnett & Veenstra, 2017; Oncini & Guetto, 2017 and 2018). Pampel's (2012) operationalisation of embodied cultural capital is valuable from three perspectives. Firstly, later operationalisations have followed this format, e.g. Oncini and Guetto (2018), McGovern and Nazroo (2015) and Pinxten and Lievens (2014). Secondly, it enables the further exploration of the social dimension of leisure, previously identified as relevant for understanding health inequalities (cf. Pinxten & Lievens, 2014). Thirdly, it also enables the exploration

of a broader spectrum of meaningful spare time routines as a field useful for the development of relevant skills, knowledge and abilities relevant for adopting a healthy lifestyle (cf. Elias & Dunning, 1986).

For Bourdieu, in general, such meaningful instrumentalization of leisure for the pursuit of purposeful long-lasting activities and skills, instead of the pointless spending of time on *purposeless and meaningless* activities represents the distinctive line between the more and less affluent social classes (cf. Pampel, 2012). For him, the affluent class is more likely to be involved in the whole spectrum of cultural activities that 'indicate the quality of the person' (Bourdieu, 2010:278). Here, Bourdieu's value of leisure activities is in line with the Aristotelian conceptualisation of a *virtuous persona*. As such, affluent people will be more likely to continuously and routinely participate (actively as creator and passively as a spectator) in activities related to art, music and volunteering, because by participating in such a broad spectrum of activities they will generally be able to develop more virtuous and meaningful skills (Bourdieu, 2010; Cuypers, Krokstad, Holmen, Knudtsen, Bygren & Holmen, 2011; Pampel, 2012). Here, Bourdieu's idea of *virtuous* leisure as the embodied form of cultural capital relates to previously discussed skilfulness in life that can also be a source of self-focused health protective behaviour. Thus, Bourdieu's idea on the meaningful instrumentalization of leisure is also in line with Elias and Dunning's (1986) argument, that the function of leisure is the opportunity for a meaningful controlled emotional experience. Therefore, more affluent people with more opportunities for pursuing different leisure activities will be more likely to internally control their emotions and develop a higher level of self-control. Bourdieu's idea on the meaningful instrumentalization of leisure also links with Stuij's (2015) differences in socialization between more and less affluent families. Stuij (2015), in the Netherlands, qualitatively researched differences in children's socialization in sport and leisure in accordance with family socio-economic backgrounds. The results indicate several differences

between both groups. In families with higher socioeconomic status, sport and leisure practice is more structured, regulated and controlled in comparison with their peers from families with lower socio-economic status. In the first group, i.e., families with higher socioeconomic status, time, place and people involved in children's sport are regulated, whereas, in the second group, i.e., families with lower socio-economic status, there is more freedom and social experimenting. Children from higher socio-economic backgrounds are more likely to participate in sports clubs and in a greater variety of extracurricular activities compared to their peers from lower socio-economic backgrounds. However, both socioeconomic groups of children are internally homogeneous, regardless of their ethnic background (western and non-western children from the higher socio-economic background are similar and vice-versa). This suggests that meaningful instrumentalization of leisure, controlled participation and skill-based leisure (instead of values-based leisure cf. Gagne, Frohlich & Abel, 2015) is evidently distinctive for more affluent families in comparison to less affluent families. Here, Pampel (2012) adopts a similar interpretation of *purposeful leisure* that she further links to a healthier diet. Thus, it can be argued that meaningful routinised control over activities within one's own time in order to pursue a distinctive standard of 'quality of personality' is a specific quality of Bourdieu's idea on links between leisure and embodied cultural capital, pertinent to the affluent class. Meaningful control over the activities within one's own time, will, therefore, express the level of embodied cultural capital and be reflected in an internal psychological control (i.e. self-control), pertinent to the habitus of the affluent class. Thus, a more affluent class will pursue more meaningful leisure activities, which to a great extent link to culture-related activities; however, it also suggests the idea of control and perpetual and routinized meaningfulness (Bourdieu, 2010).

OBJECTIFIED CULTURAL CAPITAL

The family's original conditions of existence and cultural valuables in the home environment (books, music, art and other collectable valuables) relate to the concept of objectified cultural capital. Therefore, an objectified form of capital, in a similar manner to both other types of cultural capital, represents the cultivation of culture, practice and embodied (i.e., cognitive) resource of one's behaviour. Positive association between objectified cultural capital (collections of books and other cultural valuables) and self-rated health has been previously identified (Veenstra & Abel, 2015). Also, collections of cultural valuables at home (i.e., books), as a proxy of objectified cultural capital, are significantly associated with a healthier diet (Oncini & Guetto, 2017).

Further, Bourdieu's concepts of capital as a classificatory mechanism and as a driver of social hierarchy and division of both urban social and geographical space will be discussed in the context of urban health inequalities (cf. Kandt, 2015, 2018). In particular, it will be discussed in relation to urban disparities and the determinants of a heathy lifestyle in Sheffield's socially and geographically divided space (ibid.).

2.3.2 SPATIAL DISTRIBUTION OF CAPITAL REFLECTING THE INEQUALITY AND STRATIFICATION OF NEIGHBOURHOODS

Bourdieu argues that the *volume and structure* (i.e., composition) of a person's capital are variables that position them in the physical as well as in the social world, because they are intertwined and together they reflect the range of choices socially and physically available to him/her (i.e., capital portfolio) (Bourdieu, 1987, 1990, 1996, 2018; Veenstra, 2017). In this context, Bourdieu discusses how social space tends to *retranslate* itself into physical living space i.e., habitat and form 'definite distributional arrangements' of people and houses (i.e., city centre vs. suburbs) (Bourdieu, 1996:12; cf. Bourdieu, 1989). He

understands the concept of distance as multidimensional, namely in social and geographical (spatial) dimensions and argues that they are interrelated within *'socially ranked geographical space'*, where the greater physical distance to the 'goods or facilities' corresponds to the greater social distance and lower levels of both types of capital of the person and vice-versa (Bourdieu, 2010:118). Accordingly, physical space locates the person on the physical map and social space locates the person on the social map in accordance to his/her social class and socioeconomic status. In line with Bourdieu, both dimensions of space overlap and create multidimensional persisting patterns of unequally stratified urban areas. Thus, for Bourdieu, urban space is at once 'a material, objective structure and a symbolic matrix' (Piçon-Charlot & Piçon, 2018:120). Such stratified mapping of his ideas of social space and capital onto the physical urban space reflects the accumulation, unequal distribution of the means and unequal access to the means and ultimately reflects the relations between more affluent and deprived groups (cf. Savage, Hanquinet, Cunningham & Hjellbrekke, 2018).

The relationships between Bourdieu's multidimensional conceptualisation of capital and urban geographical space have been recently presented in the context of the city of Porto (Pereira, 2018). Seven neighbourhoods in the city have been selected for the research in order to present different social and spatial capital related formations. The results have been congruent with Bourdieu's results in Distinction (2010), where accumulated economic and cultural capital in physical space reflect socio-economic conditions, class-determined dominance and unequal distribution and accessibility of resources (Bourdieu, 2010). Pinçon-Charlot and Pinçon (2018), in order to understand genealogical perpetuation of the economic, social and physical dominance in the context of modern Paris, extend Bourdieu's model of social space and research the territorial and social domination of French dynastic families. Their understanding of domination over the space is cross-dimensional, extended

through social space and centuries of ancestry as well as through physical space, with the possession of properties in multiple locations across the city.

Spatial deprivation in less affluent neighbourhoods creates significantly distinctive (unhealthy) lifestyles compared with more affluent neighbourhoods (Brownson, Fielding & Maylahn, 2009; Estabrooks, Lee & Gyurcsik, 2003; Kandt, 2015, 2018). In the context of a healthy lifestyle, the stratified structure of urban areas and the geographical position and quality of neighbourhoods, seems particularly interesting. Here, proximity to green areas is for example an element reflecting reputation, stability, residents' overall well-being and thus the higher economic value of properties within such neighbourhoods. The latter results in the concentration of the urban population in accordance with their social status (Filion, Bunting & Warriner, 1999). In this context, living conditions such as quality of housing and availability of health care services are identified as determinants of health and a healthy lifestyle (Whitehead & Dahlgren, 1992; Connolly, Baker & Fellows, 2019). In line with Bourdieu's thinking, Cockerham and Hinote (2009:209) argue that the characteristics and the quality of the neighbourhood reflect the 'character of the environment' and the capacity for socialization and lifestyle. Moreover, they argue that living conditions in the neighbourhood also indicate families' social status and as such are useful structural indicators of standard of living.

Thus, introducing Bourdieu's economic and cultural forms of capital as proxy measures of residents' objective standard of living would be a reasonable way to identify material resources of inequality in urban areas. This multidimensional nature of urban space, indicating the intertwined nature of social, economic and physical urban space is crucial for understanding perpetual inequalities in urban space, and therefore proposes a format for further investigation. Accordingly, Bourdieu's capital framework offers a relevant and detailed social and spatial epistemic and methodological platform

for further investigation compared with Sen's approach. Sen's capability approach is looser, merely ontological and more general, particularly in the context of health inequalities, as applied by Marmot (2015).

2.2.3 CONCLUSION

Marmot (2010), in his report on urban health inequalities and the health gap between most deprived and most affluent urban areas, argues that in the UK the difference in life expectancy between the poorest and most affluent urban areas per person is 7 years and 17 years for disability-free life expectancy. When 5% of the population with the highest and the lowest income is excluded from the sample, disability-free life expectancy is still between 6 and 13 years[3]. Because in urban areas, the geographical distance between the poorest and the most affluent communities is relatively short (maximum of two miles), this difference in life expectancy in one city is even more striking. Marmot demonstrates his idea in the case of London.

However, the case of Sheffield is similar. Here, in affluent areas like Fulwood female life expectancy is 86.4 years, and in less affluent areas like in Burngreave it drops to 78.3 years (Sheffield City Council Public Health Strategy, 2017). In the context of a healthy lifestyle, in the more affluent areas of Sheffield generally there are higher levels of physical activity, healthy diet and no smoking and vice-versa. Equally, in the more affluent areas of Sheffield generally there are lower levels of diagnosed asthma, coronary heart disease, stroke, clinical depression and obesity (Sheffield Lifestyle, Morbidity and

[3] Following the striking message of the report from 2010, recently in 2020 a new report has been published. The research group reported that since 2010 there has been an increase in life expectancy, particularly in the most deprived areas in the UK and in particular for women. Compared to other European high-income countries, rates of life expectancy in the UK decreased at a lower rate. Equally, regional inequalities in life expectancy are growing and there are still striking differences between the North and South of the UK. The report also presents the effects of funding cuts that have happened since 2010, where the more deprived communities lost more funding than the less deprived.

Mortality Quilts, 2018). Thus, in the case of Sheffield, the social gradient complements the gradient in health, because socio-economic circumstances and inequalities in health are intertwined.

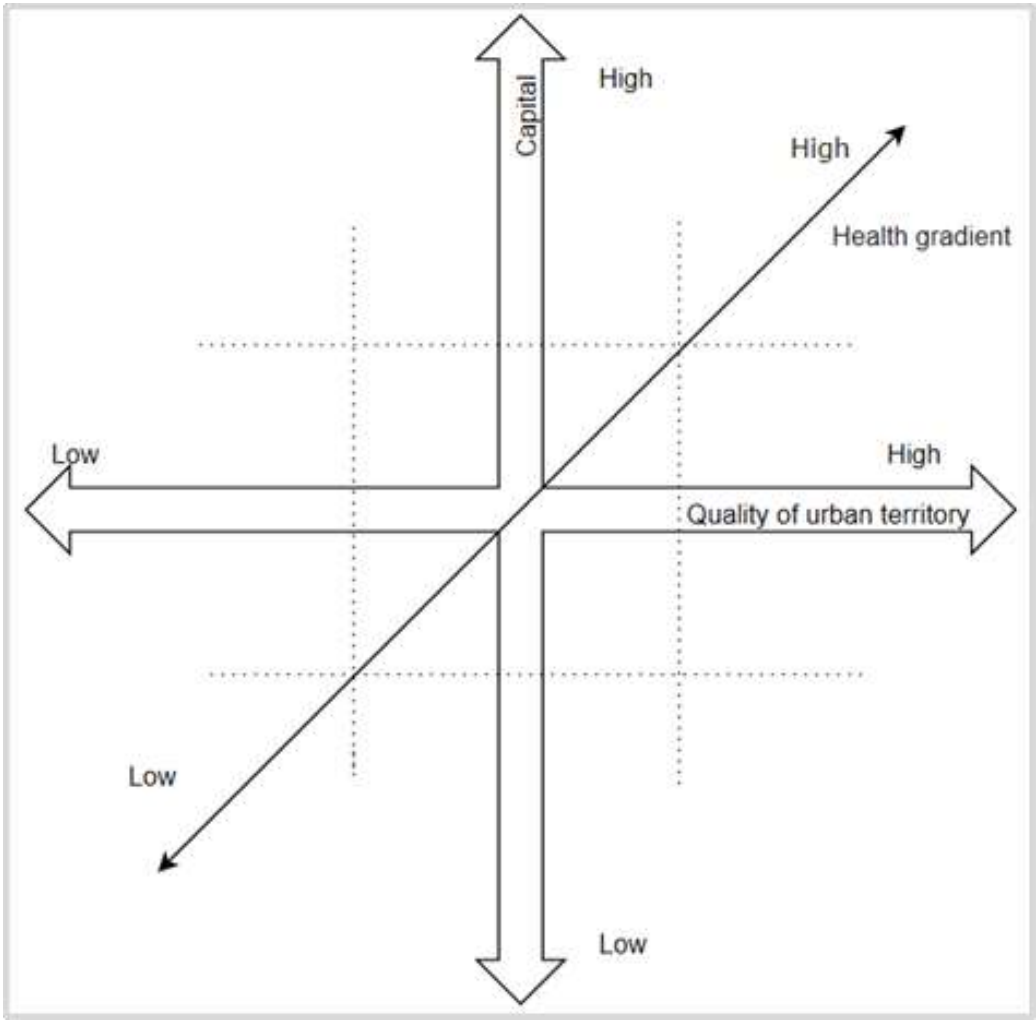
As discussed beforehand, capital is at the same time a resource of one's behaviour and lifestyle and a classifier within social hierarchy. This means that socioeconomic *positionality* and the physical location of each person within an urban area is defined by three characteristics. First, social position (defined by the levels of economic and cultural capital); second, geographical position (neighbourhood characteristics) (Bourdieu, 1996); third, lifestyle (healthy or unhealthy). Thus, all three dimensions together are objective determinants that taken together reflect deeper structural inequalities. All three dimensions (researched jointly) of the matrix of urban space reflect the perpetual pathway of social inequality and the wealth-to-health pathway (cf. Marmot, 2015).

Thus, compared to Sen's capability approach (with an economic background of inequality), Bourdieu's capital approach (with a background from the sociology of inequalities) offers a more holistic understanding of inequalities, linking socioeconomic, spatial and behavioural dimensions. Thus, it seems more appropriate for the analysis of persisting urban inequalities in health. Besides, as aforementioned, Marmot's concept of *proportionate universalism* and more precisely targeted interventionism, is easier to capture with Bourdieu's epistemic and methodological stratified social and geographical notion of the concept of capital, than with Sen's less precise concept.

Figure 2.4 shows Bourdieu's approach, instrumentalised by economic and cultural capital in order to identify distinctive urban areas, linked with Marmot's social gradient in health. The vertical axis, referred to as ‘Capital’, represents the joint level of economic and cultural capital. The horizontal axis stretches over ‘quality of urban territory’ and essentially represents the

retranslation of economic inequality to physical urban space. The intersection between both dimensions (horizontal and vertical) is related to higher or lower levels of economic capital, dividing social and geographical space in its own essence. Structurally, economic and cultural capital is accumulated in a higher quality neighbourhood, both following the health gradient and vice-versa.

FIGURE 2.4: THE INTERTWINED NATURE OF SOCIO-ECONOMIC, SPATIAL AND HEALTH INEQUALITY IN AN URBAN SPACE



In his investigation of the causal pathway of perpetual inequalities in health in an urban area, Bourdieu's approach (2010) linking a persons' socioeconomic environment with his/her internal habitual disposition, represents the general direction of pathway. At the same time, the concept of capital is presented as a dimension (classifier) within the social hierarchy and as the dispositional capacity of one's behaviour and healthy lifestyle. However, in the context of healthy lifestyle, constitutive characteristics of habitus remain on the one side limited to taste (Burnett & Veenstra, 2017); on the other, capitals are representing habitual schemes impacting decision-making process (Oncini & Guetto, 2017; Pinxten & Lievens, 2014). Thus, the concept of habitus remains either vague or poorly investigated as a socially defined, yet independent concept (cf. Veenstra & Burnett, 2014). However, the psychological concept of self-control can sufficiently complement the concept of habitus in the context of healthy lifestyle as a complex disposition of psyche and thereby addresses the gap in the literature. Therefore, the next section will discuss the concept of habitus and its links to the concept of self-control.

2.4 PSYCHOLOGICAL RESOURCES OF RESIDENT'S HEALTH

This chapter firstly contextualises the concept of habitus from the perspective of self-control and its links to a healthy lifestyle. The concept is linked to the psychological dimension of self-control and regulation of thought, emotion, impulses, and performance that can sufficiently complement the operationalisation of the concept of habitus in the context of health and healthy lifestyle and contribute to the formation of the pathway of perpetual multidimensional inequalities in health.

2.4.1 THE CONCEPT OF HABITUS AS A RESOURCE OF INTERNAL HABITUAL CONTROL

The concept of habitus is not uniquely Bourdieu's. Instead, it has been introduced beforehand in Aristotelian (4th century BC), Aquinian (13th century) and scholastic (14th century) philosophical and ethical thought (Stres, 2018; Wacquant, 2016).

To identify habitus, Aristotle uses the (Greek) word hexis. The word habitus is a thirteen century Latin translation by Thomas Aquinas in his Summa Theologiae (Stres, 2018). Aristotle used the word hexis to identify the 'intermediary state between potentiality and actuality' (Aristotle, 1986:122). Here, the potentiality of the soul is understood as souls' capacity and actuality is understood as souls' employment (Aristotle, 1986:117). In line with Eikeland (2008: 105), Aristotelian habitus is as an 'acquired ability, skill, habit, or incorporated *disposition* and *proclivity* for acting and feeling in certain ways, resulting from practice, exercise, or habituation' (Eikeland, 2008:105). Thus, Aristotelian habitus predisposes inclination and capacity of the person to act and perform in certain ways (ibid., cf. Aristotle & Rackham, 1996:247). For Aristotle, the concept of habitus is therefore a moral category and principle. As such, Aristotelian habitus can be

either good (i.e., virtuous) or bad (i.e., unvirtuous, vicious). Here, the Aristotelian idea of a virtuous person is for his habitus to work or function well (i.e., érgon) and perform *at its best* (i.e., áristos)[4], actualising *habitual* and inherently associated *physical* and *bodily* potentiality. One's virtuous internal disposition is, as such, reflected in his exemplary *civilised* external behaviour.

In Aristotelian Eudemian ethics (1996) self-control is inherently linked to ability of the spirit to be ready to endure and rationally control natural want, pleasure and pain. Thus, control, for Aristotle, is regulated *rational*, whereby lack of control is unregulated *irrational*, impulsive. For him, the capacity and potentiality of the soul lie in balance between the non-cognitive initiative 'push' factors like desires, appetite and natural wants and inhibitive 'pull' factors of the cognitive rational part of the soul. In this respect, he directly refers to the idea of self-control: 'for the self-controlled, though experiencing desire and appetite, yet do not do the things that they desire, but defer to the intellect' (Aristotle, 1986:213). He identifies two opposite capabilities of the psyche, namely desire and intellect whereby one's *motivation* is the element of the soul that enables rational performance. Thus, relevant to this research, there are three elements of Aristotelian psyche, namely non-cognitive irrational elements of impulsive behaviour, cognitive rational elements enabling restrained behaviour (potentiality) and motivational elements enabling the dynamics between both[5].

Because for Aristotle the concept of habitus has moral value, habitus of the self-controlled man will act more *righteously* and *virtuously* than a man lacking self-control who will be more likely to act in an *unvirtuous* manner. Self-control for Aristotelian men (just men!) therefore becomes an ethical and moral category

[4] The idea of Aristotelian autonomous behaviour is in the literature often linked to individuals' flourishment, individuals' optimal functioning and potentiality (Sen, 2010; Sayer, 2011; Ryan & Deci, 2000; Deci & Ryan, 2002; Chirkov, Ryan, Kim & Kaplan, 2003)

[5] In his writings Aristotle refers to the components of the psyche as 'faculties'.

forma mentis and *actuality of all virtuous potentialities* of the habitus[6]. Health and a healthy lifestyle are inherently linked to the character of such virtuous men, where body represents the manifestation of such potentiality of the psyche (Dewey, 1929). In line with liberal theory, for Aristotle, a healthy lifestyle is an indispensable condition (i.e., mean) of one's health and the latter is an effective end similar to wealth and well-being (i.e. end). In this line of argument, it should be mentioned that for Aristotle, soul and body are an unseparated unity, where the body is the 'first actuality' of the soul (Aristotle, 1986, p:157).[7]

In his writings, Aristotle is concerned with categorical differences in the potentiality of psyche and differences in virtuous behaviours. However, he is less concerned with the question of socioeconomic prosperity as a context in which these distinctive psychological dispositions accrue. As aforementioned, his utilitarian perception of a person's well-being does not consider socioeconomic circumstances in which self-control of psyche develops. Sen (1999) and Nussbaum (2011) therefore argue that from the perspective of social inequalities, Aristotelian thought is inappropriate and does not meet ontological, epistemological and methodological scientific standards in the context of research in social inequality.

Following an Aristotelian line of argument that understands the concept of habitus as a moral category, scholars like Thomas Aquinas, Anselm of Canterbury and Bonaventura distinguished between *habitus entitivus* and *habitus operativus.* The former is the essential moral disposition and category, whereby the latter is inclination to act accordingly (cf. Stres, 2018; Wacquant, 2016). Nevertheless, for philosophers and theologians, habitus remains a moral

[6] This Aristotelian thought is in line with John Paul II 'Theology of the body' (Paul John, I. I. & Waldstein, M., 2006), when he argues that ' The body, in fact, and only the body, is capable of making visible what is invisible: the spiritual and the divine" (TOB 19:4).

[7] This distinctive ontological premise becomes useful for understanding more modern Bourdieusian understanding of the body-habitus relation, effecting his epistemological and methodological stance.

and ethical category, without any reference to the socio-economic context in which the moral category accrues.

Rooted in Scholastic philosophy, sociologists like Emile Durkheim, Marcel Mauss, Max Weber, Thorsten Veblen and Edmund Husserl operated with the idea of habitus as an internal mental disposition (Wacquant, 2016).

More recently, Norbert Elias theorised the concept of habitus, considering the social context in which habitual dispositions (in particular, the disposition of self-control) accrue. Elias understood the concept of habitus as 'social personality structure' (Elias & Dunning, 1986) or 'second skin' (Paulle, van Heerikhuizen & Emirbayer, 2013), in the continual perspective of society's development. For Elias, the person's and society's virtue of impulsive self-control linked with emotional self-constraint is a sign of a general society's civilising process, psychogenesis and social development. Elias's (1994) analysis of the socio-psychological genesis of self-control is practical and described through the changing practice of human behaviour over the centuries. He describes the genesis of table manners, meat-eating habits, nose blowing, spitting, behaviour in the bedroom and finally social changes towards decreased tolerance of aggressiveness and gender inequality. All the described habits, routines and behaviours Elias portrays in the developmental and historical perspective transform from raw to more fine forms over several centuries (Wilterdink, 2017).

In his book: The Civilising Process (1994), Elias, referring back to Aristotelian habitus, argues that leisure activities (which earlier in history were based on mainly religious activities, but are now more leisure-focused) have a socio-psychological function to enable training of one's emotional response to different situations and to balance social and personal restraints. Leisure, with different activities and areas of interest (i.e., music, theatre, art), therefore

collectively provides people with emotional training of self-control (and thus cultivated, civilised pleasure).

Thus, Elias (1994:47) stated that:

> 'The quest for excitement, for the Aristotelian 'enthusiasm' in our leisure activities is complementary to the control and restraint of overt emotionality in our ordinary life. One cannot understand the one without the other.'

He argues that Aristotelian leisure (e.g. drama and music) is the centrepiece of the habitual 'catharsis' i.e., curative cleaning, cleansing. Aristotelian catharsis is referring to the liberating movement of the soul that is through participation in cultural activities able to eliminate all the harmful substances from the body and mind (i.e. aggressiveness, impulsivity and similar undesirable and socially unacceptable behaviours). Elias argues that leisure activities and organised events can function in such a purifying way because they enable a trained balancing of overexcitement, enthusiasm or tension, thus generally enabling people's capacity to self-control. As such, self-control, rooted in human psyche, becomes autonomous power and ability to self-manage, enabling genesis of socio-psychological perpetual inequality.

From this perspective, Elias and Scotson (1994) operate with the concept of self-control in relation to social regulation, external control and power. They positioned their research in Winston Parva community near Leicester in the late 1950s and early 1960s. Analysing three distinct neighbourhoods, where one neighbourhood was regarded as a high delinquency area of low standing and the other two as safe, established neighbourhoods, they observed the nature of power on which the superiority of the neighbourhoods has been continuously established over the 'less worthy' neighbourhood. Superiority has not been established by economic, racial or any other socio-economic factor, but solely

regarding the duration of residence in that place. Group cohesion and collective identification of the 'oldness' has been a foundation for group's superiority and their feeling of human superiority and stigmatisation of the 'outsider', newcomers. In this regard, Elias and Scotson analysed self-control as a self-regulatory behavioural mechanism and a foundation of acceptable behaviour (i.e. carrot and stick mechanism). In this sense, individuals' level of self-control as of 'good' behaviour becomes a character-forming influence and an element of 'collective identification' and group social habitus. Thereby, self-control becomes a resource of social control and an element of collective subconscious identification and group characteristics (ibid.). Here, their analysis is not presented from a strictly developmental and long-term perspective, but from a more directly observable present perspective (Paulle, Heerikhuizen & Emirbayer, 2013; Wilterdink, 2017). In this respect, in a short span of a few generations such self-control becomes a part of 'group charisma' and the power resource of 'established' people, whereas 'outsiders' with lower levels of self-control become stigmatised as people of 'lesser worth' (Elias & Scotson, 1994; Paulle, van Heerikhuizen & Emirbayer, 2012).

More recently, Bourdieu adapted the general concept of habitus as a central function of the self and a relatively stable tendency to act and behave in a certain way, embedded in an individual's socioeconomic environment (cf. Burnett & Veenstra, 2017; Pinxten & Lievens, 2014). Following the Bourdieusian conceptualisation of capital as a classifier of external social structure, habitus represents the internal 'classificatory system' of the psyche (Bourdieu, 2010:170). Accordingly, habitus for Bourdieu is the inner space of the psyche, where a person on a subconscious level, *internalises* their externally-structured status within social hierarchy through a psychological process of internalisation (i.e., embodiment) that regulates their self-conception and ways of behaving and thinking in accordance to their position within a social hierarchy (Lahire, 2003; Quesada, Hart & Bourgois, 2011; Sayer, 2005). Bourdieu argues that

perpetual and mechanical consistency between the dominating and dominated social class and their class habitus happens voluntarily (Bourdieu, 2001). The process of *volunteer subordination* of depreciated people (i.e., the working class) therefore happens subconsciously and uncontrollably, i.e., 'below the level of consciousness'. External social space and structure inherently pathologically marked with power relations and social inequalities, in Bourdieu's habitus, become internalised and *embodied*. Through the psychological process of internalisation, the sense of shared *identity* and *class habitus* is created (Quesada, Hart & Bourgois, 2011). On this note, previous research used the concept of subjective social status as an internal classificatory mechanism and representation of such shared identity of class habitus. Previous research has linked subjective social class to several behavioural outcomes (Kraus, Piff & Keltner, 2009), and also directly to better health (McGovern & Nazroo, 2015).

Generally, Bourdieu does not use habitus or class habitus as an independent tool for his investigation, despite presenting it as an autonomous concept (cf. Wacquant, 2014). Instead, he *identifies* and addresses habitus through different *tastes and lifestyles*, pertinent to the bourgeois or to the working class. *Taste,* for him, is therefore the *manifestation of habitus* and a general reproductive scheme (i.e., amor fati[8]). Accordingly, taste is a representation of such shared identity of class habitus. Bourdieu systematically researched how *taste,* as acquired disposition of habitus, is distinctive to one's socio-economic status and, as such, naturally (i.e., voluntarily), hierarchically diversifies social and physical space between the bourgeois and working class (Bourdieu, 2010; Schmitz, Flemmen & Rosenlund, 2018).

[8] Bourdieu distinguishes between two dichotomies of habitus, namely between determinism and freedom. In case when individual is embracing and 'loving' (lat. amor) 'given' social destiny (lat. fati), Bourdieu calls this position of habitus amor fati. The latter is opposite to odium fati (when someone resists and challenges his/her own social destiny) and is 'choosing' own life choices. *Amor fati* reflects the 'reproductive' scheme of habitus by accepting one's socially determined fate (Reed – Danahay, 2004). In contrast, odium fati reflects the 'resisting' scheme of habitus. Taste for Bourdieu is the form par excellence of amor fati (2010:241).

Bourdieu defines the clear distinctive identity of the less and more affluent classes based on distinguishing tastes (Bourdieu, 2010). Here, bourgeois taste is *sophisticated* and *refined* with a tendency to favour quality over quantity and form over substance, whereby working-class taste is less sophisticated, less refined, less cultivated, prefers quantity over quality and substance over form (Bourdieu, 2010)[9]. Naturally, both meta dispositions of taste would therefore, in social space, spontaneously create social distance, which will also be reflected in physical distance[10]. The less affluent social class, for him, are those 'who don't know how to live', 'don't know how to relax', eat unhealthy and simple food, 'picnic beside major roads' and enjoy 'prefabricated leisure activities designed for them by the engineers of cultural mass production' (Bourdieu, 2010:174 – 175). On the other side of the taste-spectrum are the practices of the more affluent social classes, embedded in their 'absolute freedom of choice' of work and leisure practice. Distinctive social classes, for Bourdieu, therefore, share similar unspoken identities through their similar but distinctive taste for lifestyles (Bourdieu, 1990; Savage, 2015). Accordingly, Bourdieu's bodily aesthetic (e.g. 'thin and sleek' vs. 'overweight and out of shape') and distinctive physical posture (the way it is 'carried') derives its classifying principle from *taste* and reflects one's social identity, socioeconomic status and place in the social hierarchy (i.e., bodily hexis [11]) (Bourdieu, 2004 and 2010). Such 'psychologisation of the relation to the body' is for him inseparable from class habitus (Bourdieu, 2010, p. 368). Here, a thin, shaped and nurtured body is an

[9] Reference to Aristotelian distinction between virtuous and vicious habitus and to Elias's civilised and uncivilised habitus

[10] See chapter 2.3.2 on links between social and spatial distribution and intertwined nature of capital

[11] As discussed beforehand, hexis is another word that Bourdieu borrowed from Aristotle, although, he has (similarly as with the word habitus) substantially changed its original meaning. Nevertheless, the ontological premise on the unity between the body and soul (i.e. habitus) in Bourdieu's writings remains similar to Aristotle's idea. This ontological premise is important in order to understand the roots of Bourdieu's epistemological and methodological position.

element of a healthy affluent person and vice-versa[12]. Thus, for Bourdieu, there is an unseparated unity between body and habitus. This premise seems important for further clarification of his epistemological and methodological stance. By adopting the idea of unseparated unity between body and soul, Bourdieu's line of reasoning can again be traced back to Aristotle (1986).

Simultaneously, self-control of a *virtuous* person is also essential for Bourdieu, particularly in relation to body and health. Bourdieu's bodily aesthetic is, therefore, ontologically close to an Aristotelian virtuous person, not affected by temporary temptations (i.e., unhealthy eating, meaningless watching of TV instead of meaningful exercise in nature), but instead driven by *virtuous* health-protective behaviours in order to achieve the ultimate goal of meaningful healthy living. Thus, for Bourdieu, *lifestyles* defined by taste and their 'vulgar' or 'sophisticated' interests are an essential *operationalization* of class habitus (Schmitz, Flemmen & Resenlund, 2018).

Bourdieu's preoccupation with taste as an *aesthetic* dimension of inequality, without inadequate engagement with other psychological and emotional domains has been criticised (Sayer, 2005; cf. Reay, 2015; Stones, 2017). For Sayer, *control* in the context of emotional self-command, composure and self-possession (i.e., 'not losing it') is a clear distinctive quality and skill of Bourdieu's middle class (Sayer, 2011). From his perspective, moderation and limited display of strong emotions (i.e., excessive happiness or sadness) is perceived as professional and competent, linked to person's dignity, internal power and autonomy.

Briefly, the idea of psychological self-control as a meta-scheme and common component behind the social control can be found in Bourdieu's Distinction

[12] Here, Bourdieusian idea is close to Aristotelian and Christian thought on how through the physical body 'the invisible is made visible'.

(2010). Bourdieu argues that the dominating class possesses an inner potency that comes from spiritual, intellectual and emotional strength and gives them power of self-control that enables them to subconsciously control the dominated class. Such inner strength of the dominating class, therefore, becomes their *identity of superiority*, whereby inner weakness and powerlessness becomes the identity of inferiority, characteristics of the dominated class (cf. Bourdieu, 2010). Such dynamics between the dominating and dominated class happens voluntarily, through the voluntary *subordination* of depreciated helpless people (i.e., working class). Voluntarily *subordination* can be expressed through the form of *uncontrolled* bodily emotions (e.g. shame, humiliation, anxiety, and guilt) or through the form of *uncontrolled* impulses and sentiments (e.g. love admiration and respect). In this context, subordination is expressed through the internal perception of reducing *control over the external conditions and* represents the social language of *embodied helpless* and subordinated status (ibid.). Thus, having control over the emotions as well as not having control over emotions are the two distinctive identities of opposite social classes.

Here, Sayer argues that Bourdieu's idea of 'feel for the game' is a major feature of his contribution to social science. Bourdieu (Bourdieu, 1994, cf. Sayer, 2011) uses the example of the tennis game where an experienced player, through training, acquires practical ability and skill to adjust his bodily and emotional reaction to almost every predictable and unpredictable opponent's move (i.e., social situation). Acquisition of tennis skills requires repetition and training until players' moves become intuitive, fully embodied and less impulsive. For Bourdieu, this 'feel for the game' is a skill and disposition incorporated in a persons' *habitus* and derives from the 'set of dispositions that people acquire through repeated practice and experience in accordance with their socio-economic position' (i.e., habitat) (Sayer, 2011:75). Such 'feel for the game' in the literature has been sometimes also *equalised* with the concept of habitus (Paulle,

van Heerikhuizen & Emirbayer, 2013) and resembles the muscle-analogy presented by Elias (1994) and Elias and Norbert (1986)[13].

For Sayer, a person's set of skills and related dispositions, transposable from one situation to another, similar to bike riding skills or skills needed for playing an instrument, are representative results of habitus (Stones, 2017)[14]. Skills of psyche as dispositions of habitus therefore represent stocks of knowledge and typified *ways of behaving* or categorising[15]. Adoptive controlled behaviour, which through practice becomes *intuitive* and adapted for different social and behavioural situations, is therefore just another form of Bourdieu's 'feel for the game' that can be evaluated by a person's set of appropriate skills and level of self-control. Activation of these habitual dispositions and self-control in response to circumstances has significant influence also for the persons judgments about ends with reference to his/her assessment of their own well-being (cf. Sayer, 2011)[16]. Sayer argues that when people feel the lack of balance among needs, wants and concerns in the context of their health (e.g. life-work balance) and reflect upon that, they engage in practical reasoning. This means that they are responsive to the problem and that they engage their internal set of skills in order to adjust them to a particular context (i.e., healthy lifestyle). In this line of thought, the idea of health protective behaviour is a form of balanced reasonable behaviour, linked with emotional self-control and internal resourcefulness, forming a socially distinctive identity. Here, Sayer's idea of internal emotional self-control as an essence of habitus' links with Elias's (1994) and Elias and Norbert's (1986) work.

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[13] In general, the Bourdieusian idea of the skill being a central psychological dimension of an individual links back to Aristotle. In this line of reasoning, Barnes (2006: 106) with reference to Aristotle's De Anima argues that 'possessing a soul is like possessing a skill. A carpenter's skill is not some part of him, responsible for his skilled acts; similarly, a living creature's animator or soul is not some part of it, responsible for its living activities.'

[14] cf. Aristotle (1986)

[15] Here, the similarity between Bourdieu's idea on cultural capital and habitus can be argued.

[16] Here, there is a strong similarity between Aristotelian habitus/psyche and Sayer's idea of habitual dispositions.

Previously, emotions and socio-emotional differences have been explored as a form of capital by Reay (2004). However, recent research acknowledges that understanding of links between emotions and social dominance within Bourdieu's research needs to be addressed in the context of habitus (Holt, Bowlby & Lea, 2013; Reay, 2015). In this line of argument, Edgerton and Roberts (2014) present an argument where emotions form the non-cognitive part of habitus, whereby, intellectual and sensory experiences are linked to the cognitive part of habitus.

Further exploring the non-cognitive part of habitus, Schmitz, Flemmen and Resenlund (2018) recently investigated how fears and worries, embedded in class habitus, are further impacting mechanisms of domination and the power structure of society. In this manner, they argue that different social classes perceive fears and worries in particular societal and symbolic order reflecting the capital volume and structure. Generally, the volume and structure of capital corresponds to the volume and intensity of fear. Lower social classes having little overall capital suffer from stronger overall fear, anxiety, social scepticism and low trust compared to that of people from the middle and upper classes. Such perceptions of lower classes could be associated with the absence of control over the course of their life. Upper classes, in contrast, are primarily characterized by the very absence of such worries, because they are in control over the course of their life. Thus, it could be argued that the level of fear reflects the level of control over one's own life. Higher levels of fear in lower social classes therefore reflect the similarly lower perception of control over one's own life and vice versa. Here, they argue that the volume and structure of capital does not only reflect what a person possesses, but also involves the possession of *specific* fears. Such *habitus of fear* therefore does not only reflect unequal distribution of capital and related social inequality, but also reflects inequality in different psychological structures of people. Thus, the very nature of fear and its symbolic dimension of subordination (i.e., not being in control)

can be understood as a contributor to the reproduction of symbolic power relations. Schmitz, Flemmen and Resenlund's research (2018) is therefore one of a few examples of epistemic and methodological clarity of habitus in the context of social inequalities that can develop an understanding of multidimensional perpetual inequalities. In line with Schmitz, Flemmen and Resenlund (2018), it could be argued that people with lower levels of external resourcefulness and thus lower levels of capital lack the internal perception of control, thus are unable to cope with stressful situations in their lives. Accordingly, people with a higher level of external resourcefulness and thus a higher level of capital, have internal perception of control, thus are able to cope with stressful situations in their lives. In line with this reasoning, emotions and their control become a distinctive part of anatomy of habitus (cf. Wacquant, 2016). Here, external material inequality translates to internal cognitive disposition that further enables the perpetual reproduction of inequalities in an ontologically and epistemologically similar manner as argued by Marmot (2015).

Overall, despite Bourdieu's extensive ontological elaboration of his idea on habitus, the latter remains (perhaps deliberately) epistemologically abstract and methodologically under researched. Wacquant (2016) refers to these unclarities as the 'theoretical pudding of habitus' that is reflected in its 'empirical eating' (p.70), which leaves the anatomy of habitus somewhat unexplored. Here, it could be argued that Bourdieu's vagueness and abstraction of habitus is rooted in Aristotelian ontological unity between body and soul. As discussed earlier, for Aristotle (1986), the relation between body and soul lies in the association between matter and form. For Aristotle, there is unquestionable 'unity' between the body and soul (Barnes, 2006). In this line of argument, Aristotle (1986:159) argues that:

> ‘If then we must say something in general about all types of soul, it would be the first actuality of a natural body with organs. We should not then inquire whether the soul and the body are one thing, any more than whether the wax and its imprint are, or in general whether the matter of each thing is one with that of which it is the matter. For although unity and being are spoken of in a number of ways, it is of the actuality that they are most properly said.’

Ontological unity between body and soul (i.e habitus in Bourdieu’s writings) links to epistemological and methodological inseparability of habitus from lifestyle and level of cultural capital (cf. Bourdieu, 2010). Here, it should be noted that whereby Bourdieu draws from Aristotle’s vocabulary and ontological unity between body and soul, he did not draw from an Aristotelian systematic and structural approach towards psyche in order to fulfill the void of habitus. Here, a more structural approach towards the idea of habitus would bring more clarity to the concept.

Accordingly, the issue of habitus, particularly in the context of a healthy lifestyle remains vague and linked either to taste and or to taste-related lifestyle and their structural reproduction. The majority of research applying Bourdieu's ideas *mutatis mutandis* understands *taste as meta disposition of habitus* and accordingly lifestyle as its disposition (cf. Lahire, 2003). There is a lack of epistemic and methodological clarity of habitus in application of Bourdieu's research in the context of health. Here, theoretical debates among researchers are discussing the ontological agency-structure dichotomy (Abel & Frohlich, 2012; Veenstra & Burnett, 2014) and related methodological issues, where the concept of habitus at the end still remains either ‘abstract’ or ‘absent’ (Veenstra & Burnett, 2014) and therefore needs special attention in the context of health-interventionism (de Morais Sato et al., 2018). The issue contributes to the difficulties with epistemological and methodological operationalization of habitus in the context of a pathway of inequalities in health and a healthy lifestyle (Hinote, 2015, cf. Cockerham & Hinote, 2009).

In this line of reasoning, Marmot's concept of control as a person's internal capability of perception of control, embedded in his/her environment, could represent an attempt to bring more clarity into understanding of perpetual social inequalities in urban areas. Following this line of thought, the concept of self-control and ability to regulate one's thought, emotions, impulses and performance is ingrained in the concept of habitus (i.e., Elias, 1994; Elias & Dunning, 1986; Bourdieu, 1990). Marmot's ontological naturalism and epistemic pragmatism in the context of health-inequalities, bringing to light concepts from psychology and combining them with Bourdieu's understanding of persisting social inequalities in health and healthy lifestyle could be beneficial for both lines of thought in the context of health and a healthy lifestyle. On the one hand, natural sciences (medicine and psychology) could gain deeper understanding of the socio-economic impact on the distinctive qualities of a person's psyche, while, on the other hand, social sciences could gain more understanding of the mechanisms enabling perpetual inequalities and self-reproduction of dominance. Thus, in line with this research, the concept of self-control from psychology, joined with Bourdieu's understanding of perpetual inequalities and Marmot's naturalist view, could provide a broader analytical framework for understanding the persisting multidimensional inequalities in health in an urban area.

2.4.2 THE CONCEPT OF SELF-CONTROL AS AN INDICATOR OF HEALTH-RELATED INEQUALITY

Self-control happens when a person consciously regulates and delays the reinforcement of (re)action instead of taking immediate impulsive reaction (e.g. waking up and going for a run instead of sleeping in or not eating a delicious cake to lose weight) (Carlson, Johnson & Jacobs, 2010; Tangney et al., 2004). From a behavioural perspective, self-control is a learned and developed ability

of self-regulation and of coping with various situations where a person needs to resist temptation (Baumeister & Tierney, 2011). Such an internal habit (i.e., skill) of self-control enables a person to override their unconscious and uncontrolled emotional impulses considered as abnormal, uncivilised and dangerous (cf. Dolan & Connolly, 2014). Because of these characteristics, trait self-control has been identified as a significant factor in the path between one's *intention* to behave in certain manner and *actual* behaviour and performance, i.e. intention-behaviour path (Pfeffer, Englert & Müller-Alcazar, 2019; Pfeffer & Strobach, 2017).

Self-control therefore operates as an internal capacity to alter one's own impulsive behavioural response in line with goals and standards in order to enable not only social survival but also success, thriving and dominance. Thus, self-control can be understood as a distinctive quality and ability to overcome primal impulsive response and to enforce a more rational, civilised, virtuous and controlled type of behaviour. Consequently, self-control is also considered as a central function and disposition of the habitual self within his/her socio-cultural environment (Baumeister, Vohs & Tice, 2007). Accordingly, self-control is considered as an intimate resource and capacity of strength and best performance (cf. Baumeister, Tice & Vohs, 2018; Baumeister & Tierney, 2011; Baumeister & Vohs, 2007).

In line with Freud (Freud, 1930), Tangney et al. (2004) argue that such human capacity to inhibit antisocial impulses in order to adapt (fit) social (i.e., dominant) life is the *hallmark* of civilised life (Tangney et al.., 2004: 272). In this line of reasoning, Baumeister (2005) argued how an individual's ability to control own thoughts, emotions, immediate impulses and performance, is shaped within society and its cultural, social and moral norms. Thus, humans are *cultural animals* as opposed to Aristotle's social/political animals (ibid.).

Such an idea links with Elias and Dunning's (1986) concept of trait self-control being a central element of the civilised society. Accordingly, such a perspective links also to Bourdieu's theory of habitus, where self-control can be understood as an element of acculturation, socialisation, collectivisation and assimilation in the dominating culture or an element of dominating (i.e., controlling) culture itself. Accordingly, self-control becomes part of a person's *identity* and an element of social distinction and perpetual inequality.

Recently, in psychology, research on heritability and intergenerational transmission of self-control emerged. In this line of reasoning, it is argued that the level of self-control is intergenerationally *genetically* transferred and heritable. Bolger, Meldrum and Barnes (2018) and Wang, Fan, Tao and Gao (2017) investigated intergenerational transmission of self-control from parents to children. High parental levels of self-control (in particular, mothers' self-control) have been identified as a significant predictor of children's level of self-control across childhood and adolescence. Here, Bolger, Meldrum and Barnes (2018) identified maternal/female self-control as being more stable than paternal/male self-control and thus a better predictor of children's self-control. This line of reasoning can complement research in sociology, where it is argued that self-control is transferred through social learning, cultivation and *Bildung* (cf. Bourdieu, 1986; Wang, Fan, Tao & Gao, 2016).

Recently, Strulik (2019a, 2019b) researched the concept of trait self-control as a component of life-cycle health and longevity. Here, it has been argued that lower self-control reduces average life by up to five years in combination with unhealthy food consumption, less physical exercise and lower investment in one's own health.

Baumeister, Vohs and Tice (2007) and Baumeister (2005) argued that self-control resembles a muscle. Just like muscle, in order to gain strength and enduring

stamina, self-control needs to be trained and skilled in various cultural situations that need exertion of controlled response. The idea links to Elias and Dunning (1986), when self-control is presented as socio-psychological function, trained in various situations that need an emotional response (i.e., various leisure activities). Interestingly, Elias and Dunning (1986) in identical manner use the analogy of muscle and self-control. Equally, the idea of self-control operating as a muscle is identical to Bourdieu's embodiment of the 'feel for the game' where an experienced player through training acquires practical ability and skill to adjust his bodily and emotional reaction to almost every predictable and unpredictable opponent's move (i.e., social situation). Acquisition of tennis skills requires repetition and training until players' moves become intuitive, fully embodied and less impulsive. In a similar way, it could be argued that the cognitive-behavioural skill of self-control if trained in different social situations becomes intuitive and essential set of internal resources.

According to Baumeister, Vohs and Tice (2007), just like muscle, self-control gets depleted, when it is over exercised, or the resources get short. This hypothesis has been tested under controlled environments of laboratories, where people have been given two or more successive tasks to complete, in which they needed to exert a level of self-control. A second task appeared to be exerted with lower results, because a level of self-control has been previously depleted. Thus, the authors suggested, self-control is a limited resource. However, Crescioni et al (2011) have tested trait self-control in different periods of time and argued to be stable over time. Highly resourceful people with higher levels of self-control will generally develop more positive personal and social outcomes, whereby low resourceful people with lower levels of self-control will generally develop less positive personal and social outcomes. Nevertheless, after two decades of research on self-control (predominantly in controlled laboratory environment), socioeconomic context in which self-

control accrues remains under researched, in particular in *real, natural* (i.e., less controlled) environments outside the lab (Baumeister, Tice & Vohs, 2018).

DIFFERENTIATING BETWEEN DIFFERENT CONCEPTS OF CONTROL

Generally, the concept of self-control needs to be differentiated from two other types of control, namely 'locus of control' and 'perception of control'. The concept of locus of control was developed by Rotter and is a derivation of Marx's alienation theory in psychology (1966). Locus of control in cognitive psychology is learned subjective expectation about the outcomes of situations (Kraus, Piff & Keltner, 2009; Manstead, 2018; Mirowsky & Ross, 2013). In cases of *external* locus of control there is a general perception that the outcomes of situations are determined by external forces like fate, luck, chance or powerful others. Concurrently, in cases of *internal* locus of control it is believed that the outcomes of situations are determined by a person's internal choice and his/her own action (Mirowsky & Ross, 2013; Rotter, 1966). Thus, locus of control is believed to be a generalised concept about the self (Bandura & Walters, 1977). Rotter (1966) argues that people who hold a perception and belief that they can internally control their own destiny are: 1) more alert to those aspects of the environment which provide useful information for their future behaviour; 2) take steps to improve their environmental conditions; 3) place greater value on the skill of achieving reinforcements and are generally more concerned with their ability, particularly their failures and 4) are resistive to subtle attempts to influence them (Rotter, 1966:25). The concept of locus of control has been widely applied in the context of health and, in general, argues that people with internal locus of control develop healthier lifestyles than people with an external perception of control.

Wallston, Wallston and DeVellis (1978) adapted the concept of locus of control in the context of health and developed a general health locus of control scale.

The items of the scale comprise three subscales: internality (internal health locus of control), powerful others externality (such as doctors and other practitioners) and chance externality (such as fate or luck). There is an extensive body of literature, researching the health sense of control, which generally suggests that people scoring high on the chance dimension of health locus of control ('pure chance') pursue less healthy lifestyles (Helmer, Krämer & Mikolajczyk, 2012; Norman, Bennett, Smith & Murphy, 1998). People scoring low on the chance dimension of health locus of control ('pure internals') pursue a healthier lifestyle (more exercise, healthy diet and less smoking and drinking alcohol). The dimension of powerful others is insignificant (Cheng, Cheung & Lo, 2016; Grotz, Hapke, Lampert & Baumeister, 2011) or related to the performance of less healthy lifestyles (Norman, Bennett, Smith & Murphy, 1998). People's socio-economic conditions like higher age, low socioeconomic status and migration background have been associated with 'powerful others' and 'chance' dimensions (Grotz, Hapke, Lampert & Baumeister, 2011). The general concept of locus of control has been adapted within Marmot's wealth-to-health pathway of multidimensional inequalities in health.

People's locus of control influences the development of two distinctive perceptions of control, namely perception i.e., awareness of control and perception of powerlessness (Mirowsky & Ross, 2013). People with high intimate (i.e., internal) awareness of control generally develop a perception that their actions and efforts will affect the desired outcome and will therefore be determined by their internal agentic behaviour. Such intimate awareness will lead them to develop general self-orientation of control, mastery and effectiveness (Mirowsky & Ross, 2013). Accordingly, people with a lower awareness of intimate control tend to develop a perception that their efforts will not result in a desired outcome and will be determined by external forces like luck, fate, chance or powerful others. Such intimate perceptions will therefore lead them to develop a general self-orientation of powerlessness and

helplessness. In this context a person's perception of control and mastery over their own life has been previously researched as a mediator between subjective perception of social class and several positive and negative social outcomes (Lachman & Weaver, 1997; Kraus, Piff & Keltner, 2009; Manstead, 2018). Higher levels of a person's sense of control have been linked to several positive social outcomes such as well-being, health and better educational attainment (Kraus, Piff & Keltner, 2009; Lachman & Weaver, 1997; Mirowsky & Ross, 2013).

The concept of locus of control has been linked to Baumeister's understanding of self-control, willpower and the learned resourcefulness model. Referring to Rotter's concept of locus of control, Stillman, Baumeister & Mele (2011) argued that people with higher self-control hold fewer 'irrational' beliefs (i.e., belief that chance and/or fate or other external factors are controlling the outcome of events in their lives) and are better in controlling and tolerating noxious stimuli. Thus, people with a smaller repertoire of self-control skills and habits are more likely to develop an internal sense of helplessness, whereas people with a higher repertoire of self-control skills are more likely to develop an internal sense of resourcefulness.

Thus, the concept of perceived self-control is a concept which is distinctive from the idea of self-control. The concept of perceived sense of control has been previously well researched in the socio-economic context and in relation to health-inequalities and has been also adapted by Marmot (2015) to explain perpetual inequalities in health and healthy lifestyles. Both concepts, namely the concept of locus of control and the concept of perceived self-control have been researched as mediators between socioeconomic status and health and healthy lifestyles, the concept of self-control remains under-researched from this perspective. Nonetheless, more recently in order to enhance an understanding of the context in which self-control accrues as a component of the self, Baumeister, Tice and Vohs (2018) suggested that the research interest

should be expanded outside the laboratory controlled environment into the real world environment (and sacrifice some degree of control). Additionally, they suggested that self-control in the context of social inequality is a promising field of research.

DISTINCTIVE DIMENSIONS OF SELF-CONTROL

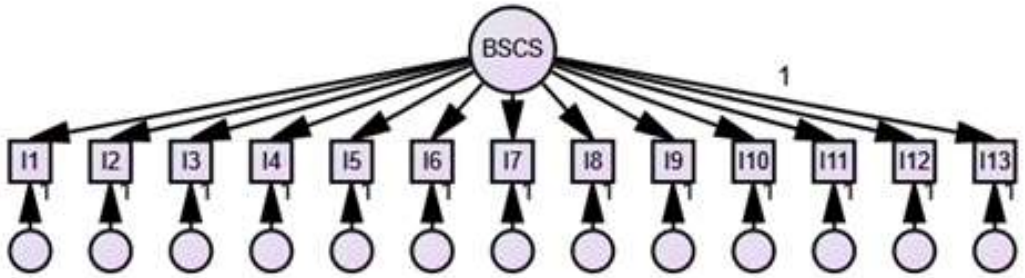
Empirically, Tangney et al. (2004) developed the original 36-item self-control scale from four major domains of self-control, namely, control over thoughts, emotions, impulses, performance and breaking habits. In order to improve the scale's efficiency and usefulness, they have developed and tested brief version of the scale, called brief self-control scale (BSCS) with 13 items.

The authors did not provide evidence of factor loadings nor give a substantial explanation of the dimensionality of the scale, except a short footnote in their original paper, where they identified the following five factors of the BSCS:

- F1 Self-Discipline (5 items)
- F2 Deliberate/Nonimpulsive action (3 items)
- F3 Healthy Habits (2 items)
- F4 Work Ethics (2 items)
- F5 Reliability (1 item)

Thus, a substantial part of the information on item loadings is missing and the BSCS was developed as unidimensional with a good internal reliability (Cronbach's α in study 1 =0.83 and Cronbach's α in study 2 =0.83) (Tangney et al, 2004). However, the factor structure remains one of the methodological issues of the scale (Hagger, Zhang, Kangro et al., 2018; Lindner, Nagy & Retelsdorf, 2015; Maloney, Grawitch & Barber, 2012) (Figure 2.5).

