Leisure and subjective well-being

The moderating effect of personality traits

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Abstract

The main objective of this study was the investigation of the moderating effect of the Big-Five personality traits on the relationship between leisure and subjective well-being. Life satisfaction was used to proxy subjective well-being. The findings on the effect of leisure on subjective well-being are consistent with previous research: (1) leisure engagement has a positive effect on life satisfaction;(2) Regarding the leisure activities: watching TV, reading, holidays, sports and going out have positive effects on life satisfaction. Holidays have the greatest (positive) effect on life satisfaction. Internet usage however is found to have a detrimental effect on life satisfaction; (3) Certain personality traits benefit more from leisure activities than others: a high score on conscientiousness indicates less benefits from watching TV, reading, holidays, sports and outdoor activities; a high score on agreeableness indicates even less benefits from Internet and more from sports; high score on openness to experience indicates less benefits from reading, using Internet and outdoor activities; a high score in neuroticism indicates benefits from engaging in sports, holidays and from outdoor activities.

Contents

1. Introduction

How people allocate their time for leisure activities is part of their consumption patterns and it is not only vital for the leisure industry (Cotte & Ratneshwar, 2003), but it is also important in terms of an individual's subjective well-being, as it provides a way to satisfy needs (Brajša-Žganec, Merkaš, & Šverko, 2011). Subjective well-being is the conceptualization of the happiness construct consisting of the components overall satisfaction with one's life, positive affect and lack of negative affect (Diener, Emmons, Larson, & Griffin, 1985). It comprises several life domains that contribute to the overall life satisfaction of an individual. Leisure is one of those domains. Leisure is a form of an intentional activity individuals engage in such as sports, watching TV and traveling and is considered a form of self-expression (Dimanche & Samdahl, 1994). It is defined as the time spent on activities that are undertaken outside labour time (Newman, Tay, & Diener, 2014).

More and more studies on subjective well-being investigate the happiness that individuals attain from specific leisure activities they engage in and have found that engaging in leisure consumption has its effect on the leisure satisfaction and overall life satisfaction levels (Lu & Argyle, 1994; Brown & Frankel, 1993; Kuykendall, Tay, & Ng, 2015). The relationship between leisure consumption and subjective well-being is however ambiguous. The first reason for the ambiguous results is the variation in the activities that are captured as leisure. Empirical research on leisure consumption and happiness has found several associations. Some previous studies have noted a positive relationship between leisure consumption and happiness through higher levels of social engagement (Bailey & Fernando, 2012; Brajša-Žganec, Merkaš, & Šverko, 2011). Still, others have found that not all leisure activities are leading towards an increase in happiness levels. For example TV consumption does not lead to an increase in happiness (Frey, Benesch, & Strutzer, 2005) while practicing sports does increase it (Downward & Rasciute, 2011).

A second reason for the ambiguous results is that the effect might not be homogenous. That is, they do not hold for everyone in the same manner. An example of this is the findings on watching TV. Some studies have found a negative effect (Frey, Benesch, & Strutzer, 2005), while other studies have found a positive effect on the subjective well-being of individuals (Wei, Huang, Stodolska, & Yu, 2015). The observation that leisure activities have a dubious effect on happiness levels can be attributed to the fact that individuals might not derive the same satisfaction from their leisure activities which can be explained further by the different personalities of individuals that are found to be a major factor determining individual happiness levels (Lyubomirsky, Sheldon, & Schkade, 2005). Differences in personality make individuals prone to experience and enjoy leisure activities differently. Therefore, it is argued that leisure activities do not have a uniform effect on the subjective well-being of individuals (Nawijn & Veenhoven, 2013). There have been previous studies conducted on the relationship between consumption and the moderating effect of personality. Matz et al. (2016) have looked at consumption patterns of individuals and their subjective well-being and used the concept of psychological fit to explain this phenomenon and argued that personality differences are an important variable to explain happiness. They found that personality-matched consumption results in higher level of subjective well-being reporting. Soto & Luhmann (2013) have explored the moderating effect

of personality on the relationship between income and happiness. They concluded that personality traits moderated the effect of income on happiness.