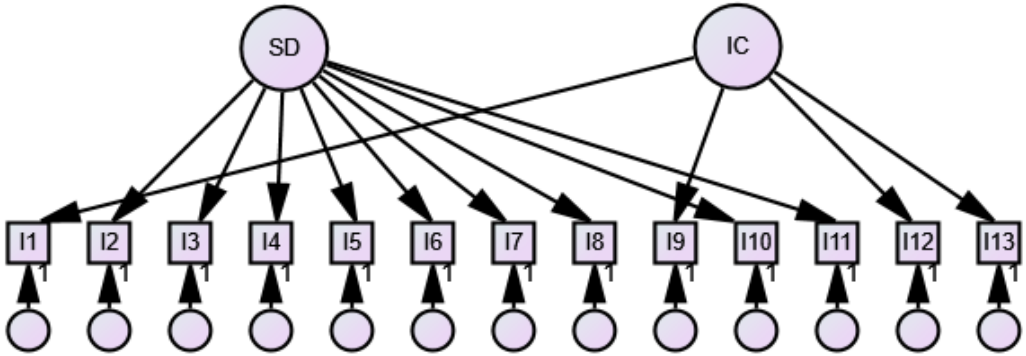
FIGURE 2.5: BSCS AS A UNIDIMENSIONAL CONCEPT PROPOSED BY TANGNEY ET AL. (2004)



Source: Lindner, Nagy & Retelsdorf, 2015

Ferrari, Stevens and Jason (2009) studied self-control in relation to abstinence maintenance and identified two dimensions of self-control, namely self-discipline (SD, 9 items) and impulse control (IC, 4 items) (see Figure 2.6). They identified impulse control as one's ability to resist short-term awards in order to achieve long-term goals (i.e., abstinence maintenance). Also, they linked self-control to general patterns of behaviour. Because of the study's focus on impulse control, they introduced the dimension of impulse control explicitly and were interested in whether the Tangney et al.'s (2004) measure can capture the dimension. Accordingly, the study identified the positive relationship between impulse control and length of abstinence and the negative relationship between self-control and length of abstinence. The factor solution was low and explained 34.3% of the total variance. However, according to Lindner, Nagy and Retelsdorf (2015), the dimension of self-control reflects the negatively worded items, whereas the dimension of self-discipline reflects the positively worded items, thus they argue that the relationship might reflect the wording effect instead of interpretable facets.

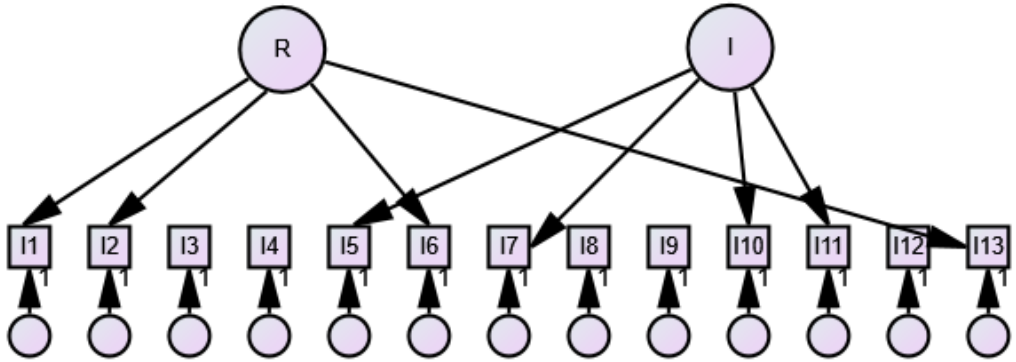
FIGURE 2.6: BSCS AS TWO-DIMENSIONAL CONCEPT AS PROPOSED BY FERRARI, STEVENS AND JASON (2009)



Source: Lindner, Nagy & Retelsdorf, 2015

Similarly, Maloney, Grawitch and Berber (2012) studied the factor structure of the BSCS and identified two factors of the scale, namely restraint and impulsivity. The restraint factor is identical to self-control and self-discipline. The impulsivity factor is related to the tendency to act spontaneously rather than to override the impulses. However, in order to clarify the constructs in their factor analysis they identified two distinctive factors with only 8 items (restraint 4 items and impulsivity 4 items) and removed 5 items from the 13-item BSCS (see Figure 2.7).

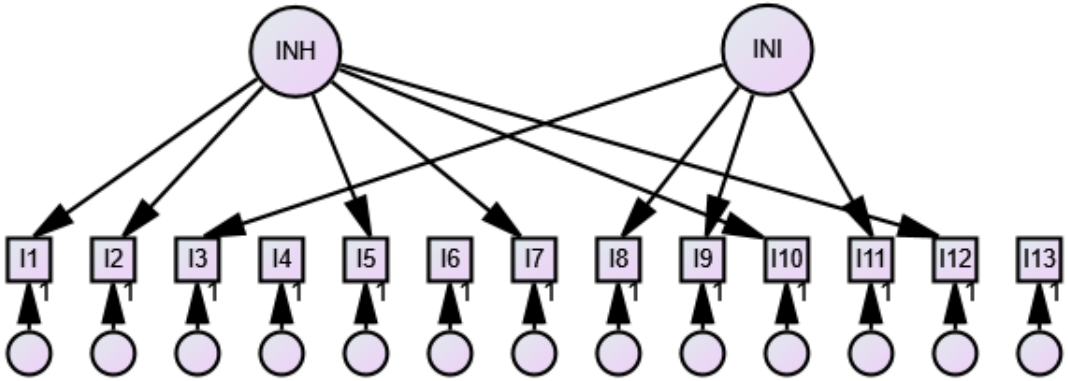
FIGURE 2.7: THE CONCEPTUALISATION OF THE BSCS AS PROPOSED BY MALONEY, GRAWITCH AND BERBER (2012)



Source: Lindner, Nagy & Retelsdorf, 2015

Finally, De Ridder, de Boer, Lugtig, Bakker and Hooft (2011) identified inhibition (i.e., ability to override the impulsive reaction and refrain from undesired behaviours) and initiation (i.e., ability to work towards goal-directed behaviours and initiate desired behaviours) as distinctive factors of the BSCS. Three items could not be classified, six items loaded to the inhibition factor and four loaded to the initiation factor. The authors confirmed that inhibitory self-control is a better predictor of undesired behaviours (i.e., smoking, alcohol consumption) and initiatory self-control is a better predictor of desired behaviours (i.e., hours of exercise and study) (Figure 2.8).

FIGURE 2.8: THE CONCEPTUALISATION OF THE BSCS AS PROPOSED BY DE RIDDER, DE BOER, LUGTIG, BAKKER AND HOOFT (2011)



Source: Lindner, Nagy and Retelsdorf (2015)

Lindner, Nagy and Retelsdorf (2015) compared the relative performance of these two-dimensional conceptualisations and found no clear evidence that any of the applications would be significantly better in predicting positive achievement-related outcome variables than Tangney et al.'s (2004) original unidimensional application.

TRAIT AND STATE SELF-CONTROL

Generally, the theories of self-control differ between two dimensions of self-control, namely a general level of trait (dispositional) self-control and a more specific state (temporary) level of self-control.

Trait self-control is understood as a generally stable internal capacity to control one's own thoughts, emotions, impulses and performance in order to relatively effortlessly adopt to fit the external social environment (Tangney, Baumeister & Boone, 2018). Therefore, people with high trait self-control have better and positive outcomes across various (horizontal) spheres of their lives (Tangney et al., 2004). In the context of a healthy lifestyle, trait self-control has been linked to regular exercise, healthy diet, lower alcohol intake and smoking cessation (Briki, 2018; Cresconi, Ehrlinger, Alquist, Conlon, Baumeister, Schatschneider & Button, 2011; Forestier, Sarrazin, Allenet, Gauchet, Heuze & Chalabaev, 2018; Luehrig-Jones, Tahaney & Palfai, 2018). Crescioni et al (2011) have tested trait self-control in different periods of time and found it to be stable over time. Also, trait self-control has been formed to be significant in predicting subjective well-being, because it initiates desired behaviours (like goal progress and self-efficiency) and inhibits undesired ones (Briki, 2018). Thus, it could be argued, that trait self-control is a relatively constant disposition of the psyche, stable across different social situations and over different periods of time (cf. de Ridder et al., 2011).

Accordingly, previous research suggests that substantial differences exist in people's capacity for trait self-control (Tangney et al., 2004). These differences show that higher trait self-control is linked to generally greater success in life (less pathological behaviour, less crime, higher subjective well-being, better grades and higher interpersonal success) and vice versa (ibid. Burt, 2014). Thus, it could be argued that people with higher levels of trait self-control exhibit a higher internal capacity of psyche that enables them to be more successful, socially desirable and also lead a healthy life. From this perspective it could be argued that trait self-control is a person's internal *habit* that defines his/her general tendency to engage in controlled actions (higher self-control). In contrast, trait self-control, as a general habit, also defines his/her general tendency to engage in impulsive and uncontrolled actions (lower self-control). In this manner, Hagger, Zhang, Kangro, Ries, Wang, Heritage & Chan (2018:5), in line with the typical understanding of trait self-control, define it as a general 'tendency to engage in conscious, deliberative control over actions and supress impulsive, habitual, well-learned dominant responses that occur with little thought or conscious intervention. However, in line withAristotle's (previously discussed) idea on self-control, the general theory of self-control is not particularly concerned with the socio-economic context from which self-control accrues, and the socio-economic context of self-control concept is still scarce and empirically limited on the links between self-control and lower levels of education (Burt, 2014). Recently, Vohs (2013) presented a theoretical framework called the limited-resource model of self-control. She argued how deprived people, in order to overcome more obstacles, are more likely to deplete the internal resource of self-control, which will lead them to a higher likelihood of encountering problematic behaviours, like overeating or/and overspending. Following her proposal, the limited-resource model has been theoretically explored in the context of an affluent population and levels of economic capital (Rickard, 2017) and other related deprivation models (Carmel & Leiser, 2017; Pepper & Nettle, 2017). However, Baumeister, Tice and Vohs (2018) analysing

the application of self-control theory in its second decade since its introduction, argued how extreme poverty has an impact on ego-depletion and lower level of self-control (cf. Vohs, 2013). However, the research on self-control outside the laboratory and a controlled environment is still scarce, thus the 'real-world findings' could enrich an understanding of the model (Baumeister, Tice & Vohs, 2018:144).

If trait self-control identifies a persons' level of dispositional self-control and general resourcefulness, then state self-control identifies their temporary (state) level of self-control. The concept of state self-control indicates that a person's level of self-control varies at any given moment of time (vanDellen & Hoyle, 2010). Typically, differences in self-control throughout the day have been identified as relevant for the level of self-control.

However, where state and trait self-control are resources from the same internal pool of internal energy, then both types of control should vary synchronically over time. From this perspective, the concept of self-control could complement social theories concerned with inequality and domination, embedded in economic and social inequality, however fundamentally linked with the psychological element of control. Nevertheless, the empirical research on trait self-control and its links to state self-control are rare outside the controlled laboratory environment.

Pfeffer and Strobach (2017) argued that recent studies recognised that state self-control seems to be a better predictor of healthy lifestyle than trait self-control. Thus, they further suggest that future studies should simultaneously assess the level of trait and state self-control as predictors of healthy lifestyle.

The concept of self-control is central to a great variety of positive behaviours and psychological regulations that refer to more reasoned (i.e., 'proper', desired) and less impulsive (i.e., undesired) behaviours (e.g. crime, overeating, binge drinking) (Baumeister, Vohs & Tice, 2007; Vohs, 2013). Accordingly, self-control is an 'important factor of success in life' (Baumeister, Vohs & Tice, 2007). It therefore follows that self-control is also a habit of goal-prioritisation and impulse-regulation in the context of a healthy lifestyle (Briki, 2018; Forestier et al., 2018). Generally, unhealthy forms of behaviour tend to be attractive in the short term and therefore need to be restrained and inhibited in the long term. Similarly, healthy forms of behaviour tend to be unattractive in the short term and therefore need to be encouraged in the long term (Forestier et al., 2018). Here, the concept of self-control has been identified as important for successful implementation, regulation and maintenance of healthy lifestyle behaviours (ibid). Previous studies explored how higher learned resourcefulness is linked to smoking cessation (Kennett, Morris & Bangs, 2006), maintaining exercise involvement (Levesque, Gauvin & Desharnais, 2003), healthy diet (Kennett & Nisbet, 1998) and adherence to prescribed medical regimens (Rosenbaum & Ben-Ari Smira, 1986).

In the context of behavioural change strategies and interventions, a person's cognitive-behavioural repertoire and learned resourcefulness of self-control do not directly correspond to change strategies per se, but rather to one's ability to assess and apply behavioural changes in an appropriate manner (Levesque, Gauvin & Desharnais, 2003; Rosenbaum, 1990). In this sense, people with a higher level of self-control (i.e., learned resourcefulness) 'try harder' when attempting healthy lifestyle change and are eventually also more successful with the implementation of healthy lifestyles (Levesque, Gauvin & Desharnais, 2003). This links with Baumeister's idea of resourcefulness, that in times of

struggle and challenging situations, people with a higher level of learned resourcefulness are more stress resistant and able to help themselves. The idea resembles the concept of cultural capital where this (especially institutionalised) represents the set of skills and pertinent knowledge within a broader spectrum of problem-solving skills and knowledge on risks that a person applies in the context of health by adapting long-term healthy lifestyle.

Thus, higher levels of learned resourcefulness become a person's internal asset and advantage, especially from the perspective of social inequality (Vohs, 2013). Here, deprived people have to overcome more difficult situations in daily life, they are more likely to tap into the same common pool of internal resourcefulness and self-control and are therefore more likely to deplete their self-control resource (ibid). This is more likely to lead them to more impulsive and less desired behaviours. Thus, in the context of social inequality the concept of self-control becomes a psychological classifier of social position. Interventions in health-inequalities, concerning self-control need to be tackled in proportion to the level of deprivation (cf. Marmot's *proportionate universalism*). However, the mechanisms through which self-control accrues, links between state and trait self-control and their effects on a desired set of healthy behaviours is under-researched (Forestier et al., 2018).

Vohs (2013), in her limited-resource model of self-control, argued that self-control is a stable but limited learned resource and internal power and capacity of a person. Thus, people differ in their learning histories and naturally, differ among themselves (Tangney, Baumeister & Boone, 2004). Socio-economic disparities impair people's capacity to exert self-control, because they deplete persons' internal resources and capacity for self-control (Vohs, 2013). This results in more impulsive decision making, lower performance and ultimately, in more harmful behaviours that further add to the perpetuation of inequalities. She supports her proposed limited-resource model of self-control with

theoretical underpinnings of more impulsive behaviours (compulsive eating, money spending) and even chronic physical pain. Her main argument about how the concept of self-control can complement understanding of multidimensional socio-economic deprivation is that deprived people are caught in the eternal cycle of perpetual deprivation because the external material deprivation and dealing with existential issues and permanent stress drains them with little internal capacity left for resisting impulses and rational decision-making. Thus, internal learned resourcefulness or deprivation becomes a person's internal habitual characteristic and general behavioural matrix. If self-control becomes his/her asset and advantage in different social situations, then a lack of self-control becomes a disadvantage. In both cases, self-control or lack of it becomes one's social identity, translated from one social situation to another. Thus, the concept of self-control as a meta-scheme of regulation of thoughts, emotions, impulses and performance can appropriately infuse the concept of habitus as a durable classificatory matrix and disposition towards certain behaviours and actions (Lizardo, 2004). Here, the analogy between self-control and trained muscle is again appropriate and has been used in both cases (in the case of the theory of habitus and in the case of the theory of self-control). However, muscle training is multidimensional - internal and external. Exercise of control takes place in people's external socio-economic background, where more affluent people are able to control their everyday life through a higher standard of living, more predictable and controlled socio-economic circumstances and a greater spectrum of social and cultural activities. Such an externally diverse but stable environment converts into a person's internal disposition and level of high self-control that further enables controlled and positive behaviour, including health-protective behaviours. Thus, it is reasonable to understand emotional and bodily control as a 'power resource' and an element of multidimensional (economic, social and psychological) inequality (Paulle, van Heerikhuizen & Emirbayer, 2013:163).

From this perspective, a person's internal learned resourcefulness as self-control is proposed as a habitual mediator between his/her socio-economic background (level of income, education and occupation) and a set of positive health-related behaviours (i.e., healthy lifestyle). Because of the links between self-control and a general tendency to regulate thought, emotion, impulses and performance, the concept seems appropriate for the application in the context of perpetual health-inequalities. The concept of self-control is, therefore, in place to complement Bourdieu's theory on habitus. This theory which conceptualises habitus as a matrix of certain behaviour, linked to the concept of social power and dominance, is an approach that is able to explain ingrained perpetual multidimensional inequalities in urban areas more precisely than Sen's approach, used by Marmot (2015). Jointly, the social approach of Bourdieu and psychological framework of self-control can contribute to a more complex understanding of perpetual inequality in health, informing Marmot's pathway of inequalities and interventions in health and a healthy lifestyle.

2.4.3 CONCLUSION

Generally, there is a substantive amount of research on Bourdieu's concepts, focusing on how socioeconomic status, depicted by the level of economic and cultural capital, are predictors of particular critical behaviours like physical activity, alcohol consumption and healthy eating (MacArthur, Jacob et al., 2017; Skuland, 2015; Wiltshire, Lee & Williams, 2017) and a healthy lifestyle in general (Burnett & Veenstra, 2017; Oncini & Guetto, 2017, 2018). Apart from taste, other dimensions of habitus in relation to socioeconomic status are rarely investigated as independent factors. Only recently interdisciplinary research emerged, incorporating psychological dimensions into Bourdieu's framework (Schmitz & Barth, 2018; Schmitz, 2019; Schmitz, Flemmen & Rosenlund, 2018). Accordingly, self-control as a distinctive dimension of habitus and a mediator between socioeconomic status and lifestyle has been under researched and

could inform Bourdieu's ideas on reproduction of health-related structural inequalities.

Here, Bourdieu's theorisation of lifestyle, linking socioeconomic standard of living, habitus and a healthy lifestyle in a consecutive pathway of inequality, provides a unifying framework of research in the context of a healthy lifestyle. Accordingly, interventions in line with Bourdieu's framework need to be framed in a similarly holistic manner. Burnett and Veenstra (2017) argue that any intervention in any isolated factor (capital, habitus and practice), in order to improve health, will not change health-related practice directly. In a similar manner, Spotswood and Tapp (2013) present a capital portfolio approach (intervention in capital level will affect health-related practice) as an effective method of intervention. Consequently, for any health-related practice, both authors (Burnett & Veenstra, 2017; Spotswood and Tapp, 2013) suggest intervention in the context of all related concepts, namely, capital, habitus and practice. Such a perspective is in line with recent guidelines for the design of interventions in critical behaviours (cf. Michie, Atkins & West, 2014). The guidelines state that particular critical behaviour (e.g. smoking, alcohol consumption, lack of physical activity) should not be targeted in isolation. Instead, it should be treated as a 'part of a system' of intertwined behaviours (Michie, Atkins & West, 2014:35). Combined theories would fuel more in-depth understanding and targeted design of interventions in health and a healthy lifestyle in line with the idea of proportionate universalism as proposed by Marmot et al. (2010).

Accordingly, research in psychology, in particular that focusing on the concept of self-control as a stable component of self-regulation of thought, emotion and impulses, argues how people with a higher level of self-control live healthier lives with more physical exercise, healthy diet, less smoking and alcohol consumption. The same research suggests that the concept of self-control has a

classifying potency, dividing the population between people with lower and those with higher levels of self-control (Baumeister, 2010; Tangney, Boone & Baumeister, 2004). Here, people with higher levels of self-control are generally more successful in life and vice-versa. In the theory of self-control, the distinction is made between stable (trait) self-control and temporary (state) self-control. Even though both concepts are coming from the same root (i.e., same regulative capacity of psyche), they are rarely researched together or outside a controlled laboratory environment.

Self-control, at both trait and state levels, is established as a predictor of healthy or unhealthy behaviour and also a predictor of healthy and unhealthy lifestyles. Here again, higher levels of trait and state self-control predict more positive behaviours and vice-versa. Nevertheless, both concepts taken together (i.e., state and trait self-control) as predictors, could bring more understanding to the complexity of health-related behaviours. Accordingly, self-control as a scheme of psyche (i.e., forma mentis) forming lifestyle could complement an understanding of habitus and the production and reproduction of lifestyle relative to a socioeconomic context and an individual's capital portfolio. Here, in comparison to Marmot's concept of self-control as an individual's general capacity, the concept of self-control with its regulatory and classificatory potency can at the same time address the distinctive paradigms of interventionism in the context of health inequalities and also capture the complexity of Bourdieu's habitus. Also, the mechanism by which material resources influence cognitive resources and healthy lifestyle is less known and rarely tested in a 'real' environment, outside the controlled laboratory environments. Accordingly, bringing all lines of thought together (social, economic and psychological) could inform an understanding of multidimensional perpetual inequality. As a result, a multidimensional pathway of inequality, linking a person's socioeconomic status, internal structure of psyche and lifestyle, could be identified. By combining both

theories, each theory would complement each other. The psychological dimension of self-control could complement Bourdieu's theory of habitus and his psychology of social class and equally, Bourdieu's concepts of capital would expand the understanding of the socioeconomic context in which self-control accrues and extend self-control theory in the realm of urban social psychology. Equally, Bourdieu's spatial distribution of capital in urban areas in combination with the context of self-control could fuel more complex understanding of how self-control is spatially distributed within an urban area.

Overall, the pertinent literature suggest that self-control might play a role in the relationship between capital, socio-economic standard of living and a healthy lifestyle, in particular in regard to patterns of physical activity, healthy diet, smoking and alcohol consumption. However, such model has not been tested previously as a mechanism to explain perpetual inequalities in health and a healthy lifestyle. To investigate the problem of the pathway of inequality, the following chapter presents the conceptual framework and the development of hypotheses.

2.5 CONCEPTUAL FRAMEWORK

Bourdieu's approach is adopted in order to understand the general direction of the pathway, starting from material resources and external socioeconomic conditions of living (i.e., means of economic and cultural capital), through a person's psychological cognitive resource of self-control (i.e., habitus) to health-related behaviours and health (i.e., ends). The conceptual framework represents more specific graphical and verbal explanations of the proposed theoretical framework (see Figure 2.9).

FIGURE 2.9: FRAMEWORK PROPOSING THE PERPETUAL CAUSAL PATHWAY FROM SOCIO-ECONOMIC FACTORS, THROUGH A SELF-CONTROL TO A HEALTHY LIFESTYLE AND HEALTH

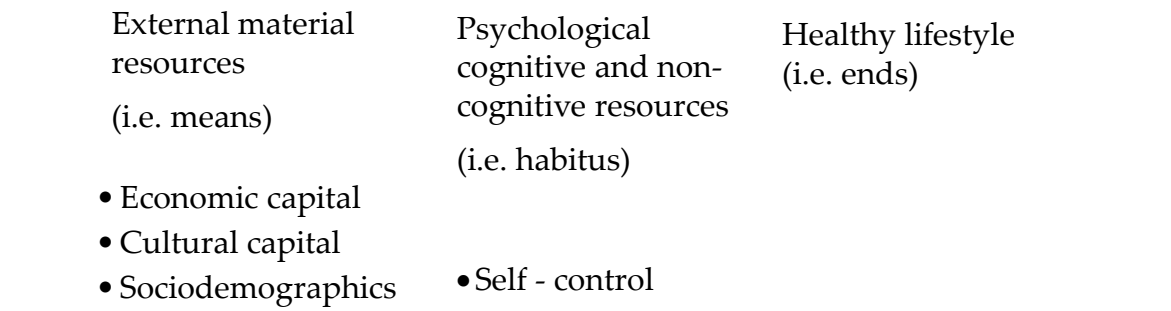


Figure 2.9 present an inter-disciplinary conceptual framework, identifying the multidimensional pathway of inequality. The relevant definitions of the concepts and specific variables to be examined will be presented below.

2.5.1 MEASURING ITEMS

In order to avoid any alternative explanations that would potentially cause confusion and misunderstanding of the conceptual framework, operational definitions of key measuring items were established (Gray, 2018; Sekran & Bougie, 2016; Shoemaker, Tankard & Lasorsa, 2004).

SOCIOECONOMIC STATUS (SES)

Individual socioeconomic status (SES) is understood as an indicator of one's socioeconomic position (i.e., social class, socioeconomic status), combining the information on income, education and occupation (Bourdieu, 1987; Schmitz, Flemmen & Rosenlund, 2018). More specifically, SES is an element of external resourcefulness of residents' health and material inequality (Bourdieu, 1987; Mirowsky & Ross, 2013) (see Table 2.1).

TABLE 2.1: THE ITEMS MEASURING THE CONSTRUCT OF AN INDIVIDUALS' SOCIOECONOMIC STATUS

Sources	Items	Codes
Bourdieu, 1987; Mirowsky & Ross, 2013; Schmitz, Flemmen & Rosenlund, 2018	Level of annual income	INC
	Level of own education	EDU1
	Level of occupation	OCC

ECONOMIC CAPITAL (EC)

The concept of economic capital represents the broad range of economic resources that position individual in the material world, consisting of income, home ownership and level of comfort in everyday life. Indicators of socioeconomic position (i.e., social class), material inequality and element of external resourcefulness (Bourdieu, 1990; Burnett & Veenstra, 2017; Savage, 2014; Schmitz, Flemmen & Rosenlund, 2018) (see Table 2.2).

TABLE 2.2: THE ITEMS MEASURING THE CONSTRUCT OF AN INDIVIDUALS' LEVEL OF ECONOMIC CAPITAL

Sources	Items	Codes
Veenstra, 2017; Savage, 2014; Schmitz, Flemmen & Rosenlund, 2018	Level of annual income	INC
	Housing situation	HOUSE
	Level of comfort in everyday life	COMFORT

CULTURAL CAPITAL (CC)

The concept of cultural capital represents the broad range of cultural resources that position individual in the material world, consisting of institutionalised (own and parental education), objectified (cultural valuables at home) and embodied (participation in leisure) form. Cultural capital is considered as an indicator of socioeconomic position (i.e., social class) and material inequality (Abel et al, 2014; Bourdieu, 2018; Cuypers et al., 2012; Holt, 1997; Mirowsky & Ross, 1998; Pampel, 2012; Pinxten & Lievens, 2014; Schmitz, Flemmen & Rosenlund, 2018) (see Table 2.3).

TABLE 2.3: THE ITEMS MEASURING THE CONSTRUCT OF AN INDIVIDUALS' LEVEL OF CULTURAL CAPITAL

Sources	Items	Codes
Pampel, 2012; Pinxten & Lievens, 2014; Schmitz, Flemmen & Rosenlund, 2018	Level of own education	EDU1
	Level of parental education	EDU2
	Cultural valuables at home	CHILDCC
	Leisure participation Watch TV	LEISURE1
	Go to cinema	LEISURE2
	Go leisure shopping e.g. for clothes (not food)	LEISURE3
	Read a book or newspaper	LEISURE4
	Attend organised cultural events e.g. concerts, live theatre, exhibitions	LEISURE5
	Get together with relatives	LEISURE6
	Get together with friends	LEISURE7
	Play cards or board games	LEISURE8
	Listen to music	LEISURE9
	Attend organised sporting events as a spectator (e.g. football)	LEISURE10
	Do crafts, drawing, painting, sculpting or photography	LEISURE11
	Spend time on the internet/PC (e.g. browsing, playing online games)	LEISURE12

SELF-CONTROL

Self-control is cognitive-behavioural capacity to regulate thoughts, emotions, impulses and performance in order to alter one's own immediate behavioural response in line with controlled long-term rational goals and standards (Baumeister, Vohs & Tice, 2007). In the context of this research, self-control consists of trait (dispositional) and state (situational) components. Self-control is an element of internal resourcefulness, embedded in socio-economic living conditions and predictor of behavioural outcomes (Baumeister, Vohs & Tice, 2007; Elias & Dunning, 1986; Sayer, 2011; Vohs, 2013) (see Table 2.4).

TABLE 2.4: THE ITEMS MEASURING THE CONSTRUCT OF AN INDIVIDUALS' LEVEL OF SELF-CONTROL

Source	Items	Codes
Trait self-control Tangney, Baumeister and Boone (2004)	I am good at resisting temptation	TraitSC1
	I have a hard time breaking bad habits	TraitSC2
	I am lazy	TraitSC3
	I say inappropriate things	TraitSC4
	I do certain things that are bad for me because they are fun to do	TraitSC5
	I refuse things that are bad for me	TraitSC6
	I wish I had more self-discipline	TraitSC7
	People would say I have strong self-discipline	TraitSC8
	Pleasure and fun sometimes keep me from getting work done	TraitSC9
	I have trouble concentrating	TraitSC10
	I am able to work effectively toward long-term goals	TraitSC11
	Sometimes I can't stop myself from doing something, even if I know it is wrong	TraitSC12
	I often act without thinking through all the alternatives	TraitSC13
State self-control Bertrams, Englert and Dickhäuser (2010)	I have to force myself to stay focused	StateSC1
	I have strong willpower	StateSC2
	I am having trouble pulling myself together	StateSC3
	I could resist any temptation	StateSC4
	I am having trouble paying attention	StateSC5
	I would have no trouble bringing myself to do difficult tasks	StateSC6
	I need something pleasant to make me feel better	StateSC7
	I feel drained	StateSC8
	I feel calm and rational	StateSC9
	I feel like giving up	StateSC10
	I feel overwhelmed	StateSC11

HEALTHY AND UNHEALTHY LIFESTYLE

Behaviours and/or activities pursued for the purpose of protecting and maintaining physical and mental health, directed towards decreasing the probability of encountering illnesses are defined as healthy lifestyle (Pender, Murdaugh & Parsons, 2014; Ping, Cao, Tan, Guo, Dou & Yang, 2018; WHO, 1998). Healthy lifestyle is often promoted by regular exercise, healthy diet, low alcohol intake and smoking absenteeism (Burnett & Veenstra, 2017; WHO, 1998) (see Table 2.5).

In the context of physical activity, literature differentiates between vigorous and moderate levels of activity. Among the established questionnaires, the International Physical Activity Questionnaire provides a straightforward scale of the level of physical activity and the final score of one's physical activity (i.e., WLTAS score - for a detailed measure of the score see Table 2.5)

.

TABLE 2.5: THE ITEMS MEASURING THE CONSTRUCT OF AN INDIVIDUALS' HEALTHY LIFESTYLE

Sources	Items	Codes
Healthy lifestyle HLS (high WLTAS score, healthy diet)	High level of Physical activity (International Physical Activity Questionnaire, 2005) Travelling to work Riding a bicycle Running	 TravellingWork1 TravellingWork2
	Weekly leisure activity score (WLTAS) (Godin, 2011) Overall exercise score (9 x Strenuous) + (5 x Moderate) + (3 x Mild) strenuous exercise (heart beating rapidly) moderate exercise (not exhausting) mild exercise (minimal effort)	WLTASscorehigh
	Healthy Diet (Forestier et al., 2018) Eat fruit or vegetables	Diet1
	Eat high-fibre food (e.g. whole wheat pasta, whole grain bread, brown rice)	Diet2
	Eat a variety of foods which give a balance of the four food groups (fruits and vegetables, dairy products, carbohydrates, meat/fish/eggs)	Diet3
	Eat food that is low in fat (e.g. chicken, fish) or drink skimmed milk	Diet4
	Drink water	Diet5
Unhealthy lifestyle UNHLS (low WLTAS score, unhealthy diet, alcohol	Low level of physical activity (International Physical Activity Questionnaire, 2005) Travelling to work Walking	 TravellingWork3 TravellingWork4

consumption and smoking)	Other (bus, car)	
	Weekly leisure activity score (WLTAS) (Godin, 2011)	WLTASscorelow
	Unhealthy Diet (Forestier et al., 2018) Eat food such as chips, chocolate and sweets	Diet6
	Add white sugar or your food and drink	Diet7
	Eat fried food	Diet8
	Add salt to your food	Diet9
	Drink sugary drinks (e.g. fizzy soft drinks, sports drinks, energy drinks, fruit-flavoured drinks)	Diet10
	Smoking Number of cigarettes you smoke during last week	Cigarettes
	Number of times you vape	Vaping
	Alcohol consumption Number of units of alcohol drunk	AlcUnits
	Number of times when you have 6 or more units of alcohol in one session	BingeAlc
	Number of days you drink alcohol	AlcDays

2.5.2 MODERATING VARIABLES

2.5.2.1 GENDER

In relation to social class, Bourdieu theorises the concept of body and bodily hexis (Bourdeiu, 2001) as an expression of socio-psychological constructions between genders. In the context of symbolic violence and masculine domination, he argues that female body compared to male body is more likely to be exposed to class-related objectification (e.g. nurtured sleek body as an expression of psychological properties of control of bodily appetites). Therefore, in the context of male dominance, females are more likely to voluntarily, naturally (i.e., intuitively, subtly) submit to the norms of body appearance in relation to their social class (cf. Christensen & Carpiano, 2014).

Following this line of reasoning, previous applications of Bourdieu's approach in the context of health inequalities, identified gender as significantly relevant variable. On the one hand, previous research investigated inequalities in health and health-related behaviours with a specific focus on females (de Morais Sato, Ulian, Unsain & Scagliusi, 2018) or males (Smith & Dumas, 2019; Veenstra & Abel, 2015). On the other hand, previous research concluded that females with higher levels of cultural capital are more likely to follow healthy lifestyle, i.e., significantly lower levels of BMI and do more exercise (Pampel, 2012). However, recently Oncini and Guetto (2018), when investigating eating, smoking and drinking patterns of affluent women point out that more educated women with higher levels of cultural capital are more likely to adapt unhealthy behaviours (i.e., unhealthy diet, smoking and alcohol consumption) as their level of cultural resources increases.

Application of Tangney et al.'s (2004) BSCS is rare in the context of demographic variables. However, Malouf, Schaefer, Witt, Moore, Stuewig &

Tangney (2014) investigated self-control in relation to risky behaviours like criminality and substance abuse (e.g. alcohol, cocaine, alcohol). Here, they concluded that self-control is independent on variables like race, age or sex, and thus irrespective of socio-economic factors. However, they identify self-control as a universal factor of antisocial behaviours.

2.5.2.2 AGE

Previous applications of Bourdieu's approach, in the context of health inequalities, identified age as relevant variable (Pinxten & Lievens, 2014; Burnett & Veenstra, 2017). Here, aforementioned research established that higher levels of economic and cultural capital are accumulated among the established middle-class population above 45 years of age (cf. Burnett & Veenstra, 2017).

Baumeister, Wright and Carreon (2019) recently argued that with an increasing age people learn how to manage their level of trait self-control efficiently and as a result learn how to manage their lives more effectively (including health-related issues). These results contradict research by Kaygusuz, Duyan, Oksal & Duyan (2015) stating that there is no significant relationship between trait self-control and age.

2.5.2.3 RELIGION

Previous applications of Bourdieu's approach, in the context of health inequalities, identifying religion as a relevant variable is scarce. In contrast, research on self-control in relation to religion is easier to identify. Baumeister (2005) argued that religion and similar spiritual values-based beliefs are functioning as control factors, impacting regulatory behaviours. Another line of argument argued that self-control and religious beliefs have a complementary effect on healthy lifestyle (Rounding, Lee, Jacobson & Ji, 2012; Desmond, Ulmer

& Bader, 2013). DeWall, Pond, Carter, McCullough, Lambert, Fincham & Nezlek (2014) argued that self-control is a mediator between religious believe and healthy lifestyle, however, Thus, the question on the more detailed role and meaning of religious belief in the context of socio-economic inequalities in health and healthy lifestyle remain under researched.

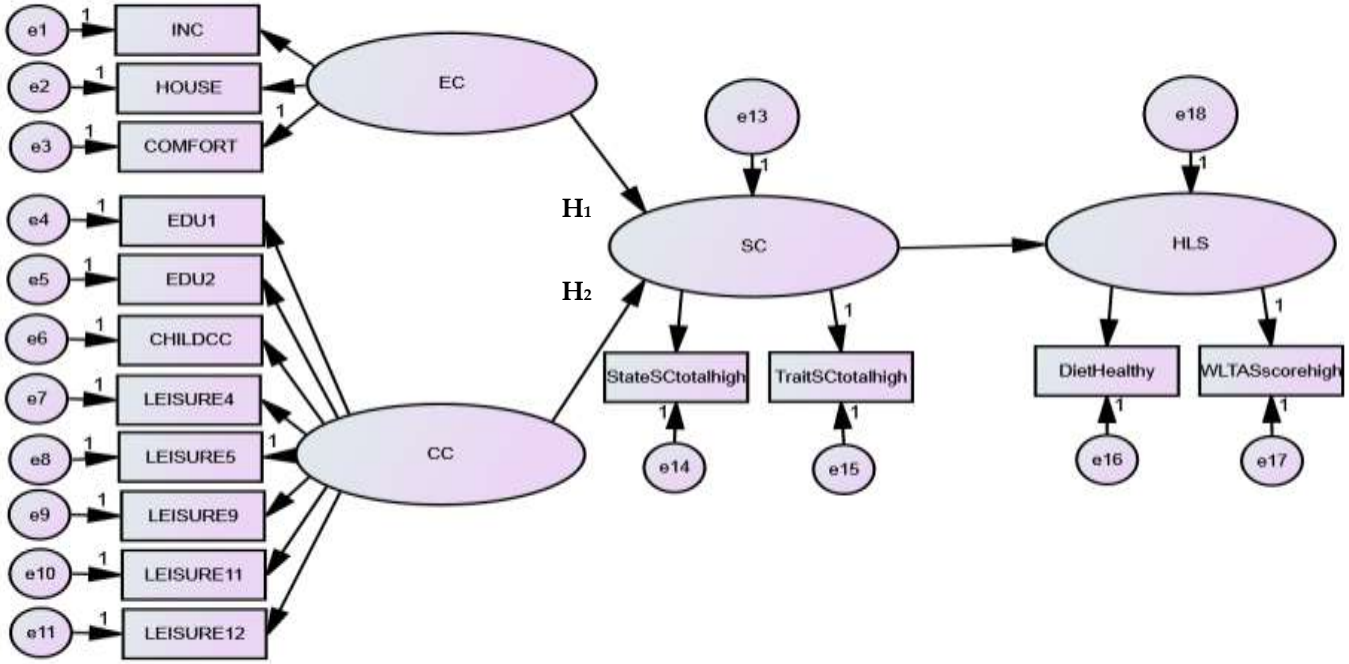
2.5.2.4 URBAN LIVING AREA (I.E., WARD)

Bourdieu's approach in the context of inequalities, applied in works of Bourdieu (1996), Piçon-Charlot & Piçon (2018), Pereira (2018), Savage et al. (2018) and others, identifying urban inequalities and their socio-spatial distribution are establishing solid theoretical background for further investigation (see chapter 2.3 and sub chapter 2.3.2).

2.5.3 THE PROPOSED CONCEPTUAL FRAMEWORKS AND DEVELOPMENT OF HYPOTHESES

The purpose of the study is to contribute to an understanding of how socio-economic and psychological inequalities collectively influence health-related inequalities, forming the pathway of perpetual multidimensional inequality. The causal relationship between independent, mediating and dependent variables, to identify the causal pathway in the conceptual framework is presented in Figure 2.10 and Figure 2.11. Oval variables represent latent constructs, whereas directly measured variables are rectangular shape. Residuals are small circles pointing on measured variables.

FIGURE 2.10: PROPOSED RESEARCH MODEL OF HEALTHY LIFESTYLE



On the left side of the framework are independent input variables, identifying a persons' material resources and socio-economic standard of living, namely level of economic and cultural capital. Variables specifically identifying the person's level of economic capital are: level of income (INC), home ownership (HOUSE) and level of every-day comfort (COMFORT) (Savage, 2014; Schmitz, Flemmen & Rosenlund, 2018; Veenstra, 2017). Variables identifying the person's level of cultural capital are the level of education (EDU1), parental education (EDU2), presence of cultural valuables at home while growing up (CHILDCC) and participation in *meaningful* leisure activities: read a book or newspaper (LEISURE4), attend organised cultural events e.g. concerts, live theatre, exhibitions (LEISURE5), listen to music (LEISURE9), do crafts, drawing, painting, sculpturing or photography (LEISURE11) and spend time on the internet/PC (LEISURE12). These variables are adapted from Pampel (2012), Schmitz, Flemmen and Rosenlund (2018) and Pinxten and Lievens (2014).

The mediating variables of a person's self-control as cognitive resource of psychological resourcefulness is adopted from Tangney et al.'s (2004) brief trait self-control scale and Ciarocco, Twenge, Muraven and Tice's (2007) and Schöndube, Bertrams, Sudeck and Fuchs's (2017) brief state self-control scale. It is hypothesised that high total level of trait (TraitSCtotalhigh) and state (StateSCtotalhigh) self-control are mediating variables.

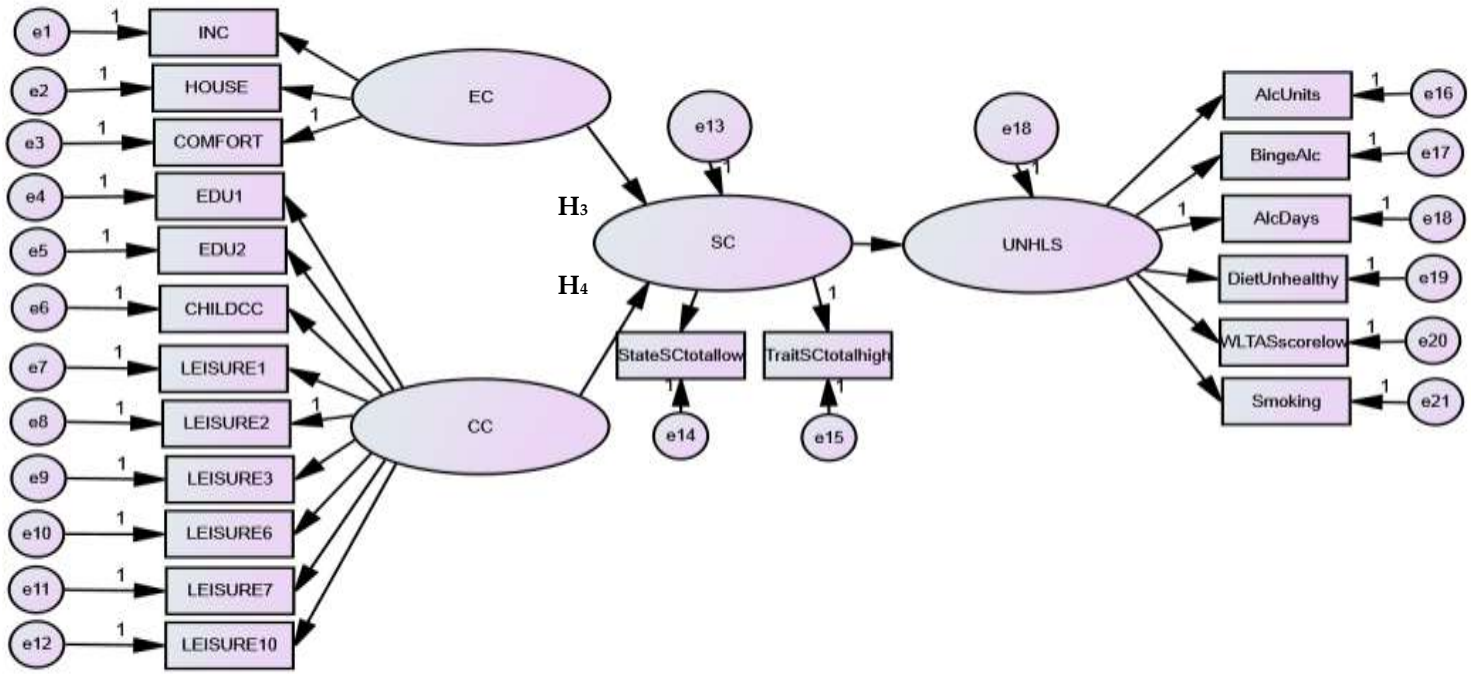
On the right side of the framework are the dependent output variables, identifying a person's healthy lifestyle. Healthy lifestyle is identified through a set of healthy behaviours like healthy diet and high WLTAS score (cf. Forestier et al., 2018).

Based on the proposed conceptual framework, the following hypotheses will be tested:

H_1: High economic capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

H_2: High cultural capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

FIGURE 2.11: PROPOSED RESEARCH MODEL OF UNHEALTHY LIFESTYLE



Variables specifying economic capital remain the same: level of income (INC), home ownership (HOUSE) and level of every-day comfort (COMFORT) (Savage, 2014; Schmitz, Flemmen & Rosenlund, 2018; Veenstra, 2017). Variables identifying the person's level of cultural capital are the level of education (EDU1), parental education (EDU2), presence of cultural valuables at home while growing up (CHILDCC) and participation in *meaningless* leisure activities: watch TV (LEISURE1), go to cinema (LEISURE2), go leisure shopping e.g. for clothes (LEISURE3), get together with relatives (LEISURE6), get together with friends (LEISURE7) and attend organised sporting events as spectator (LEISURE10). Variables are adapted from Pampel (2012), Schmitz, Flemmen and Rosenlund (2018) and Pinxten and Lievens (2014).

It is hypothesised that low total levels of trait (TraitSCtotallow) and state (StateSCtotallow) self-control are mediating variables.

On the right side of the framework are the dependent output variables, identifying a person's unhealthy lifestyle. Four types of unhealthy behaviour are identified, namely: physical activity and low WLTAS total score (Godin, 2011), unhealthy diet (Forestier et al., 2018), alcohol consumption (de Ridder et al. 2012; Luehring-Jones, Tahaney & Palfai, 2018) and smoking (Forestier et al., 2018).

Based on the proposed conceptual framework, the following hypotheses will be tested:

H_3: Low economic capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

H_4: Low cultural capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

3. RESEARCH METHODOLOGY

3.1 INTRODUCTION

The chapter outlines the research methodology that has been applied in order to answer the research question and to test the hypotheses. The chapter presents the study setting, the philosophical stance, the adopted survey design, the sample frame and the data collection process. Finally, it outlines the theoretical overview of the approach to the data analysis, where building a structural equation model is linked back to the pragmatic ontological and epistemological premise of the research.

3.2 STUDY SETTING

The research context is Sheffield's socially diverse urban community. There are two main reasons for this. First, multidimensional inequality is clearly evident in Sheffield. Although, on average, Sheffield is one of the least deprived major cities in England, it is also one of the most unequal (Making Sheffield Fairer, 2017). In fact, there are deeply rooted and persisting inequalities within Sheffield's community and neighbourhoods, starkly dividing its affluent western and deprived eastern parts. Such a noticeable divide between areas is particularly significant for Sheffield, compared to other industrial cities like Leeds, Birmingham or Bradford. This specific characteristic of Sheffield is significant for distinctive lifestyles in both communities. People on each side of the city live, exercise, shop, work and socialise within *their* own community and tend not to socialise with residents on the other side of Sheffield (ibid.). In this setting, the idea of perpetual and multidimensional inequalities in health that naturally combine three distinctive disparities, namely socio-economic, psychological and behavioural, seem particularly appropriate.

Multidimensional inequality in Sheffield is evident in intertwined economic and social deprivation, on the one hand (i.e., lower income, lower housing prices in poorer neighbourhoods, higher levels of domestic abuse and criminal behaviour), and health deprivation, on the other. Sheffield's Lifestyle, Morbidity and Mortality Quilt for 2018[17] (cf. A matter of life and healthy life, 2016) identified stark differences between Sheffield's wards, which were arranged in accordance with the Index of Multiple Deprivation (IMD). The IMD ranks wards in accordance with income, employment, education, skills and training deprivation, health deprivation and disability, crime, barriers to housing and services and living environment deprivation. Based on these criteria, the IMD differentiates among the most deprived (MD), below average deprived (BA), average deprived (AV), above average deprived (AA) and least deprived areas (LD). The most deprived areas are found on the eastern side of the city. By comparison, the most affluent areas are located on the western side. Residents in the most deprived areas share an unhealthy diet, smoking habits and lower levels of physical activity. Approximately 45% of the population in the deprived areas (between 44.81% in Park and Arbourthorne and 47.48% in Firth Park) eat fruit less than three times per week and never pursue moderate intensity exercise (between 46.48% in Park and Arbourthorne and 48.50% in Firth Park). Similarly, residents in the affluent areas share similar patterns of healthy diet, smoking less and a relatively high level of physical activity. Only approximately 30% of the population in the more affluent areas (between 28.11% in Ecclesall and 33.33% in Broomhill and Sharrow Vale) eat fruit less than three times per week and never pursue moderate intensity exercise (between 29.71% in Ecclesall and 33.53% in Broomhill and Sharrow Vale). Interestingly, excessive alcohol consumption (more than 6 days per week) does not follow the same pattern. Regular consumption of alcohol is lower among

[17] Retrieved from Sheffield City Council, https://sheffieldcc.maps.arcgis.com/apps/Cascade/index.html?appid=5a6a97bf509349a2b667541f385e48c8

the less affluent population in deprived areas and higher among more affluent population in more affluent areas (cf. Oncini & Guetto, 2018).

There is also a stark divide between the morbidity rates in the deprived and affluent areas. Overall, there are higher probabilities of asthma, coronary heart disease, stroke, diabetes, liver conditions, clinical depression and obesity in the deprived areas. By comparison, the situation is reversed in affluent areas. Moreover, mortality rates attributable to regular excessive alcohol consumption, cancer, coronary heart disease, circulatory and respiratory disease and smoking are also higher in the most deprived areas (Sheffield Lifestyle, Morbidity and Mortality Quilts, 2018).

Equally, there are significant differences in life expectancy within the city. In affluent areas (e.g. Ecclesall) life expectancy is 84.8 years for males and 88.6 years for females, whereas in less affluent areas (e.g. Firth Park) it drops to 75.3 years for males and 78.9 for females (Life expectancy for Sheffield). Thus, a social gradient in health (Marmot, 2015) is evident in Sheffield. Because of such a marked socio-geographical divide within a relatively concentrated urban space, and a clear urban agenda to tackle this stark divide, Sheffield, as a community, represents a solid foundation for researching the multidimensionality of urban inequality (see Table 3.1, where Sheffield areas are divided in accordance to the Index of Multiple Deprivation[18]).

[18] The Index of Multiple Deprivation (IMD) is an official measure of relative deprivation for small areas in the UK (source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/579151/English_Indices_of_Deprivation_2015_-_Frequently_Asked_Questions_Dec_2016.pdf). IMD ranks areas in accordance to income, employment, education, skills and training deprivation, health deprivation and disability, crime, barriers to housing and services and living environment deprivation.

TABLE 3.1: LIFE EXPECTANCY IN ACCORDANCE TO SHEFFIELD'S WARDS

Ward name	Index of Multiple Deprivation (IMD)	Quintile	Life expectancy for males/females
Firth Park	53.22	MD	75.3/78.9
Burngreave	51.99	MD	74.7/78.3
Manor Castle	49.96	MD	77.2/81.8
Southey	49.79	MD	77.2/81.1
Darnall	46.07	MD	76.7/80.3
Park & Arbourthone	43.86	MD	77.3/81.7
Shiregreen & Brightside	40.46	BA	77.7/82.6
Gleadless Valley	37.34	BA	77.8/81.8
Beauchief & Greenhill	31.43	BA	79.6/81.4
Woodhouse	29.52	BA	77.2/81.4
Richmond	29.18	BA	78.5/81.7
City	29.02	AV	82.4/87.4
Walkley	27.41	AV	77.7/81.7

Nether Edge & Sharrow	23.95	AV	79.3/81.8
Birley	22.25	AV	80.1/85.0
Hillsborough	21.07	AV	79.3/83.1
Mosborough	20.88	AA	81.2/82.7
East Ecclesfield	18.60	AA	79.7/82.2
Beighton	17.86	AA	79.5/82.3
West Ecclesfield	17.72	AA	80.7/85.5
Stocksbridge & Upper Don	17.21	AA	79.7/83.4
Stannington	16.03	LD	81.9/84.9
Broomhill & Sharrow Vale	15.73	LD	78.1/82.4
Graves Park	12.41	LD	80.6/83.1
Crookes & Crosspool	7.49	LD	81.6/81.6
Dore & Totley	6.85	LD	80.5/86.3
Fulwood	5.92	LD	82.3/86.4
Ecclesall	4.16	LD	84.8/88.6

Source: Sheffield Lifestyle, Morbidity and Mortality Quilts, 2018

The second reason for positioning the study in Sheffield is the community's long-lasting commitment to the promotion of a healthy lifestyle among its residents. Sheffield has been part of the WHO's Healthy Cities initiative since its beginnings in 1984 (WHO European Healthy Cities Network, 2019). During this time, the city of Sheffield has developed and implemented several public policies and continues to promote and monitor healthy lifestyles among its residents. As such, Sheffield became an example of a healthy, green and vivid urban area (Bambra, Fox & Scott-Samuel, 2005; Fryer, 1988; Planning Horizons 2014). The current 'Move More' campaign promotes physical activity among inactive residents who are predominantly from lower socio-economic backgrounds and, furthermore, aims for Sheffield to become the most active city in the UK by 2020 (Move More Board Sheffield, 2015). The campaign is supported by the major city partners, including the voluntary sector, the NHS, both universities (Sheffield Hallam University and Sheffield University), the Sheffield Chamber of Commerce and Sheffield International Venues (Move More, 2015). A recent City Council public health report states that health inequalities continue to exist, particularly in the more deprived areas of the city, and are not improving (A Matter of Life and Healthy Lifestyle, 2016; Health and Wealth Report, 2018). For these reasons, an exploration of the socially conditioned behaviour affecting residents' healthy lifestyle is a relevant, interesting and challenging research problem.

A partnership with Sheffield City Council has been one of the key features of this investigation. Both institutions (Sheffield Hallam University, as a leading civic university, and Sheffield City Council) are committed to an established partnership focusing on improving the quality of life of Sheffield's residents. Here, investigation of, and intervention in, residents' health is of particular importance to the partnership in which university researchers are working alongside the Council. Thus, the Public Health Office, with its principal

investigators, has been included in the investigation at several stages of the research (experts' interviews during the pretesting of the questionnaire, sampling within the wards and survey distribution phases). On completion of this investigation, the results will form part of Sheffield City Council's Joint Strategic Needs Assessment (JSNA), containing public health datasets.

3.3 THE ONTOLOGICAL, EPISTEMOLOGICAL AND METHODOLOGICAL BACKGROUND OF THE INVESTIGATION

The ontological premise of the present work is founded on the ideas about the intertwined nature and causal regularities between physical habitat i.e., a person's socioeconomic environment and habitus of psychological self-control i.e., a person's internal matrix of thought, emotion, impulses and performance regulation. The assumption of the intertwined nature between habitat and habitus, is based on the Darwinist idea that a person's human nature is immanently entwined, organically interdependent and optimally adapted to his/her living environment (Dewey, 1910). In a way *'a la Darwin'*, Bourdieu has taken an alternative approach to a social perspective on the structures of society and operated with ideas like cultural and social evolution, social distinction and dominance (cf. Bourdieu, 2010). However, if for Darwin the concept of power and dominance is a biological and organically perpetuated evolutionary process, for Bourdieu it becomes a social, self-perpetuated phenomenon and an evolutionary process, embedded in economic structures.

Such a proposition of organic social perpetuation of human (in)equalities is inextricably intertwined with the second ontological premise, namely the assumption about *causal regularities* between habitat and habitus (see chapter 2). Here, the probabilistic theory of causation argues that cause and effect are two distinctive entities, requiring sequel occurrence of cause before the effect (Hitchcock, 2018; Reichenbach & Reichenbach, 1956), although some causes are

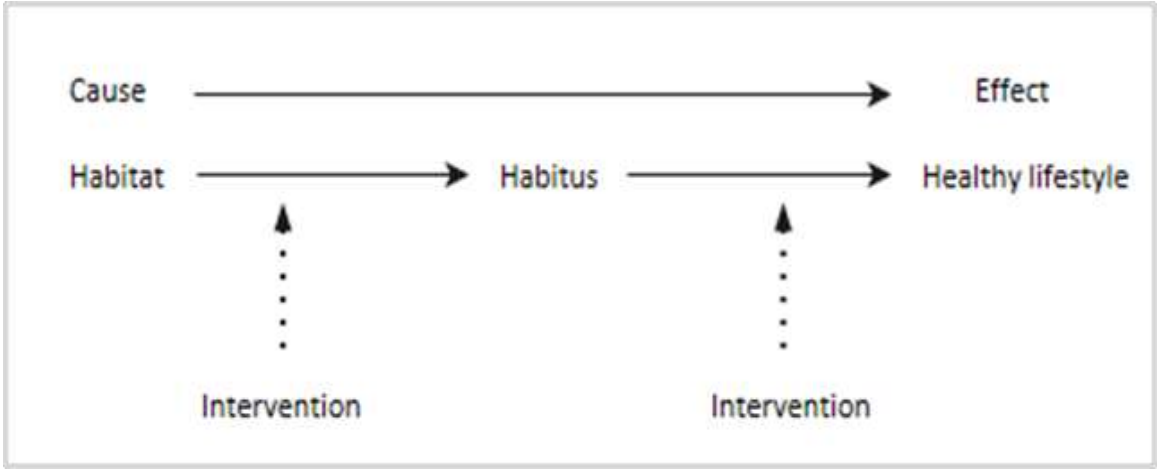
followed by the same effects and in some cases effects even happen in the absence of causes. However, the probabilistic theory of causation argues that causes *change the probability* of their effects. Here, a deprived socioeconomic environment is a cause of people's habitual lack of self-control and unhealthy lifestyle, not because all people coming from a deprived background would *necessary* have a lower level of self-control and accordingly an unhealthy lifestyle, but because people coming from a deprived background *are more likely* to develop lower levels of self-control and related health issues (cf. Hitchcock, 2018). As such, it is possible to identify the pathway of causal structures which *most likely* lead in the direction of habitual disposition and practice related healthy or unhealthy lifestyles.

For the purpose of this study, society and its structure are assumed to be a stable arrangement of measurable categories and resources i.e., material and psychological with a linear connection to an outcome i.e., lifestyle, creating the structure-disposition-practice pathway. In this case, equality is assumed to be an outcome where coefficients of independent variables like material and psychological indicators are necessarily equal to zero. In contrast, inequality is understood as an outcome where coefficients of the same variables are different to zero and have a positive value on a continuum to infinity (cf. Abbott, 2016).

Here, the concept of inequality is essentially a *structural* problem and, as such, included in the socio-political agenda of interventionism (WHO, 2013). The concept of interventionism itself is ontologically predisposing causal relations between a person and his/her environment and tries to manipulate them in order to achieve structural changes towards greater social equality. Accordingly, the basic idea of interventionism in health and a healthy lifestyle is to clearly determine causes, relations and critical elements of the pathway between habitat and habitus in order to accurately implement change in the critical factors of lifestyle. Thus, interventionism as a concept is ontologically

almost unacceptable for libertarian and utilitarian political lines of thought, where a person's autonomy and free will are embedded in the human psyche (cf. Sen, 2010) and where there are no causal links between a person and his/her environment. Thus, health-related interventions need to consider a broader spectrum of a person's socioeconomic environment, psychological disposition and healthy lifestyle, in order to avoid being ontologically inaccurate and practically ineffective. Accordingly, because the purpose of the inquiry is the *pathway* of inequality, determining the perpetual conversion of elements from one to another, the perspective on the problem is in essence deterministic. Equally, from this perspective on inequalities and interventionism, the concept of free-choices, free will and a person's autonomy becomes irrelevant (cf. Hitchcock, 2018; Quesada, Hart & Bourgois, 2011). An individual's habitus and his/her agentic behaviour is a necessary product of collective socialisation and his/her economic and social conditions (Bourdieu, 2005). The cause and effect relation, leading from habitat, to a person's level of self-control i.e., habitus, finally determining his/her healthy or unhealthy lifestyle and the points of intervention in healthy lifestyle is presented in Figure 3.1.

FIGURE 3.1: ONTOLOGICAL PREMISE ON THE CAUSALITY AND INTERVENTIONISM



All these premises represent a general ontological approach, within which it is possible to epistemologically link traditional internal-external contrasts, structure-agency dichotomies and the traditional separation of academic disciplines (Dewey, 1922, 1929; Pappas, 2017). Here, an attempt to unify hypothetic-deductive causal logic and the structure of economic, social, behavioural and psychological science offers a framework to 'go over' such traditional abstract divisions having purely intellectual purpose, without presenting any *actual* real problems of society (cf. Dewey, 2018; Morgan, 2014). This 'need for action', as in the context of interventionism is the *epistemological purpose* of the present investigation, assuring progress and evolution of knowledge (cf. Dewey, 1929; Morgan, 2014). The idea of purposefully joining separate, condensed and distinctive 'species' of thought into one logically and pragmatically conceivable new 'genus', Dewey calls 'tertium quid' i.e., third thing, middle course (Lovejoy, 1922). Dewey (ibid.) suggests that in cases where neither one nor the other theory is bringing new knowledge and views, the third way as tertium quid should be adopted in order to purposefully contribute to knowledge and develop it accordingly.

This pragmatic ontological and epistemological 'need for action' and realistic attempt to unify hypothetic-deductive causal logic and the structure of social, behavioural and psychological science therefore finally defines and determines the methodology of the present work. The method applied is therefore defined by the research question. In order to identify the causal pathway of inequality, this present inquiry follows the assumption about the general causal regularities behind perpetual inequalities in health and therefore applies a quantitative approach. In this line of reasoning, if the point of research is to be practically valuable and helpful, the results should not be misleading, errors should be avoided and the method should be rigorous in order to generate trustworthy outcomes (Roberts, Priest & Traynor; 2006).

Thus, a consistent research design has been gradually built up from objective reality, pragmatically blending Bourdieu's causal social theory with the psychological theory of self-control within a rigorous quantitative research design. Moreover, quality criteria (Johnson & Duberley, 2000:39; cf. Bryman & Bell, 2015; Maylor, Blackmon & Huemann, 2016; Saunders et al., 2012) such as reliability and validity as two important epistemological and methodological premises of traditionally reliable research design have been applied. Here, the limitation of errors has been essential in order to establish accurate, justified, trustworthy and generalizable findings (Johnson & Duberley, 2000; Roberts, Priest & Traynor, 2006). Below, the ideas of reliability and validity will be discussed in more detail, and presented as the link between the ontological, epistemological and methodological premise of knowledge generalisation.

3.4 RELIABILITY AND VALIDITY

Reliability is understood as consistency of results, derived from the accuracy of the instrument used (Heale & Twycross, 2015; Robins, Fraley & Krueger, 2007; Salkind, 2014). Punch and Oancea (2014) distinguish between two different forms of reliability; namely, reliability over time and across multiple occasions (i.e., neutrality; stability; external reliability) and internal reliability. External reliability or consistency over time is expressed in cases when *another* researcher could replicate the original research or the *same* researcher could replicate the original research at a different time and to what extent they would get the same results (Bryman & Bell, 2011). Thus, external reliability assures consistent accuracy of the instrument and the generalizability of results. In the context of this research, the established and validated scales adapted from the relevant literature are presented in the section on the survey design (see section 3.5).

In contrast, internal reliability means consistency of a measuring instrument, meaning that the items of an instrument represent the same dimension or

construct (Punch, op. cit.; Salkind, op. cit.). The latter refers to the degree to which the items are working in the same direction, are measuring the same underlying construct and are therefore homogeneous in content (Punch & Oancea, op. cit.; Salkind, op. cit.; Robins, Fraley and Krueger, 2007). There are different ways in which internal consistency is tested (e.g. split-half method where all the items are randomly split and divided between two categories to test the equal effect of every item or the Spearman-Brown index observing true and error score in order to identify the variance of each item), however, among them Cronbach's alpha is typically used. The value of Cronbach's alpha indicates how item scores vary consistently with the total score on the test (Pallant, 2016; Salkind, 2014). In this context, the Cronbach's alpha coefficient represents an 'index of internal consistency' (Robins, Fraley & Krueger, 2007:p. 466) where a figure of 0.75 means that 75 percent of the variability in the score is due to the true observed score and 25 percent of the variability in the score is due to error, causing heterogeneity. Values of Cronbach's alpha coefficient of 0.5 and below show low reliability, coefficients between 0.5 and 0.7 show moderate reliability, and values between 0.7 and 0.9 show high reliability (Hinton, McMurray & Brownlow, 2014). Thus, a good Cronbach's alpha coefficient implies not only consistency and quality of a measuring score, but also the overall meaningfulness of the instrument, essential for the generalizability of the measurement (Pallant, 2016.). Establishing the internal reliability of the self-control scales has been essential for the quality of the measuring instrument in the context of this research. Further detail is provided in the discussion of the survey design in Chapter 4, Section 4.4.

Validity is understood as the extent to which the concepts are accurately measured and therefore, they measure what they intend to measure (Robins, Fraley & Krueger, 2007; Salkind, 2014). Generally, researchers distinguish between three types of instrument validation, namely content validity, criterion

(internal) validity and construct validity (Creswell & Plano Clark, 2017; Denscombe, 2017; de Vaus, 2014; Flick, 2011; Punch, 2014; Salkind, 2014).

Content validity refers to the selection of items included in the questionnaire in order to represent an important theoretical aspect or definition of the construct. The issue is particularly relevant when selecting the items for multiple-choice answers or the items for categorical variables. Robins, Fraley and Krueger (2009) argue that the selection of the items in the questionnaire is relevant for the definition of the construct but does not necessary reflect all the items generally available. In the context of this research, for example, ill-health is identified only by the specific illnesses, whereby the less relevant illnesses are excluded from the menu. Some of the diseases might be underrepresented and some might be overrepresented; however, the final selection of the items is in accordance with the definition of the construct, relevant for the study. Equally, content validity refers to the extent to which the technical items of the questionnaire (e.g. measurement instrument, language) reflect the theoretical indicators from the topic of research interest. Salkind (2014) and Flick (2011) suggest that the establishment of content validity is processed through the piloting of the questionnaire and experts' engagement in reviewing the questionnaire. Establishing the content validity has been essential for the process of the questionnaire design and is discussed in the section on survey design and piloting of the survey (see section 3.5 and 3.5.1).

In psychology, external validity represents the core of research validation (Robins, Fraley & Krueger, 2009). There are two distinctive aspects of external validity, namely, convergent and discriminant (i.e., divergent) aspects. Convergent external validity demonstrates variable loadings on the factors, whereas discriminant external validity demonstrates the extent to which the scale items discriminate from each other and do not correlate with each other

(ibid.). Both aspects of external validity are tested by applying factor analysis and discussed in chapter 4; section 4.4.1.

In order to identify discriminant validity, average variance extracted (AVE) and maximum shared variance (MSV) is calculated (Hair et al., 2014). Here, AVE of 'each construct is compared with shared variance between constructs' and AVE needs to be higher than maximum shared variance in order to establish discriminant validity (Farrell & Rudd, 2009:2). In order to establish convergent validity of the scale, internal composite reliability (CR) of the scale items needs to be higher than 0.5 and AVE needs to be lower than CR and higher than 0.5 (see chapter 4, section 4.4.1 and sub section 4.4.1.3).

Convergent external validity is particularly relevant in the context of psychology and personality self-reports (ibid.). Here, convergence among different measurement scales raises the issue of result contamination where there is strong association between two constructs. The issue is addressed as common method bias, since the use of a single method can induce contamination of results, whereby the use of several methods can reduce the contamination. In the context of Tangney et al.'s (2004) self-control scale the authors discussed the issue of high correlation between the scores of self-control and the scores of social desirability. Here, higher scores of self-control are contaminated by social desirability bias i.e., tendency to provide the socially desirable answers instead of the actual response. Tangney et al. (2004) provide an explanation of this issue with the self-control scale. Firstly, contamination of results might happen, because people would have a high score on the self-control scale because they want to conform to socially desired and approved norms (ibid., p. 315). Secondly, they argue that the contamination might happen because people with high self-control are more likely to act in a socially desirable (selfless) way and do what is best for the community as opposed to

what suits their (selfish) interests. Common method bias is tested the chapter 4, section 4.4.2.

Finally, structural (internal) validity refers to the internal structure of the indicators that reflect the construct domains. Here, structural validity presents the evidence on unidimensional or multidimensional structure of the constructs extracted from the literature (see chapter 4, section 4.4.1). The issue of the internal validity also relates to construct validity.

In relation to psychological measures, it has been previously argued that researchers are primarily concerned with the concept of construct validity and related evidence on the validation of different scales that have an implication for human performance, emotions and cognition (Robins, Fraley & Krueger, 2009). In this context, construct validity refers to the extent to which 'the measure conforms to theoretical expectations' (de Vaus, 2014, p. 51). Thus, in psychology research and related psychological measurements, construct validity becomes a central concern, understood as a *continuous research process* of validation of a particular measure instead of a *specific condition* that needs to be achieved (ibid.). Here, attributes of reliability are producing similar results across different population groups and settings complement the concept of construct validity instead of being separate from it.

Robins, Fraley & Krueger (2007; p. 476) present examples of study designs with construct validity which are relevant for this study. The first relevant form of construct validity is generalizability which provides evidence that results are consistent across different populations and settings and therefore interpretations can be generalised. Generalizability is represented in the decision about the population size from which a representative sample will be drawn, the reliability test and the level of confidence in the generalisations of the study. The second relevant form of construct validity is content validity,

achieved through the engagement of panel experts, reviews of the questionnaire and engagement of experts. The latter provide linguistic and visual clarity of the questionnaire, length and form of the questionnaire. The third form of construct validity is structural (internal) validity, where the internal structure of the indicators reflects the construct domains. Construct validity is tested through exploratory factor analysis which provides evidence of the factor structure. Table 3.2 provides a summary of the key domains for evaluating reliability and validity of the measures adopted in this study.

TABLE 3.2: SUMMARY OF THE KEY DOMAINS FOR EVALUATING RELIABILITY AND VALIDITY

Domain	Definition	Measures used
External consistency reliability	Consistent accuracy of the instrument Generalizability of results	Use of established and validated scales from the relevant literature
Internal consistency reliability	Interrelationships between the indicator variables Similar indicators are highly correlated on the same construct (Punch & Oancea, 2014; Salkind, 2014; Hair et al., 2017).	Cronbach alpha cut-off point by 0.5 (Hinton, McMurray & Brownlow, 2014; Pallant, 2014
Content validity	The content of the measure is reflecting the theoretical indicators (Punch & Oancea, 2014; Salkind, 2014)	Piloting of the questionnaire Experts' engagement
Construct validity	Instrument measures the theoretical variable Established by convergent and discriminant validity	Factor analysis: Exploratory factor analysis

Convergent validity	Variable loadings on the factors Indicators are supposed to share a high variance (Hair et al., 2017)	Correlation coefficient higher than 0.50 t-values statistically significant ($p<0.05$) Internal composite reliability (CR) higher than 0.50 Average variance extracted (AVE) lower than CR and higher than 0.50 Common method bias (Harman's single factor test)
Discriminant validity	The extent to which the scale items discriminate from each other and do not correlate with each other	Average variance extracted (AVE) Maximum shared variance (MSV) AVE > MSV

The ideas of reliability and validity, discussed in this chapter, have tried to bridge the ontological, epistemological and methodological divide. Here, the idea of a rigorous pragmatic approach in order to deliver helpful results needs to be built on trustworthy unbiased evidence (cf. Roberts, Priest & Trainor, 2006). In similar vein, a survey as the method of data collection was implemented as a research strategy and will be discussed below.

3.5 SURVEY DESIGN

This research has on the one hand, adopted a Bourdieusian approach and, on the other hand, applied the theory of self-control in order to identify the pathway of inequality and provide a holistic design of interventions in health-related lifestyle. Thus, a survey has been used as a research strategy, and instruments from these studies have been adapted for this context. This idea of

valid, rigorous and trustworthy instrument adaptation links back to the pragmatic ontological premise of this study, which is building on reliability and validity and optimising the generalisation of the results of the study (see chapter 3, section 3.3 and Table 3.2).

The questionnaire can be found in Appendix A. In the introductory part of the survey, positioned at the beginning of the questionnaire, prospective participants were informed that participation in the survey was voluntary and anonymous. They were also informed about the aim of the study and had the opportunity to withdraw from the survey at any stage. The contact information of the research team director was also provided for respondents to obtain further information about the survey. Furthermore, the respondents were assured that all data was collected in accordance with GDPR and provided with a link which provides information about the latter: https://www.shu.ac.uk/about-this-website/privacy-policy/privacy-notices/privacy-notice-for-research

The first part of the questionnaire (Section A) referred to questions about leisure activities in a typical week. A 7-point Likert-type scale was used to identify frequency of engagement with the statements (from 1 (Never) to 7 (More than 3 times a day). The scale has been previously used by Pampel (2012) to identify the level of embodied cultural capital. From the original 13-item scale, one factor was excluded ('take part in physical activities such as sport, going to the gym'), because the dimension of physical activity was referred to in more detail in a later question. Additionally, the factor 'handicrafts' was expanded because in the context of this research it also includes drawing, painting and sculpture. From the original 13-items, Pampel (2012) extracted four factors relevant for this study, namely culture, socialising, handicrafts and TV/music. Socialising, handicrafts and watching TV/music are associated with greater BMI, and culture is associated with lower BMI (-0.554), obesity (-0.111) and wanting to

lose weight (0.124). In order to achieve comparative scale equivalence (i.e., unification of assessment on the same metric), Pampel's (2012) original unit ('month'), has been replaced with the unit 'week'.

The second part of the questionnaire (Section B) is concerned with measuring trait (B1) and state (B2) self-control. The items for assessing dispositional trait self-control are from the widely adopted brief self-control scale developed by Tangney, Baumeister and Boone (2004). The brief 13-item scale is a short version of the longer 36-item scale developed by same authors. Originally Tangney, Baumeister and Boone (2004) used a 5-point Likert scale. Forestier et al. used a 7-point Likert scale ranging from 'Completely Disagree' to 'Completely Agree' (with a reliability alpha of 0.77). In the current study (with items 2, 3, 4, 5, 7, 9, 11, 12 and 13 reversed), the Cronbach's α was 0.75 and shows an acceptable level of internal reliability.

The brief trait self-control scale has been used previously to directly and positively predict physical activity, healthy diet, less binge drinking and less smoking (Briki, 2018; Cresconi et al., 2011; Forestier et al., 2018; Luehrig-Jones, Tahaney & Palfai, 2018; Schöndube et al., 2017).

The state self-control scale was originally developed by Ciarocco, Twenge, Muraven and Tice (2014). The scale has been widely used, particularly its German translation and adaptation by Bertrams, Englert and Dickhäuser (2010). Based on Ciarocco et al.'s (2014) original scale, Bertrams, Unger and Dickhäuser (2011) developed and tested a brief 10-item version of the scale. Moreover, based on both existing scales (Bertrams, Unger & Dickhäuser, 2011; Ciarocco's et al., 2014), Schöndube et al. (2017) developed a 6-item scale for measuring the concept of Self-Control Strength. The 6-item scale has good reliability (Cronbach's α = 0.75). The items from both scales have been compared by a panel of experts and adopted accordingly, for the English-speaking

environment. In the current study (with items 1, 2, 3, 5, 7, 8, 10 and 11 reversed), the Cronbach's α was 0.83 and shows good reliability (see Table 3.3).

TABLE 3.3: PROCESS OF ITEM DEVELOPMENT FROM BERTRAMS, ENGLERT AND DICKHÄUSER'S (2010) SCALE AND SCHÖNDUBE, BERTRAMS, SUDECK AND FUCHS'S (2017) SCALE

	A State Self-Control Scale brief version Bertrams, Englert and Dickhäuser (2010)	B State Self-Control Strength Schöndube, Bertrams, Sudeck and Fuchs (2017)	C State Self-Control Scale adapted in this study (Combination of A and B)
1	I need something pleasant to make me feel better.	I have to force myself to stay focused.	I have to force myself to stay focused (B1)
2	I feel drained.	I am full of willpower.	I have no willpower (B2)
3	If I were tempted by something right now, it would be very difficult to resist.	I am having trouble pulling myself together.	I am having trouble pulling myself together (B3)
4	I would want to quit any difficult task I were given.	I could resist any temptation.	I could resist any temptation (B4)
5	I feel calm and rational.	I am having trouble paying attention.	I am having trouble paying attention (B5)
6	I can't absorb any more information.	I am having no trouble bringing myself to do disagreeable things.	I would have no trouble bringing myself to do difficult tasks (B6)
7	I feel lazy.		I need something pleasant to make me feel better (A1)
8	I feel sharp and focused.		I feel drained (A2)
9	I want to give up.		I feel calm and rational (A5)
10	I feel like my willpower is gone.		I feel like giving up (A9)
11			I feel overwhelmed (added by a panel of experts)

The third part of the questionnaire (Section C) captures data on respondents' health, health problems, conditions and disabilities. The question is a modified version of an ongoing Yorkshire Health Study and has been adapted in accordance with the Sheffield Lifestyle, Morbidity and Mortality Quilt (2018), where the item 'obesity' has been added in order to enable further comparison of the results.

Section D examines lifestyle with specific reference to smoking (D1) and vaping (D2) behaviour, travelling to work (D3), exercise (D4) diet (D5) and alcohol consumption (D6, D7 and D8). Smoking (D1) was measured as the number of cigarettes respondents smoked during the last week and vaping (D2), by the number of times respondents vaped during the last week. The level of exercise (D4) is measured by the number of times during the last week (weekly leisure activity score) the respondents did mild, moderate or strenuous exercise for more than 15 minutes. A weekly leisure activity score (WLTAS) (Godin, 2011) is computed in arbitrary units by summing the products of the separate components according to the formula:

WLTAS = (9 x Strenuous) + (5 x Moderate) + (3 x Mild)

A WLTAS score of less than 14 units indicates a low level of physical activity with low benefits to health, 14-23 units indicates some level of physical activity with some benefits to health and 24 units or more indicates activity with substantial benefits to health. Also, the level of exercise was measured by the number of times during the last week respondents travelled to work, school or college or to the shops in a particular way of travelling without taking into account their weekly supermarket shop (D3).

Diet and consumption of healthy and unhealthy food (D5) was measured by adopting a 7-point Likert-type scale, where 1 identified 'Not at all' and 7

identified 'More than once every day'. Items of healthy and unhealthy diet in the scale are adopted from Forestier et al. (2018) where they use the Healthy Eating Behaviour Scale (Pelletier, Dion, Slovinec-D'Angelo & Ried, 2004). Their 8-item scale is comprised of two subscales, where four items measure healthy food (items 1-4) and 4 items measure unhealthy food (items 5-8). The diet score is a sum of responses from each subscale ranging from 4 to 28. The sum of scores is justified because some of items of healthy and unhealthy food may be unrelated (cf. Forestier et al., 2018). The original scale has been adopted and modified in line with the City Council's agenda on promoting healthy diet through a reduction of sugar and salt. Thus, in order to still enable a comparison of results with the original scale, the first item of the original scale (i.e., Eat vegetables, fruits or grain products) was divided into two items ('Eat fruit or vegetables' and 'Eat high-fibre food (i.e., whole wheat pasta, whole grain bread, brown rice) (cf. Pechey, Jebb, Kelly, Almiron-Roig, Conde, Nakamura ... & Marteau, 2013). In order to retain two subscales relating to healthy and unhealthy food, a fifth item was added (Drink sugary drinks (e.g. fizzy soft drinks, sports drinks, fruit-flavoured drinks). As a result, a 10-item scale comprised of two subscales, each with five items, was used to measure healthy diet (items 1-5) and unhealthy diet (items 6-10).

Cronbach's alpha has been calculated for both sub-scales separately (items 1-5 as a healthy diet sub-scale and items 6-10 as an unhealthy diet sub-scale). Cronbach's alpha for the healthy diet sub-scale was 0.679, including the problematic item 'drink water'. After excluding this item, the Cronbach's alpha has been improved to 0.712. Equally, Cronbach's alpha for the remaining unhealthy diet sub-scale and items 6-10 was 0.496. Accordingly, the items 1-4 (with 'drink water excluded) were excluded.

As stated above, alcohol consumption is measured by the number of units of alcohol that respondents consumed during the last week (D6), number of times

during the last week in which respondents consumed more than 6 units in one session (D7), and by the number of days on which respondents consumed alcohol (D8). These measures are in line with Luehring-Jones, Tahaney and Palfai's (2018) and de Ridder et al.'s (2012) exploration of heavy episodic drinking and average per occasion drinking. Here, heavy episodic drinking (i.e., binge drinking) is defined in line with NHS (2019) drinking six units of alcohol (60 or more grams of pure alcohol) in one sitting at least once per month for women and eight units in one sitting for men. Per occasion drinking is defined as the average number of drinks consumed in one sitting.

Section E covers respondent occupation. In section E1, occupation type and categories of annual income are adapted from PAMCO UK (2018)[19]: A (higher managerial, professional) B (intermediate managerial, administrative and professional), C1 (supervisory, clerical and junior managerial, administrative and professional), C2 (skilled manual workers), D (semi-skilled and unskilled manual workers), E (retired, casual worker or unemployed). Another category, full-time student, was also added. The occupation types in section E1 correspond with categories of annual income (£70,000+, £50,000 - £69,999, £30,000-£49,999, £20,000-£29,999, £12,000-£19,999, £5,000-£11,999, £3,500-£4,999 and up to £3,999) in section E2. Additionally, section E3 - level of comfort in everyday life - was used as a proxy measure of economic capital (on a scale from 1 indicating 'very difficult to live comfortably' to 7 indicating 'very easy to live comfortably).

The last section of the questionnaire (Section F) captures the sociodemographic characteristics of respondents. In section F1, measures of a person's housing condition (full ownership with or without mortgage, private ownership, council tenancy or membership of a housing association) were adapted as measures of

[19] Retrived directly from PAMCO

their level of economic capital. In section F2, own and parental education is measured on a scale, where 1 indicates 'No qualification' and 7 indicates 'Postgraduate degree or equivalent'. In section F3, the presence of cultural valuables at home are measured on a scale where 1 indicates 'complete disagreement with the statement' I grew up in a home with lots of books, music, art, and other cultural interests' and 7 indicates 'complete agreement with the statement'.

In section F4, respondent gender is recorded (male, female and other). In section F5, age is recorded at a respondent's year of birth. In section F6, established longevity of residence in the UK is recorded through five categories: Born in UK, 20 or more years living in the UK, 10-19 years living in the UK, 1-9 years living in the UK and the category: 'prefer not to say'. In section F7, marital status is identified by the following categories: single, married, living with partner, widowed, separated/divorced. In section F8, ethnic background is identified by the following categories: white (British, Irish and Gypsy or Irish traveler), mixed/multiple ethnic background (White and Black Caribbean, White and Black African, White and Asian, Other mixed background), Asian/Asian British (Indian, Pakistani, Bangladeshi, Chinese and Other Asian background), Black/African/Caribbean or Black British (Caribbean, African, Other black background) and Other ethnic group (Arab and any other ethnic group). Finally, the category 'Don't know/Prefer not to say' was added. The categories are in line with the 2011 Census.

3.5.1 PILOTING OF THE SURVEY

In order to establish content validity and improve the survey data quality with respect to response rates, pretesting of the survey was carried out in three stages. At the first stage, an internal panel of experts (in particular, two senior statisticians at the Sheffield Hallam University) were consulted. The experts

focused, in particular, on reading the questionnaire (and the adaptation to the English-speaking environment), clarity of the instructions, the response categories (i.e., items/statements) and potential sensitivity of the data/bias (cf. Rothgeb, Willis & Forsyth, 2007).

At the second stage, a panel of external experts was consulted consisting of Sheffield City Council's Public Health Office team including the Head of Department, a Departmental Consultant and their Principal Analyst. Two meetings with the Council's Public Health Office team took place on 22nd and 25th of February 2019. The consultation resulted in minor changes to the instrument. In question D1 vaping was added because of the City Council's interest in the relationship between smoking and vaping. Further, question D2 was added, asking about the mode of travel to work, school, college or to the shops, because of the City Council's interest in residents' travelling patterns in relation to other physical activity. Furthermore, question F9 on the religious background of Sheffield's residents was added. The City Council was interested to explore the relationship between religious background and alcohol consumption. Lastly, question F10 was amended to enable a comparison of data at ward level, from previous Council surveys and reports.

In the third phase, the survey was pilot tested. The general public and research colleagues were consulted, but no further changes were needed because of the extensive revision of the instrument at stages one and two. After the survey release online, two respondents gave valuable feedback. Firstly, a semi-retired pensioner pointed out that category 'retired person' was unable to describe his status. The item 'retired' was therefore changed to 'retired (including part-time work)'. Also, technical details relating to the questionnaire were improved, for example one question allowed multiple answers and at the same time did not allow changes once the answers had been recorded. Secondly, question C1 'Do you have any long-standing illness, health problem, condition or disability?' did

not allow a pregnant respondent to specify her condition. The question was therefore changed to: 'Do you have any long-standing illness, health problem, disability or condition (including pregnancy)?' Table 3.4 provides a summary of the process of questionnaire construction, including sources and adaptation details.

TABLE 3.4: QUESTIONNAIRE SOURCE MATERIAL AND ADAPTATIONS BY VARIABLE/CONTENT

Section	Variable	Construct	Source	Adaptation of the scale for the purpose of the present study
A Leisure	Leisure activities	Embodied or incorporated cultural capital	Pampel, F. C. (2012). Does reading keep you thin? Leisure activities, cultural tastes, and body weight in comparative perspective. *Sociology of health & illness*, *34*(3), 396-411. Sociology of health & Illness	Excluded 1 item: take part in physical activities such as sport, going to the gym because of the purpose of the study Item 11: Handcrafts include also drawing, painting and sculpturing
B Self-control	B1 Trait self-control	Self-control	Tangney, J. P., Boone, A. L., & Baumeister, R. F. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*, 181-220.	Original Tangney et al.'s (2004) scale is 5-point Likert scale. They proposed it as a unidimensional concept. Forestier et al. used 7-point Likert scale from 1 - Completely disagree to 7-Completely agree (reliability alpha = 0.77).
	B2 State self-control		Ciarocco, N. J., Twenge, J. M., Muraven, M., & Tice, D. M. (2010). The state self-control capacity scale: Reliability, validity, and correlations with physical and psychological stress. Monmouth University. (Unpublished version, widely adopted). English version acquired by Bertrams A. Adopted in Schöndube, A., Bertrams, A., Sudeck, G., & Fuchs, R. (2017). Self-control strength and physical exercise: an ecological momentary assessment study. *Psychology of sport and exercise*, *29*, 19-26.	Schöndube et al. (2017) identified 6 items from original Ciarocco's et al. (2010) scale. All 6 items have been through protocol analysis adopted for English population. Items 7 to 10 are adopted from English version of Ciarocco's et al. (2010) 10-items scale and adapted from the English speaking respondents. Item 11 is added as a new item.
C Health	Health and long-	Health	Yorkshire Health Study (Health Questionnaire ongoing short, ongoing)	The question 'Do you have any long-standing illness, health problem, condition or disability?' was changed to

	standing conditions		Available on https://docs.wixstatic.com/ugd/54a892_f89c322f47184c8389f5fa5055174445.pdf	'Do you have any long-standing illness, health problem, disability or condition (including pregnancy)? Item 'obesity' added in order to enable com*p*arison to the Sheffield Lifestyle, Morbidity and Mortality Quilt (2018)
D Lifestyle	D1 Smoking	Healthy lifestyle	Forestier, C., Sarrazin, P., Allenet, B., Gauchet, A., Heuzé, J. P., & Chalabaev, A. (2018). "Are you in full possession of your capacity?". A mechanistic self-control approach at trait and state levels to predict different health behaviors. *Personality and Individual Differences*, *134*, 214-221.	Item on smoking added (Sheffield City Council request)
	D2 Vaping			Item on smoking added (Sheffield City Council request)
	D3 and D4 Physical activity		Godin, G. (2011). The Godin-Shephard leisure-time physical activity questionnaire. *The Health & Fitness Journal of Canada*, *4*(1), 18-22.	Item on travelling to work, school, college or to the shops added (Sheffield City Council request)
	D5 Diet		Forestier, C., Sarrazin, P., Allenet, B., Gauchet, A., Heuzé, J. P., & Chalabaev, A. (2018). "Are you in full possession of your capacity?". A mechanistic self-control approach at trait and state levels to predict different health behaviors. *Personality and Individual Differences*, *134*, 214-221.	Items 1, 2, 3, 6 and 8 adapted for the purpose of this study Item 1: Eat vegetables, fruits or a grain product has been divided between two variables (double barrel item). Item 1: 'Eat fruit or vegetables', Item 2: Eat high-fibre food (e.g. whole wheat pasta, whole grain bread, brown rice) Item 3: starches replaced with carbo hydrates Item 4: 'I eat foods that are low in fat, saturated fat and cholesterol' because of inconsistency replaced with 'Eat food that is low in fat (e.g. chicken, skimmed milk, fish)' Item 10: added (Sheffield City Council request)
	D6 – D8		Luehring-Jones, P., Tahaney, K. D., & Palfai,	

	Binge drinking		T. P. (2018). The effect of self-control on drinking outcomes is mediated by automatic appetitive responses to alcohol. *Personality and Individual Differences*, *125*, 116-119.	
E Work Occupation	E1 Level of occupation	Socio-demographics	South Yorkshire Cohort (Health Questionnaire 2, 2013 - 2015) and PAMCO UK (2018) Available on https://docs.wixstatic.com/ugd/54a892_534f7184382e4d38b5666170084e825f.pdf	Adapted version: added 'retired (including part-time work), casual worker or unemployed' and 'full-time student' Instead of 'Modern professional occupations' just 'professional occupations'
	E2 Personal annual income	Economic capital	Retrieved from PAMCO UK[20] (2018)	No adaptation
	E3 Level of comfort in everyday life	Economic capital	Level of comfort in everyday life as a measure of economic capital used in Pinxten, W., & Lievens, J. (2014). The importance of economic, social and cultural capital in understanding health inequalities: using a Bourdieu-based approach in research on physical and mental health perceptions.	Linguistic adaptation of items. Original items ranging from 'it is very difficult to live comfortably' to 'we can live very comfortably' adapted and rephrased ('very easy to live comfortably')

[20] The Publishers Audience Measurement Company (PAMCo), is the governing body which oversees audience measurement for the published media industry, responsible for the new joint industry currency (JIC) called PAMCo – Audience Measurement for Publishers in place of NRS data. More information available on https://pamco.co.uk

			Sociology of health & illness, *36*(7), 1095-1110.	
F Socio-demographics	F1 Home ownership	Economic capital	Burnett, P. J., & Veenstra, G. (2017). Margins of freedom: a field-theoretic approach to class-based health dispositions and practices. *Sociology of health & illness*, *39*(7), 1050-1067.	Originally authors used the items: Fully owned, partially owned and rented Adapted version of items: Full ownership (with or without mortgage), private renting, council tenant and member of a housing association
	F2 Highest level of education	Institutionalised cultural capital	Burnett, P. J., & Veenstra, G. (2017). Margins of freedom: a field-theoretic approach to class-based health dispositions and practices. *Sociology of health & illness*, *39*(7), 1050-1067.	Originally, they used the following items for identifying the level of own and parental education: less than high school, high school graduate, community college or technical school diploma, bachelor's degree, post-bachelor's degree Adapted version of items identifying the level of education: no qualification, below CSE/entry grade, CSEs of equivalent, GCSEs or equivalent, A-level or equivalent, bachelor's degree of equivalent, postgraduate degree of equivalent
	F3 Cultural valuables at home	Objectified cultural capital	Schmitz, A., Flemmen, M., & Rosenlund, L. (2018). Social class, symbolic domination, and Angst: The example of the Norwegian social space. *The Sociological Review*, *66*(3), 623-644.	Originally authors used 4-item Likert scale of agreement ranging from completely disagree to completely agree. In order to keep with scale equivalence, adapted version employed 7-item Likert scale.
	F4 and F5 Gender and age	Socio-demographics Age and gender	Burnett, P. J., & Veenstra, G. (2017). Margins of freedom: a field-theoretic approach to class-based health dispositions and practices. *Sociology of health & illness*, *39*(7), 1050-1067.	Originally authors identified two categories of gender (male and female). Adapted version included category 'other' and 'prefer not to say' Originally authors used categorical data to identify age (19-34, 35-44, 45-54,-55-64, 65 and older). Adapted version of the questionnaire used discrete numerical data.
	F6	Socio-	Burnett, P. J., & Veenstra, G. (2017). Margins	Originally authors identified the following immigrant

	Residence/Immigrant status	demographics Immigrant status	of freedom: a field-theoretic approach to class-based health dispositions and practices. *Sociology of health & illness*, *39*(7), 1050-1067.	categories; born in Canada, immigrated to Canada more than 20 years ago, immigrated to Canada more than 10-19 years ago, immigrated to Canada 9 or fewer years ago. Adapted version of the questionnaire identified the following categories: Born in UK, 20 or more years, 10-19 years, 1-9 years, Prefer not to say
	F7 Marital status	Socio-demographics Marital status	Burnett, P. J., & Veenstra, G. (2017). Margins of freedom: a field-theoretic approach to class-based health dispositions and practices. *Sociology of health & illness*, *39*(7), 1050-1067.	Originally authors identified the following marital statuses: married, living with partner, widowed, separated/divorced, never been married Adapted version of the questionnaire identified the following categories: single, married, living with partner, widowed, separated/divorced
	F8 Ethnic background	Socio-demographics Ethnic background	UK Census, 2011	Adopted version with added category: Prefer not to say
	F9 Ethnic background	Socio-demographics Religious background	UK Census, 2011	Sheffield City Council request
	F10	Socio-demographics Sheffield wards	Sheffield Lifestyle, Morbidity and Mortality Quilt, 2018	Sheffield City Council request

3.6 SAMPLE FRAME AND SAMPLE SIZE

Sampling methods and sample sizes in previous research applying a quantitative Bourdiesian approach in the context of health and a healthy lifestyle differ from those in self-control research in psychology. Investigations using a Bourdieusian approach sometimes draw their contribution from the secondary data, using large secondary datasets up to approximately 20,000 cases (McGovern & Nazroo, 2015; Oncini & Guetto, 2017 and 2018; Pampel, 2012) or primary datasets with smaller sample sizes up to 1,800 cases (Burnett & Veenstra, 2017; Pinxten & Lievens, 2014). Here, sampling methods usually include probability stratified or non-probability simple random sampling. With probability stratified samples, the data are usually collected using telephone surveys (Burnett & Veenstra, 2017), whereas with non-probability simple random sampling, face-to-face interviews and computer-assisted self-interviews have been applied (Pinxten & Lievens, 2014). Randomly selected samples consist of either households (Oncini & Guetto, 2017 and 2018) or individual residents aged between approximately 18 and 80 years (Pampel, 2012; Pinxten & Lievens, 2014).

Investigations in psychology, focusing on the relationship between self-control and healthy lifestyles, use primary data from much smaller sample sizes, applying non-probability sampling methods (e.g. convenience sampling). Here, samples are drawn mostly from a volunteering student population (de Ridder et al., 2011; Forestier et al., 2018; Luehrig-Jones, Tahaney & Palfai, 2018) and rarely from the general population (Briki, 2018). Briki (2018) recruited a self-selected sample of 501 exercisers aged between 18 and 65 years in the USA, using an online platform. In a similar manner, Luehrig-Jones, Tahaney, and Palfai (2018) recruited 122 undergraduate students for a purposeful sample of drinkers. In this line of research, sample sizes are generally smaller, around 350 participants, which is in line with recommendations on sample sizes for

structural equation modelling. Apart from the generally younger age of participants, research reports on other demographics are scarce and limited to ethnic background and gender. Within this context, research is sometimes biased towards the white Caucasian population, like in the case of de Ridder et al., (2011), where both samples consisted of more than 90% Caucasian, the majority being female (79% in sample 1 and 87% in sample 2). In other cases, demographics are either more representative (Briki, 2018; Luehring-Jones, Tahaney, & Palfai, 2018) or poorly reported (Forestier et al., 2018).

From a theoretical perspective, the sampling strategy applied in this study, is pragmatically linked to both approaches (i.e., sociological and psychological), using convenient sampling of typical instances (Robins, Fraley & Krueger, 2009). This approach facilitated the identification of the types of people the researcher wanted to sample and as such, the sample consisted of cases that enabled generalisation. In this research, in the first instance, non-random convenience sampling was applied, following the method which was applied in previous studies on self-control (cf. Briki, 2018). Secondly, in line with Bourdieu's ideas on stratified social space (cf. Pereira, 2018; Pinçon-Charlot & Pinçon, 2018), the typical instances (i.e., stratums) were identified in accordance with the selected variable (e.g. household income, ethnic background). Further, the sample was categorised and divided in accordance with a selected variable (e.g. income).

Regarding the sample size needed for the representativeness of a given population, theory provides different recommendations. Generally, larger sample sizes more accurately represent the qualities of a given population and therefore result in increased predictive power of the statistical model and decreased estimation error. The latter becomes relevant for the generalisation of results. However, the reality of research is facing time, budget and other restraints that prevent the researcher collecting large amounts of data.

Therefore, the optimal and pragmatic balance is needed between the actual data collection method and a sample size which provides enough predictive power for the particular method applied (VanVoorhis & Morgan, 2007).

In the context of quantitative research, the relevant literature fails to provide exact information on what is the adequate sample size for establishing enough predictive power so that results could be consistently generalised. However, there are several rules of thumb, suggesting a sample size of 10, 15 or 20 cases per predictor (cf. Tabachnick & Fidell, 2014; Lomax & Schumacker, 2004).

In similar vein, in order to establish a general rule for adequate sample sizes, Krejcie and Morgan (1970) argued that with increasing sizes of the population, the sample size increases at a diminishing rate, but further remains relatively constant at approximately 384 cases, assuming sample homogeneity. In their table they provide representative sample sizes for different increasing population sizes. In their study, Forestier et al., (2018) and de Ridder et al. (2011) adopted a similar strategy.

Likewise, there is a widely used formula from McCall (1982)[21] for determining sample size:

$$n = \left(\frac{Z\sigma}{\varepsilon}\right)^2$$

Where:

n = sample size

Z = confidence level (with a confidence level of 95%, Z = 1.962)

σ = standard deviation of scores

ε = effect size

[21] See Lomax & Schumacker, 2004

Equally, Tabachnick and Fidell (2014) argued a minimum sample size rule of thumb for testing multiple correlation would be N ≥ 50 + 8m (where m is the number of independent variables). For testing individual predictors, the rule of thumb would be N ≥ 140 + m (where m is the number of independent variables).

In the case of the present research, there are 11 independent variables. Thus, the minimum sample size needs to be higher than 151 per income range:

$N \geq 140 + 11 \rightarrow N \geq 151$

A self-selected sample of Sheffield's residents aged 18 and above was drawn, targeting a minimum of 151 respondents from each income range (i.e., lowest, middle and highest) in order to be representative.

Finally, the sample size from the lowest income range (E/D) was 234 cases, from middle income range (C1/C2) there were 210 cases and there were 272 cases from the highest income range B/A (see Table 3.5).

TABLE 3.5: SAMPLE SIZES IN ACCORDANCE TO THREE INCOME RANGES

	Income range E/D	Income range C1/C2	Income range B/A
Number of cases	278	246	321

3.7 DATA COLLECTION

An online questionnaire survey was originally used to gather quantitative data from Sheffield's residents due to the lower costs of printing, shorter turnaround time and less effort required for the participants (Braithwaite, Emery, De Lusignan & Sutton, 2003; Pan, Woodside & Meng, 2014). However, research literature discusses a few problems emerging from online data collection. This mostly relates to issues like disproportionate representativeness and low

response rates (Pan, 2010; Stellefson, Chaney & Chaney, 2008). In the context of the former, the digital divide between the affluent population with internet access and a sufficient level of e-literacy, and the deprived elements of the population without access to the internet and an insufficient level of e-literacy is often discussed (Fox & Connolly, 2018; Yoon, Jang, Vaughan & Garcia, 2020). This often results in distorted samples which are biased towards a more affluent population (ibid.). However, census data (from 2017) shows that in the UK, 90% of households have internet access and that 73% of adults are also actively accessing it using their mobile devices or smartphones, in particular for online purchases (77% of the adult population buys goods or services online). In Sheffield, only 11% of the population aged 16 and over have never used the internet, which is below the UK's average (13.1%) and below the average of nearby cities: Leeds (12.4%), Greater Manchester South (13.1%) or Greater Manchester North (14.6%) (Tackling Poverty Strategy, 2015). Moreover, only 2% of Sheffield's population cannot speak English either well or not at all (ibid.). Even in the most deprived wards, like Burngreave, Darnall and Nether Edge, the percentage of the population that does not speak English well or does not speak the language at all, is not higher than 8%. Thus, it cannot be argued that digital or language inequalities are dimensions of socio-economic inequality because access to digital technologies, including the internet, does not translate to the socioeconomic gradient. In a similar manner, going hand-in-hand with technology, the language divide does not seem to be a barrier for the general population accessing the internet and related digital services. Thus, the use of an online survey in the English language in order to identify the wealth-to-health pathway was justifiable.

Lower response rates and high dropout rates are often cited as drawbacks of online surveys (Pan, 2010; Pan, Woodside & Meng, 2013; Stellefson, Chaney & Chaney, 2008). Therefore, although online surveying is easier for people to engage in and therefore more popular, higher dropout rates and a higher

number of incomplete answers are problematic in comparison with paper-version surveys. For online surveys, the inclusion of sentence fragments (i.e., prompt sentences) to encourage respondents to continue completing the questionnaire is one way to reduce the dropout rates. Other incentives include the following: Luehrig-Jones, Tahaney and Palfai (2018) used course research credits as an incentive for student participants to engage with their survey and Briki (2013) used 30$ (approximately £23) as a compensation for participation in his survey. Furthermore, incentives like vouchers have been previously discussed as a means to increase the representativeness of the sample and lower the dropout rates. In a clinical setting, Pieper, Kotte and Ober (2018) tested the effect of the voucher incentive on the survey response rate using a £1 coffee voucher. The response rate was 48% in the group that was offered the voucher and 44% in the control group that was not incentivised. Moreover, Robb, Gatting and Wardle (2017) argue that a £250 voucher prize draw had no significant impact on the response rate (41%) compared to the no incentive scenario (38%).

Using a voucher as an incentive to boost response rates and achieve the targeted sample size has been used in previous local studies (Beaney, 2009; Sheffield City Council, 2018; Sheffield City Council, 2017). Previous research has used locally based shopping vouchers to the amount of £50 (Sheffield City Council, 2017) or £100 (Beaney, 2009; Sheffield City Council, 2018). Thus, in line with the previously established local custom and practice and the available budget, shopping vouchers to the value of £200 were used for a prize draw as an incentive to complete the questionnaire in the survey used in this study.

At the end of the questionnaire, respondents who wished to be entered into the prize draw for £200 were asked to provide their e-mail address so that they could be informed in the event that they won the £200. All e-mail addresses were stored separately from, and independently of, respondents' survey data to

maintain anonymity. Moreover, settings were used in order to prevent respondents participating in the survey multiple times. When the survey closed, one e-mail address was randomly selected from those which were voluntarily provided, and the prize winner was informed by e-mail. The voucher was collected from the prize-draw winner at the reception desk in Sheffield Business School. Ethical approval for the primary data collection was obtained prior to the questionnaire survey (Reference number: SBS-256).

3.7.1 QUALTRICS ONLINE SURVEY SOFTWARE

Forestier et al. (2018) reported that they used an online questionnaire survey hosted on Survey Monkey, whereas Briki (2018) and de Ridder et al. (2011) did not report the software used in their research. In the case of the present investigation, Qualtrics online survey software was used to establish an online questionnaire, for the purpose of distribution and for data collection. The free software is available to Sheffield Hallam University postgraduate students and staff members. Several steps were taken in order to adapt the questionnaire survey to an online layout. After the questionnaire's introductory paragraph, the potential respondents were screened for eligibility.

Based on two criteria, namely residency in Sheffield and age (i.e., being aged 18 and above), non-residents and respondents aged below 18 were excluded from participation and redirected to the end of the survey. Here, they were thanked for their interest. Eligible respondents were able to continue to participate in the survey. An online survey then followed the same order of sections as was adopted in the paper version of the survey i.e., A: About Your Leisure, B: About Your Behaviour, C: About Your Health, D: About Your Lifestyle, E: About Your Work, F: About You.

An online survey design allowed a higher level of personalisation and customisation of the survey experience in comparison to the paper version. Qualtrics allowed this through manipulation of the display logic of the questions. Accordingly, the display logic with the questions on resident health (C1) and ethnic background (E11) followed the logic of conditionality. In cases where respondents answered question C1 negatively i.e., did not have any long-standing illnesses, health problems, conditions or disability, the next question appeared. By comparison, if respondents answered question C1 positively i.e., they had a long-standing illness, health problems, conditions or disability, the subsection with the display of all the potential illnesses appeared.

Data collection was designed in two waves (A and B) (see Table 3.6). Wave A was launched on the 2nd of April 2019 with the help of City Council networks. The survey was also placed in the April 2019 edition of the Sheffield Health & Wellbeing Newsletter, a monthly newsletter reporting the news and activities of the Public Health Intelligence Team of the City Council.

Wave A also included the survey's launch among Sheffield Hallam University and Sheffield Business School staff. Sheffield Business School released two staff engagement emails, inviting staff members to participate in the survey. Further, Sheffield Hallam University promoted the survey in its University News. A press release about the survey and its local impact was also issued in the local media (The Star, Telegraph, Hallam FM and BBC Radio Sheffield). The online survey closed on the 5th of July 2019.

TABLE 3.6: SCHEDULE OF RELEASING DATES OF THE ONLINE SURVEY

Date of a release	Media Chanel	Content of the release
2.4.2014	City Council networks (email, Twitter)	Short presentation of the research was followed by the invitation to participate in the survey and prize draw.
3.5.2019	Sheffield Health & Wellbeing Newsletter	Presentation of the research, invitation to participate in the survey and prize draw.
17.5.2019	Staff Engagement e-mail	Short presentation of the research, invitation to participate in the survey and prize draw.
20.6.2019	Press release in local media (The Star, Telegraph, Hallam FM and BBC Radio Sheffield)	Presentation of the research and invitation to participate in the survey.
25.6.2019	University News	Presentation of the research and invitation to participate in the survey.
1.7.2019	Staff Engagement e-mail	Reminder and invitation to participate in the survey and prize draw.

Following the lower-than-expected response rates in wave A, in order to boost the sample size of underrepresented lower socio-economic groups (particularly stratum 1 and 2 with higher deprivation) in wave B, a paper version of the survey was used. The paper questionnaire was firstly distributed among the support staff of Sheffield Business School (cleaning, catering, maintenance teams). Further, the survey was also carried out in two of the busiest public spaces in Sheffield city centre, both within five minutes walking distance from the University. In the Moor area of the city centre, frequented by residents from the lower socioeconomic groups, potential research participants were approached selectively and purposefully to boost the sample from the lower socio-economic groups.

Additionally, 30 copies of the questionnaire were also given to two key members (15 copies each) of ethnic communities in Sheffield who agreed to distribute them among their members (see Table 3.7). The incentives were offered to the potential participants and the contact details were administered on a separate sheet of paper. For the final prize draw, all hard copy survey participants were also included prior to the random selection of the winning respondent (for more detailed information on the prize draw, see chapter 3.7).

TABLE 3.7: VENUE AND TIMEFRAME OF THE ON-SITE DATA COLLECTION

Venue	Timeframes of data collection
Peace Gardens	07/06/19 to 07/07/19
Winter Gardens	07/06/19 to 07/07/19

3.8 DATA ANALYSIS

In order to analyse the data and to test H_1, H_2, H_3 and H_4, Structural Equation Modelling (SEM) was performed, using SPSS Version 24 and Amos SPSS Version 24. Structural equation modelling (SEM) is a powerful, covariance based, multivariate analytical approach for testing the theory-grounded models (Lomax & Schumacker, 2004). The method is particularly useful for simultaneously dealing with complex causal relations between multiple causes i.e., independent, exogenous variables and multiple outcomes i.e., dependent, endogenous variables, typical of complex health-related behaviour, where the problems are multidimensional (Buhi, Goodson & Neilands, 2007). Theoretical models, generating high quality outcomes and attempting to generalise the outcomes are particularly beneficial for the design and improvement of health-related interventions (ibid). Therefore, SEM as a method of data analysis fitted the ontological and epistemological premise of the research (Hair, Black, Babin & Anderson, 2014).

In the context of this study, the underlying theory, causally linking social with psychological theory in the context of health-related urban inequalities, guided the underlying constructs in the model and the interrelationships between them (cf. Buhi, Goodson & Neilands, 2007). Equally, the underlying theory and philosophy guided the sequence of the cause-and-effect dynamic, direction and temporal precedence of causal socio-economic i.e., habitat) and psychological i.e., habitus resources of one's health and a healthy lifestyle (see section 3.3). Here, the ontological premise of SEM is grounded in theory-based casual regularities, in the idea of knowledge generalisation and in the assumption of sequential causality (Kline, 2010) (for the process of model development see Figure 3.3).

Theory in SEM identifies several assumptions that need to be met prior to the analysis (Pallant, 2016; Tabachnick & Fidell, 2014). Because SEM represents a combination of path analysis, factor analysis, causal modelling with latent variables and multiple regression analysis, the assumptions of SEM are related to these rigorous types of analyses. The assumptions need to be dealt with within the preliminary analysis and data preparation phase (see section 4.2) and are related to:

1) sample size and missing data

   SEM (in line with other regression-based techniques) requires an adequate sample size for achieving statistical power in determining the relationships between variables that allow significant generalisation of results. Thus, in order to obtain a good factor model, the size of the sample and the size of the factor loadings need to be adequate (ibid.). Equally, missing data can be handled through the various techniques (i.e., deletion or imputation) and still included in the sample.

2) normality, linearity and independence of residuals

   Multivariate normality of the data, linear relationships between variables and the absence of outliers are other assumptions that need to be met prior to the application of SEM. Thus, in the preliminary analysis and data preparation phase, data needs to be screened for outliers, skewness and kurtosis. If such abnormal issues are identified, transformation techniques must be applied (e.g. square root transformation or Log10 transformation) (see chapter 4, section 4.2.3).