Following the findings of previous studies and embracing the reasoning of Nawijn & Veenhoven (2013) who argue that a general inquiry into which leisure activities lead to higher subjective well-being should be replaced by the examination of the effects of leisure activities on different types of individuals, the research question is formulated as follows: *Which personalities seem to benefit more from specific leisure activities in terms of subjective well-being?* This is an important question, denoting the fact, as has been argued by behavioural economics, that humans do not know what is in their best interest (Becker, 2013). Governments are actively pursuing to influence the leisure patterns of individuals by promoting and making some leisure activities (e.g. sports, cultural consumption) more accessible (Wheatley & Bickerton, 2017). Determining the moderating effect of personality on the relationship between leisure consumption and subjective well-being is therefore an important step for tailoring messages and interventions to achieve maximum results.

The present study contributes to the existing literature by providing an explanation why leisure activities are having ambiguous effects on subjective well-being through the examination of the moderating effect of the personality traits of the Five Factor Model (FFM) model on the relationship between several leisure activities and self-reported happiness levels. The added value of adding all five personality traits allows for more insight into how different types benefit from different types of leisure. Hills & Argye (2001) have tested the social dimension of leisure and personality traits and considered only the traits extraversion and neuroticism. They have generally drawn conclusions on the amount of time spent on certain activities by happy extraverts/introverts. By incorporating all five traits this study therefore aims at finding out whether the generally accepted notion of personality-based leisure choice in happiness studies is a significant predictor of subjective well-being.

Previous studies have distinguished between types of leisure activities, such as active/passive and social/solitary (Wang & Wong, 2011; Hills & Argyle, 2001). This thesis distinguishes between indoor and outdoor activities and looks at specific leisure activities (e.g. watching TV, reading, Internet usage, holidays, and outdoor activities) to examine how they relate in terms of life satisfaction levels and the personalities that benefit from them. Using Dutch LISS data and ordinary least squares (OLS) regression analysis these effects are analysed.

In the remainder of the thesis, in section 2 previous studies will be reviewed and hypotheses will be formed. In section 3, the data and methodology will be presented. Section 4 reports the findings and in section 5 discusses the results and section 6 concludes.

2. Literature Review

2.1 Subjective well-being and its determinants

Happiness or subjective well-being is an important goal for individuals and an important field of study, as it has spill-over effects on several life domains of individuals and on economic outcomes (Diener & Seligman, 2004). The importance of the concept of subjective well-being has been explored extensively in areas related to health. Happy people are for example found healthier (Pettit, Kline, Gencoz, Gencoz, & Joiner, 2001) and live a longer life (Frey B. , 2011). Happiness or subjective well-being is defined as the subjective evaluation of how life is going for an individual (Richard & Diener, 2009). The word happiness is used interchangeably with the words subjective well-being and life satisfaction. While life satisfaction is used to evaluate the general appraisal of an individual's overall life, subjective well-being also comprises positive and negative moods (Veenhoven, 1997). In general the concept of subjective well-being embodies a cognitive and an affective dimension. The cognitive component relates to how satisfied people are with their lives and is called life satisfaction, the affective component on the other hand measures how often people feel positive and negative emotions. Subjective well-being is then defined according to Diener et al. (1985) by a high life satisfaction level, high positive affect, and low negative affect.

There are several ways to measure subjective well-being. Kahnemann & Krueger (2006) argue for the measurement of moods at the moment they occur, which they call experienced utility. In surveys covering a large amount of respondents however, the happiness metrics is usually based on a single question related to the subjective evaluation of an individual's overall happiness (Nawijn & Veenhoven, 2013; Veenhoven, 1997), which is the equivalent of Kahnemann & Krueger's remembered utility. While the (subjective) happiness metric, that is subjective well-being as being evaluated by individuals themselves, is not prone from distortion and the reliability and validity is doubted, it is still widely used and accepted in academic research focused on happiness, since happiness cannot be inferred from behaviour (Veenhoven, 1997; Easterlin, 2003; Veenhoven, 2002).

Previous studies that have looked at the relationship between leisure consumption and happiness have also made use of the subjective happiness metric (Sirgy, Kruger, Lee, & Yu, 2011; Benesch, Frey, & Stutzer, 2007). What comes forward from these studies is that leisure activities have different effects on people. These differences in happiness levels can be attributed to several factors; such as the circumstances they find themselves in, the actions they have undertaken themselves, and the different capabilities that individuals are endowed with (Diener, 1984; Lyubomirsky, Sheldon, & Schkade, 2005).