3) absence of multicollinearity and singularity

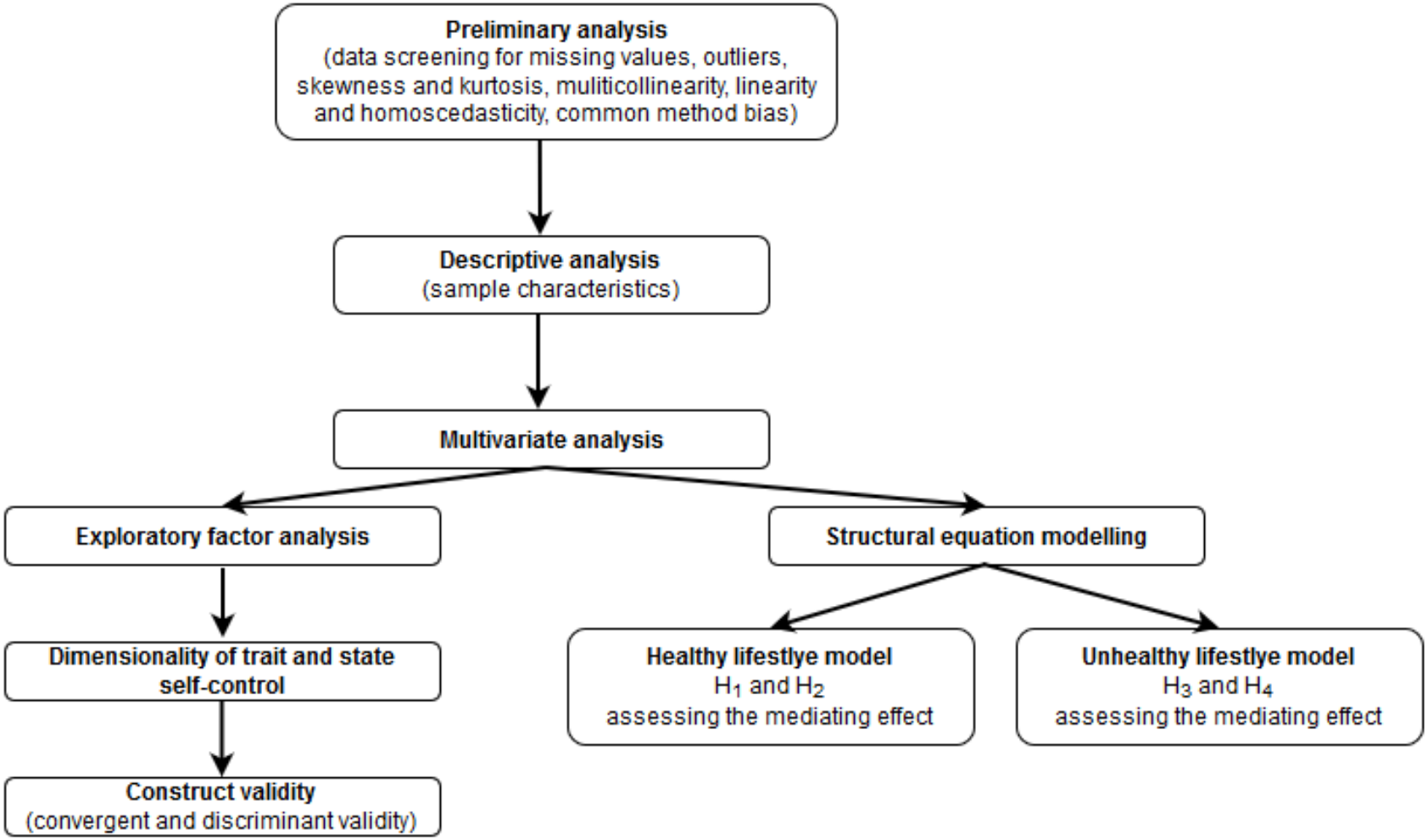
   Further, the data needs to be screened for the issues of multicollinearity and singularity (see chapter 4, section 4.2.4). Collinearity diagnostic tests are computed to provide multicollinearity tolerance values and VIF values. Tolerance is an indicator of multiple correlations between independent variables that can obscure the identified contribution of independent variables (Pallant, 2016). Tolerance values lower than 0.10 are an indication of such multiple correlations between the variables. Equally, VIF (Variance inflation factor) is another indication of multicollinearity. VIF values above 10 are indicative of multicollinearity (ibid.).

The process of data analysis followed the path of SEM model development (see Figure 3.2). Thus, preliminary analysis focused on screening for missing values, outliers, skewness and kurtosis, multicollinearity, linearity, homoscedasticity and issues around common method bias. The sample characteristics are presented in the context of descriptive analysis.

The multivariate data analysis was conducted in two parts. Firstly, exploratory factor analysis was conducted in order to identify the dimensions of trait and state self-control. Construct validity was confirmed by applying convergent

and discriminant validity. Previously validated constructs have been included in the development of the SEM.

FIGURE 3.2: SUMMARY OF DATA ANALYSIS PROCESS



Theoretically, there are several steps in the development of an SEM: model specification and identification, model estimation, model testing and model modification (Lomax & Schumacker, 2004; Tabachnick & Fidell, 2014). Model specification and identification are the first steps towards developing an SEM. At this stage, based on theoretical considerations, the researcher a priori specifies the model, the relationships between variables, the nature of variables (latent vs. observed; dependent vs. independent) and the predicted pathway (Lomax & Schumacker, 2004) (see chapter 2 for theoretical background of this research).

The initial step of model specification and identification is followed by model estimation. In this step the researcher estimates the parameters of the model. There are three basic approaches to estimating a model, namely ordinary least squares, generalised least squares and maximum likelihood methods (Lomax & Schumacker, 2004). Approaches vary in their scale dependency and related distributional assumptions. The ordinary least squares method has no distributional assumption or scale dependency (in the case of scale transformation, estimates are not transformed accordingly). The generalised least squares method and maximum likelihood method are not dependent on the scale (in the case of scale transformation, estimates are transformed accordingly) and assume distributional normality. In the case of this research, the maximum likelihood method with estimated means and intercepts was applied and assumptions on data normality were met (see chapter 4, section 4.2 on data preparation and presentation).

The step of model testing involves assessing the fit of the specified model to the data (ibid.). Here goodness-of-fit (GOF) indices for the model identify how well a theoretically estimated covariance matrix fits the actual observed covariance matrix (Hair et al., 2017). A chi-square test is the key measure of GOF, assessing the probability (indicated by a p) that estimated and observed matrixes are

equal. Small chi-square values indicate that both matrixes fit each other well and relatively large chi-square values indicate that estimated and observed matrices differ. Besides chi-square, degrees of freedom (df) indicate the *known* amount of information available on the model parameters. Relative chi-square indicates the adjustment of chi-square for the sample size, where the ratio between chi-square and df is 3:1. However, higher flexibility is accepted with sample sizes higher than 750. As an alternative to GOF, there are other basic measures of fit indices such as absolute and incremental indices (Hair et al., 2017; Tabachnick & Fidell, 2014). Absolute fit indices represent basic assessment of fit between estimated and observed matrixes. Relevant absolute fit indices are chi-square, GFI (goodness-of-fit index), RMSEA (root mean square error of approximation) and relative chi-square (chi-square:df ratio). Further, incremental fit indices identify the fit between the estimated model and the alternative null model. The null model assumes that there are no covariances among factors in the covariance matrix. The TLI (Tucker Lewis index) and the CFI (comparative fit index) are among the most widely used indices (Hair et al., 2017).

Theoretically, several relevant model fit indices need to be reported. Lomax & Schumacker (2004) suggest reporting chi-square df, the *p* value, RMSEA, SRMR (standardised root mean square) and the GFI (goodness-of-fit-index). Hair et al. (2017) suggest reporting a minimum of three of four indices, among them at least chi-square and df, one absolute index, preferably RMSEA and one incremental index, preferably CFI or TLI. Tabachnick & Fidell (2014) suggest reporting the CFI and RMSEA. For the purpose of this research, four indices are adequate to provide the evidence of model fit, namely chi-square, df, *p*, CFI and RMSEA (see Table 3.8). Forestier et al. (2018) reported all the adopted fit indices.

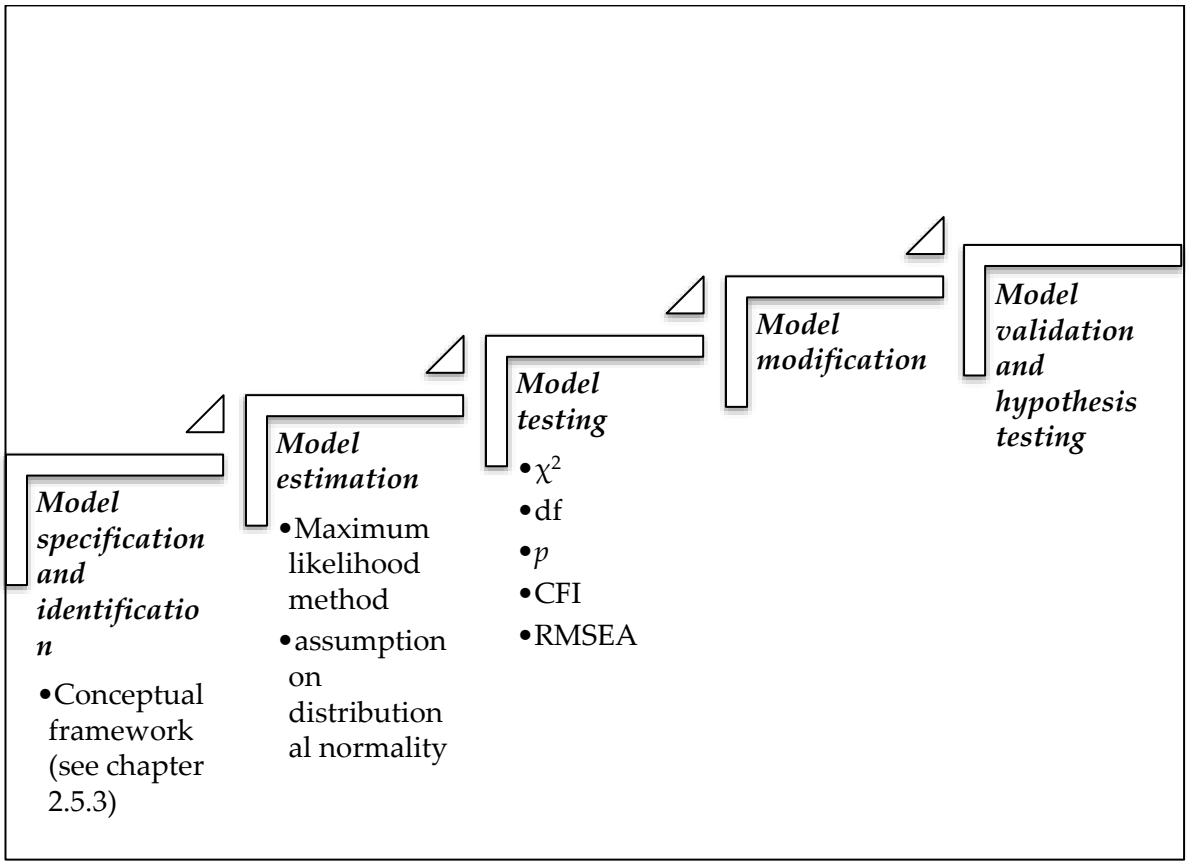
TABLE 3.8: RELEVANT MODEL FIT INDICES AND THEIR CUT-OFF CRITERIA

Type of fit	Fit index	Description	Cut-off criteria
Absolute fit indices	χ^2 Chi-square	Fundamental measure of the difference between the observed and estimated covariance matrices (Hair et al., 2016)	Normally, the ratio between χ^2 and df is 3:1 except with the samples larger than 750, where higher flexibility is accepted (Hair et al., 2016).
	df Degrees of freedom	Degrees of freedom represent the *known* amount of information available on the model parameters	
	p	Probability value (probability of the occurrence of an event that represent an alternative hypothesis)	Below 0.05
	RMSEA	Root mean square error of approximation (how well the model would fit the population covariance matrix with optimally chosen parameter values)	Below 0.07 with sample size above 250 cases and more than 30 observed variables (Hair et al., 2016)
Incremental fit indices	CFI	Comparative fit index (compares proposed model to baseline model)	Above 0.90 with sample size above 250 cases and more than 30 observed variables (Hair et al., 2016)

Source: cf. Sawang & Unsworth, 2011; Hair et al., 2017

In cases where the SEM values are not satisfactory and the model does not fit the data well, the final step of model development is applied, namely, model modification (cf. Lomax & Schumacker, 2004) (see Figure 3.3). In this step, critical values and parameters are identified and excluded from the model and fit indices from the previous stage are checked again. When the researcher has achieved the satisfactory fit indices and model fit, the hypotheses testing phase is undertaken. Every pathway between the constructs represents a hypothesis. The null hypothesis is rejected when the *p*-value is lower than the significance level (i.e., $p < 0.05$) and the null hypothesis cannot be rejected when the *p*-value is higher than the significance level (i.e., $p > 0.05$).

FIGURE 3.3: THE PROCESS OF MODEL DEVELOPMENT



3.9 CONCLUSION

The previous chapter discussed the main aspects of relevant research ontology and epistemology, pragmatically linking them both to the associated methodologies. The ontological premise of this research is building on the concepts of causality, regularity and interventionism. A survey was adopted as the research strategy, and instruments from referential studies in sociology and psychology were adapted to suit this particular context. This idea of valid, rigorous and trustworthy instrument adaptation links back to the pragmatic ontological premise of this study, which is building on reliability and validity and optimising the generalisation of the results of the study.

The sampling strategy applied in this study pragmatically links theoretical approaches from sociology and psychology, applying convenient sampling of typical instances. In the first instance, convenient sampling was applied, referring back to relevant psychological research on self-control that has used the same method in previous studies (cf. Briki, 2018). In the second instance, the sample has been categorised in accordance with the income variable and related income ranges.

The sample size is in line with Tabachnick and Fidell's (2014) rule of thumb where sample size can be calculated as $N \geq 140 + m$ (where m is the number of independent variables). In the case of the present research, there are 11 independent variables, making 151 cases per category within each income range. The chapter concludes with a presentation of relevant steps towards the data analysis process, applying the SEM approach. The results of the analysis are presented in the next chapter.

4. RESEARCH RESULTS

4.1 INTRODUCTION

This chapter presents the results of the data analysis. In line with objective 2 and to test H_1, H_2, H_3, and H_4, SEM was applied. Drawing on previously discussed assumptions relating to SEM and relevant steps in model design, this chapter follows the process of analysis presented previously (see Figure 3.3). Accordingly, the chapter begins with a data preparation phase where assumptions about the sample size and data normality are tested. The results of the descriptive analysis are then presented and sample bias discussed. The chapter then moves on to present the results of the multivariate analysis, where exploratory and confirmatory factor analysis were carried out for both trait and state self-control. The identified dimensions are then built into models of healthy and unhealthy lifestyles and tested using structural equation modelling. Finally, both models are presented and the hypotheses tested.

4.2 PRELIMINARY ANALYSIS

As discussed in Chapter 3, section 3.8, there are several assumptions in SEM that need to be met prior to analysis (Pallant, 2016; Tabachnick & Fidell, 2014). These relate to sample size, missing data and implementation, outliers, skewness and kurtosis, and testing for multicollinearity.

4.2.1 SAMPLE SIZE

The sample size for this research was in line with Tabachnick and Fidell's (2014) recommendations regarding acceptable sample sizes and was discussed in more detail in Chapter 3, section 3.6.

4.2.2 MISSING DATA AND IMPUTATION METHOD

SEM requires there to be no missing data. In the original data set from the online survey, there were 28 cases where screening questions relating to either residency in Sheffield or respondent age (18 or over) were answered negatively. By default, these were identified as system-missing values and were removed from the dataset. Additionally, 54 cases where all the questions were unanswered by respondents were also removed; such cases were, by default, identified either as system-missing or user-missing values. Altogether, 82 cases were removed from the dataset, leaving 845 cases for the analysis. These cases were also examined for missing values. Further details on patterns of missing data are presented in Appendix B.

Hair et al. (2016) argue that variables with less than 10 percent of data missing are not problematic if the missing data occurs in a random manner. In such cases, any type of imputation method can be applied. Among these, the mean substitution method is widely used and recommended due to the consistency of results obtained (ibid.). Within the existing data set, most variables had less than 10 percent of cases missing and only five variables had more (see Appendix B.1).

Additionally, the imputation of missing values is only possible with metric data (Hair et al., 2017). Thus, in line with both criteria, only the following variables were eligible for the treatment of missing values: DIET1 – DIET10, COMFORT, CHILDCC, LEISURE1 – LEISURE12, TraitSC1 – TraitSC13, StateSC1 – StateSC11, StrenuousEx, ModerateEx, MildEx, BingeAlc, and Cigarettes. (See Appendix B.2 for a summary of the data imputation.)

4.2.3 OUTLIERS, SKEWNESS, AND KURTOSIS

To address the next assumption that needed to be met prior to the application of SEM, the data set was checked for outliers, normal distribution of the variables, and skewness and kurtosis. Firstly, outliers were identified in the dependent variables of strenuous, moderate, and mild exercise, alcohol consumption, and smoking and vaping, where the collected data were in metric form to allow for more flexible answers. The skewness and kurtosis statistics indicated that all the values were within the range of ± 2 and the standard scores of the z-distribution were within the range of ± 4 (Garson, 2012). Extreme values i.e., outliers were removed from the data (e.g., scores indicating exercise more than 20 times per week, more than 300 cigarettes per week, 400 vapes, and so on). Altogether, 17 such cases were removed. In cases where the Likert scale predefined the scope of the answers, no outliers were identified.

Problems with deviations from the normality of the distribution were also investigated. The distribution of the majority of variables was normal. Further, skewness and kurtosis of variables was examined. Skewness refers to the amount of asymmetry in the variation of data relative to the normal distribution, while kurtosis refers to the level and shape of 'peakedness' in the data distribution (Pallant, 2016). In cases where skewness and kurtosis lay outside the range of ± 1, data transformation was applied. For critical variables (see Table 4.1), two types of transformation were applied: log transformation (i.e., Log10) and square root transformation (i.e., Sqrt), and the results were compared. Both transformations corrected for positive skew and kurtosis, unequal variances, and lack of linearity (Field, 2018).

Table 4.1 presents the critical variables and values for skewness and kurtosis before and after the transformations. Square root transformation was adopted with the following variables: number of alcoholic drinks per occasion (D6),

number of cigarettes smoked per week (D1), number of vapes per week (D2), and the level of comfort in everyday living (E3). Log10 transformation was adopted in the case of binge drinking (D7), housing situation (F1), where I grew up (F3), level of occupation (E1), and length of residence (F6). No variables in the established state and trait self-control scales were transformed.

TABLE 4.1: TRANSFORMED VARIABLES

Variable	Before transformation		After transformation Log10		After transformation Sqrt	
	skewness	kurtosis	skewness	kurtosis	skewness	kurtosis
Alcoholic drinks per occasion 1 (D6)	2.627	10.288	-0.247	-0.233	1.009*	1.599*
Alcohol binge (D7)	2.209	5.358	0.984*	0.032*	1.511	2.028
During the last week, how many cigarettes did you smoke? (D1)	2.190	6.224	-0.440	-0.541	0.818*	0.353*
During the last week, how many times did you vape? (D2)	1.839	3.454	-0.370	-0.964	0.769*	-0.147*
Your housing situation (F1)	2.265	4.731	1.487*	1.038*	1.831	2.586
Level of comfort (E3)	-0.169	-0.406	-1,456	2.843	-0.717*	0.558*
Where I grew up (cultural capital at home) (F3)	-0.430	-1.068	-1.165*	0.400*	-0.759	-0.561
Level of occupation (E1)	-0.760	-0.670	-1.442*	0.625*	-1.108	-0.118
Length of residence (F6)	3.650	12.992	2.577*	5.208*	2.751	6.312

*adopted transformations

4.2.4 TESTING FOR MULTICOLLINEARITY AND SINGULARITY

The data were also screened for multicollinearity and singularity. According to Pallant (2016), multicollinearity occurs when independent variables are highly correlated (r=0.9 and above) and singularity occurs when one independent variable is a combination of other independent variables and they are perfectly correlated. They both should not be present regression modelling.

To test for the multicollinearity, tolerance values and VIF values were examined. Tolerance values for the Healthy Lifestyle (HLS) model for all possible iterations ranged from 0.824 to 0.993. VIF values ranged from 1.007 to 1.213. Tolerance values for the Unhealthy Lifestyle (UNHLS) model for all possible iterations ranged from 0.835 to 0.993. VIF values ranged from 1.007 to 1.099. All the tolerance values were larger than the threshold of 0.10 and all the VIF values were below the threshold of 10, indicating no problem with the multicollinearity of independent variables (Pallant, 2016).

4.2.5 RECODING OF VARIABLES

Recoding is a type of data manipulation where changes are made to the original data set in order to:

- transform skewed variables (e.g., log10 transformation to achieve a normal distribution);
- group variables (e.g. years of birth recoded to age groups);
- add up individual item scores to form an overall score (e.g., 13 items added up to identify an overall self-control score) (Pallant, 2016).

Firstly, the respondents' dates of birth were transformed into their actual age. The variable 'age' was then re-coded into a new variable named 'Age_Range' to denote age ranges. In line with Burnett and Veenstra (2017), five age categories

were used: 1) 18 - 34 years, 2) 35 - 44 years, 3) 45 - 54 years, 4) 55 - 64 years, and 5) 65 and older. Table 4.2 shows the code plan for the variable 'Age'.

TABLE 4.2: CODE PLAN FOR INDEPENDENT VARIABLE 'AGE'

'Please give the year of your birth (XXXX)'	
Previous value labels 'age'	Developed code plan 'age_ranges'
1930 - 2001 = discrete data	1) 18 - 34 years
	2) 35 - 44 years
	3) 45 - 54 years
	4) 55 - 64 years
	5) 65 and older

The variable 'exercise' was originally treated as discrete data, where participants stated their weekly level of exercise as strenuous, moderate, or mild. The weekly exercise score was then calculated and summed in line with WLTAS formulae (9 x strenuous exercise + 5 x moderate exercise + 3 x mild exercise). Additionally, in line with Godin (2011), the summed units of exercise were recoded to form the following three variables: 1) less than 14 units of exercise per week (low benefits for health); 2) between 14 and 23 units of exercise per week (some benefits for health); and 3) more than 24 units of exercise per week (substantial benefits for health). Table 4.3 shows the code plan for the variable 'WLTAS'.

TABLE 4.3: CODE PLAN FOR DEPENDENT VARIABLE 'WLTAS'

'Number of times you exercised for more than 15 minutes last week'		
Previous value labels 'exercise'	Developed code plan (WLTAS)	Further developed code plan 'WLTAS_ranges'
discrete data on 1) mild exercise 2) moderate exercise 3) strenuous exercise	Units of weekly exercise calculated in line with formulae 9 x strenuous exercise + 5 x moderate exercise + 3 x mild exercise	1) less than 14 units of exercise (low benefits for health) → WLTASlow
		2) 14 - 23 units of exercise (some benefits for health) → WLTASmedium
		3) more than 24 units of exercise (substantial benefits for health) → WLTAShigh

In line with research by Forestier et al. (2018), the variable 'Diet' was recoded into two dimensions: 'Diet_healthy' (items 1-5) and 'Diet_unhealthy' (items 6-10). Table 4.4 shows the code plan for the variable 'Diet'. To obtain the summed scores for 'healthy' and 'unhealthy' diet the responses were calculated for each subscale.

TABLE 4.4: CODE PLAN FOR DEPENDENT VARIABLE 'DIET'

'Please indicate the number of times you did each of the following last week'		
Previous value labels 'Diet'	Developed code plan for 'Diet_healthy' A summed score of 'healthy' items	Developed code plan for 'Diet_unhealthy' A summed score of 'unhealthy' items
1) Eat fruit and vegetables	1) Eat fruit and vegetables	
2) Eat high-fibre food (e.g., whole wheat pasta, whole grain bread, brown rice)	2) Eat a variety of foods to provide a balance of the four main food groups	
3) Eat a variety of foods to provide a balance of the four main food groups	3) Eat a variety of foods to provide a balance of the four main food groups	
4) Eat food that is low in fat	4) Eat food that is low in fat	
5) Drink water	5) Drink water	
6) Eat food such as chips, chocolate, and sweets		6) Eat food such as chips, chocolate, and sweets
7) Add white sugar to your food and drink		7) Add white sugar to your food and drink
8) Eat fried food		8) Eat fried food
9) Add salt to your food		9) Add salt to your food
10) Drink sugary drinks		10) Drink sugary drinks

To identify the level of income for each social grade, the variable 'personal annual income', previously coded as 'income', was recoded into 'income_group'. There are five social grades identified in the UK: E (lowest), D, C1/C2, B, and A (highest) (Office for National Statistics, 2019). PAMCO (2019)[22] uses the following groups of net annual income: up to £3,499, £3,500-£4,999, £5,000-£11,999, £12,000-£19,999, £20,000-£29,999, £30,000-£49,999,

[22] The Publishers Audience Measurement Company (PAMCo) is the governing body that oversees audience measurement for the published media industry.

£50,000-£69,999, and >£70,000 and links these accordingly to the social grades (see Table 4.5).

TABLE 4.5: MEAN INCOME BY SOCIAL GRADE

	Social grade E	Social grade D	Social grade C2	Social grade C1	Social grade B	Social grade A
Mean income of chief earner	£8,994, 12	£15,779,89	£21,238,96	£23,761,00	£35,698,31	£44,919,31

The average monthly net salary in the UK is approximately £1,730 (salaryaftertax.com, 2019). The relative poverty line is defined as earnings less than 60% of the mean, which is £1.038/month. To clearly identify the three main income groups in the UK (lower, middle, and higher social grade), the first four income categories (up to £3,499, £3,500-£4,999, £5,000-£11,999, and £12,000 - £19,999) were merged into the lower income group E-D using the methodology applied by PAMCO. Additionally, social grades C2 and C1 were merged as were social grades B and A. The values of the variable were then recorded in line with these three groups. Table 4.6 shows the code plan for the variable 'Income'.

TABLE 4.6: CODE PLAN FOR INDEPENDENT VARIABLE 'INCOME'

'Please estimate your personal annual income'	
Previous value labels 'income'	Developed code plan 'income_group X'
1) Up to £3,499	1) up to £19,999 (working class, income group E-D)
2) £3,500 - £4,999	
3) £5,000 - £11,999	
4) £12,000 - £19,999	
5) £20,000 - £29,999	2) £20,000 - £29,999 (lower middle class, income group C1-C2)
6) £30,000 - £49,999	3) £30,000 – (upper middle class, income group B-A)
7) £50,000 - £69,999	
8) £70,000 +	

The variable 'comfortincome', which indicated participants' level of comfort within their available income, was also recoded into two dimensions. Values between 1-3 were recoded into a 'comfortlow' variable while values between 4-7 were recoded into a 'comforthigh' variable (see Table 4.7).

TABLE 4.7: CODE PLAN FOR DEPENDENT VARIABLE 'COMFORTINCOME'

Please indicate how comfortably you live within your available income?	
Previous value labels 'comfortincome'	Developed code plan
-99 = 'System missing' 1 = 'Very Difficult' 2 = 'Difficult' 3 = 'Somewhat 'Difficult' 4 = 'Neither Difficult Nor Easy' 5 = 'Somewhat Easy' 6 = 'Easy' 7 = 'Very Easy'	-99 = 'System missing' 1 – 3 = 'ComfortLow' 4 = 'ComfortMiddle' 5 – 7 = 'ComfortHigh'

The variable 'childhoodCC' indicated participants' level of agreement with the following statement: 'I grew up in a home with lots of books, music, art, and other cultural interests'. It was recoded into two dimensions where values between 1-3 were recoded into a 'childhoodCCLow' variable and values between 4-7 were recoded into a 'childhoodCCHigh' variable (see Table 4.8).

TABLE 4.8: CODE PLAN FOR DEPENDENT VARIABLE 'CHILDHOODCC'

I grew up in a home with lots of books, music, art, and other cultural interests.	
Previous value labels 'comfortincome'	Developed code plan
-99 = 'System missing' 1 = 'Completely Disagree' 2 = 'Disagree' 3 = 'Somewhat Disagree' 4 = 'Neither Disagree Nor Agree' 5 = 'Somewhat Agree' 6 = 'Agree' 7 = 'Completely Agree'	-99 = 'System missing' 1 – 3 = 'ChildhoodCCLow' 4 = 'ChildhoodCCMiddle' 5 – 7 = 'ChildhoodCCHigh'

The variable 'education1' indicated participants' level of education while variable 'education2' indicated the level of their parents' education. Both variables were recoded into two dimensions. First, lower levels of education: (1) No formal education, 2) 1-4 GCSEs or equivalent qualification, 3) 5 or more GCSEs or equivalent qualifications, and 4) Apprenticeship) were recoded into an 'Education1Low' variable. Second, higher levels of education: (1) 2 or more A-levels or equivalent qualifications, 2) Bachelors degree or equivalent qualification, and 3) Postgraduate degree or equivalent qualification) were recoded into an 'Education1High' variable. Lower and higher levels of parental education were recoded the same way (see Table 4.9).

TABLE 4.9: CODE PLAN FOR DEPENDENT VARIABLE 'EDUCATION1' AND 'EDUCATION2'

Highest level of educational qualification		
Previous value labels 'education1' and 'education2'	Developed code plan 'education1'	Developed code plan 'education2'
-99 = 'System missing' 1 = ' No formal education 2 = '1-4 GCSEs or equivalent qualification' 3 = '5 or more GCSEs or equivalent qualifications 4 = 'Apprenticeship'5 = '2 or more A-levels or equivalent qualifications' 6 = 'Bachelor's degree or equivalent qualification' 7 = 'Postgraduate degree or equivalent qualification'	-99 = 'System missing' 1 – 4 = 'Education1Low' 5 – 7 = 'Education1High'	-99 = 'System missing' 1 – 4 = 'Education2Low' 5 – 7 = 'Education2High'

The variable 'housing' provided a measure of participants' housing situation (1 – Full ownership, with or without mortgage, 2 – Private renting, 3 – Council tenant, 4 – Member of housing association, 5 – Other). Respondents' ratings on this variable were recoded into two dimensions. Full ownership was recoded to

a ‘housinghigh’ variable while all other categories were recoded to a ‘housinglow’ variable (see Table 4.10).

TABLE 4.10: CODE PLAN FOR DEPENDENT VARIABLE ‘HOUSING’

Please indicate your housing situation	
Previous value labels ‘housing’	Developed code plan
-99 = ‘System missing' 1 = 'Full ownership (with or without mortgage)' 2 = 'Private renting' 3 = 'Council tenant' 4 = 'Member of housing association’ 5 = 'Other’	-99 = ‘System missing' 1 = 'HousingHigh' 2 - 5 = 'HousingLow'

4.2.4.1 REVERSE CODING AND HIGHER AND LOWER LEVELS OF SELF-CONTROL

In their original scale, Tangley, Baumeister, and Boone (2004) justified reverse coding for nine of the thirteen items from the original brief self-control scale. Their original scale consisted of positively and negatively formulated statements. In developing the scale, it was suggested that a combination of positively and negatively formulated statements would reduce response bias and help increase the validity of the scores (Suárez-Alvarez, Pedrosa, Lozano Fernández, García-Cueto, Cuesta & Muñiz, 2018). When statements are all formulated in the same way (i.e., all positively formulated or all negatively formulated), respondents tend to agree with the positively formulated statements and disagree with the negatively formulated ones. Thus, they answer the questions in an automatic manner, following the same pattern. As such, the answers do not reflect the actual behavioural characteristics of the respondents. Thus, a mix of positively and negatively formulated statements will prevent respondents answering in an automatic manner (ibid.). However, some academics have a negative perception of reverse coding (Weijters, Baumgartner & Schillewaet, 2013). This is largely because it is difficult to

interpret the ratings on reverse coded items as their semantic meaning will have changed.

Nevertheless, in line with the original Tangney, Baumeister and Boone (2004) scale, the negatively formulated items in this research were reverse coded so that higher scores on all items indicated higher levels of self-control and vice-versa. In previous research, recoding has rarely been reported (cf. Briki, 2018; Cresconi, 2011; de Ridder et al., 2011; Ferrari et al., 2012; Forestier et al., 2018; Luehrig-Jones, Tahaney & Palfai, 2018; Maloney, Grawitch & Barber, 2012) and therefore it is unclear whether these authors followed Tangley, Baumeister and Boone's (2004) recommendation. Table 4.11 presents the reverse coding for Tangley, Baumeister and Boone's (2004) brief trait self-control scale.

TABLE 4.11: REVERSE CODING FOR DEPENDENT VARIABLES MEASURING 'TRAIT SELF-CONTROL'

Trait self-control	
I have a hard time breaking bad habits (item no. 2) I am lazy (item no. 3) I say inappropriate things (item no. 4) I do certain things that are bad for me because they are fun to do (item no. 5) I wish I had more self-discipline (item no. 7) Pleasure and fun sometimes keep me from getting work done (item no. 9) I have trouble concentrating (item no. 10) I am able to work effectively toward long-term goals (item no. 11) Sometimes I can't stop myself from doing something, even if I know it is wrong (item no. 12) I often act without thinking through all the alternatives (item no. 13)	
Previous value labels	Developed code plan
-99 = 'System missing' 1 = 'Completely Disagree' 2 = 'Disagree' 3 = 'Somewhat Disagree' 4 = 'Neither Disagree Nor Agree'5 = 'Somewhat Agree' 6 = 'Agree' 7 = 'Completely Agree'	-99 = 'System missing' 1 = 'Completely Agree' 2 = 'Agree' 3 = 'Somewhat Agree' 4 = 'Neither Disagree Nor Agree' 5 = 'Somewhat Disagree' 6 = 'Disagree' 7 = 'Completely Disagree'

Schöndube, Bertrams, Sudeck and Fuchs (2017) also used reverse coding for their version of the adapted brief state self-control scale. Thus, five of the eight negatively formulated items on the scale were reverse coded (see Table 4.12).

TABLE 4.12: REVERSE CODING FOR DEPENDENT VARIABLE 'STATE SELF-CONTROL'

State self-control I have to force myself to stay focused (item no. 1) I have no willpower (item no. 2) I am having trouble pulling myself together (item no. 3) I am having trouble paying attention (item no. 5) I need something pleasant to make me feel better (item no. 7) I feel drained (item no. 8) I feel like giving up (item no. 10) I feel overwhelmed (item no. 11)	
Previous value labels	Developed code plan
-99 = 'System missing' 1 = 'Completely Disagree' 2 = 'Disagree' 3 = 'Somewhat Disagree' 4 = 'Neither Disagree Nor Agree'5 = 'Somewhat Agree' 6 = 'Agree' 7 = 'Completely Agree'	-99 = 'System missing' 1 = 'Completely Agree' 2 = 'Agree' 3 = 'Somewhat Agree' 4 = 'Neither Disagree Nor Agree' 5 = 'Somewhat Disagree' 6 = 'Disagree' 7 = 'Completely Disagree'

Finally, all the response items in both the trait self-control and state self-control scales were recoded. Low scores (1-3) on each item from both scales were recoded to 'low dimension' and high scores (5-7) were recoded to 'high dimension'.

4.2.4.3 SUMMARY OF RECODED VARIABLES

A summary of all recoded independent and dependent variables on the dimension high – low (with labels) is presented in Table 4.13.

TABLE 4.13: SUMMARY OF ALL RECODED INDEPENDENT AND DEPENDENT VARIABLES

Construct	Original items and codes	Recoded items and codes
Economic capital	Level of annual income (INC)	1) Low level of annual income (INC_Low) 2) High level of annual income (INC_High)
	Housing situation (HOUSING)	1) No full ownership (HOUSING_Low) 2) Full ownership (HOUSING_High)
	Level of comfort in everyday life (COMFORT)	1) Low level of comfort in everyday life (COMFORT_Low) 2) High level of comfort in everyday life (COMFORT_High)
Cultural capital	Level of own education (EDU1)	1) Low level of own education (EDU1_Low) 2) High level of own education (EDU1_High)
	Level of parental education (EDU2)	1) Low level of parental education (EDU2_Low) 2) High level of parental education (EDU2_High)
	Cultural valuables at home (ChildhoodCC)	1) Low level (ChildhoodCC_Low) 2) High level (ChildhoodCC_High)
Healthy lifestyle	Diet Unhealthy Diet (Diet 1- Diet 5) Healthy Diet (Diet 6 – Diet 10)	1) Unhealthy Diet (UnhealthyDiet) 2) Healthy Diet (HealthyDiet)
	Physical activity (WLTASscore)	3) Low level of physical activity (WLTASscoreLow) 4) High level of physical activity (WLTASscoreHigh)
Trait Self-control	13-item brief self-control scale	1) Low scores on the items indicate a low level of trait self-control 2) High scores on the items indicate a high level of trait self-control
State Self-control	11-item state self-control scale	1) Low scores on the items indicate a low level of state self-control 2) High scores on the items indicate a high level of state self-control

4.3 DESCRIPTIVE STATISTICS

4.3.1 SAMPLE CHARACTERISTICS

The empirical analysis was conducted on data obtained from a sample of 845 residents from Sheffield aged 18 or over. The majority of participants were females (64.9%) and fewer than half were married (46.8%). In terms of ethnic background, the sample were predominantly white British (90.9%) and born in the UK (87.1%), while in terms of religious background approximately half were agnostic (50.7%) and the remainder were mostly from a Christian background (38.8%) (see Table 4.14 and Appendix A for more detailed characteristics of the survey sample).

TABLE 4.14 SUMMARY OF DEMOGRAPHIC PROFILE

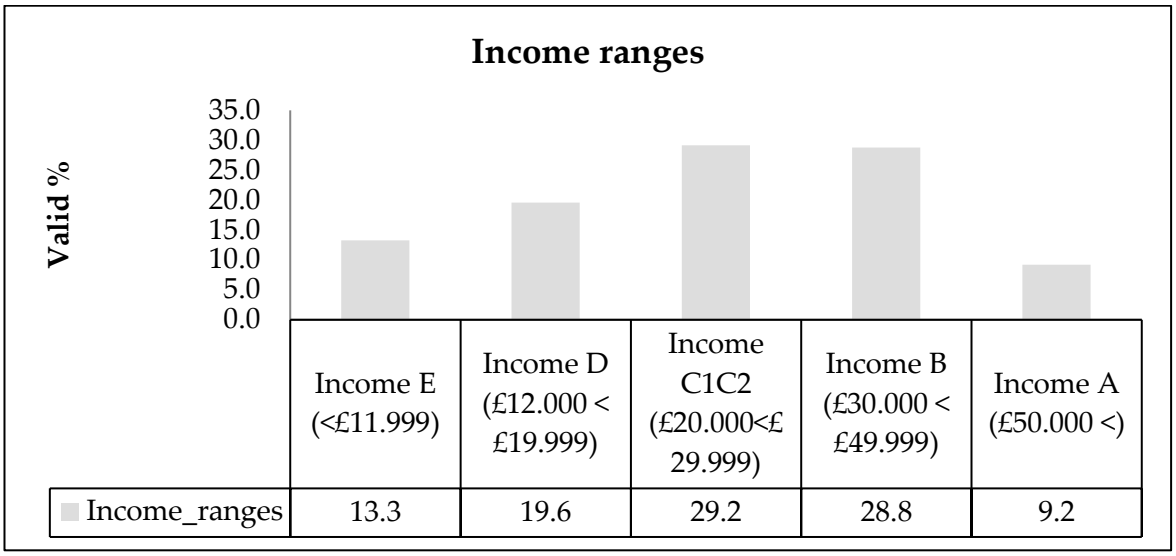
Categories	n	%
Gender		
female	495	64.9
male	295	33.9
other	4	0.5
prefer not to say	5	0.7
Age		
18-34	173	23.1
35-44	166	22.2
45-54	170	22.7
55-64	153	20.4
65 and older	87	11.6
Length of residence		
born in UK	668	87.1
20 or more years	40	5.2
10-19 years	20	2.6
1-9 years	37	4.8
prefer not to say	2	0.3
Marital status		
single	151	19.8
married	365	47.8
living with partner	151	19.8
widowed	28	3.7
separated/divorced	61	8.0
prefer not to say	8	1.0

Ethnicity		
White	560	90.9
Mixed/Multiple ethnic groups	13	2.1
Asian/Asian British	18	2.9
Black/African/Caribbean/Black British	6	1.0
Other ethnic group	8	1.3
Don't know/Prefer not to say	11	1.8
Level of occupation		
Retired	101	13.3
Full-time student	26	3.4
Casual worker or unemployed	24	3.2
Routine manual and service occupations	30	3.9
Semi-routine manual and service occupations	28	3.7
Technical and craft occupations	20	2.6
Clerical and intermediate occupations	142	18.7
Traditional professional occupations	59	7.8
Professional occupations	194	25.5
Middle or junior managers	82	10.8
Senior managers or administrators	55	7.2
Religion		
Christian	295	38.8
Muslim	28	3.7
Hindu	3	0.4
Jewish	2	0.3
No religion	386	50.7
Other	19	2.5
Prefer not to say	28	3.7

As shown in Figure 4.1, based on income almost one third of the sample (29.2%) were in the C1/C2 social class. By comparison, 13.4% of the sample received an income lower than £11,999 (social class E); 19.6% received an income between £12.000 and £19.999 (social class D), and 28.7% received an income between £30.000 and £49.999 (social class B). The remaining 9.1% received an annual income of £50.000 or more, which places them in social class A.

The distribution of the sample is similar to the distribution of employee earnings in the UK in 2018 (Office for National Statistics, Employee earnings in the UK, 2018). It is similarly negatively skewed, reflecting the higher proportion of the population in the C1/C2 and B income groups.

FIGURE 4.1: PROPORTION OF THE SAMPLE IN EACH INCOME GROUP



	Income E (<£11.999)	Income D (£12.000 < £19.999)	Income C1C2 (£20.000<£ 29.999)	Income B (£30.000 < £49.999)	Income A (£50.000 <)
Income_ranges	13.3	19.6	29.2	28.8	9.2

As shown in Figure 4.2 , the majority of subjects have either a bachelor's degree (34.1%) or postgraduate degree (31.2%) as their highest qualification, compared with 10.5% with '2 or more A-levels or equivalent' and 2.5% with an apprenticeship. Additionally, 7.5% have 5 or more GCSEs, 8.0% have 1-4 GCSEs, and 6.2% have 'no formal qualifications'. As such, there is a negative skew in the distribution of educational qualifications. Moreover, the skew is particularly marked in comparison with the distribution in the general population (NOMIS, Official Labour Market Statistics, 2019). In the latter, 39.3% have a bachelor's degree or higher qualification, 17.0% have 2 or more A-levels, 2.9% have apprenticeships, 15.7% have 5 or more GCSEs, 10.5% have 1-4 GCSEs, and 7.8% have no formal qualifications.

Figure 4.3 shows the distribution of housing type among the sample. This is unimodal and negatively skewed as the majority were homeowners (70.9%), followed by private renting (16.9%), council tenants (6.7%), and members of housing association (1.2%). By comparison, only 4.3% reported less favourable housing situations such as living with parents or relatives and paying the rent, living in trust (housing community), or living with a partner who is a house owner. This reflects the relative affluence of the majority of the sample who are white British residents born in the UK.

FIGURE 4.2: HIGHEST EDUCATIONAL QUALIFICATION

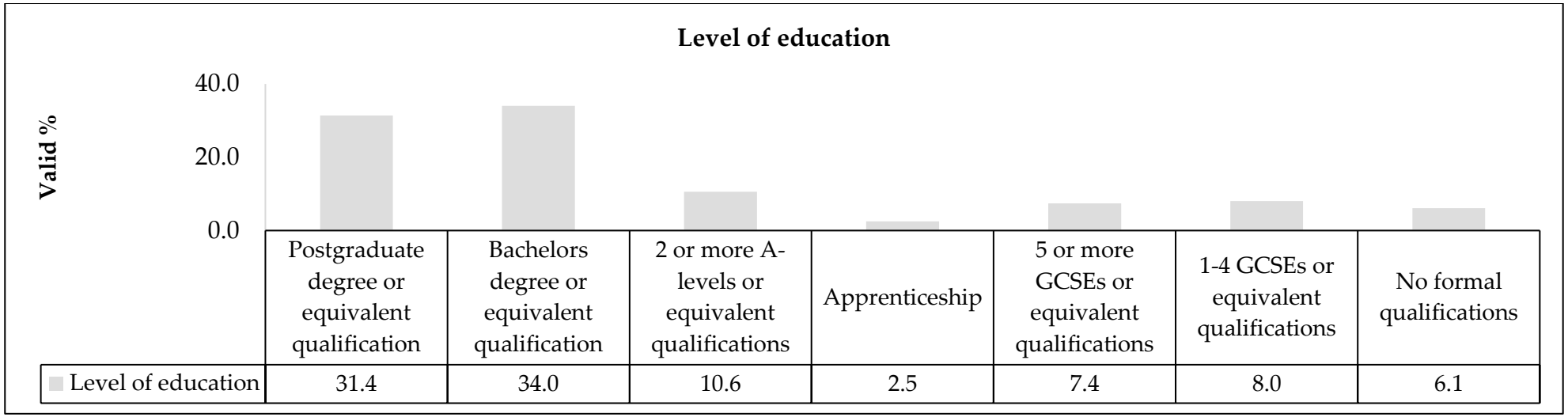
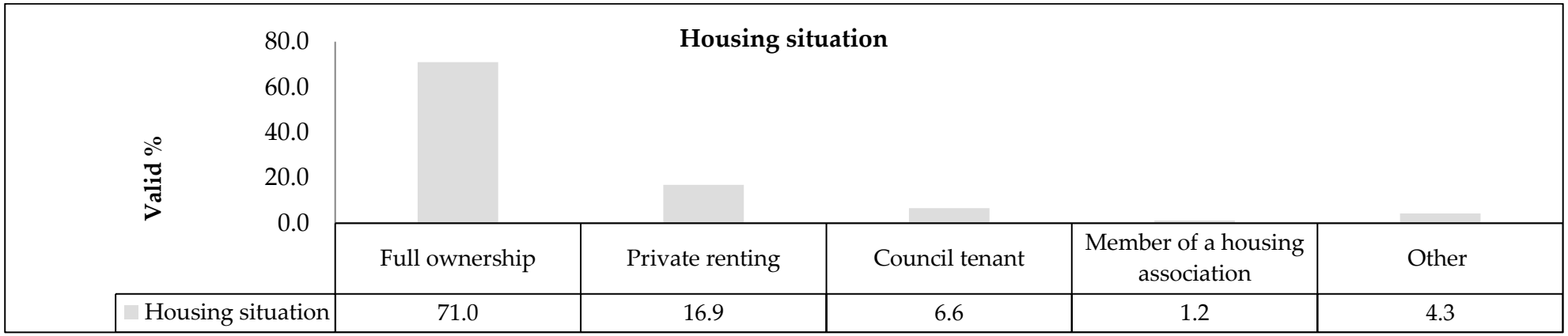


FIGURE 4.3: HOUSING SITUATION



4.4 MULTIVARIATE ANALYSIS

4.4.1 EXPLORATORY FACTOR ANALYSIS OF SELF-CONTROL

To identify the latent factors from both the trait and state self-control scales and their corresponding items, exploratory factor analyses (EFA) were employed. Prior to the EFA, assumptions in relation to the sample and sample size needed to be tested (see chapter 4.2 on preliminary analysis). This involved testing for the sample adequacy and the use of the Kaiser-Mayer-Olkin (KMO) in order to assess the proportion of variance in the variables that might be caused by underlying factors. Further to that, Bartlett's test of sphericity (BTS) was used to test the factorability of the variables i.e. their intercorrelation and whether they can be summarised using a smaller number of factors; the null hypothesis of the test being that the variables are orthogonal, i.e. not correlated (cf. Lee Chan & Idris, 2017). In line with Hair et al., (2017) factorability is assumed when KMO is greater than 0.6 and BTS is significant at $\alpha < 0.05$. Table 4.15 presents the criteria for EFA in this analysis.

TABLE 4.15: CRITERIA FOR EFA

Indicator	Cut-off value	Source
Kaiser-Meyer-Olkin (KMO)	0.6 or above	Hair et al. (2017)
Bartlett's test of sphericity	significant at $\alpha < 0.05$	Hair et al. (2017)
Corrected item-total correlation	>0.3	Pallant (2016)
Factor loadings	Variables with loadings lower than 0.4 were excluded from the model	Stevens (2012); Tabachnick & Fidell (2014)

Both EFAs were conducted in two phases. In the first phase, an EFA was conducted on 13 items for Trait SC and 11 items for State SC using SPSS 24. Factor analysis was chosen over principal components analysis because the aim

was to identify the underlying dimensions that relate to the interrelationships between the observed variables (Preacher & MacCallum, 2003). In both cases, maximum likelihood extraction was used because this is argued to be the best choice in cases where the distribution is normal (Fabrigar, Wegener, MacCallum & Strahan, 1999). This also corresponds with the method subsequently used in the confirmatory factor analysis (CFA) (deWinter & Dodou, 2012; Matsunaga, 2010; Tabachnick & Fidell, 2014). Promax rotation was then employed to facilitate intercorrelation of factors (Matsunaga, 2010) because oblique rotation reflects reality more appropriately for most social science constructs (Costello & Osborne, 2005). Variables with loadings lower than 0.4 were excluded from the model (Stevens, 2012), and where the differences between variable loadings on two or more factors was less than 0.10 (Tabachnick & Fidell, 2014). The number of factors to be retained was determined by minimum eigenvalues of 1, visual examination of the scree plots, and the results of a Monte Carlo parallel analysis using raw data permutation with Castellan's (1992) BRMIC, 24, 72–77 algorithm (O'Connor, 2000; Watkins, 2008). In each model, the remaining items loaded on the corresponding factor at a significant level ($p < 0.001$). The analyses confirmed that Trait SC has three dimensions whereas State SC has only two dimensions. In both cases, construct validity was confirmed by establishing both convergent and discriminant validity.

In the second phase of the analysis, which involved testing the hypotheses, the identified dimensions of Trait and State SC were transformed into two components (low levels and high levels of each dimension – see section 4.2.5 on recoding the Trait SC and State SC variables).

4.4.1.1 TRAIT SELF-CONTROL

The KMO measure (0.807) confirmed the adequacy of sampling and the BTS was significant ($p < 0.001$). From the initial 13 items, 10 items loaded on three dimensions and the loadings explained 57.49% of the variance in the data. Based on a thematic analysis and with reference to the extant literature, the dimensions were labelled *Restraint*, *Impulsivity*, and *Performance*, respectively (see Table 4.16).

Cronbach's alpha was used as a measure of internal consistency and overall reliability of trait self-control scale. Results of reliability analysis showed that the items of all three factors were over the minimum cut-off point of 0.5. Thus, the results show satisfactory level of internal consistency and overall reliability (cf. Hinton, McMurray & Brownlow, 2014; Pallant, 2016).

TABLE 4.16: ITEMS LOADING FOR THE TRAIT SELF-CONTROL CONSTRUCT

Factor	Items	Label	Reliability alpha
Factor 1	TraitSC1 TraitSC7_new_reversed TraitSC8 TraitSC2_new_reversed	Restraint	0.73
Factor 2	TraitSC5_new_reversed TraitSC12_new_reversed TraitSC4_new_reversed TraitSC13_new_reversed	Impulsivity	0.67
Factor 3	TraitSC10_new_reversed TraitSC9_new_reversed	Performance	0.60

The Corrected Item-Total Correlation (CITC) was used as a measure of internal consistency as it indicates how each item correlates with the total score (Pallant, 2016). The values of CITC ranged between 0.400 and 0.509, apart from item no. 9 (TraitSC9_new_reversed) which had a value of 0.377. According to Pallant (2016), low values (below 0.3) indicate low item validity. While item no. 9 had a

value above 0.3, given its proximity to the CITC threshold, it was removed. However, this did not improve the overall variance explained; therefore, the item was not excluded from the analysis. Compared with previous studies (Ferrari et al., 2009; Maloney et al., 2012) the overall variance explained by the three factors and their associated items was high (see Table 4.17). This supported the decision to retain the third factor despite only having two items loaded onto it and its lower reliability compared with factors 1 and 2 (Cronbach alpha of Factor 3 was 0.60, compared to Factor 2 with an alpha value of 0.67 and Factor 1 with an alpha value of 0.73).

TABLE 4.17: EXPLAINED VARIANCE OF RELEVANT REFERENCE STUDIES

Authors	Explained total variance
Ferrari et al. (2009)	34.3%
Maloney et al. (2012)	39%
This study	57.49%

4.4.1.2 STATE SELF-CONTROL

The Kaiser-Meyer-Olkin measure confirmed the adequacy of sampling (KMO = 0.855) and Bartlett's test of sphericity was significant ($p < 0.001$). From the initial 11 items, seven loaded on two dimensions. Based on a thematic analysis and with reference to the literature, the dimensions were labelled *State SC1* and *State SC2*. For State Self-control, the two dimensions are as follows (see Table 4.18).

Cronbach's alpha was calculated for the state self-control scale. The results of the analysis showed that the items of both factors show high reliability and internal consistency (cf. Hinton, McMurray & Brownlow, 2014; Pallant, 2016).

TABLE 4.18: ITEMS LOADING FOR THE STATE SELF-CONTROL CONSTRUCT

Factor	Items	Label	Reliability alpha
Factor 1	StateSC10_new_reversed StateSC11_new_reversed StateSC8_new_reversed StateSC9	State SC1	0.81
Factor 2	StateSC1_new_reversed StateSC5_new_reversed StateSC3_new_reversed	State SC2	0.81

The values of CITC ranged between 0.539 and 0.691; the results were therefore considered satisfactory (ibid.).

4.4.1.3 CONSTRUCT VALIDITY OF TRAIT AND STATE SELF-CONTROL

In line with quality criteria, the extracted dimensions were tested for convergent and discriminant validity. Convergent validity was tested by calculating the composite reliability (CR) and average variance extracted (AVE). CR should be higher than 0.5, ideally 0.7 or higher, while AVE should be greater than 0.5 and lower than CR (Hair, Blac, Babin & Anderson, 2014) (see Table 4.19). Acceptable AVE scores for trait self-control were not achieved (values were lower than the 0.5 cut-off value). However, low AVE seems to be the case with multidimensional self-control scales. Hagger et al. (2018) have been exploring the structure and validity of BSCS across national groups. They compared the AVE of unidimensional and multidimensional constructs. The original unidimensional BSCS had an AVE of 0.6, whereas Maloney et al.'s (2012) two-dimensional self-control construct had an AVE of 0.27 with a restraint dimension and an AVE of 0.24 with a non-impulsivity dimension. In line with de Ridder et al.'s (2011) two-dimensional concept of self-control, AVE was 0.35 with the inhibitory self-control factor and only 0.17 with the initiatory self-control factor. Thus, despite the low AVE in this study, all the items and

identified factors were preserved. They provide a good theoretical justification for the Trait SC construct (Hair et al., 2014). Moreover, all the other validity criteria were met.

Hair et al. (2014) further suggest that the conditions for discriminant validity are met when the AVE is greater than the maximum shared variance (MSV). Together with the adequate factor loadings (higher than 0.5), the criteria for the construct validity of trait self-control were therefore met (ibid.) (see Table 4.19).

TABLE 4.19: FACTOR LOADINGS FOR THE CONSTRUCT OF TRAIT SELF-CONTROL

Construct	Items	Factor Loadings	Average variance extracted (AVE)	Average variance extracted^2	Composite (construct) reliability (CR)	Maximum shared variance (MSV)
Restraint	TraitSC1	0.718	0.379	0.144	0.707	0.194
	TraitSC7_new_reversed	0.619				
	TraitSC8	0.583				
	TraitSC2_new_reversed	0.528				
Impulsivity	TraitSC12_new_reversed	0.579	0.319	0.102	0.652	0.136
	TraitSC5_new_reversed	0.569				
	TraitSC13_new_reversed	0.557				
	TraitSC4_new_reversed	0.556				
Performance	TraitSC10_new_reversed	0.825	0.449	0.202	0.602	0.181
	TraitSC9_new_reversed	0.467				

The conditions for AVE for state self-control were met (values higher than the 0.5 cut-off value (see Table 4.20). AVE for state self-control was also greater than the maximum shared variance (MSV). Together with adequate factor loadings (higher than 0.5), all the validity criteria for construct validity for state self-control were met (ibid.).

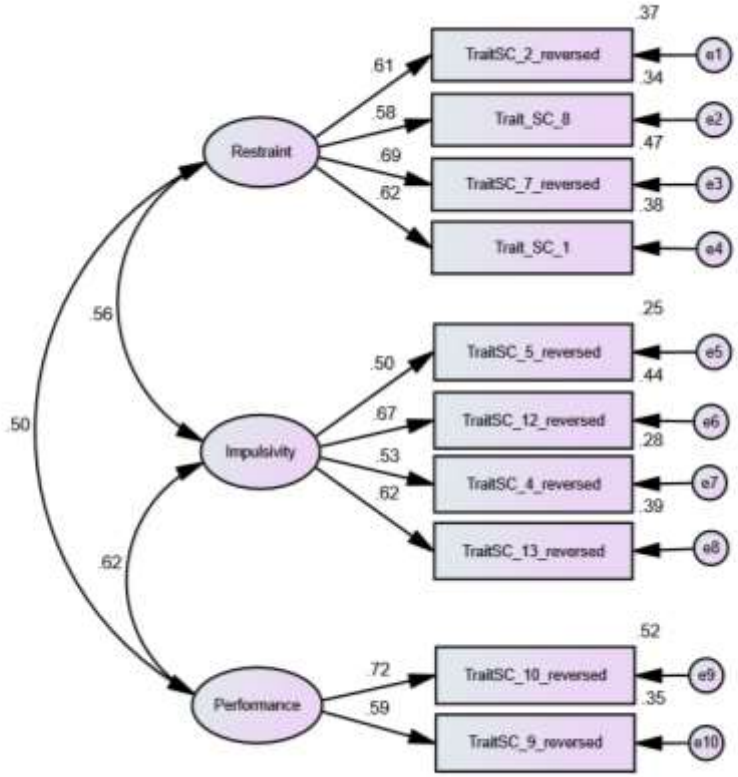
TABLE 4.20: FACTOR LOADINGS FOR THE CONSTRUCT OF STATE SELF-CONTROL

Construct	Items	Factor Loadings	Average variance extracted (AVE)	Average variance extracted^2	Composite (construct) reliability (CR)	Maximum shared variance (MSV)
Factor1	StateSC10_new_reversed	0.875	0.535	0.286	0.818	0.307
	StateSC11_new_reversed	0.776				
	StateSC8_new_reversed	0.652				
	StateSC9	0.589				
Factor2	StateSC1_new_reversed	0.832	0.524	0.275	0.757	0.409
	StateSC5_new_reversed	0.818				
	StateSC3_new_reversed	0.459				

4.4.1.4 INITIAL FACTOR LOADINGS OF THE TRAIT AND STATE SELF-CONTROL CONSTRUCTS

We then evaluated the identified self-control dimensions using confirmatory factor anaysis with AMOS 24. For trait self-control and the three identified dimensions of restraint, impulsivity, and performance, all the factor loadings were above the threshold of 0.4. A three-factor model was then evaluated and the indicators showed a reasonable fit. Taking only χ^2 and df (χ^2/df = 4.571, p < 0.001), the model did not fit the data particularly well. However, other indicators such as CFI (0.928) and RMSEA (0.065) showed an acceptable fit (see Figure 4.4).

FIGURE 4.4: INITIAL FACTOR LOADINGS OF THE TRAIT SELF-CONTROL CONSTRUCT[23]



(χ^2=146.271; df = 32; χ^2/df = 4.571; p < 0.001; CFI = 0.928; RMSEA = 0.065)

[23] cf. with Figure 2.6

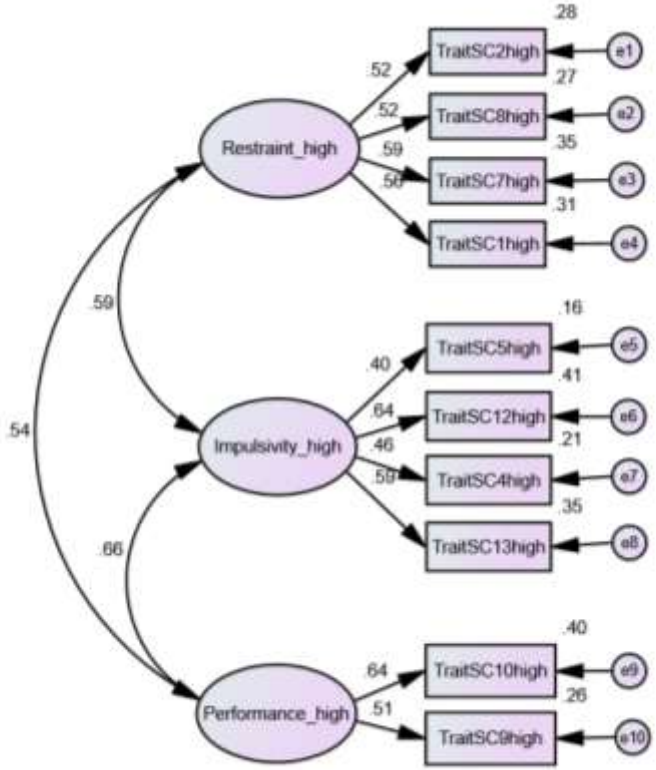
Unfortunately, despite several attempts, the state self-control model was unable to be loaded in AMOS; as such, further analysis was not possible and the path coefficients could not be identified graphically. There might be several reasons for this. One possible explanation would be reaching the iteration limit. However, even when the limit was manually changed from 50 to 100, the path coefficients were not identified graphically. Therefore, we did not proceed any further with the analysis of this concept and state self-control was therefore excluded from the hypothesis testing.

4.4.1.5 FACTOR LOADINGS OF THE HIGH AND LOW TRAIT SELF-CONTROL CONSTRUCT

In line with the hypotheses and the distinction between high and low levels of self-control, trait self-control was further explored in a two-dimensional direction i.e., low levels vs. high levels. The remaining 10 items of the initial 13-item BSCS were transformed into two dimensions: low and high. Scores on the trait self-control scale equal to five and higher were considered to be representative of high self-control, while scores equal to three and lower were considered to be representative of low self-control.

Firstly, we confirmed the three dimensions of the high self-control construct. Factor loadings are presented in Figure 4.5. Our factor model (χ^2/df = 3,194; $p < 0.001$; CFI = 0.934; RMSEA = 0.051) fitted the data better than the previous general model of self-control.

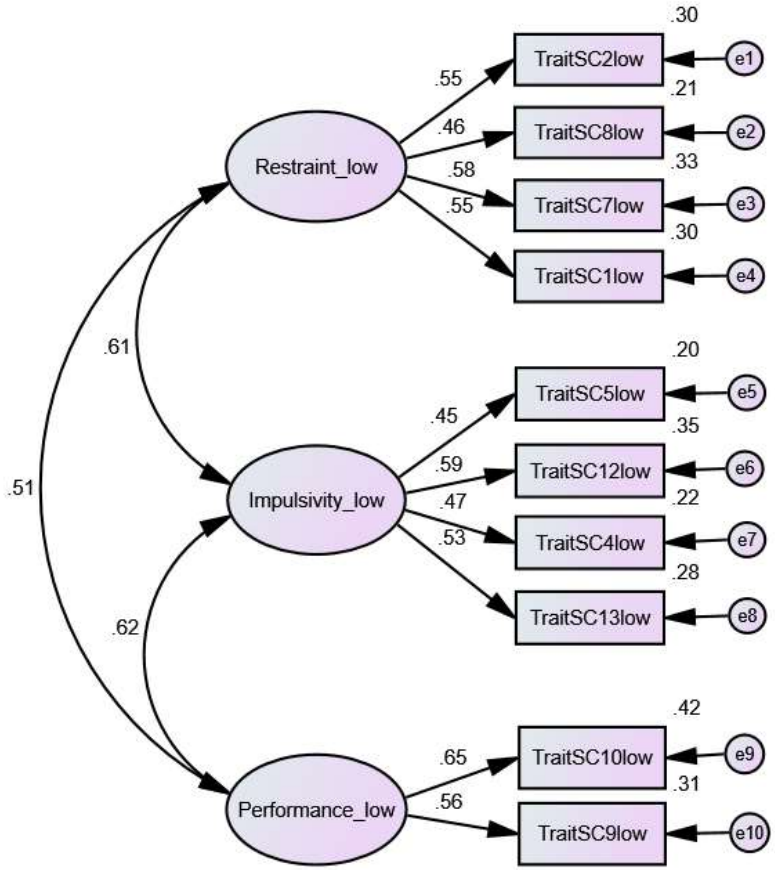
FIGURE 4.5: FACTOR LOADINGS OF THE HIGH TRAIT SELF-CONTROL CONSTRUCT



(χ^2 = 102.221; df = 32; χ^2/df = 3,194; p < 0.001; CFI = 0.934; RMSEA = 0.051)

The dimensions for the low self-control construct were also confirmed. Factor loadings are presented in Figure 4.6. Our factor model of low self-control dimensions (χ^2/df = 2.473; $p < 0.001$; CFI = 0.951; RMSEA = 0.042) also fitted the data better than the previous general model of self-control.

FIGURE 4.6: FACTOR LOADINGS OF THE LOW TRAIT SELF-CONTROL CONSTRUCT

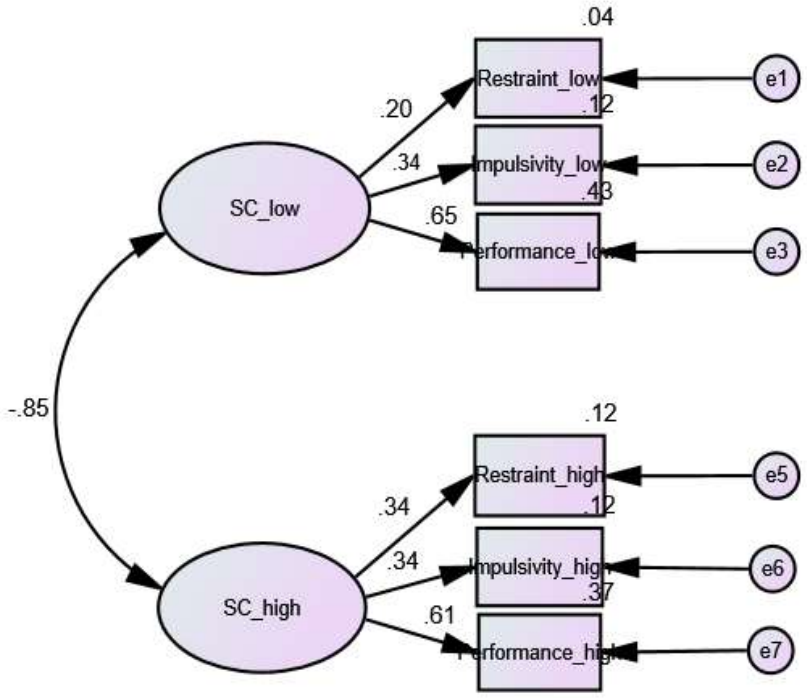


($\chi^2 = 79.144$; df = 32; $\chi^2/df = 2.473$; $p < 0.001$; CFI = 0.951; RMSEA = 0.042)

As discussed previously (see chapter 2, section 2.4.2), the level of self-control was measured as an overall score. Thus, the items of each identified dimension (e.g., restraint) were calculated as a cumulative score of this dimension (item 2 reversed + item 8 reversed + item 7 + item 1) and further linked to the overall level of self-control.

Figure 4.7 presents the final cumulative dimensions of low and high trait self-control.

FIGURE 4.7: FINAL CUMULATIVE DIMENSIONS OF LOW AND HIGH TRAIT SELF-CONTROL



All three dimensions were then separated into low and high values, providing an overall summary of each sub-dimension i.e., *restraint_low* and *restraint_high*, *impulsivity_low* and *impulsivity_high* and *performance_low* and *performance_high*. The dimension in Figure 4.8 and 4.9 are presented in similar manner as dimensions identified by Tangney et al. (2004) in Figure 2.4, by Ferrari, Stevens and Jason (2009) in Figure 2.5, by Maloney, Grawitch and Berber (2012) in Figure 2.6 and by DeRidder et al. (2012) in Figure 2.7.

FIGURE 4.8: LOW DIMENSIONS OF THE TRAIT SELF-CONTROL AS PROPOSED IN THIS STUDY

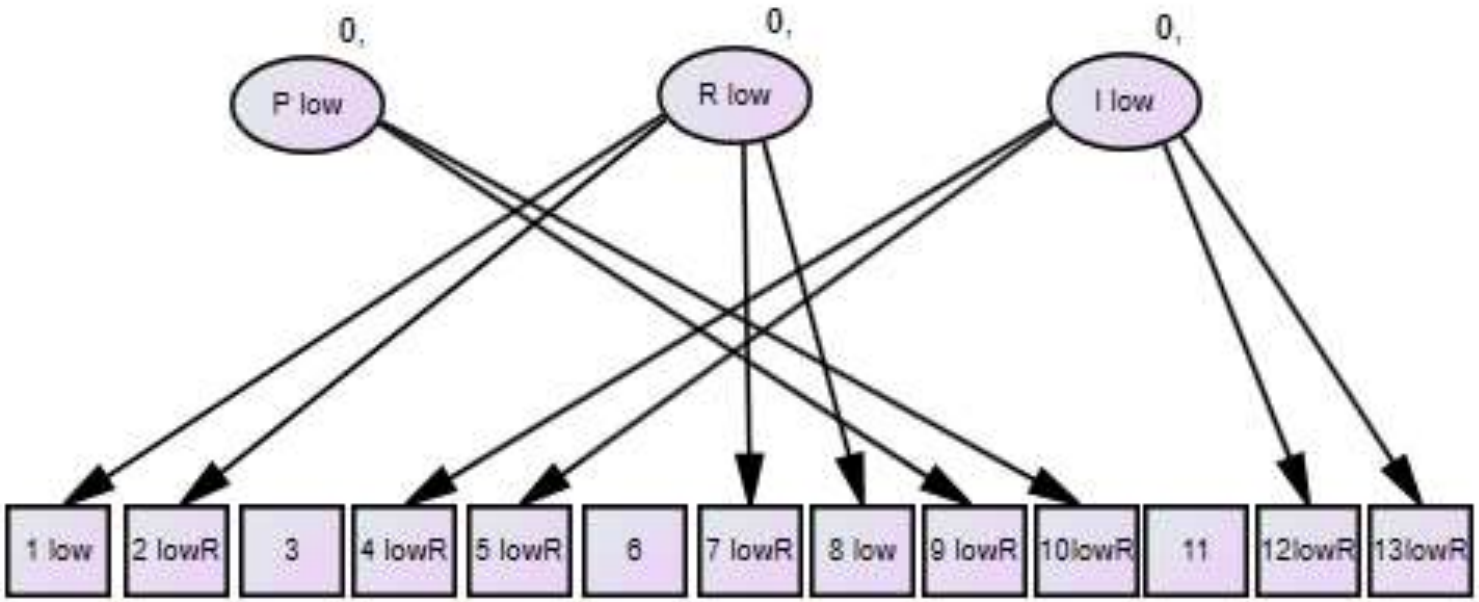
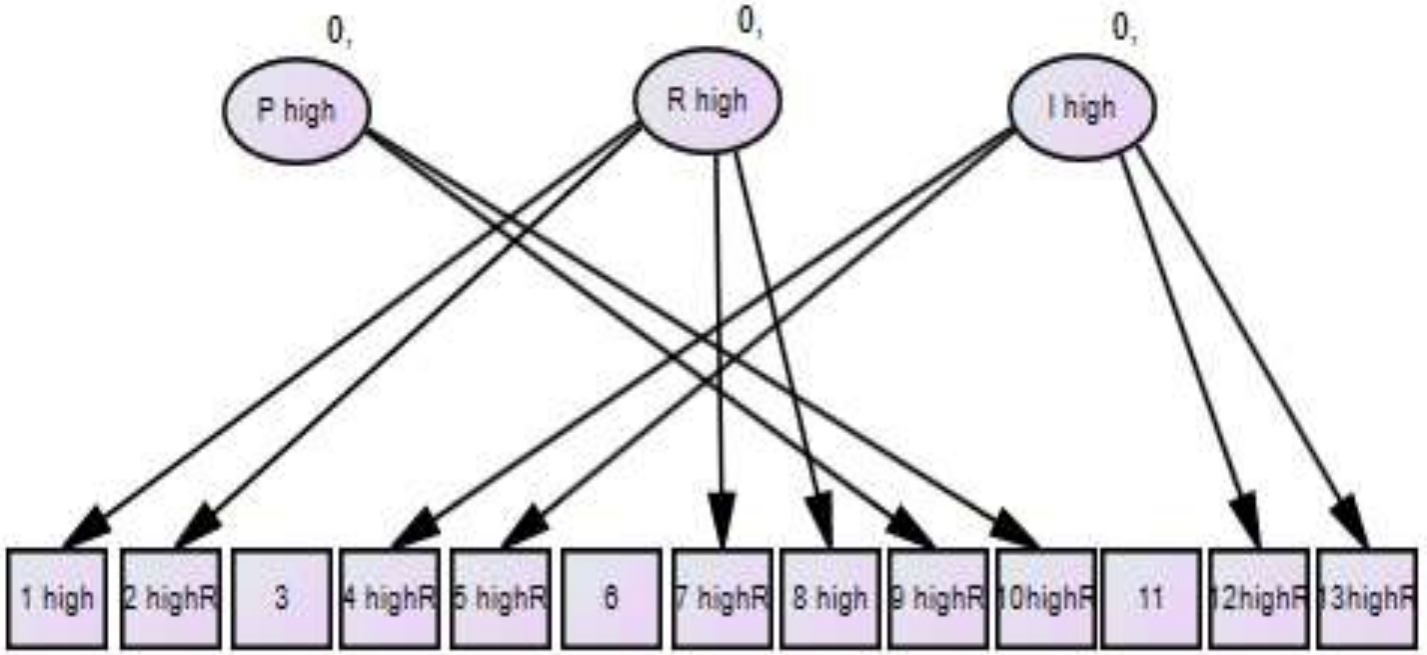


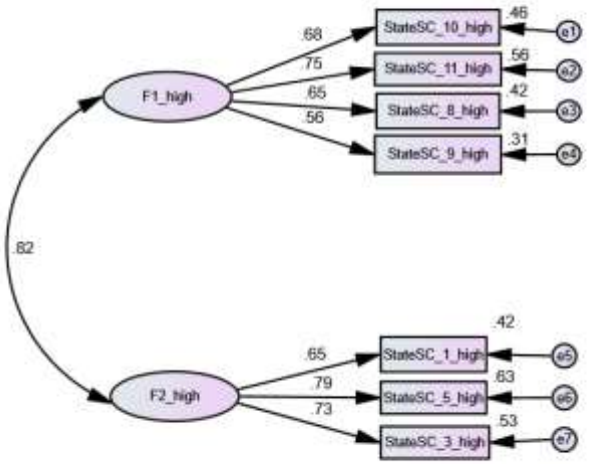
FIGURE 4.9: HIGH DIMENSIONS OF THE TRAIT SELF-CONTROL AS PROPOSED IN THIS STUDY



4.4.1.6 FACTOR LOADINGS OF THE HIGH AND LOW STATE SELF-CONTROL CONSTRUCT

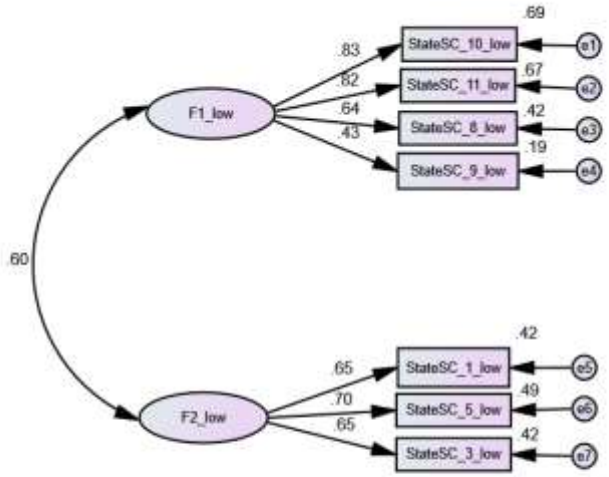
The state self-control construct was explored by transforming the initial state self-control scale into two dimensions: low and high. This conceptual distinction between high and low values of the construct is in line with the hypotheses that aim to test the structural links among distinctive high and low levels of capital, self-control and lifestyle. The two factors of state self-control were tested on two dimensions, low and high. Scores equal to five and higher were considered to indicate high state self-control and the scores equal to three and lower were considered to indicate low state self-control. The factor loadings are presented in Figures 4.10 and 4.11.

FIGURE 4.10: FACTOR LOADINGS OF THE HIGH STATE SELF-CONTROL CONSTRUCT



(χ^2 = 74.696; df = 13; χ^2/df = 5.746; $p \leq 0.001$; CFI = 0.928; RMSEA = 0.075

FIGURE 4.11: FACTOR LOADINGS OF THE LOW STATE SELF-CONTROL CONSTRUCT



(χ^2 = 38.283; df = 13; χ^2/df = 2.944; $p \leq 0.001$; CFI = 0.919; RMSEA = 0.048)

The factor model of the high self-control construct demonstrated a poor fit (χ^2/df = 5.746; $p \leq 0.001$; CFI = 0.928; RMSEA = 0.075). Thus, the high state self-control construct was, at that point, excluded from hypotheses testing.

The model was tested for the low state self-control separately. However, despite several attempts, the UNHLS model with low state self-control construct was unable to be identified because of poor data-fit. As such, further analysis was not possible, and the path coefficients could not be identified graphically. There might be several reasons for this. One possible explanation would be that iteration limit was reached, however, even when the limit was manually changed from 50 to 100, the path coefficients were not identified graphically. Therefore, because the scale has been explored and tested to a much lesser extent than the BSCS, at this point, we did not proceed any further with the analysis of state self-control concept.

4.4.2 TESTING FOR COMMON METHOD BIAS (COMMON METHOD VARIANCE)

Common method variance is the systematic measurement error of an instrument and ultimately effects the contamination of results. Consequently, by applying the same scale, the researcher is measuring two constructs which ultimately results in shared variance between similar constructs and contaminated results (de Vries & Van Gelder, 2015). Tangney, Baumeister and Boone (2004) have warned that self-control shares a substantial amount of variance with scores on social desirability.

To test for common method bias, Harman's single factor test was conducted in SPSS. Harman's single factor score is computed by exploratory factor analysis. In cases where more than 50% of the variance in score is extracted with a single factor, common method bias is diagnosed. In the trait self-control scale, the single factor extracted 24.1% of the variance, therefore there was no threat of common method

bias. In the case of state self-control, the single factor extracted 33.5% of the variance, therefore once again there was no threat of common method bias.

To further reduce the potential for common method bias, several methods are available including the common latent factor approach and the marker variable approach (Chang, Witteloostuijn & Eden, 2010).

In the case of this research, a common latent factor test (CLF) was applied. The common latent construct was added to the factor loadings of the trait self-control construct (see Figure 4.4). The model 'with CLF' was compared to the model 'without CLF' and the delta values were calculated to show the difference between the standardised regression weights for both models. The threshold was set at 0.5 (Eichorn, 2014; Shneor & Munim, 2019) and all values were below this critical level (see Table 4.21).

TABLE 4.21: COMPARISON OF STANDARDISED REGRESSION WEIGHTS BETWEEN THE 'WITH CLF' AND 'WITHOUT CLF' MODELS

Items	with CLF	without CLF	delta (without CLF – with CLF)
Restraint→TraitSC_2_reversed	0.590	0.605	0.015
Restraint→Trait_SC_8	0.544	0.586	0.042
Restraint→TraitSC_7_reversed	0.624	0.690	0.066
Restraint→Trait_SC_1	0.641	0.617	-0.024
Impulsivity→TraitSC_5_reversed	0.579	0.561	-0.018
Impulsivity→TraitSC_12_reversed	0.335	0.670	0.335
Impulsivity→TraitSC_4_reversed	0.261	0.536	0.275
Impulsivity→TraitSC_13_reversed	0.137	0.617	0.480
Performance→TraitSC_10_reversed	0.592	0.610	0.018
Performance→TraitSC_9_reversed	0.278	0.618	0.340

The common method variance was also examined through a comparison of the trait self-control model with one common latent factor and the original three factor model (Hair et al, 2014; Subba, 2019) - see Figure 4.4. If the single-factor model shows a satisfactory fit, there is a threat of common method variance, but the model did not show a satisfactory fit (χ^2 = 432.822; df = 36; χ^2 /df = 12.022; p < 0.001; CFI = 0.749; RMSEA = 0.114). This also indicates that there is no serious threat of common method bias.

4.4.3 MODEL ESTIMATION AND TEST RESULTS

4.4.3.1 HEALTHY LIFESTYLE

Firstly, the model was run in AMOS with four healthy lifestyle items: healthy diet, high level of physical activity (WLTAS score high variable), absence of smoking (NoSmoking variable), and absence of binge alcohol consumption (NoBingeAlcohol variable). The NoBingeAlcohol variable was not significant and the model was not identified when the variable was included.

HYPOTHESIS TESTING

H_1: High economic capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

H_2: High cultural capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.

Assessing the mediating effect

Firstly, in order to test H_1, the mediating effect of high self-control was assessed using Baron and Kenny's (1986) model. They suggest assessing the effect of the independent variable (high EC) on the dependent variable (HLS). Then, they suggest

assessing the effect of the independent variable (high EC) on the mediator (high trait SC). Finally, they suggest assessing the effect of the mediator variable (high trait SC) on the dependent variable (HLS). If these conditions manifest in the hypothesized direction, then the influence of the independent variable on the dependent variable should be less in the third regression equation than in the second (Baron & Kenny, 1986). Further to this, partial mediation exists when the influence of the independent variable on the dependent variable is reduced when the mediator is controlled. Perfect mediation exists if the independent variable has no influence on the dependent variable when the mediator is controlled.

The tables below present the results of testing of the model before the mediator variable was entered into the model compared with the model after the mediator variable was entered. The results show that the β-value was reduced from 0.61 to 0.51 and that the result is significant ($p < 0.001$). Further, the results show that the independent variable (high EC) has a significant direct impact on the dependent variable (HLS), and also on the mediator (high trait SC). Additionally, the mediator has a significant impact on the dependent variable (HLS). Therefore, it can be concluded that the effect of mediation is partial (see Tables 4.22 and 4.23).

TABLE 4.22: RESULTS BEFORE THE MEDIATOR ENTERED THE HLS MODEL

	β	SE	CR	*p*	Result
high EC → HLS	0.61	2.933	3.81	$p < 0.001$	Significant

TABLE 4.23: RESULTS AFTER THE MEDIATOR ENTERED THE HLS MODEL

	β	SE	CR	*p*	Result
high EC → HLS	0.51	2.33	3.68	$p < 0.001$	Significant
high EC → high trait SC	0.36	0.52	3.71	$p < 0.001$	Significant
high trait SC →HLS	0.27	0.28	3.00	$p < 0.001$	Significant

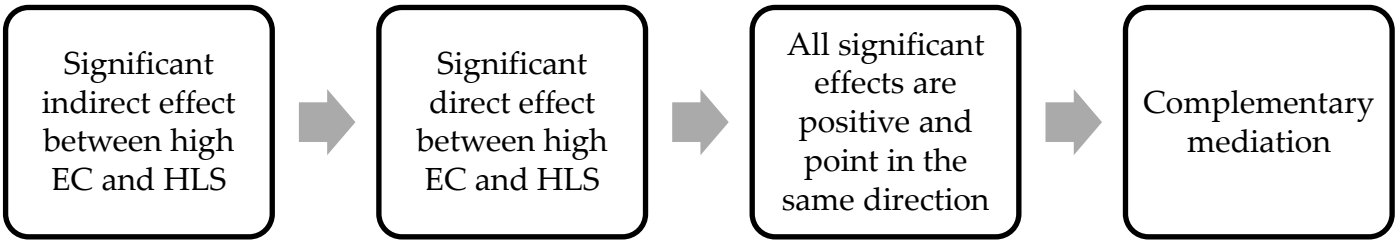
The model showed a positive direct effect of high economic capital on high trait self-control ($\beta = 0.356$; $p < 0.001$) and a positive direct effect of high trait self-control on healthy lifestyle ($\beta = 0.235$; $p < 0.001$). Thus, high economic capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait self-control. As such, H_1 was partially supported (state self-control was excluded from the test).

Regarding H_2, a positive direct effect of high cultural capital on a healthy lifestyle was identified ($\beta = 0.436$; $p < 0.001$), but the direct effect of high cultural capital on high trait self-control was not significant ($p = 0.206$). Therefore, a positive indirect effect of high cultural capital on a healthy lifestyle, mediated through a high level of trait and state self-control was not identified and H_2 was rejected.

Based on Barron and Kenny's (1986) mediation argument, to strengthen an understanding of mediation, other researchers such as Zhao, Lynch and Qimei Chen (2010) and Hadi, Abdullah and Sentosa (2016) present an alternative typology for establishing a mediation effect. Additionally, following such an approach, in this research a significant indirect effect between high EC and HLS and a significant direct effect between high EC and HLS must be established. Further to that, the positive significant effects between all the variables are tested. In cases where both

indirect and direct effects exist and point in the same direction, complementary mediation is established (Figure 4.12).

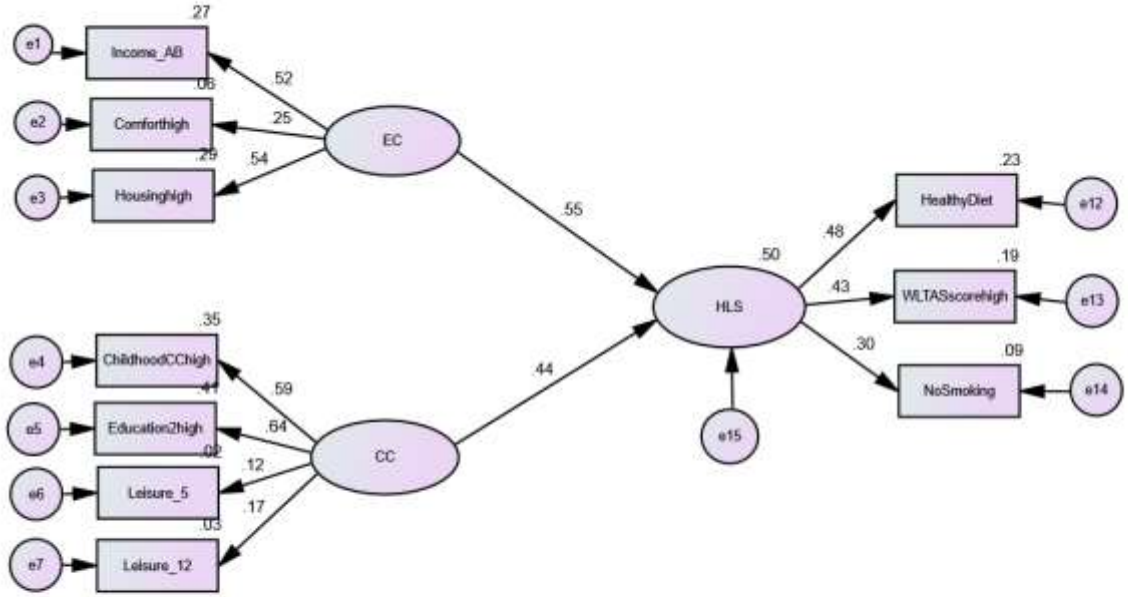
FIGURE 4.12. ZHAO, LYNCH AND QIMEI CHEN'S (2010) MEDIATION DECISION TREE



Finally, the bootstrap method (Preacher & Hayes, 2004; 2008) was employed. Bootstrapping is a non-parametric resampling test (Hadi, Abdullah & Sentosa, 2016) which is an advantage compared to Sobel's test, which assumes a normal distribution. This approach is loosely based on the law of large numbers and involves repeated resampling from the study sample to obtain sampling distributions as the foundation for best-estimated coefficients, their variability and likelihood of differing from zero (Hair et al., 2014). In this study, 5000 resamples and 95% confidence intervals were used, and the significance of the direct path for both models was evaluated. Both models showed a good fit (see Figures 4.12 and 4.13).

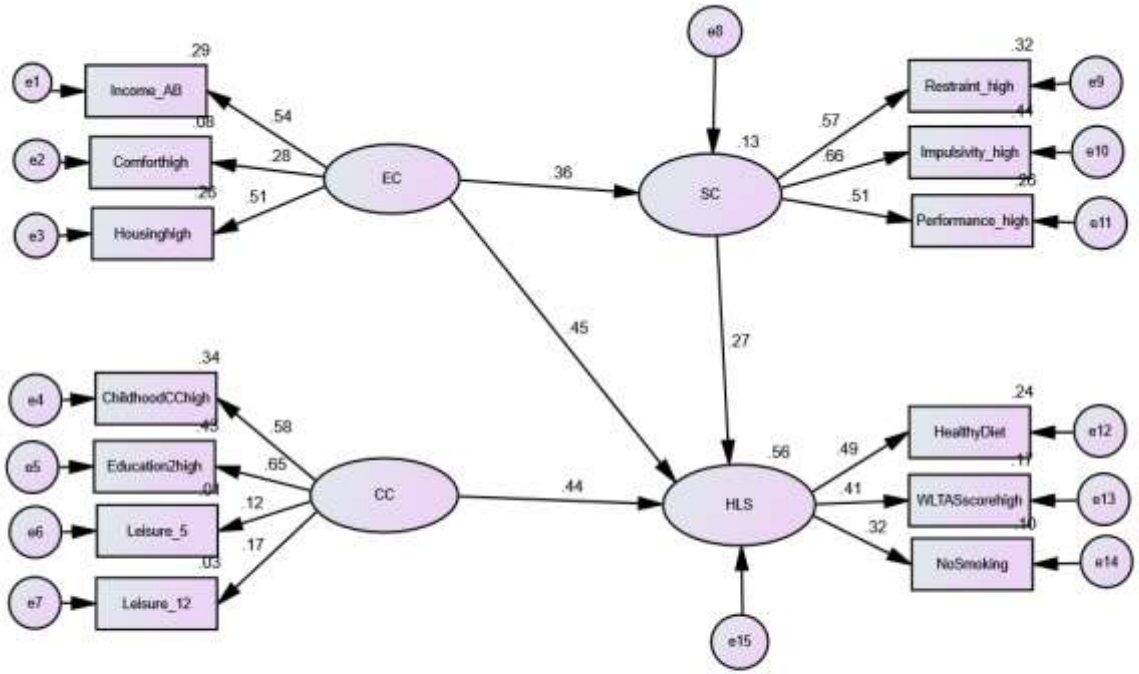
Further to that, the mediating variable was then included, and bootstrapping was again employed. The significance of both models was tested again and both models showed a good fit (Hadi, Abdullah & Sentosa, 2016) (see Figures 4.13 and 4.14).

FIGURE 4.13: BOOTSTRAPPED STRUCTURAL MODEL OF HEALTHY LIFESTYLE ASSESSING THE DIRECT PATHWAYS



($\chi^2 = 80.511$; df = 33; $\chi^2/df = 2.439$; $p < 0.001$; CFI = 0.892; RMSEA = 0.041)

FIGURE 4.14: BOOTSTRAPPED STRUCTURAL MODEL OF HEALTHY LIFESTYLE WITH MEDIATING VARIABLE INCLUDED



($\chi^2 = 133.990$; df = 61; $\chi^2/df = 2.196$; $p < 0.001$; CFI = 0.906; RMSEA = 0.03

4.4.3.2 UNHEALTHY LIFESTYLE

The model was then run with four unhealthy lifestyle items: unhealthy diet, low level of physical activity (WLTASscorelow variable), smoking (Smoking variable), and binge alcohol consumption (BingeAlcohol variable). Cultural capital was not significantly related to low trait self-control or to an unhealthy lifestyle and was therefore excluded from the model.

HYPOTHESIS TESTING

H_3: Low economic capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

H_4: Low cultural capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

Assessing the mediating effect

Firstly, in order to test H_3, the mediating effect of low trait self-control was assessed using Baron and Kenny's (1986) model.

The tables below present the test results before the mediator variable was entered into the model compared with the model after the mediator was entered. The results show that the β-value was reduced from 0.70 to 0.58 and that the result is significant ($p < 0.001$). Further, the results show that the independent variable (low EC) has a significant direct impact on the dependent variable (UNHLS), and also on the mediator (low trait SC), while the mediator has a significant impact on the dependent variable (UNHLS). Overall, it can be concluded that the effect of mediation is partial (see Tables 4.24 and 4.25).

TABLE 4.24: RESULTS BEFORE THE MEDIATOR ENTERED THE UNHLS MODEL

	β	SE	CR	*p*	Result
low EC → UNHLS	0.70	1.985	4.870	$p < 0.001$	Significant

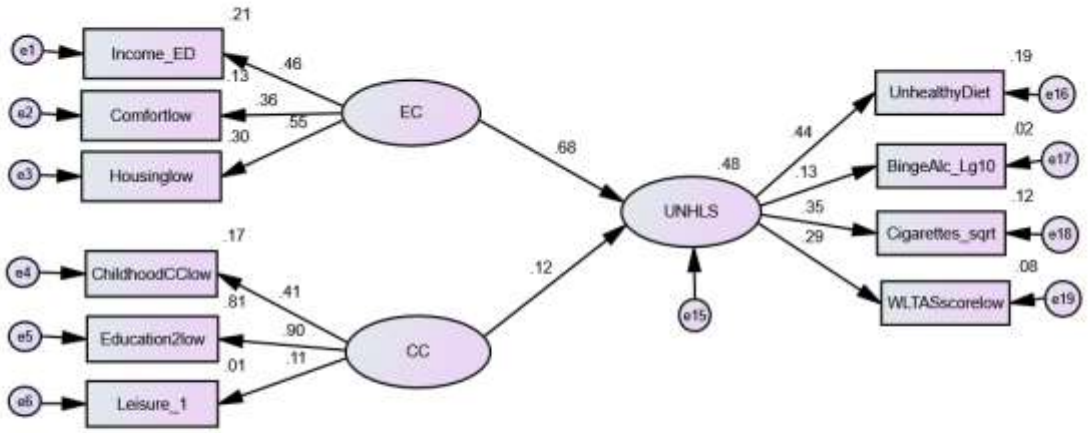
TABLE 4.25: RESULTS AFTERTHE MEDIATOR ENTERED THE UNHLS MODEL

	β	SE	CR	*p*	Result
low EC → UNHLS	0.579	1.966	4.217	$p < 0.001$	Significant
low EC → low trait SC	0.338	0.059	2.743	$p < 0.001$	Significant
low trait SC →UNHLS	0.334	4.015	2.465	$p < 0.001$	Significant

The final model showed a positive direct effect between low economic capital and low trait self-control ($\beta = 0.338$; $p < 0.001$) and a positive direct effect between low trait self-control and an unhealthy lifestyle ($\beta = 0.334$; $p < 0.001$). Thus, low economic capital has a positive indirect effect on unhealthy lifestyle, mediated through a low level of trait self-control. As such, H_3 was partially supported (state self-control was excluded from the test).

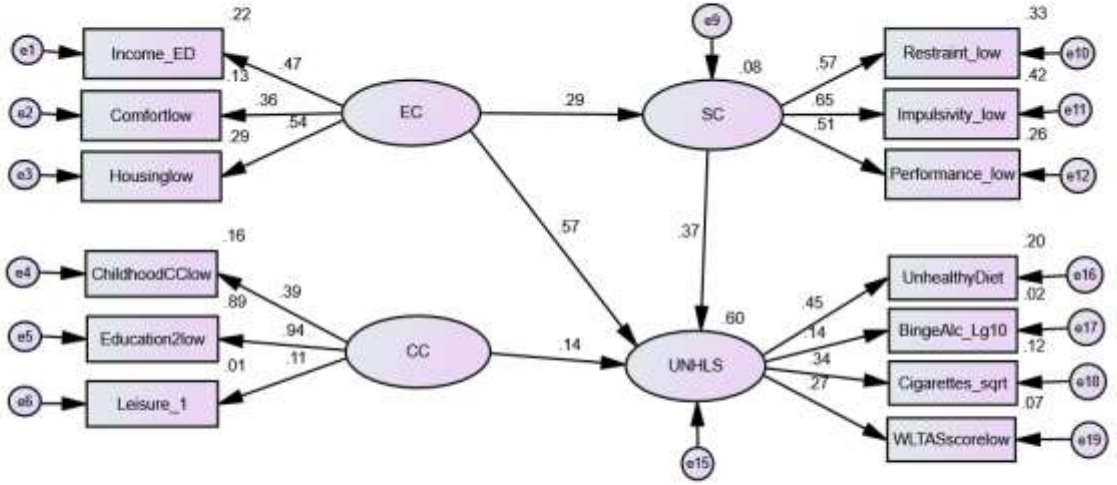
Regarding H_4, the direct effect of low cultural capital on an unhealthy lifestyle was not significant ($p = 0.187$). Moreover, the direct effect of low cultural capital on low trait self-control was not significant ($p = 0.251$). Thus, low cultural capital does not have a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait self-control, and H_4 was rejected. The bootstrap method (Preacher & Hayes, 2004; 2008) was employed and the mediating variable was then included, and bootstrapping was again employed. The significance of both models was tested again and both models showed a good fit (Hadi, Abdullah & Sentosa, 2016) (see Figures 4.15 and 4.16).

FIGURE 4.15: BOOTSTRAPPED STRUCTURAL MODEL OF UNHEALTHY LIFESTYLE ASSESSING THE DIRECT PATHWAY



($\chi^2 = 67.816$; df = 33; $\chi^2/df = 2.055$; $p < 0.001$; CFI = 0.905; RMSEA = 0.035)

FIGURE 4.16: BOOTSTRAPPED STRUCTURAL MODEL OF UNHEALTHY LIFESTYLE WITH MEDIATING VARIABLE INCLUDED



(χ^2 = 126.306; df = 61; χ^2/df = 2.070; p < 0.001; CFI = 0.908; RMSEA = 0.036

Finally, the variance accounted for (VAF) was calculated: if the VAF value is greater than 80%, there is a full mediation effect; a VAF between 20% and 80% represents partial mediation; and for values less than 20%, there is no mediation effect (Hair et al., 2014). The VAF for the structural model of HLS was 17.9% and the VAF for the structural model of UNHLS was 17.3%, which indicates no mediating effect.

A summary of the tested hypotheses is presented in Table 4.26.

TABLE 4.26: SUMMARY OF TESTED HYPOTHESES

Hypothesis		Standardised coefficients	*p*	Conclusion
H_1	High economic capital → high trait self-control High trait self-control → healthy lifestyle	$\beta_1 = 0.356$ $\beta_2 = 0.235$	0.001 0.023	Partial Support
H_2	High cultural capital → high trait self-control High trait self-control → healthy lifestyle	/ $\beta_3 = 0.436$	/ 0.023	Reject
H_3	Low economic capital → low trait self-control Low trait self-control → unhealthy lifestyle	$\beta_4 = 0.338$ $\beta_5 = 0.334$	0.006 0.011	Partial Support
H_4	Low cultural capital → low trait self-control Low trait self-control → unhealthy lifestyle	/ /	/ /	Reject

4.4.3.3 EFFECTS OF MODERATING VARIABLES

To test the predictive validity of both models across different sub-groups within the sample differentiating by living area, gender, age and religion, Potthoff (1966) suggests a subgroup analysis, where for each subgroup a separate model is run. Further, the models are compared for their validity for each group of interest. More recently, Hair et al. (2014) suggest that for nonmetric moderators the focus of the analysis is on the structural model estimates rather than on the comparison of the structural models. Following this line of an argument, the models were tested for the difference between parameters in constrained and unconstrained variants of the models.

LIVING AREA (WARD)

The sample was divided into residents living in affluent wards (the above average wards and those with the least deprivation) and residents living in deprived wards (most deprived wards and wards below the average deprivation).

HEALTHY LIFESTYLE

The healthy lifestyle model was significant for deprived and nondeprived wards and showed a good fit after the variable 'Attend organised cultural events' was removed from the model. After testing for the differences among the parameters between constrained and unconstrained variants of the model, the results suggest that non-deprivation in the living area is not a significant moderator at the model level (Table 4.27).

TABLE 4.27: TESTING FOR THE LEVEL OF DEPRIVATION (BY WARD) AS A MODERATOR FOR THE HLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	157.222	100	< 0.001	0.870	0.033
Fully constrained	166.221	112	0.001	0.817	0.031
Model differences	8.999	12*	/	/	/

**p*-value = 0.703

UNHEALTHY LIFESTYLE

The unhealthy lifestyle model showed a good fit for wards with higher and no deprivation after excluding the CC latent construct. After testing for differences among the parameters between constrained and unconstrained variants of the model, the results indicate that level of deprivation in the living area is a significant moderator at the model level (see Table 4.28).

TABLE 4.28: TESTING FOR THE LEVEL OF DEPRIVATION (BY WARD) AS A MODERATOR FOR THE UNHLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	106.292	64	0.001	0.872	0.036
Fully constrained	125.613	74	< 0.001	0.843	0.037
Model differences	19.321	10*	/	/	/

**p*-value = 0.036

GENDER

The sample was divided into male and female respondents and the models for each gender sub-group were compared.

HEALTHY LIFESTYLE

The healthy lifestyle model was significant for males and females and showed a good fit. After testing for differences among the parameters between constrained and unconstrained variants of the model, the results suggest that gender is not a significant moderator at the model level (see Table 4.29).

TABLE 4.29: TESTING FOR GENDER AS A MODERATOR FOR THE HLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	161.256	100	< 0.001	0.914	0.028
Fully constrained	180.126	112	< 0.001	0.904	0.028
Model differences	18.87	12*	/	/	/

**p*-value = 0.092

UNHEALTHY LIFESTYLE

The unhealthy lifestyle model was significant for males and females after excluding the CC latent construct and showed a good fit. After testing for differences among the parameters between constrained and unconstrained variants of the model, the results indicate that gender is a significant moderator at the model level (see Table 4.30)

TABLE 4.30: TESTING FOR GENDER AS A MODERATOR FOR THE UNHLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	106.292	64	0.001	0.872	0.036
Fully constrained	125.248	74	< 0.001	0.843	0.037
Model differences	19.321	10*	/	/	/

**p*-value = 0.036

AGE

The sample was divided into residents under the age of 45 and residents over the age of 45. Both models were tested for the moderating effects of age.

HEALTHY LIFESTYLE

The healthy lifestyle model was significant for both age groups and showed a good fit after the item 'Spend time on the internet' was excluded from the model. After testing for differences among the parameters between constrained and unconstrained variants of the model, the results indicate that age is not a significant moderator at the model level (4.31).

TABLE 4.31: TESTING FOR AGE AS A MODERATOR FOR THE HLS MODEL

Overall model	χ^2		df	*p*-value	CFI	RMSEA
Unconstrained	163.422		100	< 0.001	0.906	0.029
Fully constrained	179.759		112	< 0.001	0.899	0.028
Model differences	16.337		12	/	/	/

**p*-value = 0.176

UNHEALTHY LIFESTYLE

The unhealthy lifestyle model was significant for both age groups after excluding the CC latent construct and showed a good fit. After testing for differences among the parameters between constrained and unconstrained variants of the model, the results indicate that age is a significant moderator at the model level (see Table 4.32).

TABLE 4.32: TESTING FOR AGE AS A MODERATOR FOR THE UNHLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	107.546	64	0.001	0.911	0.030
Fully constrained	126.596	74	, 0.001	0.893	0.031
Model differences	19.05	10	/	/	/

**p*-value = 0.040

RELIGION

The sample was divided into residents declaring themselves as religious (i.e., any religion) and residents declaring themselves as atheists (i.e., no religion). Both models were tested for the moderating effects of religion.

HEALTHY LIFESTYLE

The healthy lifestyle model was significant for religious and non-religious group and showed a good fit. After testing for the differences among the parameters between constrained and unconstrained variants of the model, the results indicate that religion is not significant moderator at the model level (see Table 4.33).

TABLE 4.33: TESTING FOR RELIGION AS A MODERATOR FOR THE HLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	166.458	122	0.005	0.933	0.023
Fully constrained	181.898	135	0.004	0.929	0.022
Model differences	15.44	13*	/	/	/

**p*-value = 0.281

UNHEALTHY LIFESTYLE

The unhealthy lifestyle model was significant for both religious groups after excluding the CC latent construct and showed a good fit. After testing for the differences among the parameters between constrained and unconstrained variants of the model, the results indicate that religion is not a significant moderator at the model level (see Table 4.34).

TABLE 4.34: TESTING FOR RELIGION AS A MODERATOR FOR THE UNHLS MODEL

Overall model	χ^2	df	*p*-value	CFI	RMSEA
Unconstrained	105.190	64	0.001	0.912	0.030
Fully constrained	122.882	74	< 0.001	0.896	0.030
Model differences	17.692	10	/	/	/

**p*-value = 0.060

A summary of the moderation effects is presented in the Table 4.35 below.

TABLE 4.35: SUMMARY OF THE TESTED MODERATION EFFECTS

Moderating variable	HLS model	UNHLS model
Ward deprived vs. affluent	Not significant	Significant
Gender Females vs. males	Not significant	Significant
Age Up to 45 vs. 45+	Not significant	Significant
Religion Religious vs. non-religious	Not significant	Not significant

4.5 CONCLUSION

In line with objective 2 and H_1, H_2, H_3, and H_4, the chapter presented the data analysis steps undertaken in the development of the structural equation models. The first part of the chapter addressed the assumptions of SEM (on sample size and missing data, normality, linearity and independence of residuals, and on the absence of multicollinearity). The second part of the chapter presented the results of the descriptive analysis and characteristics of the sample. The third part of the chapter presented the exploratory factor analysis and identified three dimensions of the trait self-control construct: *restraint*, *impulsivity,* and *performance*. Further to that, the significance of state self-control could not be tested because of technical issues relating to AMOS, despite the confirmation of the construct using CFA. As such, the analysis of this concept did not proceed any further and state self-control was therefore excluded from the hypothesis testing. All three dimensions of the trait self-control construct were separated into low and high values, providing an overall summary of each sub-dimension i.e., *restraint_low* and *restraint_high*, *impulsivity_low* and *impulsivity_high* and *performance_low* and *performance_high*. The results of the analysis showed a good fit (see Figures 4.6 and 4.7).

Finally, both models (HLS and UNHLS) were tested. Both showed a good fit after applying bootstrapping with mediating variable included (HLS: χ^2 = 133.990; DF = 61; χ^2/DF = 2.196; p < 0.001; CFI = 0.906; RMSEA = 0.038 and UNHLS: χ^2 = 126.306; DF = 61; χ^2 /DF = 2.070; p < 0.001; CFI = 0.908; RMSEA = 0.036). Both hypotheses linked to economic capital (H_1 and H_3) were partially supported and both hypotheses linked to cultural capital (H_2 and H_4) were unsupported. In order to test H_1, the mediating effect of high trait self-control was assessed. The effect of mediation was partial. To test H_3, the mediating effect of low trait self-control was assessed and again, its effect was partial. Finally, both models were tested for the effects of moderating variables, namely the effects of living area (i.e. ward), gender, age, and religion. The moderating effects of ward, gender and age were significant for unhealthy lifestyle model, whereby the effects of religion were insignificant for both models (see Table 4.35and 4.36).

TABLE 4.36: SUMMARY OF SUPPORTED RESULTS

Model	Supported hypothesis	Supported effects of moderating variables
Healthy lifestyle	H_1: High economic capital → high trait self-control → healthy lifestyle	/
Unhealthy lifestyle	H_3: Low economic capital → low trait self-control → unhealthy lifestyle	1) Ward 2) Gender 3) Age

5. DISCUSSION OF FINDINGS

5.1 INTRODUCTION

The chapter outlines the key theoretical, methodological and practical findings. Firstly, the theoretical findings are discussed in light of the three main theories which underpin this research, namely, Marmots' wealth-to-health-pathway, Bourdieu's social theory and Baumeister's self-control theory. Secondly, the methodological findings relate to Baumeister's' self-control scale and the adaptation to structural equation modelling. Thirdly, the contribution to practice of the recommended interventions is discussed in the context of Marmots' idea on proportionate universalism.

5.1 KEY FINDINGS

This study has investigated multidimensional inequality in the context of health and healthy lifestyles. In line with recent research on perpetual inequalities (Manstead, 2018; Piff, Kraus & Keltner, 2017), the concept has to be understood from a multidimensional perspective, combining external material socioeconomic and internal psychological factors that mutually impact on healthy lifestyles.

In terms of relevant social theories, Bourdieu's approach towards multidimensional and persistent social inequalities was loosely adopted for this research. This involved identifying a broad spectrum of external socio-economic factors associated with the level of cultural and economic capital, both of which are converted into the internal disposition of habitus and impact on an individual's healthy lifestyle. In this respect, previous research has established clear causal links between forms of capital, health, and a healthy lifestyle (Burnett & Veenstra, 2017; McGovern & Nazroo, 2015; Oncini & Guetto, 2017, 2018; Pampel, 2012; Veenstra & Abel, 2015).

Regarding psychological theories, Tangney et al.'s (2004) concept of self-control has been established as a psychosocial classifier, differentiating people in accordance with their learning histories and thus naturally distinguishing them in terms of levels of self-control and impulsivity (Tangney, Baumeister & Boone, 2004; Vohs, 2013). The internal psychological regulatory mechanism of self-control has been linked to several positive behaviours, particularly in the context of a healthy lifestyle (Briki, 2018; Cresconi et al., 2011; Forestier et al., 2018; Luehrig, Jones, Tahaney & Palfay, 2018).

Linking the social and psychological dimensions of a healthy lifestyle, the basic theoretical framework of this research was guided by the question of how a person's external socio-economic conditions, expressed in the types and structure of economic and cultural capital, are internalised into the habitual psychological disposition of self-control, further impacting residents' health-protective behaviour and healthy lifestyles.

The following four hypotheses were tested:

H_1: High economic capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.
H_2: High cultural capital has a positive indirect effect on a healthy lifestyle, mediated through a high level of trait and state self-control.
H_3: Low economic capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.
H_4: Low cultural capital has a positive indirect effect on an unhealthy lifestyle, mediated through a low level of trait and state self-control.

In the context of a healthy lifestyle (see Figure 4.14), H_1, linking high economic capital and a healthy lifestyle mediated through a high level of self-control, was partially supported because only trait self-control was tested. H_2, linking high

cultural capital and a healthy lifestyle mediated through a high level of self-control, was rejected. When testing for the effects of moderating variables, the healthy lifestyle model was insignificant for the effects of all the tested variables. women (see Table 4.35).

In the context of an unhealthy lifestyle, H_3, linking low economic capital and an unhealthy lifestyle, mediated through a low level of self-control, was partially supported because only trait self-control was tested (see Figure 4.16). H_4, linking low cultural capital and an unhealthy lifestyle mediated through a low level of self-control, was rejected. The unhealthy lifestyle model was significant for the effects of ward, gender and age. A summary of key results is presented in Table 4.35.