Life circumstances are factors that are argued to have the greatest potential for increasing happiness, as individuals and societies can influence them directly (Easterlin, 2003). These include demographic factors and job, income, health variables. Increased happiness levels resulting from life circumstances are nevertheless not lasting in the sense of increasing happiness beyond the set point, because of hedonic adaptation (Lyubomirsky, Sheldon, & Schkade, 2005). Hedonic adaptation refers to the occurrence that individuals adapt to changes in life circumstances, and that these changes therefore only temporarily affect subjective well-being (Kahnemann & Krueger, 2006).

Factors that do have a lasting impact on the happiness level are intentional activities and capabilities. Lyubomirsky et al. (2005) define intentional activities as deliberate (habitual) actions undertaken by individuals that encompass variation in the execution of the activities and therefore hamper hedonic adaptation. Leisure activities fit in this category.

Capabilities, on the other hand reflect genetic factors and personality, which have been considered an important factor in happiness studies (Weiss, Bates, & Luciano, 2008; Lykken & Tellegen, 1996). It is identified in the set point theory of happiness positing that any increase in happiness is transitory, and will return to the initial level influenced by genetic factors (Fujita & Diener, 2005).

In the next sub-section previous research on the relationship between several leisure activities - assumed as intentional activities – and subjective well-being will be described, followed by a review on the literature related to personality traits that reflect the capability factor.

2.2 Leisure and subjective well-being

Individuals have to choose how to allocate their time between work and leisure. Stebbins (2005, p. 350) defines leisure as: "*uncoerced activity undertaken during free time where such activity is something people want to do and, at a personally satisfying level using their abilities and resources, they succeed in doing*". Leisure therefore consists of activities that people engage in in their free time and is measured by the diverse leisure activities an individual engages in, the time they spent in these activities or frequency that people assign to leisure activities (Kuykendall, Tay, & Ng, 2015).

Newman et al. (2014) describe five psychological mechanisms that serve as mediating factors between leisure and subjective well-being. Through the detachment/recovery mechanism leisure activities help individuals to distance themselves from work and life issues and are therefore argued to indirectly affecting subjective well-being. The autonomy mechanism is related to intrinsic and autonomous motivation reflecting the free choice in leisure that leads to greater subjective well-being. Kuykendall et al. (2015) also support the effect of this mechanism with their findings that intrinsic motivation and perceived freedom (i.e. autonomy) determine the influence of leisure engagement on subjective well-being. Challenging and skill-based leisure activities that require commitment result in higher subjective well-being through the mastery mechanism. Leisure activities that produce meaning in people's lives are also argued to increase subjective well-being. Social leisure activities that involve other people and social networks result in higher subjective well-being through the affiliate mechanism. Consistent with other research (Leung & Lee, 2005), Newman et al. (2014) conclude that affiliation might have the strongest predicting power of subjective well-being.

In accordance with the affiliation mechanism, Hills et al. (2000) found that social motivation - that is leisure activities involving friends and fulfilment of social needs - correlate with leisure enjoyment in activities that are undertaken with other people. Furthermore, they found that paratelic activities (pursued just for fun, no goals involved) were found more enjoyable. Brajša-Žganec et al. (2011) have looked at which leisure activities contribute more to subjective well-being. They found that leisure engagement has an enhancing effect on subjective well-being, however the type of leisure activities

that have a higher contribution to subjective well-being is found to differ according to age and gender. Brown et al. (2015) and Wheatley & Bickerton (2017) have both found that frequent engagement in leisure, especially in sports leads to higher subjective well-being. Ateca-Armstrong et al. (2014) have found that in general leisure consumption increases the subjective well-being of individuals compared to individuals who do not consume leisure at all. Overall, leisure engagement is expected to contribute to subjective well-being, as it is an activity under personal control (Brown, MacDonald, & Mitchell, 2015). Therefore, in line with the literature, the first hypothesis is:

Hypothesis 1: Engagement in leisure activities is positively related to subjective well-being.