Thus, by uniquely combining elements from Bourdieu`s social theory with elements of Baumeister`s and Tangney et al.'s (2004) psychological theory, this study is the first to provide combined evidence for the multidimensional pathway of perpetual inequalities in health and healthy lifestyles. It has addressed a gap in the literature by following calls for:

1) more comprehensive understanding of persisting inequalities, where the concept needs to be understood from a multidimensional perspective (Manstead, 2018; Piff, Kraus & Keltner, 2017). This involves combining a material external, socioeconomic dimension with an internal psychological dimension, which represent two separate but essentially intertwined dimensions of inequality (Kraus et al., 2012; Manstead, 2018; Piff, Kraus & Keltner, 2018).

2) clearer understanding of habitus and habitual dispositions and their impact on decision-making processes and lifestyle (Oncini & Guetto, 2017; Pinxten & Lievens, 2014; Schmitz, Flemmen & Rosenlund, 2018; Veenstra & Burnett, 2014).

3) investigation of self-control in relation to socio-economic standard of living (Tangney, Baumeister & Boone, 2004; Vohs, 2013) in order to gain more understanding of how self-control accrues in the natural socio-economic context, outside controlled laboratory environments (cf. Baumeister, Tice & Vohs, 2018; Baumeister, Wright & Carreon, 2019; Vohs, 2013).

4) practical (cf. WHO, 2013) and theoretical requirements for pragmatically implementing a mix of different strategies, theories and lines of reasoning when tackling health issues and health inequalities (cf. Øversveen et al., 2017; Schmitz & Barth, 2019; Schmitz, Flemmen & Rosenlund, 2018).

In line with the theoretical foundations of this study, the key findings will be interpreted from three main perspectives: the theoretical perspective of the material resources of health-related inequalities, the theoretical perspective of the psychological resources of health and related inequalities, and the practical perspective of interventions in health and the lifestyles of residents.

5.2 INTERPRETATION OF KEY FINDINGS

5.2.1 MATERIAL RESOURCES OF RESIDENTS' HEALTH

As shown in chapter 4.4.3, in the healthy lifestyle model, only high economic capital has a significant direct impact on healthy lifestyle ($\beta = 0.61$, $p < 0.001$) and a significant indirect impact mediated through high trait self-control ($\beta = 0.51$, $p < 0.001$). Equally, low economic capital is directly ($\beta = 0.70$, $p < 0.001$) and indirectly ($\beta = 0.58$, $p < 0.001$) significant for predicting an unhealthy lifestyle. Thus, economic capital converts into an internal disposition of trait self-control and further impacts the health and healthy lifestyles of residents. Conversely, the results of analysis show that in the healthy lifestyle model, a high level of cultural capital is a directly significant predictor of healthy lifestyle but is an

insignificant predictor when the mediating variable is introduced. In the unhealthy lifestyle model, cultural capital is completely insignificant. Thus, the results show that cultural capital does not convert into an internal disposition of trait self-control.

Based on the results of this study the following points of discussion regarding material resources and Bourdieu's capital theory in the context of inequalities in health and healthy lifestyles will be reviewed.

1) *Economic and cultural capital are two separate resources of health-related lifestyle*

The results suggest that the level of economic capital is the true source of perpetual multidimensional inequality. In both models, only economic capital had significant direct and indirect effect on health-related lifestyle. This supports the argument that economic capital accumulates, converts to different forms (e.g. from external to internal, psychological) and becomes a crucial factor in the mechanism that facilitates the perpetual maintenance of multidimensional inequality (Piff, Kraus & Keltner, 2017; Manstead, 2018).

The results indicate that economic capital and cultural capital are two separate resources of a health-related lifestyle. This is suggested in both models where economic and cultural capital have distinctive pathways of conversion. In the healthy lifestyle model, high economic capital has significant direct and indirect effects on healthy lifestyle. By comparison, high cultural capital has a direct effect on a healthy lifestyle; however, there is no indirect effect of high cultural capital on a healthy lifestyle, mediated through a high level of trait self-control (see Figure 4.14).

In the model of an unhealthy lifestyle, cultural capital is completely nonsignificant and was therefore excluded from the model (see Figure 4.16).

This supports the argument that economic and cultural capital have two distinctive patterns of conversion from the external to the internal dimension, further impacting health-related lifestyle. Moreover, these results suggest that the addition of the psychological dimension to the pathway between external resources and lifestyle shows that the influence of economic and cultural capital on healthy and unhealthy lifestyle is more complex then suggested by previous research (Bourdieu, 2010; Burnett and Veenstra, 2015, 2017). .

2) The *multi-faceted nature of cultural capital*

The results suggest that embodied cultural capital (i.e., leisure participation), institutionalised cultural capital (i.e., level of parental and own education), and objectified cultural capital (i.e., childhood circumstances and presence of cultural valuables while growing up) have combined and also have an individual direct impact on healthy lifestyle. Thus, the influence of cultural capital on healthy and unhealthy lifestyles is complex. The results of this study also provide evidence regarding the way embodied cultural capital, although operationalised in an objective manner, represents an internal resource of a healthy lifestyle rather than the material resource of such a lifestyle. Both points of the argument will be discussed further below.

5.2.1.1 ECONOMIC AND CULTURAL CAPITAL AS TWO SEPARATE RESOURCES OF A HEALTH-RELATED LIFESTYLE

Applying Bourdieu's theory (1986, 2010), the established literature on health inequalities supports the notion that intertwined economic and cultural types of capital form an individual's capital portfolio and present a set of resources pertaining to social position, material comfort in everyday life, health-related lifestyles and health (Abel, 2007, 2008; Burnett & Veenstra, 2015, 2017; McGovern & Nazroo, 2015; Veenstra & Abel, 2015). However, Pinxten and

Lievens (2014) moved away from this notion and presented contrasting arguments. They argued that different forms of capital have a distinctively different and not necessarily associated impact on outcomes e.g. lifestyle. They further argue that such impacts should be the focus of future investigations into health inequalities. In developing their argument, they contend that embodied cultural capital i.e., cultural participation in various leisure activities appears to be relevant for physical health but not for mental health, whereas economic capital is relevant for both. This indicates that the interplay between both types of capital is less significant in explaining overall health inequalities than Bourdieu's theory initially suggests.

In line with the results of this research (see chapter 4.4.3 and subchapter 4.4.3.1 on healthy lifestyle model testing and subchapter 4.4.3.2 on unhealthy lifestyle model testing), economic capital lies at the root of all inequalities (cf. Bourdieu, 1986), because it converts into an internal disposition of trait self-control, related to an individual's control of impulses and behaviour and further impacting on their lifestyle. However, the results also show that economic capital not only converts easily into money (e.g., housing situation) and lifestyle i.e., healthy or unhealthy, it also converts into the internal psychological disposition of trait self-control. As such, economic capital transforms and accumulates and readily enables different benefits to be derived from it. By contrast, cultural capital is only a significant predictor of a healthy lifestyle and it remains completely nonsignificant with regard to an unhealthy lifestyle.

Thus, the results do not support the idea of cultural capital being a key element in the behavioural transformation of social inequality into health inequality (Abel, 2007). Equally, the results do not comply fully with Oncini and Guetto's (2018, 2017), Pampel's (2012) and Mackenback's (2012) arguments on cultural capital being a key element in persistent health-related inequalities. By contrast, this research supports the idea that cultural capital is a relevant predictor of

health and a healthy lifestyle but does not contribute to an understanding of the causal mechanism that facilitates the perpetual maintenance of multidimensional inequality (Piff, Kraus & Keltner, 2017; Manstead, 2018).

Finally, the results only partially support the intertwined nature of both types of capital that together form an individual's capital portfolio and present a set of resources pertaining to social position, material comfort in everyday life, and a healthy lifestyle and good health (Burnett & Veenstra, 2015 and 2017; Abel, 2007, 2008; Veenstra & Abel, 2015; McGovern & Nazroo, 2015). The results indicate that economic and cultural capital together are not dimensions of material socio-economic inequality. Moreover, the findings provide evidence to show that there are issues around the interplay of all three sub-categories of cultural capital (i.e., institutionalised, embodied, and objectified) (cf. Bourdieu, 1986). These issues are now examined in further detail.

5.2.1.2 MULTI-FACETED NATURE OF CULTURAL CAPITAL

This research investigated the intertwined nature and impact of cultural capital on trait self-control and subsequent healthy or unhealthy lifestyles. It examined all three types of cultural capital: embodied cultural capital (leisure participation), institutionalised cultural capital (level of parental and own education), and objectified cultural capital (childhood circumstances and presence of cultural valuables while growing up).

Generally, cultural capital has been identified as a predictor of positive behavioural outcome, i.e. a healthy lifestyle, however it has not been identified as a significant predictor of negative behavioural outcome, i.e. an unhealthy lifestyle. Thus, it can be argued, that a level of cultural capital is a sign of socio-economic progress and a source of abundance in general and particularly in the context of a healthy lifestyle.

The results of this study complement Rifkin's (2001) general idea of capital (cf. OECD, 2013), where its stocks in one generation influence the opportunities and well-being of the next. Here, cultural capital accumulation identified through the level of cultural valuables present at home while growing up and the level of partental education are stronger predictors of a healthy lifestyle than one's leisure activities. In line with Bourdieu's notion of lifestyle appropriation i.e., acculturation as a form of informal education and socialisation embedded in a family environment, together with multidimensional and persistent inequalities, the results add to an understanding of how inter-generational accumulation of cultural capital, in the form of institutionalised and objectified capital, present an asset that adds to the mechanism of perpetual inequalities. Based on this line of reasoning, the results confirm Øvrum and Rickertsen's (2015) and Oncini and Guetto's (2017) argument as to how childhood circumstances and social origins are major contributors to inequality in general and inequality in the context of health and a healthy lifestyle.

In terms of embodied cultural capital, the results (see Figure 4.14) generally support Pampel's (2012) distinction between *purposeful (i.e., meaningful)* leisure, which is associated with cultural activities (including spending time on the computer) and *meaningless* leisure, which is associated with socialising, handicrafts, and watching television. Attendance at cultural events and spending time on the internet and/or PC as dimensions of high embodied cultural capital are a significant predictor of healthy lifestyles. By contrast, watching television as an element of low cultural capital and meaningless leisure participation is a significant predictor of unhealthy lifestyles. The results of this study also show that institutionalised cultural capital (i.e., own and parental education) is not a unidimensional concept and that parental education is not necessarily correlated with respondents' own education. In this respect, their own education is not a significant predictor of a healthy lifestyle, unlike parental education. Thus, this study only partially confirms previous research

which argued that one's own *and* parental education *mutually* impact inequalities in healthy lifestyle (Abel et al., 2014; Burnett & Veenstra, 2017; Oncini & Guetto, 2017).

The results of this study provide evidence regarding the way embodied cultural capital, although operationalised in an objective manner, represents a cultural resource relevant to the appropriation of a healthy lifestyle rather than the material resource of such a lifestyle. From the objective perspective of the material resources of a healthy lifestyle, it appears that institutionalised cultural capital and objectified cultural capital can to some extent be externalised, objectively accumulated, transmitted inter-generationally and separated from an individual in order to identify one's social position and material circumstances of living. By contrast, embodied cultural capital i.e., leisure participation is intimately and fundamentally linked to an adult person and his/her cultivation and *Bildung* (cf. Bourdieu, 1986). In this way, embodied cultural capital cannot accumulate objectively and dies together with the person. This is especially relevant in Bourdieu's work, where leisure participation is linked to self-fulfilment, life satisfaction, and subjective well-being (Lenneis & Pfister, 2016; Parsons, Mackenzie, Filep & Brymer, 2019). In contrast to Pinxten and Lievens' (2014) research, this line of argument presents participation in leisure activities i.e., embodied cultural capital, as a contributor to mental health (Hayosh, 2017).

Thus, complete separation, objectification, and detachment of embodied cultural capital from a psychological habitual disposition is not possible. The power of this dimension compared to that of the other two dimensions when identifying the variable of cultural capital, supports the notion that leisure participation as a measure of embodied cultural capital in the context of health inequalities has weaker predictive value than the level of parental education,

i.e. institutionalised cultural capital and childhood circumstances and presence of cultural valuables while growing up, i.e. objectified cultural capital.

It can be concluded that different types of cultural capital have a distinctive nature and pattern of accumulation and conversion and are therefore separate resources of health-related lifestyles. Cultural capital in its institutionalised and objectified forms can to some extent be objectified, externally accumulated and transmitted inter-generationally. In this way, it can become an effective identifier of one's social position and material circumstances of living. However, cultural capital in its embodied form is essentially one's internal cultural capacity relevant to the appropriation of a healthy lifestyle. Embodied cultural capital, even in its most objective form, as applied in this research, represents one's cultural capacity and adds value and complexity to human nature.

Overall, because of the fluid and complex nature of cultural capital, it is a less reliable predictor of inequalities in a healthy lifestyle. The results show that while cultural capital is a significant predictor of a healthy lifestyle, it is not a significant predictor of an unhealthy lifestyle. As such, the results did not confirm the argument that cultural capital is a key element of health inequalities (Abel, 2007; Mackenback, 2012; Oncini & Guetto, 2017, 2018; Pampel, 2012). Only economic capital is providing a reliable resource and dimensionality on both sides of the healthy to unhealthy lifestyle spectrum. Therefore, by contrast, the contribution of economic capital to the accumulation, conversion and reproduction of health-related inequalities is vital.

5.2.1.3 CONTRIBUTION TO AN UNDERSTANDING OF BOURDIEU'S 'STRUCTURE-DISPOSITION-PRACTICE' PATHWAY

The results of this study inform an understanding of perpetual inequalities in health and healthy lifestyles from the perspective of Bourdieu's theory. There are three main areas where the contribution to Bourdieu's theory can be highlighted.

Firstly, this study contributes to Bourdieu's capital theory and, secondly, it contributes to an understanding of habitus as an internal resource of a healthy lifestyle. Thirdly, it contributes to a realist approach towards a 'structure-disposition-practice' pathway of health-related inequalities by applying a quantitative methodology.

1) *Contribution to Bourdieu's capital theory*

   Building on previous relevant research (Burnett & Veenstra, 2017; McGovern & Nazroo, 2015; Pinxten & Lievens, 2014; Pampel, 2012; Oncini & Guetto, 2017, 2018) and adopting an objective approach towards the operationalisation of capital in the context of health and a healthy lifestyle, the results of this study contribute to two main points of Bourdieu's notion of capital. Firstly, this study supports Bourdieu's notion of economic capital being 'at the root of all the other types of capital' (Bourdieu, 1986:54). The results also indicate that economic and cultural capital are two separate entities with distinctive patterns of conversion from structure to disposition and practice (cf. Pinxten & Lievens, 2014). However, only economic capital is identified as a significant predictor of perpetual multidimensional inequalities in healthy and unhealthy lifestyles.

Secondly, the results indicate that capital is a multidimensional concept, combining its external and internal dimensions. Because of the fluid and complex nature of cultural capital, it is a less reliable predictor of inequalities in healthy lifestyle. As such, the results only partially support previous research which found that cultural capital is a key element in predicting health inequalities (Abel, 2007; Mackenback, 2012; Oncini & Guetto, 2017, 2018; Pampel, 2012).

2) *Contribution to Bourdieu's habitus theory*

This research complements the concept of habitus in the context of perpetual health inequalities in several ways. Firstly, it establishes the psychological concept of trait self-control with its classifying potency, dividing the population into people with lower and higher levels of trait self-control (Baumeister, 2010; Tangney, Boone & Baumeister, 2004), as a meta disposition of habitus and as an element of class habitus.

Further to this, the results on the pathway between economic capital, trait self-control and health-related lifestyle complement Bourdieu's (1987) subjective perspective on social class. They also, to some extent, align with Manstead's (2018) arguments on how lower/working social class individuals with predominantly lower levels of economic resources develop distinctive and different socio-psychological perspectives that may lead to the development of a distinctive, less desired and socially non-acceptable identity, pertinent to lower social class (e.g. impulsive behaviour). Here, the identified pathway of inequality shows how visible external socio-economic factors collectively convert into an invisible internal dimension of psyche that finally impact healthy lifestyle and health (cf. Quesada, Hart & Bourgois, 2011). In this way, socio-economic factors, level of trait self-control and finally body, health and healthy lifestyle become a shared representation and manifestation of class

identity and class habitus (cf. Kraus, Piff & Keltner, 2009). Trait self-control (and lack of it) subconsciously becomes a part of person's own and shared identity and an element of perpetual classifiable socio-economic distinction (cf. Elias & Dunning, 1986; Schmitz, Flemmen & Resenlund, 2018).

Secondly, this research complements Bourdieu's, (2010) and Sayer's (2011) idea on 'feel for the game' as an acquired internal skill and habitual reaction in various situations, resembling intuitive impulsive reactions in sport (e.g., tennis, see chapter 2.4.1 on the concept of habitus). Such 'feel for the game' resembles the muscle-analogy presented by Elias (1994) and Elias and Dunning (1986). In this research, an individual's level of trait self-control applied in the context of health and healthy lifestyle is understood as a fixed skill of psyche and a disposition of habitus and a way of behavioural reaction, embedded in one's socio-economic position (Sayer, 2011). However, in contrast to previous research and theoretical beliefs, this research presents an argument where such 'feel for the game' is not linked to one's level of cultural capital and cultural experience (similar to Baumeister's cultural animal discussed in chapter 2.4.2), but one's level of economic capital and related economic power derived from it. Based on the results of this research it is argued that internal skill and level of trait self-control is identified as a meta disposition of habitus. Further, the results of this study support the notion that trait self-control is a fixed habitual disposition and responsive skill influenced by the level of economic comfort in one's everyday life and objective well-being.

Thirdly, this research contributes to habitus theory by introducing three new faculties (i.e. components, powers) of habitus, namely, cognitive, non-cognitive and motivational faculties of habitus. This idea was firstly

supported by Edgerton and Roberts (2014) who investigated enduring educational inequalities in relation to two facets of habitus: cognitive and non-cognitive. They argue that the cognitive part of the habitus is linked to the cognitive socialisation process that takes place during an individual's upbringing (i.e., Bourdieu's *Bildung*). Thus, alongside the formal schooling process, informal learning, adopted cognitive operations, and learned habitual dispositions are acquired within the family and its wider social origins. Children from a more affluent background with a higher level of parental education and a culture-infused upbringing develop a different set of skills, behavioural dispositions, and analytical tools compared to children from a poorer background (cf. Stuij, 2015). Thus, the concept of institutionalised and objectified cultural capital can add value to an understanding of the internal cognitive part of the habitus. Regarding the non-cognitive part of the habitus, Edgerton and Roberts (2014) draw from Nash (2001) and associate it with an individual's self-concept, self-discipline, and self-control in relation to academic performance. In relation to the non-cognitive part of habitus, their line of argument contrasts with Tangney et al.'s (2004) in relation to the concept of trait self-control being linked to cognitive psychological processes.

Nevertheless, the bipolar concept of habitus is offering an interesting and reasonable explanation in the context of this study for two main reasons. Firstly, Edgerton and Roberts (2014) present an argument for a precisely defined and structured habitus that bears more explanatory potential in the context of perpetual social inequalities in health and healthy lifestyle. This argument brings to light the potential for psychological operationalisation of habitus. Secondly, they link the concept of habitus to cognitive and non-cognitive processes, including self-control, relevant to this study. Equally, their bipolar conceptualisation of habitus can be

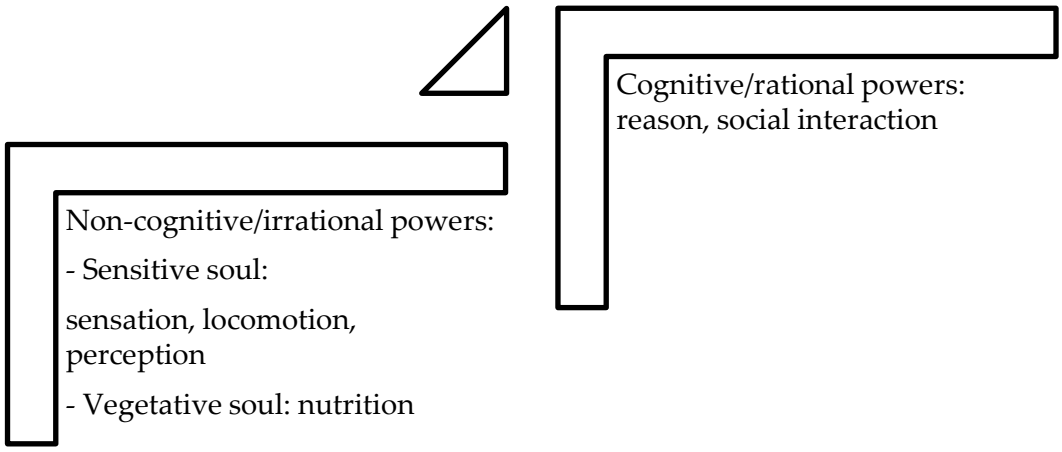
linked back to the Aristotelian division of soul and psyche (see chapter 2.4.1). It could be argued that the latter, presenting the idea of structured psyche, has been overlooked by Bourdieu who – in many other cases – implemented an Aristotelian line of thought.

In line with this argument, Aristotle establishes a classificatory and hierarchical system of different powers of the psyche (i.e. soul) and identifies them as 'faculties' (Aristotle, 1986). Aristotle in De Anima stated that (1986:162):

> 'Now of the faculties of the soul, some living things have all those that we have talked of, as we said, some have some of them, and some only one. The faculties we spoke of were the nutritive, perceptive, desiderative, locomotive, and intellective, plants having only the nutritive, other living things both this and perceptive. But if they have the perceptive faculty they have also that of desire. For desire is appetite, passion or wish, all animals have at least one of the senses, namely touch, and for that for which there is perception there is also both pleasure and pain and the pleasant and painful, and for those for whom there are these there is also appetite, the desire for the pleasant.'

Accordingly, Aristotle differentiates between three main types of souls, namely: a vegetative soul with the power of nutrition; a sensitive soul with the power of sensation, locomotion and perception; and a rational soul with the power of reason and social interaction. Here, rational souls not only have the power of reason and social interaction but also possesses all the powers of hierarchically lower souls, namely the powers of sensitive souls and vegetative souls. Rational souls, for Aristotle, are cognitive, whereby sensitive and vegetative souls are non-cognitive (i.e. irrational) souls (see Figure 5.1).

FIGURE 5.1: THREE KINDS OF SOULS AND THEIR POWERS ACCORDING TO ARISTOTLE

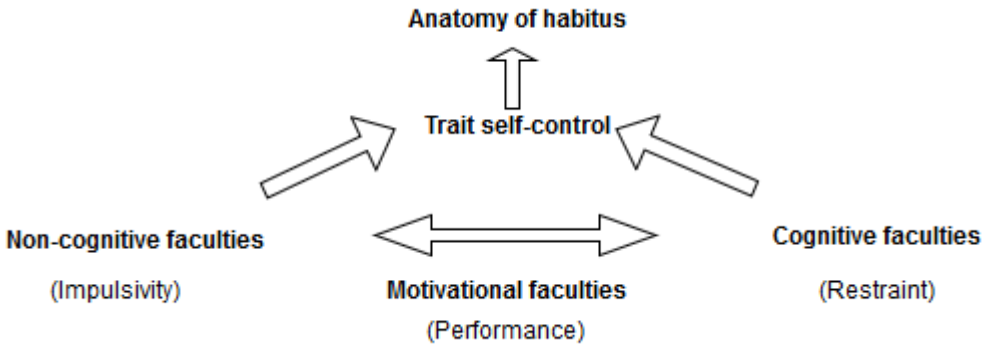


In addition to this, in his final chapter of De Anima, Aristotle starts to briefly discuss the concept of motivation 'as a soul's capacity to set in motion the ensouled body' (1986:211). The motivating capacity for Aristotle is the capacity of the soul to balance out the initiatory 'push' factors of non-cognitive desires and inhibitory 'pull' factors of the cognitive rational part of the soul (cf. De Ridder et al., 2011; Maloney et al., 2012). In this respect, he directly refers to the idea of self-control, 'for the self-controlled, though experiencing desire and appetite, yet do not do the things that they desire, but defer to the intellect' (1986:213). Thus, he identifies two motivational facilities of the psyche, namely desire and intellect.

Thus, the results of this study support the tripartite structure of habitus linking Edgerton's and Roberts (2014) and Aristotle's idea on cognitive/rational and non-cognitive powers of habitus and complement it accordingly. In the context of this study, *impulsivity* as an identified factor of trait self-control can be associated to non-cognitive initiatory faculties ('push' power), *restraint* as another identified factor of trait self-control can be associated to inhibitory cognitive faculties ('pull' power)

and *performance* can be identified as the motivational faculty of habitus (see Figure 5.2).

FIGURE 5.2: ANATOMY OF HABITUS WITH IDENTIFIED COGNITIVE, NON-COGNITIVE AND MOTIVATIONAL FACULTIES



This idea builds on Edgerton and Roberts' bipolar conceptualisation of habitus and is supported by the Aristotelian line of argument. By this kind of combination and incorporation of Bourdieu's concepts, the tripartite structure of habitus can be supported, without contradicting the ontological unity of habitus (i.e., psyche, soul), body, and habitat. Its contribution to a realist 'structure-disposition-practice' pathway, creating a perpetual advantageous or disadvantageous internal disposition, resulting in the production and reproduction of inequalities in health and healthy lifestyle will be discussed below.

3) *Contribution to the 'structure-disposition-practice' pathway*

Firstly, this research complements Bourdieu's (2010, p:171) pathway of inequality where the objectively classifiable material conditions of living convert into an internal disposition of habitus that through classifiable practices impacts lifestyles. Edgerton and Roberts (2014) theorised this pathway in the direction: 'structure-disposition-practice'.

Secondly, from a methodological perspective, this study complements previous research (Pinxten & Lievens, 2014; Pampel, 2012; Burnett & Veenstra, 2017) that explored the relations between capital and healthy and unhealthy lifestyles but did not engage with causal relationships or effects of mediating variables. Equally, the pragmatic framework identifying the direct causal links in the pathway of inequality is relevant especially from an interventionist perspective (cf. Hitchcock, 2018; Quesada, Hart & Bourgois, 2011) (see chapter 5.2.5.2). Thus, this research is making a methodological contribution by applying Bourdieu's concepts in the context of health and healthy lifestyles and exploring, identifying and quantifying the pathway between structure, disposition and practice. It incorporates Bordieu's fundamental ontological ideas like multidimensionality (i.e. considering internal and external dimensionality), causality (i.e. considering pathway and perpetual nature and reproduction of inequalities in health and healthy lifestyle) and the intertwined nature of habitus, habitat and body.

5.2.2 PSYCHOLOGICAL RESOURCES OF RESIDENTS' HEALTH

In the context of inequalities in health and healthy lifestyles, the results of this study raise three main points of discussion regarding psychological resources, Tangney et al.'s (2004) trait self-control scale, and Baumeister et al.'s (2007) self-control theory:

1) Trait self-control is not a unitary concept in the context of health inequalities, it is multidimensional both in terms of identified dimensions (i.e., restraint, impulsivity, and performance) and different levels of performance (i.e. low vs. high).

2) By identifying the multidimensional and multi-level facets of the BSCS (brief self-control scale), the results complement the idea of internal resourcefulness

and an understanding of perpetual inequalities and their links to healthy and unhealthy lifestyles.

3) An understanding of the psychological component of trait self-control can complement an understanding of the concept of autonomy in relation to inequalities in health.

5.2.2.1 MEASURING THE MULTIDIMENSIONAL AND MULTILEVEL CONCEPT OF SELF-CONTROL

Tangney et al. (2004) originally designed the BSCS as a unidimensional instrument, consistent with their understanding of the concept[24]. However, they did not provide any information regarding the factor structure of their scale (cf. Maloney, Grawitch & Barber, 2012). Nevertheless, the scale has since been tested broadly to predict different behavioural outcomes in different research contexts (e.g., healthy lifestyle, education, delinquency), across different populations (e.g., students and adults) and different cultures. Consequently, several authors have examined the factorial structure of the scale and identified different underlying dimensions that justify its multidimensional structure (cf. Ferrari et al., 2004; De Ridder et al., 2011; Maloney et al., 2012) (see chapter 2.4.2).

This study followed Maloney et al. (2012), who identified two overarching factors underpinning the BSCS: *restraint* (factors 1, 2, 6, and 13) and *impulsivity* (factors 5, 7, 10, and 11). They argued that restraint involves the psychological inclination and engagement in effortful and controlled actions, whereas impulsivity is its counterpart and involves an inclination towards spontaneous, impulsive, and effortless actions (Lindner, Nagy & Retelsdorf, 2015; Maloney et

[24] As discussed beforehand (see chapter 2.4.2), Baumeister et al. (1994, 1998) defined self-control as a general internal cognitive capacity and energy source of an individual used to override a primal response in order to achieve a long-term goal.

al., 2012). In the context of this research, a high level of restraint and a low level of impulsivity would be a significant predictor of a healthy lifestyle, healthy diet, regular strenuous exercise, no smoking and no binge drinking. Equally, a high level of impulsivity and a low level of restraint would predict unhealthy behaviour characterised by binge drinking, smoking, lower levels of exercise, and an unhealthy diet.

However, after testing the factorial structure of the scale in this research, three dimensions emerged as significant. The first two factors are similar to Maloney et al.'s (2012) notions of *restraint* and *impulsivity*, where a high level of restraint and a low level of impulsivity significantly predicted healthy behaviours and a low level of restraint and high level of impulsivity significantly predicted unhealthy behaviours. The third factor was identified as *performance*, a high level of which was a significant predictor of healthy behaviours and a low level, a significant predictor of unhealthy behaviours. Recognising that performance involves only two items and is therefore weaker than the other two factors, multiple tests were conducted. The results showed that the *performance* factor remained significant, and also complemented *restraint* and *impulsivity* (see chapter 4.4.1.1).

The *performance* factor is recognised in Tangney et al.'s (2004) original article. In their BSCS they provided evidence in relation to achievement and task performance as a dimension of trait self-control. Their understanding of task performance was linked to an ability to work towards long-term goals, get tasks done in time, prevent leisure activities from interfering with work responsibilities, and an ability to use time efficiently and meaningfully (ibid.). Items no. 9 ('Pleasure and fun sometimes keep me from getting work done') and no. 10 ('I have trouble concentrating') conceptually align with the idea of living a healthy lifestyle and an internal predisposition and ability to work towards a long-term commitment. Equally, Tangney et al. (2004) explain how

long-term commitment and dedicated task performance contribute to better performance (in school) and overall success. In a similar manner, *performance*, in the context of this research is theoretically and empirically relevant to a healthy lifestyle, therefore the label was retained.

Performance in relation to trait self-control has also been researched previously in connection with the intention-behaviour gap in participation in physical activity. Pfeffer and Strobach (2017) argue that executive functions in relation to self-control refer to goal-directed processes that bridge the intention-behaviour gap. Here, the performance factor, focused on goal attainment, also links with an individual's capacity and motivation to inhibit and overcome momentary pleasures, temptations, and distractions to achieve the intended goal. Thus, performance seems to be a critical factor in the intention-behaviour gap, converting the internal disposition of restraint into the behavioural component of goal-fulfilment.

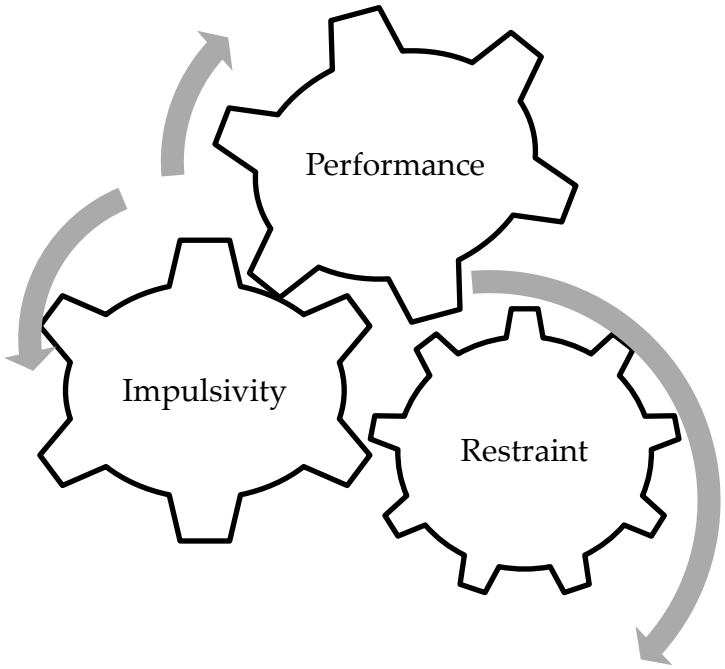
Based on the same line of reasoning, Cardol, Jong and Ward (2002) discuss the concept of autonomy in terms of decisional and executional autonomy. *Decisional* autonomy refers to the ability to make autonomous (i.e. controlled) decisions, whereas *executional* autonomy refers to the ability to act accordingly. Their idea also links to the *restraint* and *performance* variables, where restraint refers to the autonomous delay of an immediate response while performance refers to an ability to perform in line with the long-term goal. Thus, both variables: restraint and performance, feed into the same construct of individual autonomy and trait self-control. Thus, this is the first study to identify the performance dimension underpinning Tangney et al.'s (2004) trait self-control scale. Previous studies have identified two factors, namely restraint and impulsivity, whereby the contribution of this research lies in the identification of the third factor – performance. In this way, the findings of this study contradict Lindner, Nagy and Retelsdorf's (2015) research which compared the

performance of two-dimensional conceptualisations and found no clear evidence that either of them would be significantly better in predicting positive behavioural outcomes. The results from this study show that a three-dimensional conceptualilsation of trait self-control is a significantly better predictor of healthy lifestyle-related behavioural outcomes in comparison to Maloney et al.'s (2012) two-dimensional and Tangney et al.'s (2004) unidimensional conceptualisations of trait self-control (see also Table 4.17).

The concept of multidimensional self-control comprising the three identified dimensions of trait self-control also complements Allom, Panetta, Mullan and Hagger's (2016) proposed theoretical model of trait self-control, which involves the *explicit* pursuit of long-term goals and an inclination towards restrained reactions contrasted with *implicit* resistance to long-term goals and an inclination towards impulsive reactions. However, based on the results of this study, it could be argued that the theoretical model of trait self-control involves an *implicit* inclination towards impulsive reactions, an *explicit* decision regarding the restraint of impulsive reactions, an executional ability to convert intention to behaviour through actual performance, and executive functioning towards goal accomplishment (see Figure 5.3). The strong tension between these three fundamental dispositions could be linked to higher mental fatigue, ego depletion, and the limited-resource model of self-control while smoother dynamics and less tension between the three dispositions could be linked to lower mental fatigue, willpower, and resilience (Baumeister, Wright & Carreon, 2019). In this respect, intensive explicit dynamics, and a greater intention-behaviour gap, leading to fatigue and ego depletion, tap into the same pool of depleted mental resources and limited-resource model of self-control, resulting in problematic behaviours. Equally, less intensive dynamics and a smoother intention-behaviour gap, resulting in higher resilience, derives from an expanded resource model of trait self-control, resulting in positive behaviours such as a healthy lifestyle.

Thus, supporting evidence from this research not only contributes to the identification of relevant dimensions in the context of health and healthy lifestyles, it also enhances an understanding of different levels of trait self-control and their relevance for understanding the resource model of trait self-control and perpetual multidimensional inequalities in general.

FIGURE 5.3: THREE FUNDAMENTAL DISPOSITIONS OF AUTONOMOUS TRAIT SELF-CONTROL AND THEIR DYNAMICS



The results support both Baumeister's (2016) and Vohs' (2013) theoretical reasoning regarding the complexity of internal resourcefulness and ego depletion. The author believes that this is one of the first studies to research healthy lifestyles in relation to trait self-control as both a multilevel and multidimensional concept. Its contribution to the measurement instrument lies also in the lower and higher levels of trait self-control linked to healthy or unhealthy lifestyles, respectively. Previous studies in the same context (Forestier et al., 2018; Ferrari et al., 2012; Cresconi et al., 2011; Luehrig-Jones, Tahaney & Palfai, 2018) have not specifically operationalised low and high levels of trait self-control, even though they have theoretically and empirically

discussed two distinctive levels of trait self-control in relation to healthy and unhealthy lifestyles.

Thus, the results of this research support and complement the findings of Forestier et al. (2018), Luehrig-Jones, Tahaney and Palfai (2018) and Junger and van Kampen (2010) on links between different levels and dimensions of trait trait self-control and healthy and unhealthy lifestyles.

The contribution this research makes to a multilevel concept of trait self-control and how it theoretically and empirically complements an understanding of perpetual inequalities in healthy lifestyles is discussed in the next section.

5.2.2.2 BETWEEN-PERSON DIFFERENCES IN TRAIT SELF-CONTROL AND THE PERPETUATION OF HEALTH-INEQUALITIES

This research follows the call by Vohs (2013), Baumeister, Tice and Vohs (2018) and Baumeister, Wright and Carreon (2019) to include more relevant socio-economic variables in trait self-control research to complement the concept of mental power and identify between-person differences in trait self-control. Thus, this study was undertaken in the 'real', 'less-controlled', and 'wild' urban environment as opposed to the majority of research conducted in the laboratory (Baumeister, Tice & Vohs, 2018; Baumeister, Wright & Carreon, 2019). It is one of the first to test Baumeister's limited-resource model (2016) and brief self-control scale in the context of multidimensional perpetual inequalities in health and healthy lifestyles.

Baumeister, Wright and Carreon (2019), Baumeister and Monroe (2014), and Baumeister (2005) theorise how an individual's trait self-control, linked to logical reasoning, rational calculation, and the delay of immediate gratification, are developed within the socio-cultural context. Here, trait self-control as a

bottom-up account of human nature is understood as the internal adaptation and acculturation of *culture* in an individual's psyche (i.e., acculturation of culture and division of work, knowledge, morality, laws, and language). This idea links to Elias's *civilised* (i.e., educated, affluent) individual as one who is able to control their emotions, impulses, and behaviours in comparison to those who are *less civilised* (i.e., uneducated and impoverished). In this respect, both Elias's *civilised* and Baumeister's *cultural* controlled disposition of psyche and an individual's *ability to delay and convert* their feelings and thoughts into controlled responses and moderated behaviours, including health-protective behaviours, is an expression of decisional capacity and autonomy.[25]

However, the results of this study only partially confirm this line of reasoning, as cultural capital and culture-laden factors, including education, do not have a significant impact on individuals' level of trait self-control. Moreover, the results show that economic capital and economic factors have a significant impact on individuals' ability to self-control. From this perspective, both Elias's and Baumeister's theories on culturally infused self-control become weaker in economically challenging and less-than-ideal situations. The results instead complement Strulik's (2019b) research on trait self-control in the context of longevity and a life cycle model. The study further investigated the links between trait self-control and socioeconomic status. He also recommends investigation of the intergenerational transmission of trait self-control from children to parents. In this regard, the results only partially confirm Bolger, Meldrum and Barnes's (2018) and Wang, Fan, Tao and Gao's (2016) ideas on the intergenerational transmission of parental self-control to children. The results

[25] The word *autonomy* (in ancient Greek 'autos', meaning *self* and 'nomos', meaning *rule, govern*) generally describes the capacity of self-regulation, self-government, and/or self-direction (Christman & Anderson, 2005). In Western philosophy, the concept developed in three distinct but by no means independent lines of thought (Gaus, 2005), namely moral, political, and personal autonomy (Christman & Anderson, 2005; Dryden, 2010).

do not support the assumption of the transmission of trait self-control through the elements of culture and cultural capital. Thus, they contradict previous research that established the notion of transmission of trait self-control through social learning and acculturation within a family environment. However, they complement previous literature on the psychology of inequality and links between economic and psychological factors that reinforce poverty (Piff, Kraus & Keltner, 2018; Shah, Mullainathan & Shafir, 2012; Strulik, 2019a, 2019b; Vohs, 2013). They therefore complement Strulik's (2019a, 2019b) theory on how trait self-control is embedded in the socioeconomic environment.

Furthermore, both Marx's and Sen's ideas on how decisional autonomy (i.e., free will) is embedded in socio-economic conditions can be called upon to provide theoretical support. Both theories help elucidate how autonomy in the context of socio-economic circumstances and living conditions emerges and impacts human behaviour. For instance, Sen explains how socio-economic resources such as income and education may enhance 'decisional power' and '*decisional autonomy*' (Sen, 1999: 218). In his writings on sustainable development (2013), he discussed this decisional power in the context of the reproductive freedom of women as well as gender-neutral sustainable behaviour in the Western world (particularly in Europe). He argues that, with a generally increasing standard of living and higher accessibility of means, both behaviours - fertility and sustainable consumption – are changing towards more conscious and self-constrained implementation. Here, he presents arguments for declined fertility rates, increased birth control and sustainable consumption (i.e., controlled locally resourced consumption with a positive impact on local income and nature). Sen attributes both shifts to 'valuational change through reasoning and freedom' (2013: 14). Thus, more reasoning means more self-

constraint[26]. Both self-constraining behaviours therefore work better 'with more freedom, not less' (ibid: 16). As a consequence, higher decisional autonomy, following from better socio-economic circumstances, will result in valuational change and behavioural self-regulation.

Based on this line of reasoning, and in line with the results of this study, an individual's mental power linked to decisional and executional autonomy is an expression of an empowered affluent individual implementing self-constrained behaviours that contribute to a healthy lifestyle (e.g., healthy diet, higher level of exercise, and absence of smoking). Similarly, in accordance with the theory, the same individuals with a higher level of economic capital will more easily implement other self-constraining behaviours such as reproductive control with fewer children (Sen, 2013), better performance in school (Tangney et al., 2004), and lower rates of crime (Pratt, 2016).

Previous studies in social psychology have revealed that subjective socio-economic status is related to other dimensions of social hierarchy, including power and dominance (perception of control over resources, self-control, and an ability to control others), social status (level of respect and self-esteem), and identity (individuals' self-defining perceptions of his/her socio-economic rank) (Piff, Kraus & Keltner, 2017). Kraus, Park and Tan (2017) argued that the perception of one's social class status generates specific yet distinctive observable patterns of behaviour that signal one's social class to others.

Class signalling occurs through the body (posture, behaviour and physical appearance), voice (word choice, linguistic cues), and culture (leisure activities and preferences and sartorial choices). Such multi-dimensional signalling of

[26] Here, Sen's ideas come close to Elias's analysis (1994) of the socio-psychological genesis of self-control, described in chapter 5.2.2. Elias describes social changes towards decreased tolerance of aggressiveness, gender inequality and other self-constraining behaviours.

social class at a cognitive and non-cognitive level activates a social comparison process and strengthens group identity and boundaries between distinctive social classes. Consequently, the behavioural and sub-conscious signalling of social class helps to regulate, reinforce, and maintain social inequality (cf. Manstead, 2018; Bourdieu, 2010). From this perspective, individuals from a lower socio-economic background will develop *chronically lower self-control* and perceptions of their social status relative to others across all relevant domains in their lives, including health and health-related behaviour. By comparison, individuals from a higher socio-economic background will develop *chronically higher perceptions* of their social status relative to others across all relevant domains in their lives, including health and health-related behaviour.

As such, subjective perceptions of socio-economic standards of living intertwined with a disadvantaged or advantaged identity have an important effect on determining whether social outcomes are positive or negative, including educational outcomes (Harackiewicz et al., 2014) and physiological and psychological outcomes (Adler et al., 2000; Kim & Park, 2015). In general, individuals with a perception of higher subjective socio-economic status exhibit more positive outcomes, whereas individuals with a lower perspective on their status generally perform less positively (cf. Kraus, Piff & Keltner, 2009). Thus, the research indicates that subjective social class shapes general positive or negative self-definitions. In more affluent objective socio-economic conditions, intimate self-definition and identity become more positive and thus generates more positive outcomes. Comparatively, less affluent objective socio-economic conditions endorse less positive self-definitions and thus generate fewer positive outcomes. As such, the socio-economic standard of living linked to individuals' level of self-control is an essential component of perpetual inequality.

5.2.3 EFFECTS OF MODERATING VARIABLES

The findings emphasize the importance of considering living area (ward), gender and age as factors when designing interventions in health and healthy lifestyle.

LIVING AREA (WARD)

Deprivation in the living area was found to be a significant moderator in the unhealthy lifestyle model. This supports the idea of capital as an external resource being a representation of material inequality impacting the unhealthy lifestyle. The idea also aligns with the notion of persisting multidimensional inequality, where external factors appropriated by the level of external economic considerations (i.e., living area) have a negative impact on one's lifestyle. The results support Bourdieu's notion that one's level of capital is simultaneously a resource of one's lifestyle and at the same time a classifier within social hierarchy (see Chapter 2.2.3). Here, the results contribute to an understanding of translation and retranslation of economic urban inequality from a physical to a social urban space, where the intersection is creating perpetual and deeply rooted urban inequality. In a similar manner, the results contribute to an understanding of Marmot's wealth-to-health pathway, where structural inequality, linked to a lower level of economic capital is accumulated and deeply rooted in a deprived neighbourhood, systematically following the health gradient and wealth-to-health pathway.

The results also support Sen's notion that objective (i.e., external) and subjective (i.e., internal) resources are multidimensionally intertwined. In line with this reasoning, the results support Sen's idea that relative to a set of available resources, opportunities and means, people can convert them into valuable

beings and doings. This way, the results of this study support the notion of targeting interventions in such neighbourhoods.

GENDER

Gender was found to be a significant moderator in the unhealthy lifestyle model. This indicates that males and females differ in the predictability of their unhealthy behaviours, which needs to be considered when designing effective interventions. These results are in line with previous research that established gender – conditioned, i.e., female trait self-control, as a more stable predictor of behaviours compared to male trait self-control (Willems et al., 2019; Baumeister, Wright & Carreon, 2019; Bolger, Meldrum & Barnes, 2018; Gavray, Vettenburg, Pauwels & Brondeel, 2013). Higher self-discipline and level of trait self-control among girls has been identified as a significant predictor of better school grades and lower crime rates compared to boys (Duckworth & Seligman, 2006; Gavray et al., 2013). Bourdieu's theory on learned gender-induced socialisation offers support for these findings. He argues that girls from a young age learn to express *femininity* through profound and enduring submissiveness and self-restriction, whereas boys learn to display masculinity, dominance, emotional control and stability, and the denial of any psychological or physical weakness (Bourdieu, 1996; Smith & Dumas, 2019). In this respect, the feminine exertion of autonomy does not emerge equally from socially and culturally embedded factors, but from economic independence and a material self-sufficiency that creates the conditions in which an autonomous choice of a healthy lifestyle accrues (Stoljar, 2018). This perspective on autonomy (i.e., self-control) links to Benson's (1994) arguments. He contends that individual autonomy and self-control accrue in a 'content-neutral' environment as opposed to cultural-laden circumstances where women's internal capacity for self-worth and critical reasoning is damaged by oppressive gender socialisation. However, in line with Gavray et al.'s (2013) work, this study focused on female levels of trait self-

control, linked to levels of economic capital, and their effects on healthy lifestyle rather than on a process of gendered socialisation. Thus, any conclusion in this regard would exceed the aim of this research and is therefore left for future investigation.

Thus, differences in gender need to be considered when designing interventions. Here, the pathway between economic capital, trait self-control and unhealthy lifestyle is stronger for females, which makes targeting interventions and their results among females more predictable and therefore potentially more successful. In contrast, the pathway for men is less predictable and potentially more impulsive. The latter makes men more vulnerable concerning an unhealthy lifestyle. Multilevel interventions must be considered in order to be more effective; as such, interventions among unhealthy men are more expensive and need more resources and input.

Finally, it is important to recognise that the significance of gender in this research might be due to the sample being skewed towards female participants (64.9% females). Equally, an interest in participating in this research is also a sign of greater interest in health and healthy lifestyles among females. Such limitations need to be considered when inferring gender differences in longevity.

Age

Age was a significant moderator in the unhealthy lifestyle model, specifically for those above the age of 45. These results address a gap in the literature where trait self-control in older age groups has been under researched and the issue of self-control in middle and late adulthood has been left to future research (Willems et al., 2019). They also confirm Baumeister, Wright and Carreon's (2019) assumption that with increasing age people learn how to effectively

manage their level of trait self-control and as a result learn how to manage their unhealthy habits and related lifestyle more effectively. However, the results contradict Kaygusuz, Duyan, Oksal & Duyan's (2015) research which found no significant differences in the relationship between trait self-control and age.

The results also contradict Bourdieu's work in the context of a health-related lifestyle. For example, Burnett and Veenstra (2017) discuss their ideas on the intimate occupation of social space from an established, predominantly older affluent class in relation to health inequalities. However, they (in line with prevailing Bourdieusian theorists) were unable to demonstrate how exactly such an intimate interconnection between structure (level of cultural and economic capital), disposition (level of trait self-control) and practice (healthy or unhealthy lifestyle) takes place. The results of this study indicate that age does not have a significant moderating effect in the context of a healthy lifestyle, however its moderating effect is significant in relation to an unhealthy lifestyle. Here the results indicate that people above the age of 45 living in lower socio-economic circumstances and living an unhealthy lifestyle, are more likely to experience ill health, compared to people living in better socio-economic circumstances.

The combination of all dimensions (age, level of self-control and level of economic and cultural capital) also support Strulik's (2019a) argument that, with lower levels of trait self-control, individuals eat more and exercise less, which leads them to become obese. This affects longevity not only through increased BMI but also in relation to behaviour such as low health expenditure and reduced savings.

Finally, the results suggest that interventions in an unhealthy lifestyle need to consider age. Equally, the results suggest that the elderly and midlife population is more vulnerable concerning their socio-economic and

psychological position which is reflected in their unhealthier lifestyle. Thus, multilevel interventions targeting members of the population above 45 years of age should potentially be more effective compared with interventions among the younger population.

RELIGION

Religion was not found to be a significant moderator in both models. However, this might be due to the sample characteristics, where the majority of the 'religious people' in the sample declared themselves to be Christians (38.8%) and the percentage of other religious groups was much lower (4.4%) (see chapter 5, section 5.2.6).

5.2.4 MULTIDIMENSIONAL RESOURCES OF HLS AND INTERVENTIONS

The results of this study have three principal implications for health and healthy lifestyle interventions:

1) The results directly complement Marmot's 'health-to-wealth' pathway and his idea of proportionate universalism.

2) The results complement Bourdieu's theory of practice and related interventions that have previously identified intertwined economic and cultural factors as necessary for an understanding of perpetual inequalities.

3) The results complement interventions embedded in a psychological theory of trait self-control with all three identified dimensions (i.e., restraint, impulsivity, and performance) intertwined with a socio-economic milieu that sustains perpetual health-related inequalities.

4) The results identify the common patterns of diet, physical activity and smoking compared to a unique pattern of alcohol consumption as a component of unhealthy lifestyle.

5.2.4.1 COMPLEMENTING MARMOT'S 'WEALTH-TO-HEALTH' PATHWAY

The results of this study provide evidence to support Marmot's multidimensional wealth to health pathway of inequalities in health and healthy lifestyle (2004, 2015) and complement his idea of proportionate universalism as a basis for the design of interventions. The concept of proportionate universalism supports the universality of interventions across all classes in proportion to the identified level of deprivation.

Based on Sen's capability approach (Sen; 1999, 2010), Marmot originally developed a model describing a multidimensional pathway of inequality where socio-economic resources are converted into an internal capability and perception of control (i.e., internal vs external) that further impacts an individual's functioning (i.e., unhealthy or healthy lifestyle). Marmot argued that individuals from a lower socio-economic background (i.e., with lower income and a lower level of education) develop an external sense of control and an internal perception of powerlessness and helplessness that transforms into an unhealthy lifestyle. Conversely, individuals with a higher socio-economic background (i.e., with a higher income and higher level of education) develop an internal sense of control and a perception of autonomy and empowerment that transforms into a healthy lifestyle.

Following this deterministic pathway of inequality, causally linking socio-economic and psychological causes and their effects on health inequalities, this

research complements Marmot's wealth-to-health pathway through its perspective on:

- resources
- capabilities
- functionings

Firstly, the results show that healthy and unhealthy lifestyles are two distinctive pathways of inequality. Moreover, in line with Bourdieu's (1986) argument, the results indicate that economic inequality lies at the root of all other inequalities, including those relating to health and healthy lifestyles, and that inequalities in relation to cultural capital (i.e., education, culture) are clearly a derivative by-product of economic inequality.

Nevertheless, the concept of a healthy lifestyle is linked to both economic and cultural resources whereas, an unhealthy lifestyle is determined solely by the economic resources of an individual; cultural elements are not significant. Thus, this research supports the primacy of economic capital for inequality, including cultural and health inequalities. By distinguishing the resources of a healthy lifestyle in terms of economic and cultural factors and at the same time expanding the range of cultural resources (i.e., including the time spent by parental education facilitating the accumulation of cultural capital), the idea of perpetual and persistent inequalities becomes even clearer. In contrast to Marmot's pathway, this research considers the time-related and hereditary components of education and culture as both significant for individuals' lifestyles and for an understanding of deeply rooted, persistent inequalities. Thus, individuals' leisure activities and parental education together with other elements of culture (i.e., the presence of books, music, cultural interests while growing up) are all significant predictors of a healthy lifestyle. By contrast, Marmot only considers the traditional components of an individual's social

status and does not empirically consider broader indicators of socio-economic position (cf. Marmot, 2004, 2015). Thus, the results of this study provide a more comprehensive view of the resources of perpetual inequalities in health and healthy lifestyles.