2.3 Specific leisure activities and subjective well-being

Investigating the effect of leisure engagement on subjective well-being provides an overview on the overall effect of leisure. Leisure however comprises several activities that when investigated separately specify the effect of leisure on subjective well-being. In previous studies leisure has been classified differently according to the research topic. Some authors looked at project-based leisure and routine leisure (Bailey & Fernando, 2012), others have taken the range between active and passive activities (Wei, Huang, Stodolska, & Yu, 2015). Some other authors have divided leisure activities under more than two categories. Hills et al. (2000) for example have used six clusters: active/demanding, social, relaxing, hobbies, serious/solitary and serious/social. In this thesis the activities are divided as indoor (i.e. watching TV, reading, Internet usage) and outdoor (i.e. holidays, sports, visiting museum/theatre).

2.3.1 Indoor activities

Watching TV is considered the most important leisure activity in the world and the role it plays for individuals is increasing its importance (Bruni & Stanca, 2008; Frey, Benesch, & Strutzer, 2005). Its effect on the subjective well-being of individuals however is ambiguous. Wei et al. (2015) have looked at leisure time and activities and the effect on happiness, and found that people engaged in passive leisure activities are happier, while active leisure activities have no effect on the happiness levels. This finding can be explained through the detachment/recovery mechanism, as people engaged in high demanding work may need healing time through low-arousal activities, such as watching TV (Newman, Tay, & Diener, 2014). On the other hand, Frey et al. (2005) have found that TV consumption does not lead to an increase in happiness. The negative effect of watching TV is related to self-control problems that encourage individuals to continue watching TV especially in the case of people for whom the opportunity costs of time are higher. Bruni & Stanca (2008) also found a negative relationship between watching TV and happiness through its detrimental effect on relational goods consumption, which is found to increase happiness. Both studies also found that spending long hours on watching TV leads to higher material objectives and therefore lower subjective well-being. Ateca-Armstrong et al. (2014) found that passive leisure consumption such as watching TV and reading books have lower effect on self-reported happiness levels compared to active engagement in cultural consumption such as visiting museums or movies. Csikszentmihalyi & Wong (2014) also support this

finding. They compared Italian and American high school students and found that watching TV has a negative effect on self-reported happiness, while exercising has a positive effect. Based on these findings, it can be argued that watching TV has a detrimental effect on subjective well-being.

Another activity that through its low-arousal characteristic fits into the detachment/recovery mechanism is reading. And similar to watching TV, the relationship between reading and subjective well-being show ambiguous results. Reading books (Wang & Wong, 2011) and reading newspapers (Frey, Benesch, & Strutzer, 2005) are found to increase subjective well-being. Ataca-Armstrong et al. (2014) however have found that passive leisure consumption such as reading books have lower effect on self-reported happiness levels compared to active engagement in cultural consumption such as visiting museums. The lack of social interaction is argued to result in the negative association of reading with subjective well-being, since reading is an activity usually conducted alone (Brown, MacDonald, & Mitchell, 2015). Therefore, reading is assumed to decrease subjective well-being.

A fairly new leisure activity is the use of Internet. The social side of Internet in which individuals can receive emotional support and advice has been found a major enhancing determinant of subjective well-being (Leung & Lee, 2005). Valenzuela et al. (2009) have found that the use of Facebook has a positive relationship with life satisfaction and social capital. The use of social networking sites is associated with social capital that is simply the extent of a network of contacts. Larger social capital allows for deepening bonds, which have positive effects on life satisfaction. The positive effect on well-being is also found in the enhancement of self-esteem through positive feedback received online (Valkenburg, Peter, & Schouten, 2006). Next to the positive effect of the social side of Internet usage, it also has negative effects on subjective well-being through engagement in activities that are malicious (Mitchell, Lebow, Uribe, Grathouse, & Shoger, 2011). Overall, the effect on subjective well-being depends on what kind of activities people perform while using the Internet. Active forms of Internet usage that involves social interaction are found to increase subjective well-being if conducted with real-life friends (Leung & Lee, 2005). The increasing popularity of Internet has prompted scholars to investigate it with respect to the possible decrease in time allotted to other types of leisure (Anderson & Tracey, 2001). Nie & Hillygus (2002) argue that Internet usage at home is indeed detrimental towards social activities that individuals engage in. Therefore, the overall effect of using Internet is hypothesized to be negative on subjective well-being.