Secondly, the results of this research complement Marmot's notion of internal capability and sense of control as internal (i.e., psychological) components of the wealth-to-health pathway. In its initial stage (as discussed in chapter 2.2.2), the concept of a sense of control, although broadly adopted in research on health-related inequalities (Helmer, Krämer & Mikolajczyk, 2012; Mirowsky & Ross, 2013; Norman, Bennett, Smith & Murphy, 1998), did not comply completely with the aim and purpose of this study and the two identified paradigms of interventionism. Thus, the concept of trait self-control (Tangney et al., 2004) was adopted. This complements Marmot's concept of capabilities and informs the wealth-to-health pathway. In particular, Marmot's sense of control and Tangney et al.'s trait self-control complement each other as internal resources of autonomous self-regulation and an inclination towards positive psychological outcomes. This is because they have previously been linked to similar concepts such as subjective well-being, happiness, and life-satisfaction (Buyukcan-Tetik, Finkenauer & Bleidorn, 2018; Briki, 2018; Lachman & Weaver, 2004; Hofmann, Luhmann, Fisher, Vohs & Baumeister, 2013; Wardl et al., 2004). Thus, trait self-control, like a sense of control, has been identified as a mechanism contributing to feelings of mastery, empowerment, and a long-term commitment to goal accomplishment (Buyukcan-Tetik, Finkenauer & Bleidorn, 2018). Both concepts have also been identified as internal mechanisms for better interpersonal relationships and less conflict behaviour (Mirowsky & Ross, 2013; Tangney et al., 2004). These are all aspects that add to one's overall feeling of well-being, positive state of being, an absence of distress, enjoyment of life, and hopefulness about the future (Mirowsky & Ross, 2012). Thus, trait self-control, complementing the concept of a sense of control, can be interpreted as a

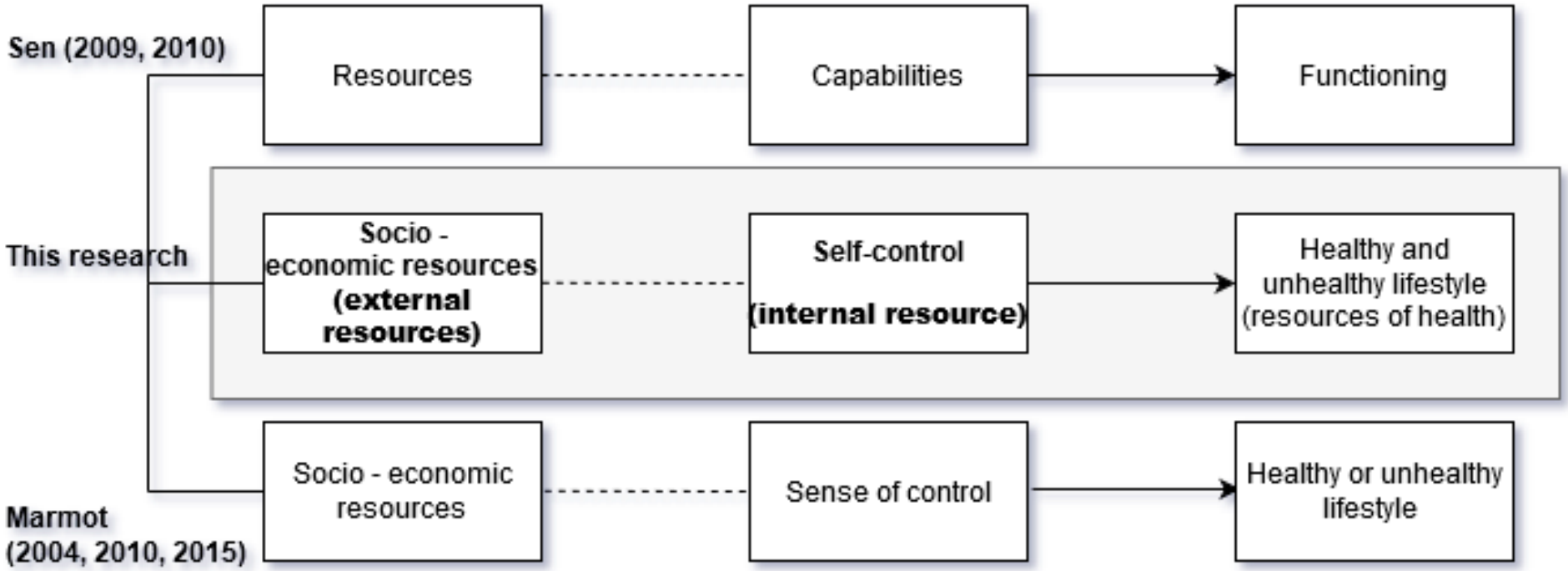
relevant internal resource and capability in relation to one's performance and as a recommendation for action in tackling health inequalities (Whitehead et al., 2016).

Finally, this research complements Marmot's wealth-to-health pathway in all three areas of discussion: resources, capabilities, and functionings (see Figure 2.2). Firstly, it expands the concept of material resources in terms of economic and cultural dimensions (cf. Hart, 2012), both of which have previously been linked to a healthy lifestyle (cf. Whitehead et al., 2016; Williams, 1995). Furthermore, this research complements Marmot's concept of capabilities and the adapted concept of sense of control and proposes a new wealth-to-health pathway linking social psychology to the concept of trait self-control (cf. Vohs, 2014). In line with this reasoning, Marmot's wealth-to-health pathway is being complemented by additional external socio-economic factors and internal trait self-control and willpower, reflected in a healthy or an unhealthy lifestyle. The pathway of inequality, in relation to Sen's and Marmot's wealth-to-health pathway, is as follows.

People from lower economic conditions with lower levels of income, a worse housing situation, and a lower level of everyday comfort in their life will develop a lower level of trait self-control with increased impulsive behaviour, a lower level of restraint, and lower levels of performance and goal-achievement. The latter will impact on an unhealthy lifestyle. Conversely, people in better economic conditions that have a higher level of income, a better housing situation, and a higher level of everyday comfort in their life will develop a higher level of trait self-control with less impulsive behaviour, a higher level of restraint and discipline, and a higher level of performance and goal-achievement. Cultural resources such as parental education and childhood circumstances together with leisure activities will fuel their cognitive resources of a healthy lifestyle. This broader combination of material and psychological

factors resulting in higher resourcefulness will lead to a healthy lifestyle (see Figure 5.4). A combination of both of these perspectives can help enhance an understanding of perpetual inequalities that result in health-related inequalities. Accordingly, Marmot's proportionate universalism bears greater value, and does so in the new context of different theories and interventions.

FIGURE 5.4: LINKS BETWEEN THE FRAMEWORKS OF SEN, MARMOT, AND THIS RESEARCH



5.2.5.2 BOURDIEU'S THEORY AND INTERVENTIONS

In line with Bourdieu's theory and interventionism, and embedded in social theories of practice, Burnett and Veenstra (2017) argued that each intervention in a healthy lifestyle and the reduction of inequalities in health should be complex and simultaneously intervene in the levels of capital, habitus and practice. Thus, each facet should never be targeted in isolation for an intervention to be effective.

Similarly, in the context of Bourdieu's theory, other researchers (Abel, 2007; Mackenback, 2012; Pampel, 2012; Oncini & Guetto, 2017, 2018) have argued that interventions targeted at the level and structure of cultural capital represent relevant points of mediation. Equally, there is an assumption that economic capital and cultural capital are inevitably intertwined and structurally balanced (Burnett & Veenstra, 2017). However, in previous research the level and the structure of capital is often not depicted (Spotswood & Tapp, 2013). Also, the research focussed on only one type of capital and its impact on health and healthy lifestyle in isolation, i.e. only cultural capital (cf. Oncini & Guetto, 2017, 2018).

The results of this study support the WHO's (2013) interventions in relation to the level and structure of capital and also social marketing campaigns in the context of health inequalities. The results also endorse interventions in relation to economic capital and behavioural change to healthy lifestyles but not interventions in the level and structure of cultural capital. Thus, interventions in health-related inequalities and unhealthy behaviours need to improve employment opportunities and the housing situation to develop economic standards, comfortable living conditions and objective well-being.

5.2.5.3 INTERVENTIONS AIMED AT BOOSTING SELF-CONTROL

Previous approaches and interventions designed to reduce failures of trait self-control (Duckworth, Milkman & Laibson, 2018, Loewenstein, 2019) have been mainly designed in a dualistic manner, stretched between one's impulsive and immediate reaction towards the satisfaction of needs and one's cognitive restraining and effortful delay of reaction with a view towards goal achievement (Maloney, Grawitch & Berber, 2012).

The results of this study complement this dualistic perspective and the mechanics of self-control by adding a third dimension, that of *performance*. This constitutes the actual execution and action towards goal achievement. The latter is particularly relevant for healthy lifestyles and related behavioural changes that require long-term commitment, goal setting, and execution. Thus, this third executive dimension of trait self-control indicates a break-even point between mere intention and actual goal realisation. This is needed for a better understanding of perpetual inequalities and intervention planning.

In this respect, interventions in the context of self-deployment are relevant. In line with Duckworth, Milkman and Laibson (2018), such interventions consist of goal setting, planning, self-monitoring, mindfulness and similar empowering techniques. Authors identify these methods as 'boosting' techniques that require internal willpower or agentic determination to be executed. Nevertheless, the results of this study show that interventions focused around these 'boosting' techniques without taking account of the socio-economic situation of an individual are problematic and unlikely to be successful. Thus, interventions entailing these techniques need to consider socio-economic factors. This links back to Marmot's notion of proportionate universalism.

Finally, the results of this study suggest that interventions in alcohol consumption need to be handled in isolation because whereas physical activity, diet, and smoking share similar patterns of behaviour and socio-economic circumstances, alcohol consumption has more distinctive traits. For instance, the patterns of alcohol consumption are problematic in less-typical social groups (e.g. educated, established women). Therefore, in terms of interventions in a healthy lifestyle, alcohol consumption needs to be treated separately and should not be based around the idea of proportionate universalism. It should be treated in isolation from other lifestyle traits in order to be successful. The latter could inform existing interventions, in particular the WHO's Health 2020: A European policy framework and strategy for the 21st century (2012) and Targets and indicators for health 2020 (2018).

Furthermore, building on both 'Psychosocial pathways and health outcomes: Informing action on health inequalities' (Public Health England, 2017) and Michie, Atkins & West's (2014) 'Behaviour change wheel model', the results of this study inform interventions aimed at boosting self-control related to health inequalities. The findings of this study demonstrate that self-control adds explanatory power to the psychosocial pathway, converting external material factors to internal psychological factors and lifestyle.

The results of this study inform the theoretical psychosocial pathway (Public Health England, 2017) because they combine the proposed framework of material factors (level of income, level of comfort and housing situation) with the newly proposed item of trait self-control (impulsivity, constraint and performance) in the context of health-related inequalities (see Figure 2.3, chapter 2.2). In this way, the findings have expanded the existing range of psychosocial factors, contributing to an understanding of the determinants of behaviour change.

The results of this study also suggest that in order to reduce inequalities in health, intervention needs to be implemented across the entire pathway of inequality. Equally, the design of a preventive approach needs to address both material and psychological factors in proportion to the level of material and psychological deprivation. The results complement Michie, Atkins & West's (2014) behaviour change wheel model. Until recently, Baumeister's self-control theory has been researched in isolation; however, the results of this study position the concept in the socio-economic context and thereby in the 'system of behaviour, linked to one's lifestyle' (Michie, Atkins & West, 2014: 35). In this way, the behavioural change wheel approach developed by Michie, Atkins & West (2014) becomes a useful tool for understanding the wider set of factors intertwined in the context of health-related inequalities. Thus, based on the results of this study, a general integrated approach for intervention in urban areas is presented (Figure 5.5).

FIGURE 5.5: WIDER MODEL OF REDUCTION OF INEQUALITY IN HEALTH IN URBAN AREA

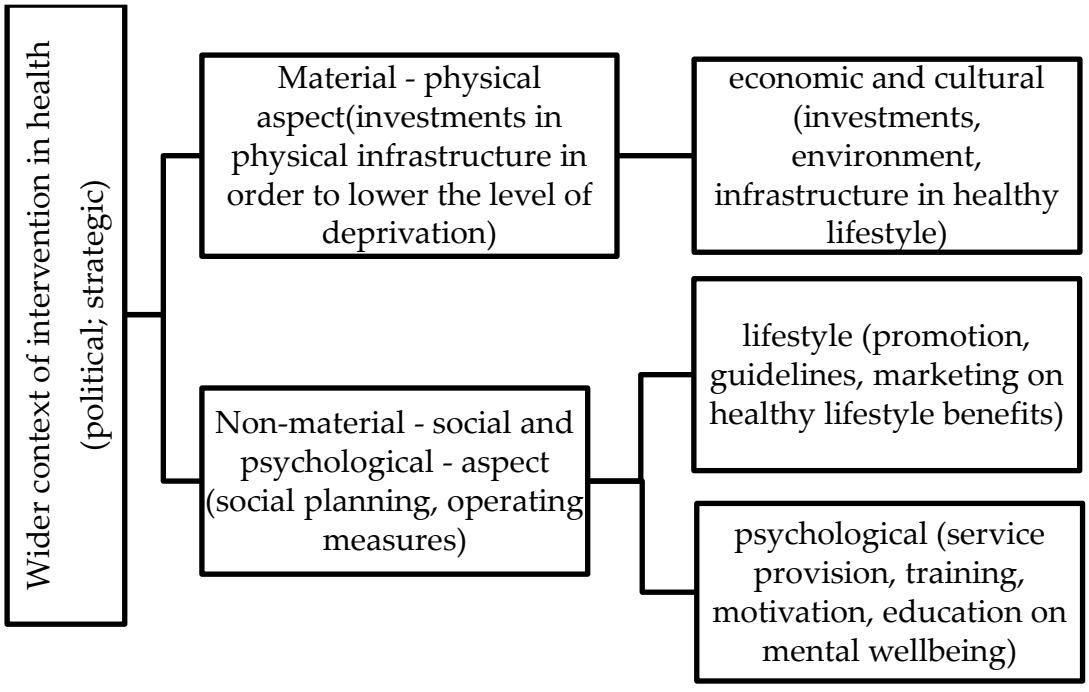


Figure 5.5 presents a wider model of stages and phases for tackling health-inequality in urban areas. The wider political and strategic context of health-related inequality reduction in urban areas requires consideration of both aspects of inequality, namely material (i.e., physical) and non-material (i.e., social and psychological). Here, both aspects need to be addressed according to the level of deprivation in the area. At the initial stage of the intervention, material aspects of health-related inequality need to be addressed. From this initial perspective, health-related inequality is tackled through investment in physical infrastructure providing opportunities for implementation of a healthy lifestyle in deprived urban communities (e.g. walking trails, public recreational spaces).

Non-material aspects of inequality are addressed in the following stage of intervention. This aspect includes social and psychological factors of inequality in urban areas, encompassing promotion, guidelines and marketing campaigns relating to a healthy lifestyle. In this instance, effective behaviour change interventions could include service provisions in terms of training and motivational workshops in deprived urban areas. Equally, health-related education and incentivisation is required and needs clear guidelines and health-oriented communication and promotion of health and wellbeing.

The psychological dimension of inequality is addressed through service provision and training on mental wellbeing. In this instance, psychological factors of interest include dimensions of control (perception of control, self-control). The latter is particularly useful, because both factors and variables have been previously researched in the context of health inequalities and were linked to material inequality on the one hand and to health and a healthy lifestyle on the other. Here, the concept of self-control was identified as a fundamental psycho-behavioural regulatory mechanism, linked to a wider area of potentially health-damaging behaviours (e.g., violence, crime). Thus, it seems

particularly reasonable to address the issue of self-control in such a sustainable manner, where the results of the improvement would last for longer and would simultaneously address a wider spectrum of problematic behaviours (e.g. violence).

Given that urban health-related inequality is a multidimensional issue encompassing material and cognitive resources, it is critically important that health considerations are linked with other policies (Public Health England, 2017) e.g. urban planning, social and education policies and small business initiatives. Moreover, tackling urban health inequalities also needs to be considered in the context of other dimensions of lifestyle inequalities e.g. political inequality, educational opportunity, gender inequality, digital inequality and in relation to differences in life expectancy (Bourdieu, 2010; Sen, 2010; WHO, 2011, 2013).

6. CONCLUSION

This research aimed to examine the problem of perpetual inequalities in health and a healthy lifestyle. The basic theoretical framework of this research was guided by the question of how one's material socio-economic conditions, identified by the level and structure of economic and cultural capital, are internalized into the habitual psychological disposition of self-control, further impacting health and a healthy lifestyle and creating the pathway of perpetual inequalities in health.

In line with this research aim, two structural models have been developed, namely a model of a healthy lifestyle and a model of an unhealthy lifestyle. By identifying the direct causal link between material factors, psychological factors and a healthy and an unhealthy lifestyle, theoretical, methodological and practical contributions have been made.

6.1 MAIN FINDINGS

The main findings of this research are three-fold, namely, theoretical, methodological and practical. These contributions are as follows.

Theoretical contribution:

1) The first study to combine Bourdieu's social theory of inequality with Baumeister's trait self-control psychological theory of individual differences in order to identify the perpetual pathway of inequality in health and healthy lifestyles. As such, this study combines two ontologically different paradigms (i.e., social and psychological theory) to provide a multidisciplinarity perspective on inequality.

2) The first study to complement Bourdieu's concept of habitus with the idea of Baumeister's trait self-control by identifying three distinctive faculties of habitus, namely, non-cognitive faculties (i.e. impulsivity), cognitive faculties (i.e. restraint) and motivational faculties (i.e. performance) of habitus that are collectively contributing to perpetual inequalities in health and healthy lifestyle. In this way, Bourdieu's vaguely presented idea of socially learned habitus has been explored and complemented with self-control theory in order to investigate the anatomy of habitus in the context of health and healthy lifestyle.

Methodological contribution:

1) The first study to identify performance as the third factor underpinning Tangney et al.'s (2004) trait self-control scale.

This study's contribution to the measurement instrument lies also in the lower and higher levels of trait self-control linked to unhealthy or healthy lifestyles, respectively. Previous studies have not specifically operationalised low and high levels of trait self-control, even though they have theoretically and empirically discussed two distinctive levels of trait self-control in relation to healthy and unhealthy lifestyles.

2) The first study adopting a Bourdieusian framework of intertwined external and internal factors with lifestyle, applying SEM.

3) One of the first studies identifying the distinctive nature of economic capital directly contributing to the perpetuation of socio-economic inequalities.

4) One of the first studies to examine the concept of trait self-control in its natural urban environment, outside the laboratory.

Practical contribution:

1) The study follows the Health 2020: a European policy framework (WHO, 2013) requirements for implementing a mix of different strategies when tackling health issues and health inequalities (cf. Øversveen et al., 2017). As such, the study demonstrates the potential for designing more effective, interdisciplinary interventions in the context of health and healthy lifestyles.

2) The study indicates that in order to be effective, interventions needs to consider Marmot's (2010, 2015, 2020) idea of proportionate universalism, where, based on the economic factors, intervention is designed in order to strengthen individuals' different levels of self-control.

3) The study indicates that interventions in healthy lifestyle should link healthy diet, physical activity and smoking cessation. However, interventions in lowering alcohol input should be individually designed. Here, the results confirm the findings from some previous research, indicating that alcohol consumption has distinctive patterns of economic and cultural factors, different than physical activity, smoking and diet.

6.2 LIMITATIONS OF THE STUDY

The first limitation to be addressed concerns the relatively broad and complex scope of the research aims and objectives. In retrospect, if the aims and objectives of this study had been more specific, the latter would have yielded more specific findings. In terms of output variables, the present study identified

the concept of lifestyle as a combination of four interrelated dimensions: physical activity, diet, smoking and alcohol consumption. This study did not focus exclusively on one health-related behaviour, but instead considered the interrelatedness of healthy and unhealthy lifestyles among a general urban population in order to understand perpetual multidimensional inequalities. In line with Bourdieu's theory, these interrelated impacts represent a more comprehensive measure of perpetual and reproducible inequalities because of their complex and intertwined nature; as such, they should not be researched in isolation (Bourdieu, 1988). However, such a broad view reduces the value of specific variables in isolation and the recognition of their individual impacts on health. Further to that, the significance of state self-control could not be tested. Thus, future research should investigate further the intertwined nature of trait and state self-control both in general and in the specific context of health and a healthy lifestyle.

Related to this issue, the second limitation concerns the study's adaptation of Bourdieu's complex (2010, 1986) theory. The broader scope of the aims and objectives of this research derives from this theory and Bourdieu's general perspective, including the importance of the inclusion of concepts (i.e., variables) and the necessary links between them. Thus, to follow this logic, a broader view of the multidimensionality of inequality and related pathways was necessary and in line with the idea of a pathway of inequality in health. The adaptation of Bourdieu's theory itself represents a limitation of the study. To overcome this drawback, future studies should adapt other complex theories in the context of inequalities such as that developed by Amartya Sen.

The third limitation concerns the quantitative methodology that was employed, and the rigorous method, including SEM, applied in this research in line with a pragmatic philosophical stance to identify the pathway of inequality. However, given the ontological complexity of Bourdieu's model, this methodology

prevented the researcher from gathering rich data that could potentially have provided more intricate findings. Equally, the type of data collected was limited in scope; greater insight into the backgrounds of participants would have provided more multifaceted findings, although time constraints also precluded the adoption of this additional method. To overcome this drawback, future studies could adopt a mixed-method approach to gain more complex insights into the intertwined nature of habitat, habitus and lifestyle. In this respect, future studies could adopt typical Bourdieusian methods such as correspondence analysis that also allow spatial data analysis which could be beneficial in the context of urban inequalities.

In this regard, the limitations associated with the measurement and data analysis method need to be acknowledged. Specifically, in the questionnaire survey, economic capital was originally measured on a seven-point Likert scale and the respondents' scores were converted to high and low categories. This may have increased statistical error by reducing the researcher's ability to detect the individuals near the boundaries (Muthén, 1984).

Further to that, the significance of state self-control could not be tested because of technical issues relating to AMOS, despite the confirmation of the construct using CFA. While these issues could potentially be addressed by using other more powerful software such as LISREL, at the time of data analysis, this software was unavailable at SHU and the budget constraints were prohibitive, thereby precluding this option.

While common method bias was examined using a number of methods, perhaps additional tests could have been employed e.g. adding a marker variable and/or a zero and equal constraints test, to reduce the potential for a Type I error, i.e. overestimating the strength of the correlation. Here, self-reporting scales are particularly problematic because there are factors that can

potentially influence the relationships between the tested variables e.g. respondent fatigue, item clarity or social desirability (Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

In the context of the brief self-control scale, the literature relating to common method bias is not well established compared to behavioural studies that problematised the issue more extensively (Chang, Witteloostuijn & Eden, 2010; Min, Park & Kim, 2016). Even though the original article of Tangney et al. (2004) reports a substantial amount of shared variance between trait self-control and social desirability, subsequent research which applied the brief trait self-control scale did not rigorously test for common method bias. Thus, to the authors' best knowledge, in the existing research on trait self-control, tests on common method bias are either limited to Harman's test or they are not reported at all. Equally, no existing research has reported the issue with common method bias results (Prem, Kubick, Diestel & Korunka, 2016). Thus, future research, especially in the context of interdisciplinary research which combines trait self-control with other socio-economic factors, should include more consistent and rigorous tests for common method bias. The issue is particularly relevant where social desirability could cause a potential threat for the relationships between the variables.

The mediating effect of trait self-control in this study was low (less than 20%). Therefore, future studies investigating the mediating effects of psychological variables should test the effects of other psychological factors in the pathway of inequality (e.g., willpower). Equally, future studies could expand their scope, and investigate other external factors, like social networks and social inclusion.

Additionally, this study did not explore the concept of state self-control in more depth for three main reasons. Firstly, the high state self-control model demonstrated a poor fit and was therefore excluded from the model. Secondly,

the analysis with the low state self-control was unable to be administered because of poor data fit. Thirdly, more powerful software e.g. LISREL was not available at SHU. As such, further analysis was not possible, and the path coefficients could not be identified graphically. Therefore, we did not proceed any further with the analysis of the state self-control concept and it remains unexplored in the context of health-related inequalities. Future research should therefore validate the scale and explore the concept in the socio-economic context of health-related inequalities.

The final limitation of this study concerns the generalisability of the results. Due to a lack of 'real' world studies on trait self-control (Baumeister et al., 2019), the psychological variables had not been previously tested in an uncontrolled environment. Furthermore, the significance level of the results was rather low, albeit comparable to similar studies (Forestier et al., 2018). To overcome this drawback, future studies should test the models of healthy and unhealthy lifestyles and further investigate the problem of multidimensional inequality in health from economic, social, and psychological perspectives using large stratified random samples of urban residents. This would facilitate the validation of the findings from this research and make possible the investigation of additional causes of inequalities in health in urban areas with a view to making further recommendations for effective policies and interventions.

6.3 RECOMMENDATIONS FOR FUTURE RESEARCH

The financial and time constraints placed on this study meant that other psychological factors that accrue in an individual's socio-economic environment and further influence healthy or unhealthy behaviours and lifestyles were not considered. Future research should therefore consider other psychological factors that could be tested as part of the multidimensional

pathway of health-related urban inequalities e.g. individual tendencies towards risk-taking, perseverance and masochism.

Similarly, the objective constraints of the research project meant that sociological factors that have an impact on an individual's psyche (e.g. habitus) and further influence healthy or unhealthy behaviour and lifestyles were not considered. In this research, the concept of social capital was omitted because previous research found it was not a significant predictor of inequalities in health (McGovern & Nazroo, 2015; Pinxten & Lievens, 2014). Also, among all types of capital, only economic and cultural capital were found by Bourdieu to be significant in positioning people in his/her social and geographical space (Bourdieu, 2010).

In this regard, there are some limitations of the research resulting from the exclusion of social capital, since it presents only a partial adaptation of Bourdieu's complex interplay between all three types of capital. Equally, Bourdieu's adaptation of social capital as an asset of interpersonal links based on economic resources (i.e. shared profession, level of education or income) has rarely been adopted in the health-inequalities context. Thus, further research in this area is suggested. Similarly, two different prominent paradigms of social capital (bottom-up interpersonal and top-down capital-based) have rarely been researched together. As such, future research should investigate the predictive value of both theories in the context of health inequalities.

Equally as interesting and currently unexplored is the concept of social capital as a context in which self-control develops. More specifically, self-control and its intergenerational transmission is a reference point where both social capital theories (Bourdieu vs. Putnam and Colman) could be explored further.

The author believes that there is potential for further investigation of Bourdieu's concepts from the perspective of self-control theory. Further to that, Bourdieu's line of research could complement understanding of the subjective perception of socio-economic standard of living intertwined with a disadvantaged or advantaged identity (cf. Kraus, Piff & Keltner, 2009; Manstead, 2018) by investigating links between lower self-control and lower social class and vice-versa. The idea seems promising particularly in the context of qualitative research. Equally, future research should further investigate how intergenerational transmission of self-control from parents to children can complement Bourdieusian ideas on social learning, cultivation and *Bildung* (cf. Bourdieu, 1986; Wang, Fan, Tao & Gao, 2016). Likewise, future research, combining Bourdieusian and Baumeister's concepts, could potentially further investigate the concept of self-control in relation to female gendered socialisation (cf. Gavray et al., 2013).

In the context of healthy and unhealthy lifestyles, future studies should focus on specific variables (e.g. alcohol consumption) and investigate individual variation within the general population. Alcohol consumption, in particular, should be investigated separately because individual patterns of consumption are not developed in relation to other factors such as smoking, levels of physical activity, and healthy or unhealthy diets. Equally, there is a need for better understanding of the impact of multilevel interventions among the young population. Moreover, the influence of religion is under researched in the context of socio-economic, psychological, and healthy lifestyle factors and should be explored further.

In order to identify the pathway of inequality, this study adopted a rigorous quantitative methodology, including SEM. While, this provided a more meticulous analysis of the causal pathway compared with less stringent variance-based methods such as a partial least squares approach, the additional

use of qualitative methods may have yielded richer material. Thus, both models could be argued to be parsimonious. As such, future research should complement the existing model with the application of qualitative methods, to investigate how an individual's level of self-control is linked to healthy and unhealthy lifestyles.

Also, future studies should continue to investigate the relationship between cultural capital and an unhealthy lifestyle. By applying SEM as a method of analysis, the pathway of inequality has been identified, linking the level and structure of economic capital with an unhealthy lifestyle, mediated through the level of self-control among the general urban population. However, by applying qualitative research to investigate members of the population with higher levels of cultural capital (e.g. journalists, theatre actors) and unhealthy lifestyles, more in-depth information could be obtained to design more specific and targeted interventions in order to tackle multidimensional inequalities in health and a healthy lifestyle.

To conclude, because health inequalities are multidimensional there is a need for them to be tackled from a broader scientific, political, economic, and social perspective in the future. Equally, the issue needs to be further researched and viewed from different ontological, epistemological and methodological approaches. Only by adopting different approaches, contributions to science, policy and practice can be made.

Here, everyone does have the right and it is realistic to expect the state to provide economic parity given that the findings of this research indicate that economic capital underpins not only socio-economic circumstances but also personality and/or physicality traits and lifestyles, forming the pathway of persisting inequality. In this realm, the state needs to intervene and provide

objective circumstances, where all this is as far as possible equally available for everyone.

Such awareness that all of us are a part of one world (and not just part of one's own family, community or nation) and the awareness that health is a right and not a privilege, is particularly significant in times of crisis like now, when it becomes apparent, how issues in health have a broader impact on the economic, cultural and social realm of society. Thus, nowadays perhaps more than ever before, built around the issues of inequality, it is apparent that old rules and policies will not be applicable for future generations. We as a society are emerging from the coronavirus pandemic, but the new 'pandemic' of raised awareness around the issues of inequality is on its way, starting with mass demonstrations in USA, followed by, for now, small-scale demonstrations in the UK and around Europe. And the message is shared around the globe: policies and politics must change. The issues around global warming that brought people out on the streets in the recent past have become secondary today. People are willing to stand up for the ideas around health and inequality. All of this makes this research and its results even more relevant.

APPENDICES

APPENDIX A: QUESTIONNAIRE

Sheffield Resident's Lifestyle Survey

In partnership with Sheffield City Council, we are examining lifestyle of Sheffield residents and would be grateful if you would take part in this anonymous survey. To take part in the survey you must be 18 or above and a permanent resident of Sheffield. Participation in this survey is voluntary and you can withdraw at any time. The information you provide will be anonymized, aggregated and used for research purposes only. Your anonymous questionnaire will be stored in the Sheffield Hallam University Data Archive and will be destroyed on completion of the study. The questionnaire should take no more than 10-15 minutes to complete. If you would like to enter the prize draw for the £200 shopping voucher, you will be asked to leave your e-mail address, phone number or other contact details on a separate sheet of paper. If you have any questions about the survey, please contact us at: p.schofield@shu.ac.uk Thank you.
Professor Peter Schofield, Dr Gill Pomfret and Jerneja Lesnik Sheffield Business School, Sheffield Hallam University, Sheffield, S1, 1WB

Section A: About Your Leisure Activities

A1. During last week, how often did you do the following activities? Please indicate by ticking the appropriate option.

	Please indicate the number of times you **did each of the following last week**	Not at all	Once	Twice	3 to 4 times	5 to 6 times	Every day	More than once every day
1	Watch TV	1	2	3	4	5	6	7
2	Go to the cinema	1	2	3	4	5	6	7
3	Go leisure shopping e.g. for clothes (not food)	1	2	3	4	5	6	7
4	Read a book or newspaper	1	2	3	4	5	6	7
5	Attend organised cultural events e.g. concerts, live theatre, exhibitions	1	2	3	4	5	6	7
6	Get together with relatives	1	2	3	4	5	6	7
7	Get together with friends	1	2	3	4	5	6	7
8	Play cards or board games	1	2	3	4	5	6	7
9	Listen to music	1	2	3	4	5	6	7
10	Attend organised sporting events as a spectator (e.g. football)	1	2	3	4	5	6	7
11	Do crafts, drawing, painting, sculpting or photography	1	2	3	4	5	6	7
12	Spend time on the internet/PC (e.g. browsing, playing online games)	1	2	3	4	5	6	7

Section B: About Your Behaviour

B1. Please indicate your level of agreement or disagreement with the following descriptions about your character/general habits.

Generally…		Completely Disagree	Disagree	Somewhat Disagree	Neither Disagree Nor Agree	Somewhat Agree	Agree	Completely Agree
1	I am good at resisting temptation	1	2	3	4	5	6	7
2	I have a hard time breaking bad habits	1	2	3	4	5	6	7
3	I am lazy	1	2	3	4	5	6	7
4	I say inappropriate things	1	2	3	4	5	6	7
5	I do certain things that are bad for me because they are fun to do	1	2	3	4	5	6	7
6	I refuse things that are bad for me	1	2	3	4	5	6	7
7	I wish I had more self-discipline	1	2	3	4	5	6	7
8	People would say that I have strong self-discipline	1	2	3	4	5	6	7
9	Pleasure and fun sometimes keep me from getting work done	1	2	3	4	5	6	7
10	I have trouble concentrating	1	2	3	4	5	6	7
11	I am able to work effectively toward long-term goals	1	2	3	4	5	6	7
12	Sometimes I can't stop myself from doing something, even if I know it is wrong	1	2	3	4	5	6	7
13	I often act without thinking through all the alternatives	1	2	3	4	5	6	7

B2. Please indicate your level of agreement or disagreement with the following statements about how you are feeling <u>at the moment.</u>

At the moment…		Completely Disagree	Disagree	Somewhat Disagree	Neither Disagree Nor Agree	Somewhat Agree	Agree	Completely Agree
1	I have to force myself to stay focused	1	2	3	4	5	6	7
2	I have strong willpower	1	2	3	4	5	6	7
3	I am having trouble pulling myself together	1	2	3	4	5	6	7
4	I could resist any temptation	1	2	3	4	5	6	7
5	I am having trouble paying attention	1	2	3	4	5	6	7
6	I would have no trouble bringing myself to do difficult tasks	1	2	3	4	5	6	7
7	I need something pleasant to make me feel better	1	2	3	4	5	6	7
8	I feel drained	1	2	3	4	5	6	7
9	I feel calm and rational	1	2	3	4	5	6	7
10	I feel like giving up	1	2	3	4	5	6	7
11	I feel overwhelmed	1	2	3	4	5	6	7

<u>Section C: About Your Health</u>

C1. Do you have any long-standing illness, health problem, condition or disability? ☐ Yes ☐ No

If yes, please click all that apply:

□ Tiredness / Fatigue
□ High blood pressure
□ Pain
□ Heart disease
□ Insomnia
□ Osteoarthritis
□ Anxiety / Nerves
□ Stroke
□ Depression
□ Cancer
□ Diabetes
□ Breathing problems e.g. chronic bronchitis, asthma or emphysema
□ Obesity
□ Other (please state) _____

<u>Section D: About Your Lifestyle</u>

D1. During last week, how many cigarettes did you smoke?
(Please insert numbers (not words) and use a 0 if you did not smoke) _____

D2. During last week, how many times did you vape?
(Please insert numbers (not words) and use a 0 if you did not vape) _____

D3. Which of the following best describes how you travelled to work, school, college or to the shops (NOT your weekly supermarket shop) during the last week?

Please indicate how you **travelled to work, school, college or to the shops (NOT your weekly supermarket shop)** during the last week		Not at all	Once	Twice	3 to 4 times	5 to 6 times	Every day	More than once every day
1	Riding a bicycle	1	2	3	4	5	6	7
2	Running	1	2	3	4	5	6	7
3	Walking	1	2	3	4	5	6	7
4	Other (bus, car)	1	2	3	4	5	6	7

D4. During last week, how many times did you do the following <u>for more than 15 minutes</u>? (Please insert numbers (not words) and use a 0 where applicable)

Please write the number of times you did each of the following **<u>for more than 15 minutes last week</u>**		Number of times
1	**Strenuous exercise (<u>heart beating rapidly</u>)** (e.g. running, jogging, hockey, football, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling)	
2	**Moderate exercise (<u>not exhausting</u>)** (e.g. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)	
3	**Mild exercise (<u>minimal effort</u>)** (e.g. slow walking, yoga, archery, fishing from the river bank, bowling, golf, snow-mobiling)	

D5. During last week, how many times did you do the following?

Please indicate the number of times you **did each of the following last week**		**Not at all**	**Once**	**Twice**	**3 to 4 times**	**5 to 6 times**	**Every day**	**More than once every day**
1	Eat fruit or vegetables	1	2	3	4	5	6	7
2	Eat high-fibre food (e.g. whole wheat pasta, whole grain bread, brown rice)	1	2	3	4	5	6	7
3	Eat a variety of foods which give a balance of the four food groups (fruits and vegetables, dairy products, carbohydrates, meat/fish/eggs)	1	2	3	4	5	6	7
4	Eat food that is low in fat (e.g. chicken, fish) or drink skimmed milk	1	2	3	4	5	6	7
5	Drink water	1	2	3	4	5	6	7
6	Eat food such as chips, chocolate and sweets	1	2	3	4	5	6	7
7	Add white sugar to your food and drink	1	2	3	4	5	6	7
8	Eat fried food	1	2	3	4	5	6	7
9	Add salt to your food	1	2	3	4	5	6	7
10	Drink sugary drinks (e.g. fizzy soft drinks, sports drinks, energy drinks, fruit-flavoured drinks)	1	2	3	4	5	6	7

D6. During the last week, how many units of alcohol did you drink? _____
1 unit of alcohol is equal to half a pint of ordinary beer, lager or cider, 1 single measure of spirits,
1 small glass of wine or 1 measure of fortified wine. (Please insert numbers (not words) and use a 0 where applicable)

D7. During the last week, how many times did you have 6 or more units of alcohol in one session?
(Please insert numbers (not words) and use a 0 where applicable) _____

D8. During the last week, on how many days did you drink alcohol?
(Please insert numbers (not words) and use a 0 where applicable) _____

Section E: About Your Work (including paid and unpaid work, or studying)

E1. Which best describes the sort of work you do? Please tick one box only.

□ **Retired**

□ **Full-time student**

□ **Casual worker or unemployed**

□ **Routine manual and service occupations** such as:

HGV driver – van driver – cleaner – porter – packer – sewing machinist – messenger – labourer – waiter/waitress – bar staff

□ **Semi-routine manual and service occupations** such as:

postal worker – machine operative – security guard – caretaker – farm worker – catering assistant – receptionist – sales assistant

□ **Technical and craft occupations** such as:

motor mechanic – fitter- inspector – plumber – printer – tool maker – electrician – gardener – train driver

□ **Clerical and intermediate occupations** such as:

secretary – personal assistant- clerical worker -office clerk – call centre agent – nursing auxiliary – nursery nurse

□ **Traditional professional occupations** such as: accountant – solicitor – medical practitioner – scientist – civil/mechanical engineer

□ **Professional occupations** such as:

teacher – nurse – physiotherapist – social worker – welfare officer – artist – musician- police officer (sergeant or above) – software designer

□ **Middle or junior managers** such as:

office manager – retail manager – bank manager – restaurant manager – warehouse manager – publican

□ **Senior managers or administrators** (usually responsible for planning, organising and co-ordinating work and finance) such as: chief finance officer (CFO) – chief executive officer (CEO)

E2. Please estimate your personal annual income.

□ Up to £3,499
□ £3,500 - £4,999
□ £5,000 - £11,999
□ £12,000 - £19,999
□ £20,000 - £29,999
□ £30,000 - £49,999
□ £50,000 - £69,999
□ £70,000 +

E3. Please, indicate how comfortably you live within your available income?

Very difficult	Difficult	Somewhat Difficult	Neither Difficult nor Easy	Somewhat Easy	Easy	Very easy
1	2	3	4	5	6	7

Section F: About You

F1. Please indicate your housing situation.

□ Full ownership (with or without mortgage)
□ Private renting
□ Council tenant
□ Member of a housing association
□ Other (please state)_____

F2. Please indicate your highest level of educational qualification.

	No formal qualifications	1-4 GCSEs or equivalent qualifications	5 or more GCSEs or equivalent qualifications	Apprenticeship	2 or more A-levels or equivalent qualifications	Bachelors degree of equivalent qualification	Postgraduate degree or equivalent qualification
Your highest achieved level	1	2	3	4	5	6	7
Your parents' highest achieved level	1	2	3	4	5	6	7

F3. Please think of your childhood and your home and indicate your level of agreement with the following statement.

	Completely Disagree	Disagree	Somewhat Disagree	Neither Disagree or Agree	Somewhat Agree	Agree	Completely Agree
I grew up in a home with lots of books, music, art, and other cultural interests.	1	2	3	4	5	6	7

F4. Please indicate your gender.

☐ Male
☐ Female
☐ Other
☐ Prefer not to say

F5. Please give the year of your birth (XXXX): _____

F6. How many years have you lived in the UK? Please tick one box only.

☐ Born in UK
☐ 20 or more years
☐ 10-19 years
☐ 1-9 years
☐ Prefer not to say

F7. Please indicate your marital status.

☐ Single

☐ Married

☐ Living with partner

☐ Widowed

☐ Separated/divorced

☐ Prefer not to say

F8. Please indicate your ethnic background.

White	**Mixed/Multiple ethnic groups**	**Asian/Asian British**	**Black/African/Caribbean or Black British**	**Other ethnic group**	**Don't know/ Prefer not to say**
□ British □ Irish □ Gypsy or Irish traveller □ Other white background	□ White and Black Caribbean □ White and Black African □ White and Asian □ Other mixed background	□ Indian □ Pakistani □ Bangladeshi □ Chinese □ Other Asian background	□ Caribbean □ African □ Other black background	□ Arab □ Any other ethnic group	□ Don't know / Prefer not to say

F9. Please indicate your religious background.

□ **Christian**	□ **Muslim**	□ **Hindu**	□ **Sikh**	□ **Jewish**	□ **Buddhist**	□ **No religion**	□ **Other** (please state) _____	□ **Prefer not to say**

F10. Please indicate the area (i.e. ward) where you live in Sheffield.

□ Beauchief & Greenhill	□ Burngreave	□ East Ecclesfield	□ Gleadless Valley	□ Manor Castle	□ Park & Arbourthorne	□ Southey
□ Beighton	□ City	□ Ecclesall	□ Graves Park	□ Mosborough	□ Richmond	□ Stannington
□ Birley	□ Crookes & Crosspool	□ Firth Park	□ Hillsborough	□ Nether Edge & Sharrow	□ Shiregreen & Brightside	□ Stocksbridge & Upper Don
□ Broomhill & Sharrow Vale	□ Darnall	□ Fulwood				
	□ Dore & Totley					

If you would like to enter the prize draw for the £200 shopping voucher, please leave your e-mail address, phone number or other contact details on a separate sheet of paper.
Thank you for your time!

If you have any queries or require further information about this survey please contact Professor Peter Schofield at Sheffield Business School, Sheffield Hallam University at p.schofield@shu.ac.uk

B.1: SUMMARY OF MISSING VALUES IN THE DATASET (845 CASES)

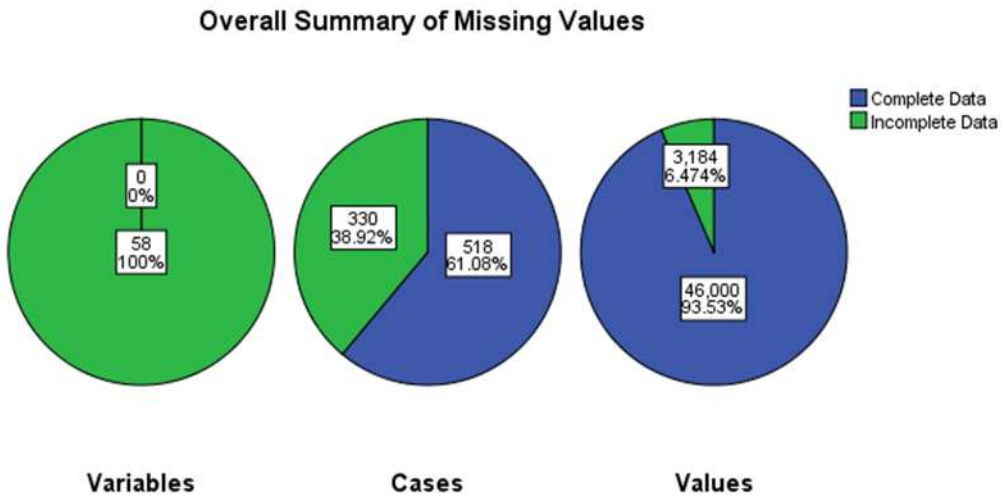


TABLE B.1. CASES OF MISSING DATA FOR EACH VARIABLE (MINIMUM OF MISSING VALUE TO BE INCLUDED IS 5%)

Variable Summary[a,b]

	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
During the last week - Mild exercise	133	15.7%	715	3.40	3.153
CC institutionalized Your parents' highest level of education	120	14.2%	728	3.61	2.200
Personal annual income	109	12.9%	739	4.93	1.421
During the last week - Moderate exercise	103	12.1%	745	2.71	2.950
During the last week - Strenuous exercise	101	11.9%	747	1.35	2.017
How difficult/easy is it for you to live comfortably with your available income?	83	9.8%	765	4.46	1.479
E1. Occupation - SUM	82	9.7%	766	6.90	3.137
Your highest level of education	81	9.6%	767	5.31	1.877
Your housing situation	80	9.4%	768	1.51	.985
CC objectified I grew up in a home with lots of books, music, art, and other cultural interests	78	9.2%	770	4.65	1.950
Diet - Drink water	76	9.0%	772	6.00	1.423
Diet - Eat food such as chips, chocolate and sweets	74	8.7%	774	3.77	1.489

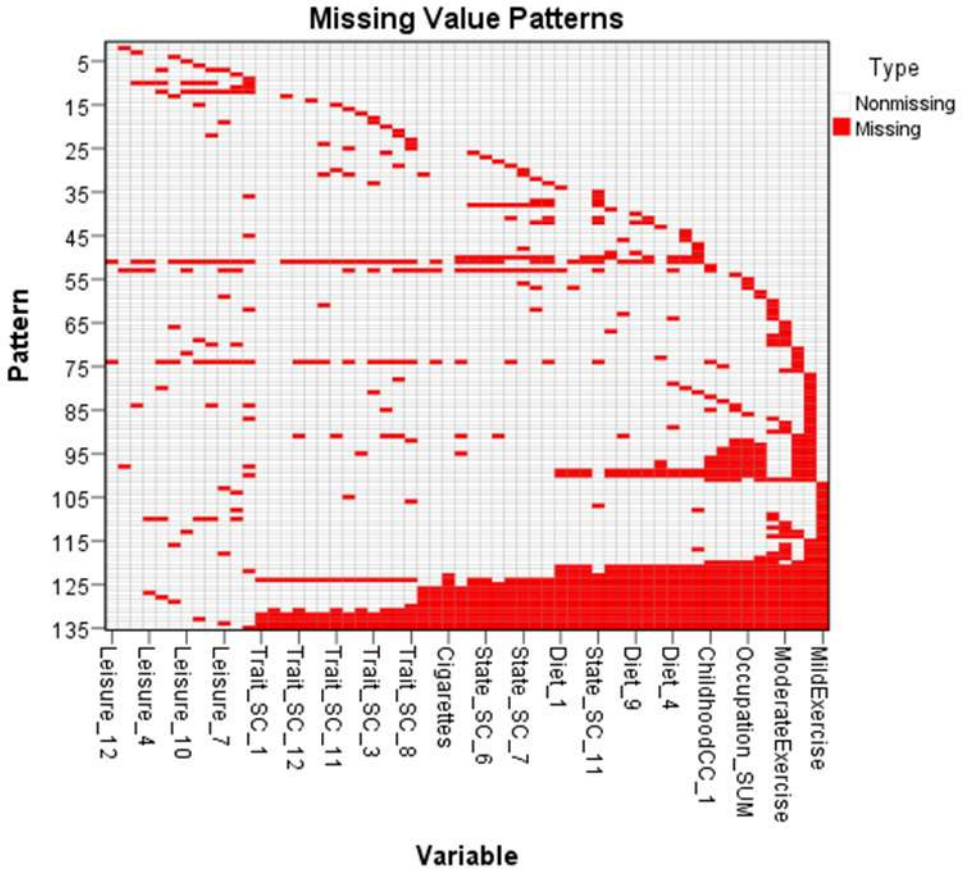
Diet - Eat food that is low in fat (e.g. chicken, fish) or drink skimmed milk	73	8.6%	775	4.74	1.633
Alcohol Binge	71	8.4%	777	.54	1.084
Diet - Drink sugary drinks	71	8.4%	777	2.03	1.533
Diet - Add salt to your food	71	8.4%	777	2.73	1.838
Diet - Eat fried food	71	8.4%	777	2.14	1.170
Diet - Add white sugar to your food or drink	71	8.4%	777	1.74	1.624
SC State I feel overwhelmed	71	8.4%	777	3.13	1.799
Diet - Eat a variety of foods	69	8.1%	779	5.33	1.369
Diet - Eat high-fibre food	69	8.1%	779	4.61	1.734
Diet - Eat fruit or vegetables	69	8.1%	779	5.74	1.259
SC State I feel like giving up	67	7.9%	781	2.53	1.650
SC State I feel calm and rational	67	7.9%	781	4.98	1.343
SC State I need something pleasant to make me feel better	65	7.7%	783	4.35	1.492
SC State I feel drained	64	7.5%	784	4.08	1.738
SC State I could resist any temptation	64	7.5%	784	3.68	1.578
SC State I would have no trouble bringing myself to do difficult tasks	63	7.4%	785	4.49	1.518
SC State I am having trouble paying attention	63	7.4%	785	3.16	1.550
SC State I am having trouble pulling myself together	62	7.3%	786	2.86	1.555

During the last week, how many cigarettes did you smoke?	59	7.0%	789	5.50	24.443
SC State I have to force myself to stay focused	59	7.0%	789	3.79	1.686
SC State I have no willpower	58	6.8%	790	3.16	1.643
SC Trait People would say that I have strong self-discipline	51	6.0%	797	4.54	1.395
SC Trait I wish I had more self-discipline	49	5.8%	799	4.56	1.683
SC Trait I often act without thinking through all the alternatives	46	5.4%	802	2.99	1.570
SC Trait I am lazy	46	5.4%	802	2.88	1.629
SC Trait I have trouble concentrating	45	5.3%	803	3.60	1.697
SC Trait I say inappropriate things	45	5.3%	803	3.26	1.617
SC Trait I am able to work effectively toward long-term goals	43	5.1%	805	5.17	1.324
SC Trait I refuse things that are bad for me	43	5.1%	805	3.99	1.544
SC Trait I have a hard time breaking bad habits	43	5.1%	805	4.29	1.657

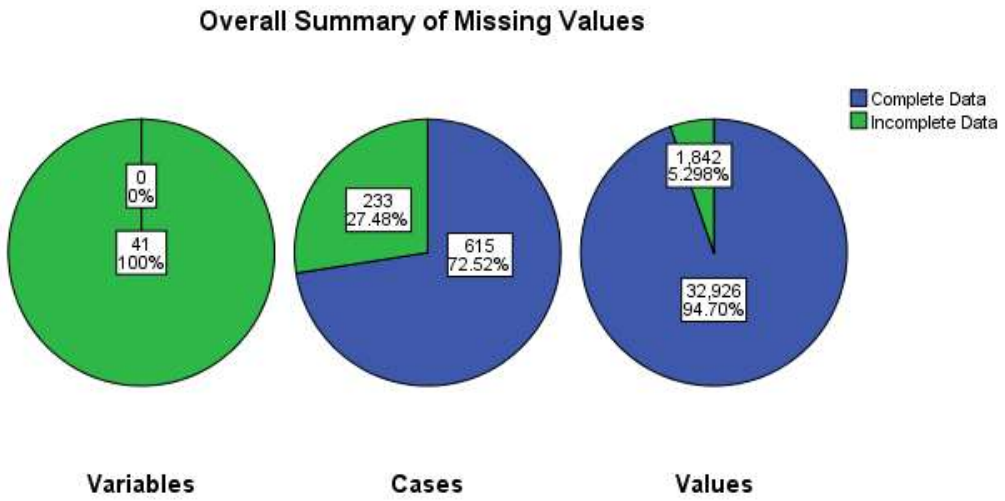
a. Maximum number of variables shown: 58

b. Minimum percentage of missing values for variable to be included: 5.0%

B.2: SUMMARY OF MISSING VALUES IN THE DATASET BEFORE IMPUTATION



B.3: SUMMARY OF MISSING VALUES IN THE DATASET AFTER IMPUTATION



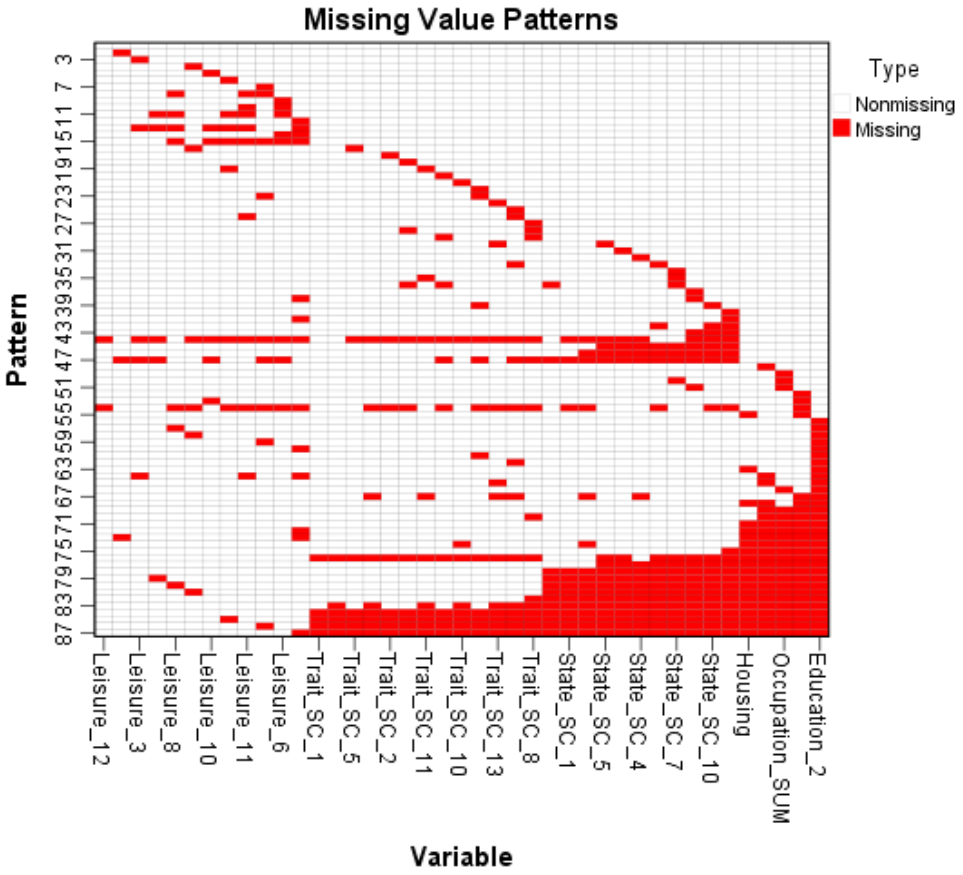

Missing Value Patterns
Type
Nonmissing
Missing
Pattern
87 83 79 75 71 67 63 59 55 51 47 43 39 35 31 27 23 19 15 11 7 3
Leisure_12
Leisure_3
Leisure_8
Leisure_10
Leisure_11
Leisure_6
Trait_SC_1
Trait_SC_5
Trait_SC_2
Trait_SC_11
Trait_SC_10
Trait_SC_13
Trait_SC_8
State_SC_1
State_SC_5
State_SC_4
State_SC_7
State_SC_10
Housing
Occupation_SUM
Education_2
Variable

TABLE C.1: CATEGORICAL VARIABLES

Column1	Variable	Categories	n	valid %
Socio-demographics	Gender	female	495	64.9
		male	295	33.9
		other	4	0.5
		prefer not to say	5	0.7
		missing	80	
	Age	18-34	173	23.1
		35-44	166	22.2
		45-54	170	22.7
		55-64	153	20.4
		65 and older	87	11.6
		missing	84	
	Length of residence	born in UK	668	87.1
		20 or more years	40	5.2
		10-19 years	20	2.6
		1-9 years	37	4.8
		prefer not to say	2	0.3
		missing	76	
	Marital status	single	151	19.8
		married	365	47.8
		living with partner	151	19.8
		widowed	28	3.7
		separated/divorced	61	8.0
		prefer not to say	8	1.0
		missing	79	
	Ethnicity	White	560	90.9
		Mixed/Multiple ethnic groups	13	2.1
		Asian/Asian British	18	2.9
		Black/African/Caribbean or Black British	6	1.0
		Other ethnic group	8	1.3
		Don't know/Prefer not to say	11	1.8
		missing	227	
	Level of occupation	Retired	101	13.3
		Full-time student	26	3.4
		Casual worker or unemployed	24	3.2
		Routine manual and service occupations	30	3.9
		Semi-routine manual and service occupations	28	3.7
		Technical and craft occupations	20	2.6