Based on previous studies described above related to the activities watching TV, reading and Internet usage the following hypothesis is formed:

Hypothesis 2: Indoor activities (i.e. watching TV, reading, Internet usage) are negatively related to subjective well-being

2.3.2 Outdoor activities

Another activity that induces detachment/recovery, but does not confine individuals indoors is traveling. In some studies travel experiences have shown a positive impact on the life satisfaction of travellers (Neal, Sirgy, & Uysal, 1999), while in others negative connotations with travel experiences related to leisure sickness are found (Vingerhoets, Van Huijgevoort, & Van Heck, 2002). Previous studies on vacationing and subjective well-being have focused on the difference between pre- and

post-trip levels of happiness. Gilbert & Abdullah (2004) and Nawijn et al. (2010) have both researched whether vacationers are happier than non-vacationers. In the study of Gilbert & Abdullah (2004) vacationers were found happier before and after the vacation. Sirgy et al. (2011) found similar results as Gilbert & Abdullah (2004) that vacations affect life satisfaction positively and showed how this effect took place by examining the spill-over effect of subjective well-being in travel experiences that influences the overall subjective well-being through different life domains. Nawijn et al. (2010) on the other hand found that happiness is more heavily experienced among vacationers compared to non-vacationers only before the trip has taken place and that the duration of the vacation has no effect on the happiness level. They suggest that having several short trips throughout the year induces higher happiness levels rather than one long trip. This is in stark contrast with the study conducted by Neal et al. (2007) who suggest that a long trip indicates a higher leisure satisfaction, and ultimately a higher overall life satisfaction. Overall these studies suggest that holidays have an enhancing effect on subjective well-being, therefore also in this study holidays are expected to have a positive effect on subjective well-being.

Another form of leisure that is considered as an outdoor activity and requires skills that induce strong commitment and lead to higher subjective well-being through the mastery and meaning mechanisms, is the practice of sports (Newman, Tay, & Diener, 2014). Physical activity is strongly encouraged by governments because of its positive effect on improving health and countering obesity (Downward & Rasciute, 2011; Huang & Humphreys, 2012). Engaging in sports also improves psychological well-being of individuals through increased self-esteem (Molina-García, Castillo, & Queralt, 2011) and social interactions (Brown, MacDonald, & Mitchell, 2015). Huang & Humphreys (2012) argue that the existence of more sports facilities increases participation in physical activities and results in a higher self-reported happiness. Giacobbi et al. (2005) found that exercising leads to an increase in positive mood and a decrease in negative mood, while the moderating effect of personality is negligible. Dolan & et al. (2014), Shin & You (2013) and Csikszentmihalyi & Wong (2014) have found that physical activities increase subjective well-being for both males and females. These studies suggest that sports have a positive effect on subjective well-being.

Finally, going out, dining out, visiting cinema, museums and live performances are also considered as outdoor activities in this thesis. Spending time outdoors for at least twenty minutes is found to enhance subjective well-being (Bailey & Fernando, 2012). Next to this general finding, more specifically the therapeutic effect of cinema attendance leads to a decrease in anxiety or depression in the sense that it permits experiencing emotions in an unrestricted but controlled way. It allows for self-expression, albeit as an enriched experience shared with strangers and is considered a highly accessible form of art (Uhrig, 2005). Uhrig (2005) has found frequent cinema attendance to increase subjective well-being. He has also found that cinema attendance is correlated with dining out and attending live performances and that these activities also increase subjective well-being. Other studies have not found this positive association (Wang & Wong, 2011; Brown, MacDonald, & Mitchell, 2015). Brown et al. (2015) argue that it might be related to the fact that cinema and theatre attendance does not incorporate interaction, which is needed for social contact that subsequently leads to a higher subjective well-being. They do however recognize the positive association these activities might have on the affective dimension of subjective well-being. Furthermore, Brown et al. (2015), who have examined the contribution of sports and cultural leisure activities on subjective well-being compared to other activities, have also found that visiting museums/galleries, theatres and popular

entertainment do not have a positive relationship with subjective well-being. Wheatley et al. (2017) who have also examined the contribution of sports and cultural activities on subjective well-being on the other hand have found a positive association of visiting museums, visiting cinema on subjective well-being. They note that this association is not dependant on the frequency of these visits in the case of visiting cinema, and in the case of visiting museum that less frequent visits result in higher subjective well-being. Ataca-Armstrong et al. (2014) have examined different types of leisure activities and their effect on subjective well-being, with as results that cultural consumption such as visiting museums lead to a stronger positive relationship with subjective well-being compared to other activities. Therefore, the last hypothesis is:

Hypothesis 3: Outdoor activities (i.e. traveling, sports, visiting cinema/museum) are positively related to subjective well-being

2.3 Personality

Some studies have found that differences in the relationship between leisure consumption and overall subjective well-being is influenced by personality differences. Personality is defined as the enduring and consistent patterns of thoughts and actions that are particular to each individual (McCrae, et al., 2000). The Five Factor Model (FFM) is used to map out individuals' personality traits and categorizes according to the following five traits: Extraversion (E; i.e. tendency to experience positive emotionality), Conscientiousness (C; i.e. tendency to be organized), Openness to experience (O; i.e. tendency to be imaginative), Agreeableness (A; i.e. tendency to be helpful) and Neuroticism (N; i.e. tendency to experience distress) (McCrae & John, 1992).

These traits have been found to predict important behaviours and studies have focused on the interplay between personality and the choice for leisure activities. Some studies for example have not found any effect of neuroticism on leisure participation (Lu & Hu, 2005). Others have found that neurotic people prefer passive hobbies rather than sports that require active engagement, which is preferred by extraverts (Lu & Argyle, 1994). Barnett (2006) has additionally found that people scoring low in neuroticism and conscientiousness participate more in physical activities. Matz et al. (2016) however have found that people scoring high on conscientiousness spend more money on health and fitness. This finding is also supported by Jopp & Hertzog (2010) who have discovered that people scoring high on conscientiousness participate more in sports. Given that people scoring high on conscientiousness are characterized by discipline and organize their actions, Matz et al. and Jopp & Hertzog's findings are more plausible. Jopp & Hertzog (2010) have distinguished between physical and social leisure activities and found that agreeableness, openness to experience and conscientiousness had effects on the choice for the type of leisure activity. Physical activities were less chosen by people who scored high on agreeableness, while watching TV had a positive relationship with the agreeableness trait. Openness to experience on the other hand resulted in less TV watching. Extraverted people were found to be engaged in more social activities and traveling. People scoring high on conscientiousness were engaged both in physical activities and TV watching.

Personality however not only influences the choice of leisure activities, but also its effect on the overall happiness level, as extraverted people are predestined to be happier than introverted people (Hayes & Joseph, 2003), and happier people score high on the agreeableness trait (Diener & Seligman, 2002). Studies have shown the moderating effect of personality traits on the direction of the relationship between (leisure) consumption and happiness. Matz et al. (2016) for example have examined whether people spend more money on products that match their personality, then they tested whether the personality-consumption matched individuals also report higher subjective well-being. They found that this was indeed the case.

This brings up the question which personalities benefit more from which type of leisure? Based on the reviewed literature and the earlier presented hypotheses, the following hypotheses are formed with respect to the moderating effect of personality:

Hypothesis 4a: Extraversion moderates the negative relationship between indoor activities and subjective well-being positively

Hypothesis 4b: Extraversion moderates the positive relationship between outdoor activities and subjective well-being positively

Hypothesis 5a: Openness to experience moderates the negative relationship between indoor activities and subjective well-being positively

Hypothesis 5b: Openness to experience moderates the positive relationship between outdoor activities and subjective well-being positively

Hypothesis 6a: Agreeableness moderates the negative relationship between indoor activities and subjective well-being negatively

Hypothesis 6b: Agreeableness moderates the positive relationship between outdoor activities and subjective well-being negatively

Hypothesis 7a: Conscientiousness moderates the negative relationship between indoor activities and subjective well-being negatively

Hypothesis 7b: Conscientiousness moderates the positive relationship between outdoor activities and subjective well-being positively

Hypothesis 8a: Neuroticism moderates the negative relationship between indoor activities and subjective well-being negatively

Hypothesis 8b: Neuroticism moderates the positive relationship between outdoor activities and subjective well-being negatively

3. Data and Methods

This chapter provides an overview on the data and methods that are used in this thesis. First, the data and variables will be briefly described. Then, the statistical model will be defined.