		Clerical and intermediate occupations	142	18.7
		Traditional professional occupations	59	7.8
		Professional occupations	194	25.5
		Middle or junior managers	82	10.8
		Senior managers or administrators	55	7.2
		missing	82	
	Religion	Christian	295	38.8
		Muslim	28	3.7
		Hindu	3	0.4
		Jewish	2	0.3
		No religion	386	50.7
		Other	19	2.5
		prefer not to say	28	3.7
		missing	82	
	Ward	Beauchief & Greenhill	26	3.5
		Beighton	18	2.4
		Birley	23	3.1
		Broomhill & Sharrow Vale	36	4.8
		Burngreave	12	1.6
		City	52	6.9
		Crookes & Crosspool	25	3.3
		Darnall	10	1.3
		Dore & Totley	25	3.3
		East Ecclesfield	15	2.0
		Ecclesall	64	8.5
		Firth Park	7	0.9
		Fulwood	27	3.6
		Gleadless Valley	50	6.6
		Graves Park	51	6.8
		Hillsborough	53	7.0
		Manor Castle	14	1.9
		Mosborough	15	2.0
		Nether Edge & Sharrow	61	8.1
		Park & Arbourthorne	20	2.7
		Richmond	17	2.3
		Shiregreen & Brightside	10	1.3
		Southey	15	2.0
		Stannington	15	2.0
		Stocksbridge & Upper Don	27	3.6
		Walkley	31	4.1
		West Ecclesfield	8	1.1
		Woodhouse	25	3.3
		missing	91	

Cultural Capital	Own education	No formal qualifications	47	6.2
		1-4 GCSEs or equivalent qualifications	61	8.0
		5 or more GCSEs or equivalent qualifications	57	7.5
		Apprenticeship	19	2.5
		2 or more A-levels or equivalent qualifications	80	10.5
		Bachelor's degree or equivalent qualification	260	34.1
		Postgraduate degree or equivalent qualification	238	31.2
		missing	81	
	Parental education	No formal qualifications	211	29.2
		1-4 GCSEs or equivalent qualifications	76	10.5
		5 or more GCSEs or equivalent qualifications	87	12.0
		Apprenticeship	48	6.6
		2 or more A-levels or equivalent qualifications	76	10.5
		Bachelor's degree or equivalent qualification	158	21.9
		Postgraduate degree or equivalent qualification	67	9.3
		missing	120	
	Cultural valuables at home (I grew up in a home with lots of books etc.)	Completely Disagree	59	7.7
		Disagree	94	12.3
		Somewhat Disagree	79	10.3
		Neither Disagree nor Agree	73	9.5
		Somewhat Agree	147	19.2
		Agree	142	18.6
		Completely Agree	171	22.4
		missing	78	
	Leisure - Watching TV	Not at all	55	6.6
		Once	33	3.9
		Twice	55	6.6
		3 to 4 times	125	14.9
		5 to 6 times	95	11.3
		Every day	410	48.9
		More than once every day	66	7.9
		missing	4	
	Leisure - Go to the cinema	Not at all	675	82.0
		Once	130	15.8
		Twice	15	1.8
		3 to 4 times	2	0.2
		5 to 6 times	1	0.1

		Every day	0	0.0
		More than once every day	0	0.0
		missing	20	
	Leisure - Go leisure shopping	Not at all	398	47.5
		Once	312	37.2
		Twice	83	9.9
		3 to 4 times	27	3.2
		5 to 6 times	11	1.3
		Every day	7	0.8
		missing	5	
	Leisure - Read book or newspaper	Not at all	133	15.9
		Once	96	11.5
		Twice	93	11.1
		3 to 4 times	137	16.3
		5 to 6 times	66	7.9
		Every day	238	28.4
		More than once every day	75	8.9
		missing	5	
	Leisure - Attend cultural events	Not at all	509	61.0
		Once	242	29.0
		Twice	61	7.3
		3 to 4 times	15	1.8
		5 to 6 times	6	0.7
		More than once every day	1	0.1
		missing	9	
	Leisure - Get together with relatives	Not at all	259	31.2
		Once	256	30.8
		Twice	149	17.9
		3 to 4 times	110	13.2
		5 to 6 times	14	1.7
		Every day	32	3.9
		More than once every day	11	1.3
		missing	12	
	Leisure - Get together with friends	Not at all	154	18.5
		Once	250	30.0
		Twice	237	28.5
		3 to 4 times	131	15.7
		5 to 6 times	34	4.1
		Every day	23	2.8
		More than once every day	4	0.5
		missing	10	
	Leisure - Play	Not at all	657	78.6

	cards/board games			
		Once	95	11.4
		Twice	46	5.5
		3 to 4 times	24	2.9
		5 to 6 times	3	0.4
		Every day	10	1.2
		More than once every day	1	0.1
		missing	7	
	Leisure - Listen to music	Not at all	64	7.7
		Once	52	6.2
		Twice	79	9.4
		3 to 4 times	138	16.5
		5 to 6 times	99	11.8
		Every day	266	31.8
		More than once every day	138	16.5
		missing	7	
	Leisure - Attend sport events	Not at all	745	89.1
		Once	56	6.7
		Twice	21	2.5
		3 to 4 times	4	0.5
		5 to 6 times	8	1.0
		Every day	1	0.1
		More than once every day	1	0.1
		missing	7	
	Leisure - Do crafts, painting, sculpturing	Not at all	544	65.2
		Once	107	12.8
		Twice	70	8.4
		3 to 4 times	59	7.1
		5 to 6 times	23	2.8
		Every day	24	2.9
		More than once every day	7	0.8
		missing	9	
	Leisure - Spending time on the internet	Not at all	42	5.0
		Once	30	3.6
		Twice	40	4.8
		3 to 4 times	103	12.2
		5 to 6 times	62	7.4
		Every day	353	42.0
		More than once every day	211	25.1
		missing	2	
Economic Capital	Level of income	Up to £3,499	30	4.1
		£3,500 - £4,999	12	1.6

		£5,000 - £11,999	56	7.6
		£12,000 - £19,999	144	19.6
		£20,000 - £29,999	214	29.2
		£30,000 - £49,999	211	28.7
		£50,000 - £69,999	56	7.6
		£70,000 +	11	1.5
		missing	109	
	Housing situation	Full ownership (with or without mortgage)	541	70.9
		Private renting	129	16.9
		Council tenant	51	6.7
		Member of a housing association	9	1.2
		Other	33	4.3
		missing	80	
	Level of everyday comfort	Very Difficult	26	3.4
		Difficult	39	5.1
		Somewhat Difficult	124	16.3
		Neither Difficult nor Easy	210	27.6
		Somewhat Easy	164	21.6
		Easy	126	16.6
		Very Easy	71	9.3
		missing	83	
Physical activity	Travelling to work etc. - Bicycle	Not at all	609	88.3
		Once	17	2.5
		Twice	16	2.3
		3 to 4 times	19	2.8
		5 to 6 times	12	1.7
		Every day	13	1.9
		More than once every day	4	0.6
		missing	153	
	Travelling to work etc. - Running	Not at all	596	87.9
		Once	37	5.5
		Twice	24	3.5
		3 to 4 times	10	1.5
		5 to 6 times	5	0.7
		Every day	3	0.4
		More than once every day	2	0.3
		missing	53	
	Travelling to work etc. - Walking	Not at all	199	27.0
		Once	67	9.1
		Twice	86	11.7
		3 to 4 times	107	14.5
		5 to 6 times	57	7.7
		Every day	142	19.3

		More than once every day	76	10.3
		missing	107	
	Travelling to work etc. - Bus, car	Not at all	102	13.5
		Once	64	8.5
		Twice	97	12.9
		3 to 4 times	131	17.4
		5 to 6 times	105	13.9
		Every day	198	26.3
		More than once every day	53	7.0
		missing	89	
	Fruit or vegetables	Not at all	5	0.6
		Once	7	0.9
		Twice	32	4.1
		3 to 4 times	106	13.7
		5 to 6 times	87	11.2
		Every day	290	37.5
		More than once every day	247	31.9
		missing	69	
	High-fibre food	Not at all	62	8.0
		Once	42	5.4
		Twice	83	10.7
		3 to 4 times	165	21.3
		5 to 6 times	99	12.8
		Every day	237	30.6
		More than once every day	86	11.1
		missing	69	
	Variety of foods	Not at all	22	2.8
		Once	11	1.4
		Twice	35	4.5
		3 to 4 times	126	16.3
		5 to 6 times	124	16.0
		Every day	333	43.0
		More than once every day	123	15.9
		missing	69	
	Food low in fat	Not at all	47	6.1
		Once	27	3.5
		Twice	85	11.0
		3 to 4 times	174	22.6
		5 to 6 times	118	15.3
		Every day	226	29.4
		More than once every day	93	12.1
		missing	73	
	Drink water	Not at all	24	3.1

		Once	8	1.0
		Twice	27	3.5
		3 to 4 times	52	6.8
		5 to 6 times	24	3.1
		Every day	275	35.9
		More than once every day	357	46.5
		missing	76	
	Chips, chocolate, sweets	Not at all	54	7.0
		Once	102	13.3
		Twice	174	22.6
		3 to 4 times	217	28.2
		5 to 6 times	95	12.4
		Every day	112	14.6
		More than once every day	15	2.0
		missing	74	
	White sugar	Not at all	602	78.0
		Once	40	5.2
		Twice	24	3.1
		3 to 4 times	22	2.8
		5 to 6 times	16	2.1
		Every day	52	6.7
		More than once every day	16	2.1
		missing	71	
	Fried food	Not at all	278	36.0
		Once	247	32.0
		Twice	151	19.6
		3 to 4 times	71	9.2
		5 to 6 times	11	1.4
		Every day	10	1.3
		More than once every day	4	0.5
		missing	71	
	Salt	Not at all	316	40.9
		Once	100	13.0
		Twice	99	12.8
		3 to 4 times	113	14.6
		5 to 6 times	38	4.9
		Every day	94	12.2
		More than once every day	12	1.6
		missing	71	
	Sugary drinks	Not at all	451	58.4
		Once	99	12.8
		Twice	85	11.0
		3 to 4 times	78	10.1

		5 to 6 times	10	1.3
		Every day	38	4.9
		More than once every day	11	1.4
		missing	71	

TABLE C.2: CONTINUOUS VARIABLES

Descriptives[a]				
			Statistic	Std. Error
During the last week - Strenuous exercise	Mean		.60	.600
	95% Confidence Interval for Mean	Lower Bound	-1.07	
		Upper Bound	2.27	
	5% Trimmed Mean		.50	
	Median		.00	
	Variance		1.800	
	Std. Deviation		1.342	
	Minimum		0	
	Maximum		3	
	Range		3	
	Interquartile Range		2	
	Skewness		2.236	.913
	Kurtosis		5.000	2.000
During the last week - Moderate exercise	Mean		2.20	.970
	95% Confidence Interval for Mean	Lower Bound	-.49	
		Upper Bound	4.89	
	5% Trimmed Mean		2.17	
	Median		3.00	
	Variance		4.700	
	Std. Deviation		2.168	
	Minimum		0	
	Maximum		5	
	Range		5	
	Interquartile Range		4	
	Skewness		.069	.913
	Kurtosis		-1.824	2.000
During the last week - Mild exercise	Mean		3.20	1.241
	95% Confidence Interval for Mean	Lower Bound	-.25	
		Upper Bound	6.65	
	5% Trimmed Mean		3.17	
	Median		2.00	
	Variance		7.700	
	Std. Deviation		2.775	

	Minimum		0	
	Maximum		7	
	Range		7	
	Interquartile Range		5	
	Skewness		.477	.913
	Kurtosis		-1.084	2.000
Alcohol Per occasion1	Mean		6.20	2.154
	95% Confidence Interval for Mean	Lower Bound	.22	
		Upper Bound	12.18	
	5% Trimmed Mean		6.33	
	Median		9.00	
	Variance		23.200	
	Std. Deviation		4.817	
	Minimum		0	
	Maximum		10	
	Range		10	
	Interquartile Range		9	
	Skewness		-.674	.913
	Kurtosis		-2.734	2.000
Alcohol Binge	Mean		1.40	1.166
	95% Confidence Interval for Mean	Lower Bound	-1.84	
		Upper Bound	4.64	
	5% Trimmed Mean		1.22	
	Median		.00	
	Variance		6.800	
	Std. Deviation		2.608	
	Minimum		0	
	Maximum		6	
	Range		6	
	Interquartile Range		4	
	Skewness		2.092	.913
	Kurtosis		4.416	2.000
Alcohol Per occasion2	Mean		3.20	1.828
	95% Confidence Interval for Mean	Lower Bound	-1.87	
		Upper Bound	8.27	
	5% Trimmed Mean		3.00	
	Median		1.00	
	Variance		16.700	
	Std. Deviation		4.087	
	Minimum		0	
	Maximum		10	
	Range		10	
	Interquartile Range		7	

	Skewness		1.593	.913
	Kurtosis		2.265	2.000
During the last week, how many cigarettes did you smoke?	Mean		4.00	4.000
	95% Confidence Interval for Mean	Lower Bound	-7.11	
		Upper Bound	15.11	
	5% Trimmed Mean		3.33	
	Median		.00	
	Variance		80.000	
	Std. Deviation		8.944	
	Minimum		0	
	Maximum		20	
	Range		20	
	Interquartile Range		10	
	Skewness		2.236	.913
	Kurtosis		5.000	2.000
SC Trait I am good at resisting temptation	Mean		4.40	.927
	95% Confidence Interval for Mean	Lower Bound	1.83	
		Upper Bound	6.97	
	5% Trimmed Mean		4.39	
	Median		4.00	
	Variance		4.300	
	Std. Deviation		2.074	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		4	
	Skewness		.236	.913
	Kurtosis		-1.963	2.000
SC Trait I have a hard time breaking bad habits REVERSED	Mean		5.00	.447
	95% Confidence Interval for Mean	Lower Bound	3.76	
		Upper Bound	6.24	
	5% Trimmed Mean		5.00	
	Median		5.00	
	Variance		1.000	
	Std. Deviation		1.000	
	Minimum		4	
	Maximum		6	
	Range		2	
	Interquartile Range		2	
	Skewness		.000	.913
	Kurtosis		-3.000	2.000
SC Trait I am lazy REVERSED	Mean		5.20	.583
	95% Confidence Interval for	Lower Bound	3.58	

	Mean	Upper Bound	6.82	
	5% Trimmed Mean		5.17	
	Median		5.00	
	Variance		1.700	
	Std. Deviation		1.304	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		3	
	Skewness		.541	.913
	Kurtosis		-1.488	2.000
SC Trait I say inappropriate things REVERSED	Mean		4.60	.400
	95% Confidence Interval for Mean	Lower Bound	3.49	
		Upper Bound	5.71	
	5% Trimmed Mean		4.56	
	Median		4.00	
	Variance		.800	
	Std. Deviation		.894	
	Minimum		4	
	Maximum		6	
	Range		2	
	Interquartile Range		2	
	Skewness		1.258	.913
	Kurtosis		.313	2.000
SC Trait I do certain things that are bad for me because they are fun to do REVERSED	Mean		4.40	.245
	95% Confidence Interval for Mean	Lower Bound	3.72	
		Upper Bound	5.08	
	5% Trimmed Mean		4.39	
	Median		4.00	
	Variance		.300	
	Std. Deviation		.548	
	Minimum		4	
	Maximum		5	
	Range		1	
	Interquartile Range		1	
	Skewness		.609	.913
	Kurtosis		-3.333	2.000
SC Trait I refuse things that are bad for me	Mean		3.80	.200
	95% Confidence Interval for Mean	Lower Bound	3.24	
		Upper Bound	4.36	
	5% Trimmed Mean		3.83	
	Median		4.00	
	Variance		.200	

	Std. Deviation		.447	
	Minimum		3	
	Maximum		4	
	Range		1	
	Interquartile Range		1	
	Skewness		-2.236	.913
	Kurtosis		5.000	2.000
SC Trait I wish I had more self-discipline REVERSED	Mean		5.00	.548
	95% Confidence Interval for Mean	Lower Bound	3.48	
		Upper Bound	6.52	
	5% Trimmed Mean		4.94	
	Median		5.00	
	Variance		1.500	
	Std. Deviation		1.225	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		1.361	.913
	Kurtosis		2.000	2.000
SC Trait People would say that I have strong self-discipline	Mean		4.00	.632
	95% Confidence Interval for Mean	Lower Bound	2.24	
		Upper Bound	5.76	
	5% Trimmed Mean		4.00	
	Median		4.00	
	Variance		2.000	
	Std. Deviation		1.414	
	Minimum		2	
	Maximum		6	
	Range		4	
	Interquartile Range		2	
	Skewness		.000	.913
	Kurtosis		2.000	2.000
SC Trait Pleasure and fun sometimes keep me from getting work done REVERSED	Mean		4.80	.374
	95% Confidence Interval for Mean	Lower Bound	3.76	
		Upper Bound	5.84	
	5% Trimmed Mean		4.78	
	Median		5.00	
	Variance		.700	
	Std. Deviation		.837	
	Minimum		4	
	Maximum		6	
	Range		2	

	Interquartile Range		2	
	Skewness		.512	.913
	Kurtosis		-.612	2.000
SC Trait I have trouble concentrating REVERSED	Mean		5.40	.510
	95% Confidence Interval for Mean	Lower Bound	3.98	
		Upper Bound	6.82	
	5% Trimmed Mean		5.39	
	Median		5.00	
	Variance		1.300	
	Std. Deviation		1.140	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		.405	.913
	Kurtosis		-.178	2.000
SC Trait I am able to work effectively toward long-term goals REVERSED	Mean		4.80	.583
	95% Confidence Interval for Mean	Lower Bound	3.18	
		Upper Bound	6.42	
	5% Trimmed Mean		4.72	
	Median		4.00	
	Variance		1.700	
	Std. Deviation		1.304	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		1.714	.913
	Kurtosis		2.664	2.000
SC Trait Sometimes I can't stop myself from doing something, even if I know it is wrong REVERSED	Mean		4.200	.2000
	95% Confidence Interval for Mean	Lower Bound	3.645	
		Upper Bound	4.755	
	5% Trimmed Mean		4.167	
	Median		4.000	
	Variance		.200	
	Std. Deviation		.4472	
	Minimum		4.0	
	Maximum		5.0	
	Range		1.0	
	Interquartile Range		.5	
	Skewness		2.236	.913
	Kurtosis		5.000	2.000
SC Trait I often act without	Mean		5.20	.583

thinking through all the alternatives REVERSED	95% Confidence Interval for Mean	Lower Bound	3.58	
		Upper Bound	6.82	
	5% Trimmed Mean		5.17	
	Median		5.00	
	Variance		1.700	
	Std. Deviation		1.304	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		3	
	Skewness		.541	.913
	Kurtosis		-1.488	2.000
SC State I have to force myself to stay focused	Mean		2.80	.490
	95% Confidence Interval for Mean	Lower Bound	1.44	
		Upper Bound	4.16	
	5% Trimmed Mean		2.83	
	Median		3.00	
	Variance		1.200	
	Std. Deviation		1.095	
	Minimum		1	
	Maximum		4	
	Range		3	
	Interquartile Range		2	
	Skewness		-1.293	.913
	Kurtosis		2.917	2.000
SC State I have no willpower REVERSED	Mean		5.20	.583
	95% Confidence Interval for Mean	Lower Bound	3.58	
		Upper Bound	6.82	
	5% Trimmed Mean		5.17	
	Median		5.00	
	Variance		1.700	
	Std. Deviation		1.304	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		3	
	Skewness		.541	.913
	Kurtosis		-1.488	2.000
SC State I am having trouble pulling myself together REVERSED	Mean		5.20	.583
	95% Confidence Interval for Mean	Lower Bound	3.58	
		Upper Bound	6.82	
	5% Trimmed Mean		5.17	
	Median		5.00	

	Variance		1.700	
	Std. Deviation		1.304	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		3	
	Skewness		.541	.913
	Kurtosis		-1.488	2.000
SC State I could resist any temptation	Mean		4.40	.678
	95% Confidence Interval for Mean	Lower Bound	2.52	
		Upper Bound	6.28	
	5% Trimmed Mean		4.33	
	Median		4.00	
	Variance		2.300	
	Std. Deviation		1.517	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		1.749	.913
	Kurtosis		3.724	2.000
SC State I am having trouble paying attention REVERSED	Mean		5.80	.490
	95% Confidence Interval for Mean	Lower Bound	4.44	
		Upper Bound	7.16	
	5% Trimmed Mean		5.83	
	Median		6.00	
	Variance		1.200	
	Std. Deviation		1.095	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		-1.293	.913
	Kurtosis		2.917	2.000
SC State I would have no trouble bringing myself to do difficult tasks	Mean		3.80	.490
	95% Confidence Interval for Mean	Lower Bound	2.44	
		Upper Bound	5.16	
	5% Trimmed Mean		3.83	
	Median		4.00	
	Variance		1.200	
	Std. Deviation		1.095	
	Minimum		2	
	Maximum		5	

	Range		3	
	Interquartile Range		2	
	Skewness		-1.293	.913
	Kurtosis		2.917	2.000
SC State I need something pleasant to make me feel better	Mean		3.60	.812
	95% Confidence Interval for Mean	Lower Bound	1.34	
		Upper Bound	5.86	
	5% Trimmed Mean		3.61	
	Median		4.00	
	Variance		3.300	
	Std. Deviation		1.817	
	Minimum		1	
	Maximum		6	
	Range		5	
	Interquartile Range		3	
	Skewness		-.267	.913
	Kurtosis		1.074	2.000
SC State I feel drained REVERSED	Mean		5.60	.510
	95% Confidence Interval for Mean	Lower Bound	4.18	
		Upper Bound	7.02	
	5% Trimmed Mean		5.61	
	Median		6.00	
	Variance		1.300	
	Std. Deviation		1.140	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		-.405	.913
	Kurtosis		-.178	2.000
SC State I feel like giving up REVERSED	Mean		6.00	.548
	95% Confidence Interval for Mean	Lower Bound	4.48	
		Upper Bound	7.52	
	5% Trimmed Mean		6.06	
	Median		6.00	
	Variance		1.500	
	Std. Deviation		1.225	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		2	
	Skewness		-1.361	.913
	Kurtosis		2.000	2.000

SC State I feel overwhelmed REVERSED	Mean		5.40	.600
	95% Confidence Interval for Mean	Lower Bound	3.73	
		Upper Bound	7.07	
	5% Trimmed Mean		5.39	
	Median		6.00	
	Variance		1.800	
	Std. Deviation		1.342	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		3	
	Skewness		-.166	.913
	Kurtosis		-2.407	2.000
SC State I feel calm and rational	Mean		4.60	.812
	95% Confidence Interval for Mean	Lower Bound	2.34	
		Upper Bound	6.86	
	5% Trimmed Mean		4.61	
	Median		5.00	
	Variance		3.300	
	Std. Deviation		1.817	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		3	
	Skewness		-.267	.913
	Kurtosis		1.074	2.000
a. During the last week, how many times did you vape? is constant. It has been omitted.				

TABLE D.1: RELEVANT FREQUENCY DISTRIBUTIONS

Variable		Income E	Income D	Income C1C2	Income B	Income A
Type of work	Retired	18.9%	17.8%	12.2%	4.3%	6.0%
	Full-time student	21.0%	2.1%	0.5%	0%	0%
	Casual worker or unemployed	18.9%	2.8%	0%	0%	1.5%
	Routine manual and service	8.4%	12.1%	2.3%	0%	0%
	Semi-routine and service	6.3%	7.8%	3.7%	0%	0%
	Technical and craft	1.0%	2.1%	4.2%	2.8%	1.5%
	Clerical and intermediate	12.6%	37.8%	30.0%	5.2%	0%
	Traditional professional	2.1%	2.1%	7.5%	12.4%	17.9%
	Professional	8.4%	10%	22.5%	46.2%	28.3%
	Middle or junior managers	1.0%	2.1%	11.3%	21.9%	11.9%
	Senior managers or administrators	1.0%	2.8%	5.6%	7.1%	32.8%
	Total	100%	100%	100%	100%	100%
Variable		Income E	Income D	Income C1C2	Income B	Income A
Education	No formal qualification	16.5%	7.0%	3.3%	0	3.0%
	1-4 GCSEs or equivalent	16.5%	11.8%	7.5%	2.9%	1.5%
	5 or more GCSEs or equivalent	7.2%	16.1%	8.9%	2.4%	1.5%
	Apprenticeship	4.1%	3.5%	1.8%	0.9%	1.5%
	2 or more A-levels or equivalent	15.5%	14.7%	11.8%	7.6%	0%
	Bachelor's degree or equivalent	19.6%	29.4%	46.2%	39.2%	22.7%
	Postgraduate degree or equivalent	20.6%	17.5%	20.3%	46.9%	69.7%
	Total	100%	100%	100%	100%	100%
Variable		Income E	Income D	Income C1C2	Income B	Income A
Age	19 - 34	35.9%	27.8%	30.3%	15.4%	3.1%
	35 - 44	17.4%	17.8%	19.7%	33.6%	18.7%

	45 - 54	13.0%	22.1%	20.2%	28.8%	34.4%
	55 - 64	16.3%	21.4%	20.7%	18.7%	31.2%
	65 +	17.4%	10.7%	9.1%	3.4%	12.5%
	Total	100%	100%	100%	100%	100%
Variable		Income E	Income D	Income C1C2	Income B	Income A
Stratified wards	Stratum 1 (most deprived)	11.7%	15.7%	11.9%	5.8%	6.1%
	Stratum 2 (below the average deprivation)	14.9%	21.4%	16.2%	16.9%	4.6%
	Stratum 3 (average level of deprivation)	36.2%	34.3%	30.0%	29.0%	33.8%
	Stratum 4 (above the average deprivation)	13..8%	5.7%	12.4%	12.1%	12.3%
	Stratum 5 (least deprived)	23.4%	22.8%	29.5%	36.2%	43.1%
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - watch TV	Not at all	11.5%	4.9%	5.2%	5.3%	7.5%
	Once	7.3%	4.9%	1.9%	2.9%	3.0%
	Twice	6.2%	9.1%	7.5%	6.2%	1.5%
	3 to 4 times	5.2%	16.2%	12.2%	18.7%	19.4%
	5 to 6 times	7.3%	12.7%	8.9%	13.4%	22.4%
	Every day	44.8%	45.8%	56.3%	48.3%	41.8%
	More than once every day	17.7%	6.3%	8.0%	5.3%	4.5%
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - go to cinema	Not at all	83.0%	80.3%	80.2%	83.6%	83.1%
	Once	13.9%	16.9%	16.9%	14.05%	16.9%
	Twice	3.2%	1.4%	2.9%	1.9%	0
	3 to 4 times	0	1.4%	0	0	0
	5 to 6 times	0	0	0	0.5%	0
	Every day	0	0	0	0	0
	More than once every day	0	0	0	0	0
	Total	100%	100%	100%	100%	100%

Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - going leisure shopping	Not at all	42.7%	47.5%	45.8%	50.0%	56.2%
	Once	36.4%	37.1%	39.1%	35.7%	39.0%
	Twice	10.4%	13.3%	9.4%	9.5%	1.6%
	3 to 4 times	7.3%	1.4%	3.3%	3.3%	1.6%
	5 to 6 times	3.1%	0.7%	1.4%	0.5%	1.6%
	Every day	0	0	0.9%	0.9%	0
	More than once every day	0	0	0	0	0
	Total	100%	100%	100%	100%	100%

Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - read books or newspapers	Not at all	22.1%	18.9%	16.0%	10.9%	12.1%
	Once	8.4%	16.8%	13.2%	10.0%	4.5%
	Twice	8.4%	15.4%	10.8%	12.8%	6.1%
	3 to 4 times	15.8%	11.2%	19.3%	18.6%	15.1%
	5 to 6 times	1.1%	7.7%	8.5%	10.5%	13.6%
	Every day	29.5%	23.8%	27.3%	26.7%	36.4%
	More than once every day	14.7%	6.3%	4.7%	10.5%	12.1%
	Total	100%	100%	100%	100%	100%

Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - attend organised cultural events	Not at all	67.7%	73.4%	56.4%	58.8%	54.5%
	Once	20.8%	21.0%	30.6%	33.0%	37.9%
	Twice	7.3%	4.9%	11.0%	5.7%	6.1%
	3 to 4 times	2.1%	0.7%	1.9%	1.4%	1.5%
	5 to 6 times	2.1%	0	0	0.5%	0
	Every day	0	0	0	0	0
	More than once every day	0	0	0	0	0
	Total	100%	100%	100%	100%	100%

Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - get together with relatives	Not at all	33.0%	29.8%	32.4%	33.0%	27.7%
	Once	27.6%	31.2%	29.0%	33.5%	30.8%
	Twice	9.6%	17.0%	20.9%	16.7%	23.1%
	3 to 4 times	18.1%	13.5%	13.8%	10.0%	12.3%
	5 to 6 times	3.2%	2.8%	0.9%	1.4%	0
	Every day	4.2%	4.2%	2.8%	4.3%	3.1%
	More than once every day	4.2%	1.4%	0	0.9%	3.1%

	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - get together with friends	Not at all	22.1%	18.8%	22.4%	14.3%	14.0%
	Once	23.1%	28.0%	28.6%	40.5%	25.0%
	Twice	26.3%	31.5%	23.3%	28.6%	39.0%
	3 to 4 times	14.7%	14.0%	20.5%	12.8%	14.1%
	5 to 6 times	7.4%	5.6%	3.3%	2.4%	3.1%
	Every day	5.3%	2.1%	1.9%	0.9%	3.1%
	More than once every day	1.0%	0	0	0.5%	1.6%
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - play cards or board games	Not at all	75.0%	84.6%	77.6%	77.5%	74.6%
	Once	10.4%	9.1%	14.3%	10.5%	11.9%
	Twice	9.4%	4.2%	5.2%	5.3%	4.5%
	3 to 4 times	1.0%	2.1%	1.9%	5.3%	4.5%
	5 to 6 times	1.0%	0	0.5%	0	0
	Every day	2.1%	0	0.5%	1.4%	4.5%
	More than once every day	1.0%	0	0	0	0
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - listen to music	Not at all	5.2%	9.1%	12.2%	1.9%	3.1%
	Once	11.4%	6.3%	3.7%	6.2%	4.6%
	Twice	8.3%	7.0%	10.3%	10.6%	13.8%
	3 to 4 times	23.0%	13.3%	11.7%	19.7%	24.6%
	5 to 6 times	8.3%	13.3%	13.6%	10.6%	18.5%
	Every day	23.9%	32.2%	34.3%	34.1%	27.7%
	More than once every day	20.0%	18.9%	14.1%	16.8%	7.7%
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - attend organised sporting events	Not at all	88.5%	93.0%	89.1%	88.5%	89.4%
	Once	5.2%	2.8%	9.0%	6.2%	9.1%
	Twice	4.2%	2.1%	1.4%	3.8%	0
	3 to 4 times	0	0	0	0.9%	1.5%
	5 to 6 times	2.1%	2.1%	0.5%	0	0
	Every day	0	0	0	0.5%	0
	More than once	0	0	0	0	0

	every day					
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - do crafts, drawing, painting etc.	Not at all	58.3%	65.5%	65.1%	71.4%	72.3%
	Once	8.3%	12.7%	13.4%	12.4%	12.3%
	Twice	9.4%	9.1%	9.1%	6.2%	6.1%
	3 to 4 times	11.4%	4.2%	8.1%	5.2%	9.2%
	5 to 6 times	5.2%	3.5%	2.4%	2.8%	0
	Every day	3.1%	4.2%	1.9%	1.9%	0
	More than once every day	4.2%	0.7	0	0	0
	Total	100%	100%	100%	100%	100%
Variable	Times per week	Income E	Income D	Income C1C2	Income B	Income A
Leisure - spend time on the internet	Not at all	7.2%	6.3%	2.8%	2.4%	4.5%
	Once	3.1%	4.9%	3.7%	3.8%	0
	Twice	7.2%	2.1%	8.0%	3.8%	4.5%
	3 to 4 times	9.3%	15.4%	11.7%	12.4%	18.2%
	5 to 6 times	10.3%	6.3%	7.5%	7.6%	9.1%
	Every day	36.1%	40.5%	39.9%	45.2%	44.0%
	More than once every day	26.8%	24.5%	26.3%	24.8%	19.7%
	Total	100%	100%	100%	100%	100%

TABLE D.2: COMPARISON OF MEANS (ANOVA TEST RESULTS)

1) Difference between the income groups and level of exercise (WLTAS)

ANOVA

WLTAS_ranges

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.109	4	3.277	5.208	.000
Within Groups	391.410	622	.629		
Total	404.520	626			

Post Hoc Test

Dependent Variable: Level of exercise (WLTAS)

Tukey HSD

Multiple Comparisons

Dependent Variable: WLTAS_ranges

	(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Income E	Income D	-.297	.112	.063	-.60	.01
		Income C1C2	-.356*	.103	.005	-.64	-.07
		Income B	-.465*	.105	.000	-.75	-.18
		Income A	-.405*	.134	.022	-.77	-.04
	Income D	Income E	.297	.112	.063	-.01	.60
		Income C1C2	-.059	.093	.969	-.31	.19
		Income B	-.168	.094	.385	-.43	.09
		Income A	-.108	.126	.913	-.45	.24
	Income C1C2	Income E	.356*	.103	.005	.07	.64
		Income D	.059	.093	.969	-.19	.31
		Income B	-.109	.083	.688	-.34	.12
		Income A	-.049	.118	.994	-.37	.27
	Income B	Income E	.465*	.105	.000	.18	.75
		Income D	.168	.094	.385	-.09	.43
		Income C1C2	.109	.083	.688	-.12	.34
		Income A	.060	.120	.987	-.27	.39
	Income A	Income E	.405*	.134	.022	.04	.77

	Income D	.108	.126	.913	-.24	.45
	Income C1C2	.049	.118	.994	-.27	.37
	Income B	-.060	.120	.987	-.39	.27

*. The mean difference is significant at the 0.05 level.

2) Difference between the income groups and diet

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Diet_healthy	Between Groups	346.466	4	86.617	3.755	.005
	Within Groups	16375.976	710	23.065		
	Total	16722.442	714			
Diet_unhealthy	Between Groups	416.004	4	104.001	5.428	.000
	Within Groups	13623.095	711	19.160		
	Total	14039.099	715			

Post Hoc Test

Dependent Variable: Diet

Tukey HSD

Multiple Comparisons

Dependent Variable		(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Diet_healthy	Tukey HSD	Income E	Income D	-.70299	.63931	.807	-2.4514	1.0454
			Income C1C2	-1.13589	.59426	.312	-2.7611	.4893
			Income B	-1.98596*	.59516	.008	-3.6136	-.3583
			Income A	-2.05263	.77306	.062	-4.1668	.0615
		Income D	Income E	.70299	.63931	.807	-1.0454	2.4514
			Income C1C2	-.43289	.52563	.923	-1.8704	1.0046
			Income B	-1.28297	.52665	.107	-2.7232	.1573
			Income A	-1.34964	.72165	.334	-3.3232	.6239
		Income C1C2	Income E	1.13589	.59426	.312	-.4893	2.7611
			Income D	.43289	.52563	.923	-1.0046	1.8704
			Income B	-.85008	.47094	.371	-2.1380	.4378
			Income A	-.91675	.68206	.664	-2.7820	.9485
		Income B	Income E	1.98596*	.59516	.008	.3583	3.6136
			Income D	1.28297	.52665	.107	-.1573	2.7232
			Income C1C2	.85008	.47094	.371	-.4378	2.1380
			Income A	-.06667	.68284	1.000	-1.9341	1.8008
		Income A	Income E	2.05263	.77306	.062	-.0615	4.1668
			Income D	1.34964	.72165	.334	-.6239	3.3232

			Income C1C2	.91675	.68206	.664	-.9485	2.7820
			Income B	.06667	.68284	1.000	-1.8008	1.9341
Diet_unhealthy	Tukey HSD	Income E	Income D	.92139	.58089	.507	-.6672	2.5100
			Income C1C2	1.51875*	.53929	.040	.0439	2.9936
			Income B	2.21551*	.54093	.000	.7362	3.6948
			Income A	2.36234*	.70311	.007	.4395	4.2852
		Income D	Income E	-.92139	.58089	.507	-2.5100	.6672
			Income C1C2	.59736	.47863	.723	-.7116	1.9063
			Income B	1.29413	.48048	.056	-.0199	2.6081
			Income A	1.44095	.65774	.184	-.3578	3.2397
		Income C1C2	Income E	-1.51875*	.53929	.040	-2.9936	-.0439
			Income D	-.59736	.47863	.723	-1.9063	.7116
			Income B	.69676	.42925	.483	-.4771	1.8707
			Income A	.84359	.62130	.655	-.8555	2.5427
		Income B	Income E	-2.21551*	.54093	.000	-3.6948	-.7362
			Income D	-1.29413	.48048	.056	-2.6081	.0199
			Income C1C2	-.69676	.42925	.483	-1.8707	.4771
			Income A	.14683	.62273	.999	-1.5562	1.8499
		Income A	Income E	-2.36234*	.70311	.007	-4.2852	-.4395
			Income D	-1.44095	.65774	.184	-3.2397	.3578
			Income C1C2	-.84359	.62130	.655	-2.5427	.8555
			Income B	-.14683	.62273	.999	-1.8499	1.5562

*. The mean difference is significant at the 0.05 level.

3) Difference between the income groups and alcohol consumption

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
alcohol1_sqroot	Between Groups	96.868	4	24.217	8.188	.000
	Within Groups	2141.195	724	2.957		
	Total	2238.063	728			
BingeAlc_sqroot	Between Groups	2.894	4	.723	1.807	.126
	Within Groups	289.909	724	.400		
	Total	292.803	728			
AlcDays_sqroot	Between Groups	32.733	4	8.183	11.493	.000
	Within Groups	515.518	724	.712		
	Total	548.251	728			

Post Hoc Test

Dependent Variable: Alcohol consumption

Tukey HSD

Multiple Comparisons

Dependent Variable		(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
alcohol1_sqroot	Tukey HSD	Income E	Income D	-.52502	.22621	.139	-1.1436	.0936
			Income C1C2	-.97914*	.21081	.000	-1.5556	-.4027
			Income B	-1.00805*	.21112	.000	-1.5854	-.4307
			Income A	-1.15134*	.27319	.000	-1.8984	-.4043
		Income D	Income E	.52502	.22621	.139	-.0936	1.1436
			Income C1C2	-.45412	.18610	.106	-.9630	.0548
			Income B	-.48303	.18645	.073	-.9929	.0269
			Income A	-.62632	.25460	.101	-1.3226	.0699
		Income C1C2	Income E	.97914*	.21081	.000	.4027	1.5556
			Income D	.45412	.18610	.106	-.0548	.9630
			Income B	-.02891	.16743	1.000	-.4868	.4290
			Income A	-.17220	.24102	.953	-.8313	.4869
		Income B	Income E	1.00805*	.21112	.000	.4307	1.5854
			Income D	.48303	.18645	.073	-.0269	.9929
			Income C1C2	.02891	.16743	1.000	-.4290	.4868
			Income A	-.14329	.24130	.976	-.8032	.5166
		Income A	Income E	1.15134*	.27319	.000	.4043	1.8984
			Income D	.62632	.25460	.101	-.0699	1.3226
			Income C1C2	.17220	.24102	.953	-.4869	.8313

			Income B	.14329	.24130	.976	-.5166	.8032
BingeAlc_sqroot	Tukey HSD	Income E	Income D	.02501	.08324	.998	-.2026	.2526
			Income C1C2	-.11028	.07757	.614	-.3224	.1018
			Income B	-.13081	.07768	.445	-.3432	.0816
			Income A	-.05944	.10052	.976	-.3343	.2155
		Income D	Income E	-.02501	.08324	.998	-.2526	.2026
			Income C1C2	-.13529	.06848	.279	-.3226	.0520
			Income B	-.15581	.06861	.156	-.3434	.0318
			Income A	-.08445	.09368	.896	-.3406	.1717
		Income C1C2	Income E	.11028	.07757	.614	-.1018	.3224
			Income D	.13529	.06848	.279	-.0520	.3226
			Income B	-.02052	.06161	.997	-.1890	.1480
			Income A	.05085	.08869	.979	-.1917	.2934
		Income B	Income E	.13081	.07768	.445	-.0816	.3432
			Income D	.15581	.06861	.156	-.0318	.3434
			Income C1C2	.02052	.06161	.997	-.1480	.1890
			Income A	.07137	.08879	.929	-.1714	.3142
		Income A	Income E	.05944	.10052	.976	-.2155	.3343
			Income D	.08445	.09368	.896	-.1717	.3406
			Income C1C2	-.05085	.08869	.979	-.2934	.1917
			Income B	-.07137	.08879	.929	-.3142	.1714
AlcDays_sqroot	Tukey HSD	Income E	Income D	-.36464*	.11100	.009	-.6682	-.0611
			Income C1C2	-.58005*	.10344	.000	-.8629	-.2972
			Income B	-.55123*	.10359	.000	-.8345	-.2679

		Income A	-.76337*	.13405	.000	-1.1299	-.3968
	Income D	Income E	.36464*	.11100	.009	.0611	.6682
		Income C1C2	-.21541	.09131	.128	-.4651	.0343
		Income B	-.18659	.09149	.248	-.4368	.0636
		Income A	-.39873*	.12493	.013	-.7404	-.0571
	Income C1C2	Income E	.58005*	.10344	.000	.2972	.8629
		Income D	.21541	.09131	.128	-.0343	.4651
		Income B	.02882	.08215	.997	-.1958	.2535
		Income A	-.18332	.11826	.530	-.5067	.1401
	Income B	Income E	.55123*	.10359	.000	.2679	.8345
		Income D	.18659	.09149	.248	-.0636	.4368
		Income C1C2	-.02882	.08215	.997	-.2535	.1958
		Income A	-.21214	.11840	.379	-.5359	.1116
	Income A	Income E	.76337*	.13405	.000	.3968	1.1299
		Income D	.39873*	.12493	.013	.0571	.7404
		Income C1C2	.18332	.11826	.530	-.1401	.5067
		Income B	.21214	.11840	.379	-.1116	.5359

*. The mean difference is significant at the 0.05 level.

4) Difference between the income groups and smoking cigarettes and vaping

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Cigarettes_sqrt	Between Groups	14.121	4	3.530	.701	.591
	Within Groups	3650.757	725	5.036		
	Total	3664.878	729			
Vaping_sqrt	Between Groups	4.549	4	1.137	.549	.700
	Within Groups	1498.914	724	2.070		
	Total	1503.463	728			

Post Hoc Test

Dependent Variable: smoking cigarettes and vaping
Tukey HSD

Multiple Comparisons

Dependent Variable		(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Cigarettes_sqrt	Tukey HSD	Income E	Income D	.04419	.29517	1.000	-.7630	.8514
			Income C1C2	.07189	.27487	.999	-.6798	.8236
			Income B	.15404	.27548	.981	-.5993	.9074
			Income A	.52831	.35647	.574	-.4465	1.5031
		Income D	Income E	-.04419	.29517	1.000	-.8514	.7630
			Income C1C2	.02771	.24260	1.000	-.6357	.6911
			Income B	.10985	.24329	.991	-.5555	.7752
			Income A	.48413	.33222	.591	-.4244	1.3926
		Income C1C2	Income E	-.07189	.27487	.999	-.8236	.6798
			Income D	-.02771	.24260	1.000	-.6911	.6357
			Income B	.08215	.21822	.996	-.5146	.6789
			Income A	.45642	.31432	.594	-.4031	1.3160
		Income B	Income E	-.15404	.27548	.981	-.9074	.5993
			Income D	-.10985	.24329	.991	-.7752	.5555
			Income C1C2	-.08215	.21822	.996	-.6789	.5146
			Income A	.37427	.31486	.758	-.4868	1.2353
		Income A	Income E	-.52831	.35647	.574	-1.5031	.4465
			Income D	-.48413	.33222	.591	-1.3926	.4244

			Income C1C2	-.45642	.31432	.594	-1.3160	.4031
			Income B	-.37427	.31486	.758	-1.2353	.4868
Vaping_sqrt	Tukey HSD	Income E	Income D	.18674	.18927	.861	-.3308	.7043
			Income C1C2	.20220	.17638	.782	-.2801	.6845
			Income B	.25915	.17664	.584	-.2239	.7422
			Income A	.17141	.22857	.944	-.4536	.7965
		Income D	Income E	-.18674	.18927	.861	-.7043	.3308
			Income C1C2	.01545	.15570	1.000	-.4103	.4413
			Income B	.07241	.15600	.990	-.3542	.4990
			Income A	-.01533	.21302	1.000	-.5979	.5672
		Income C1C2	Income E	-.20220	.17638	.782	-.6845	.2801
			Income D	-.01545	.15570	1.000	-.4413	.4103
			Income B	.05695	.14009	.994	-.3261	.4400
			Income A	-.03078	.20166	1.000	-.5822	.5207
		Income B	Income E	-.25915	.17664	.584	-.7422	.2239
			Income D	-.07241	.15600	.990	-.4990	.3542
			Income C1C2	-.05695	.14009	.994	-.4400	.3261
			Income A	-.08773	.20189	.993	-.6398	.4644
		Income A	Income E	-.17141	.22857	.944	-.7965	.4536
			Income D	.01533	.21302	1.000	-.5672	.5979
			Income C1C2	.03078	.20166	1.000	-.5207	.5822
			Income B	.08773	.20189	.993	-.4644	.6398

5) Difference between the income groups and trait self-control

ANOVA

SCTraitTOTAL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3564.923	4	891.231	3.833	.004
Within Groups	168580.633	725	232.525		
Total	172145.556	729			

Post Hoc Test
Dependent Variable: trait self-control
Tukey HSD

Multiple Comparisons

Dependent Variable: SCTraitTOTAL

	(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Income E	Income D	-3.24216	2.00580	.487	-8.7273	2.2430
		Income C1C2	-3.47897	1.86784	.339	-8.5869	1.6289
		Income B	-5.27226*	1.87201	.040	-10.3916	-.1530
		Income A	-8.78427*	2.42233	.003	-15.4085	-2.1600
	Income D	Income E	3.24216	2.00580	.487	-2.2430	8.7273
		Income C1C2	-.23681	1.64855	1.000	-4.7450	4.2714
		Income B	-2.03010	1.65327	.735	-6.5512	2.4910
		Income A	-5.54211	2.25756	.102	-11.7158	.6315
	Income C1C2	Income E	3.47897	1.86784	.339	-1.6289	8.5869
		Income D	.23681	1.64855	1.000	-4.2714	4.7450
		Income B	-1.79329	1.48288	.746	-5.8485	2.2619
		Income A	-5.30530	2.13593	.095	-11.1463	.5357
	Income B	Income E	5.27226*	1.87201	.040	.1530	10.3916
		Income D	2.03010	1.65327	.735	-2.4910	6.5512
		Income C1C2	1.79329	1.48288	.746	-2.2619	5.8485
		Income A	-3.51201	2.13958	.471	-9.3630	2.3390

	Income A	Income E	8.78427*	2.42233	.003	2.1600	15.4085
		Income D	5.54211	2.25756	.102	-.6315	11.7158
		Income C1C2	5.30530	2.13593	.095	-.5357	11.1463
		Income B	3.51201	2.13958	.471	-2.3390	9.3630

*. The mean difference is significant at the 0.05 level.

5) Difference between the income groups and state self-control

ANOVA

SCStateTOTAL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5271.103	4	1317.776	5.740	.000
Within Groups	166211.352	724	229.574		
Total	171482.455	728			

Post Hoc Test
Dependent Variable: state self-control
Tukey HSD

Multiple Comparisons

Dependent Variable: SCStateTOTAL

	(I) Income_ranges	(J) Income_ranges	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Income E	Income D	-4.58042	1.99920	.149	-10.0476	.8867
		Income C1C2	-4.74178	1.86258	.082	-9.8353	.3517
		Income B	-7.70952*	1.86671	.000	-12.8143	-2.6047
		Income A	-9.56716*	2.41203	.001	-16.1632	-2.9711
	Income D	Income E	4.58042	1.99920	.149	-.8867	10.0476
		Income C1C2	-.16136	1.63805	1.000	-4.6409	4.3182
		Income B	-3.12910	1.64275	.316	-7.6215	1.3633
		Income A	-4.98674	2.24319	.172	-11.1211	1.1476
	Income C1C2	Income E	4.74178	1.86258	.082	-.3517	9.8353
		Income D	.16136	1.63805	1.000	-4.3182	4.6409
		Income B	-2.96774	1.47344	.260	-6.9971	1.0616
		Income A	-4.82538	2.12233	.155	-10.6292	.9785
	Income B	Income E	7.70952*	1.86671	.000	2.6047	12.8143
		Income D	3.12910	1.64275	.316	-1.3633	7.6215
		Income C1C2	2.96774	1.47344	.260	-1.0616	6.9971

		Income A	-1.85764	2.12595	.906	-7.6714	3.9561
	Income A	Income E	9.56716*	2.41203	.001	2.9711	16.1632
		Income D	4.98674	2.24319	.172	-1.1476	11.1211
		Income C1C2	4.82538	2.12233	.155	-.9785	10.6292
		Income B	1.85764	2.12595	.906	-3.9561	7.6714

*. The mean difference is significant at the 0.05 level.

APPENDIX E: CORRELATION

TABLE E.1: ECONOMIC CAPITAL

Correlations

		Personal annual income	Housing_Lg10	Comfortincome_Sqrt
Personal annual income	Pearson Correlation	1	-.330**	.301**
	Sig. (2-tailed)		.000	.000
	N	739	738	733
Housing_Lg10	Pearson Correlation	-.330**	1	-.147**
	Sig. (2-tailed)	.000		.000
	N	738	768	761
Comfortincome_Sqrt	Pearson Correlation	.301**	-.147**	1
	Sig. (2-tailed)	.000	.000	
	N	733	761	765

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE E.2: CULTURAL CAPITAL

Correlations

		Your highest level of education	CC institutionalized Your parents' highest level of education	CC objectified I grew up in a home with lots of books, music, art, and other cultural interests
Your highest level of education	Pearson Correlation	1	.424**	.153**
	Sig. (2-tailed)		.000	.000
	N	767	727	763
CC institutionalized Your parents' highest level of education	Pearson Correlation	.424**	1	.498**
	Sig. (2-tailed)	.000		.000
	N	727	728	725
CC objectified I grew up in a home with lots of books, music, art, and other cultural interests	Pearson Correlation	.153**	.498**	1
	Sig. (2-tailed)	.000	.000	
	N	763	725	770

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Your highest level of education	CC institutionalized Your parents' highest level of education	CC objectified I grew up in a home with lots of books, music, art, and other cultural interests	CC embodied Attend organised cultural events e.g. concerts, live theatre, exhibitions	CC embodied Spend time on the internet/PC (e.g. browsing, playing online games)
Your highest level of education	Pearson Correlation	1	.424**	.153**	.121**	.212**
	Sig. (2-tailed)		.000	.000	.001	.000
	N	767	727	763	759	765
CC institutionalized Your parents' highest level of education	Pearson Correlation	.424**	1	.498**	.089*	.140**
	Sig. (2-tailed)	.000		.000	.017	.000
	N	727	728	725	720	726
CC objectified I grew up in a home with lots of books, music, art, and other cultural interests	Pearson Correlation	.153**	.498**	1	.080*	.080*
	Sig. (2-tailed)	.000	.000		.027	.026
	N	763	725	770	763	769
CC embodied Attend organised cultural events e.g. concerts, live theatre, exhibitions	Pearson Correlation	.121**	.089*	.080*	1	-.010
	Sig. (2-tailed)	.001	.017	.027		.769
	N	759	720	763	839	839
CC embodied Spend time on the internet/PC (e.g. browsing, playing online games)	Pearson Correlation	.212**	.140**	.080*	-.010	1
	Sig. (2-tailed)	.000	.000	.026	.769	
	N	765	726	769	839	846

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		TraitSC_TOTAL	StateSC_TOTAL
TraitSC_TOTAL	Pearson Correlation	1	.581**
	Sig. (2-tailed)		.000
	N	769	733
StateSC_TOTAL	Pearson Correlation	.581**	1
	Sig. (2-tailed)	.000	
	N	733	762

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE E.4: HEALTHY LIFESTYLE

Correlations

		WLTASscore	During the last week, how frequently have you travelled to work, to school, college or to the shops (NOT your weekly supermarket shop) in the following ways? - Riding a bicycle	Travelled to work, to school, college or to the shops - Running	Travelled to work, to school, college or to the shops - Walking	Travelled to work, to school, college or to the shops - Other (bus, car)	HealthyDiet
WLTASscore	Pearson Correlation	1	.294**	.335**	.326**	-.234**	.245**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	677	609	599	641	656	662
During the last week, how frequently have you travelled to work, to school, college or to the shops (NOT your weekly supermarket shop) in the following ways? - Riding a bicycle	Pearson Correlation	.294**	1	.121**	.045	-.200**	.069
	Sig. (2-tailed)	.000		.002	.238	.000	.073
	N	609	695	677	686	685	674
Travelled to work, to school,	Pearson Correlation	.335**	.121**	1	.158**	-.079*	.023

college or to the shops - Running	Sig. (2-tailed)	.000	.002		.000	.041	.547
	N	599	677	683	679	676	663
Travelled to work, to school, college or to the shops - Walking	Pearson Correlation	.326**	.045	.158**	1	-.285**	.108**
	Sig. (2-tailed)	.000	.238	.000		.000	.004
	N	641	686	679	741	716	718
Travelled to work, to school, college or to the shops - Other (bus, car)	Pearson Correlation	-.234**	-.200**	-.079*	-.285**	1	-.044
	Sig. (2-tailed)	.000	.000	.041	.000		.234
	N	656	685	676	716	759	739
HealthyDiet	Pearson Correlation	.245**	.069	.023	.108**	-.044	1
	Sig. (2-tailed)	.000	.073	.547	.004	.234	
	N	662	674	663	718	739	766

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

TABLE E.5: UNHEALTHY LIFESTYLE

Correlations

		UnhealthyDiet	WLTASscore	Travelled to work, to school, college or to the shops - Other (bus, car)	AlcUnits_sqrt	BingeAlc_Lg10	Cigarettes_ sqrt	Vaping_Sqrt
UnhealthyDiet	Pearson Correlation	1	-.098*	.058	.001	-.001	.164**	.037
	Sig. (2-tailed)		.012	.113	.988	.993	.000	.309
	N	766	660	737	763	226	766	764
WLTASscore	Pearson Correlation	-.098*	1	-.234**	.094*	-.161*	-.120**	.037
	Sig. (2-tailed)	.012		.000	.014	.027	.002	.343
	N	660	677	656	670	189	677	676
Travelled to work, to school, college or to the shops - Other (bus, car)	Pearson Correlation	.058	-.234**	1	-.040	-.035	.053	.096**
	Sig. (2-tailed)	.113	.000		.273	.611	.146	.008
	N	737	656	759	749	219	759	758
AlcUnits_sqrt	Pearson Correlation	.001	.094*	-.040	1	.609**	.143**	.090*
	Sig. (2-tailed)	.988	.014	.273		.000	.000	.012
	N	763	670	749	778	229	778	777
BingeAlc_Lg10	Pearson Correlation	-.001	-.161*	-.035	.609**	1	.143*	.179**
	Sig. (2-tailed)	.993	.027	.611	.000		.030	.007
	N	226	189	219	229	229	229	228

Cigarettes_sqrt	Pearson Correlation	.164**	-.120**	.053	.143**	.143*	1	.185**
	Sig. (2-tailed)	.000	.002	.146	.000	.030		.000
	N	766	677	759	778	229	789	787
Vaping_Sqrt	Pearson Correlation	.037	.037	.096**	.090*	.179**	.185**	1
	Sig. (2-tailed)	.309	.343	.008	.012	.007	.000	
	N	764	676	758	777	228	787	787

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

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