3.1 Data

The data used in this thesis is from LISS Panel Data that makes part of the MESS Project and comprises 4,500 households that cover 7,000 individuals. It is an internet-based survey conducted on a true probability sample of Dutch households since 2007. The LISS Panel consists of a Core Study that is a longitudinal study conducted every year to track changes, apart from that it also covers other research-related data collections. The Core Study has in total 8 waves (from 2008 to 2015). The variables used in these study are all covered in the Core Study (Study 4: Social integration and Leisure; Study 7: Personality) This thesis is using data of wave 5 (year 2012). The dataset used in this thesis is cross-sectional, because of the unbalanced panel data structure of LISS panel data.

The personality study incorporates the concepts life satisfaction and the Big-Five personality traits. The response rate for this study is 79,6%. The response rate for the social integration and leisure study is 65.3%.

3.2 Variables

Dependent variable

The dependent variable in this study is subjective well-being. LISS has several questions formulated that ask for the subject's self-reported life satisfaction, including a general one: *"How satisfied are you with the life you lead at the moment?"* For happiness LISS has one general question: *"On the whole, how happy would you say you are?"* Subjects can then choose from 0 to 10. Higher total score relates to a higher level of happiness or life satisfaction. Furthermore, there are also five questions of the SWLS questionnaire that respondents can fill in to evaluate their satisfaction with life. This thesis takes life satisfaction as a proxy for subjective well-being as Veenhoven (1997) argues global life satisfaction gets close in reflecting subjective well-being. In this dataset, 35.91% of the people have reported an 8 (out of 10) for the life satisfaction measure.

Independent variable

The main independent variable is leisure. It consists of 6 items as presented in table 1. Individuals are asked to report how many days in a week they spend engaging in these activities, and then they are also asked how many hours they spend on those days on these activities. Based on these two variables, the average amount of hours spent per week on these activities is calculated. For holidays

the question is based on the average number of holidays spent in the last year, both in the Netherlands and abroad.

Table 1 – List of leisure activities

Sports: average number of hours spent on sports per week

Going out: average number of hours spent on going out, theatre, cinema etc. per week

Holidays: average number of holidays spent in the last year

Watching TV: average number of hours spent on watching TV per week

Reading: average number of hours spent on reading per week

Internet: average number of hours spent on the Internet per week from: home

In order to test hypothesis 1, an index is created indicating the average time spent in the above-mentioned activities. As a robustness test, the variables are classified into low (up to 50%) medium (50%-75%) and high involvement (>75%). For hypotheses 2 and 3 two separate indexes are created for the indoor and outdoor activities. It is important to note that a huge limitation of the created indexes is the inclusion of the variable holidays that has a different measurement compared to the other variables. These indexes do however serve as robustness checks for the overall effect of leisure activities in general, and are followed by estimations conducted on the included variables separately.

The distributions of the variables are presented in table 2.

Table 2 – Distribution of the variables

Variable	Low involvement	Medium involvement	High involvement
TV	<14	14-21	>21
Reading	0	0-3	>3
Internet	<3	3-8	>8
Holidays	<4	4-5	>5
Sports	<1	1-3	>3
Out	0	0-2	>2
Average of all	<5.33	5.33-7.17	>7.17

Next to the indexes (indoor, outdoor) for hypotheses 2-3, activities that are classified under indoor and outdoor activities are regressed separately, and then all leisure activities are added simultaneously in the regression. In order to test hypotheses 4 - 8 all leisure activities are regressed separately in order to analyse the moderating effect of personality.

Moderating variable

The moderating variable is in this thesis personality. LISS asks 50 questions in total (10 questions for each trait) to determine the personality traits of the respondents based on Goldberg (1992). Subjects can respond with the following answers "1=very inaccurate, 2=moderately inaccurate, 3=neither inaccurate nor accurate, 4=moderately accurate, 5=very accurate". For each trait the scoring follows from adding up the answers of respondents to the regular questions associated with the big five traits and the reversed questions. The maximum score an individual can get from each trait is 50. The measures are internally consistent (Extraversion (α=0.87), Agreeableness (α=0.78), Conscientiousness (α=0.78), Neuroticism (α=0.88), Openness to experience (α=0.76). In this thesis the scoring for the trait emotional stability as labelled by Goldberg, is replaced by neuroticism through reversing the scores of the questions. Furthermore, the traits *surgency* and *intellect* are renamed *extraversion* and *openness to experience* respectively in order to have consistent expressions throughout the thesis and to safeguard clear interpretations of the results. These expressions are also used by previous research (Matz, Gladstone, & Stillwell, 2016; Jopp & Hertzog, 2010).

In order to have easier interpretation of the results, the traits are dichotomized into low and high values around the median. The distribution of the variables is presented in the following table:

Table 3 – Distribution of the personality traits

Personality traits	Low	High
Extraversion	13-32	33-50
Openness to Experience	17-34	35-50
Agreeableness	20-38	39-50
Conscientiousness	19-36	37-50
Neuroticism	10-25	26-50

Control variables

In order to test the robustness of the relation between leisure and subjective well-being, some variables are controlled for that have been found to influence subjective well-being in previous research. These variables are income, age, gender, marital status, and level of education (Diener, 1984). Table 4 provides description on the control variables.

Table 4 – Description of the control variables

Variable	Description
Gender	Dummy variable with female=1, male=0
Age	Continuous variable
Net household income (in euros)	Continuous variable indicating the imputed net monthly income of all household members combined
Level of Education (in CBS categories)	Categorical variable consisting of 6 categories: "primary school", "intermediate secondary education", "higher secondary education", "intermediate vocational education", "higher vocational education" and "university"
Marital status	Categorical variable; consisting of 5 categories: "married", "separated", "divorced", "widow or widower", "never been married"

In the dataset 46.17% are males and 53.83% females. The minimum age in the dataset is 15 years, while the maximum is 90 years. The average age is 44.3 years. The average net household income in the dataset is €3,282.83 with as maximum amount €3,800. 24.82% of the respondents have indicated to have an intermediate secondary education level and only 9.04% of the respondents have indicated to have a University level of education. 53.43% of the individuals are married, while 35.77% of the individuals have never been married.

3.3 Methodology

Many studies assessing the effect of leisure on subjective well-being have used probit or logit models (Wei, Huang, Stodolska, & Yu, 2015; Wang & Wong, 2011; Brown, MacDonald, & Mitchell, 2015), because the dependent variable is ordinal. This is also the case in this study, as the variable life satisfaction is an ordinal variable. It is however argued that ordinal variables can be treated as continuous variables to make interpretations simpler (Pasta, 2009). Furthermore, the results derived from ordinal and cardinal models (i.e. ordinary least squares regression; OLS) in the analysis of subjective well-being studies demonstrate similar results. Therefore, it is argued that both can be used (Ferrer-i-Carbonell & Frijters, 2004). Embracing this notion, this thesis applies OLS regressions. Treating an ordinal variable as continuous is according to Rhemtulla et al. (2012) only possible if the ordinal variable has at least five categories. In this case, the life satisfaction variable can be used, since it has at least five categories. Additionally, homoskedacity or the constant variance of the error term has to be met (Wooldridge, 2013). To correct for heteroskedacity, which results in biased results of the standard error, robust standard errors are used.

3.4 Empirical models

Following Wei et al. (2015) the following estimation equation is used to test the hypotheses:

(1) $LS_i = \beta L_i + \gamma Z_i + \varepsilon_i$

Where:

LS_i= the life satisfaction score for individual i
L_i= Indicates whether individual i engages in leisure activity and the specific activity
Z_i = vector of socio-demographic control variables influencing subjective well-being of individual i

β= coefficient on leisure engagement
γ= vector of coefficients on the control variables
ε = error term

For hypothesis 1 the empirical model is specified as:

$ls_i = \alpha + \beta_1 leisure\text{-}e_i + \gamma_1 gender_i + \gamma_2 age_i + \gamma_3 income_i + \gamma_4 education_i + \gamma_5 marital\ status_i + \varepsilon_i$

Where leisure-e_i is an index variable denoting the average time an individual engages in leisure activities. It is measured by the average amount of hours spent on leisure per week.

In order to test the relation with personality variables, the second step of the regression includes the personality traits as control variables in the model:

$ls_i = \alpha + \beta_1 leisure\text{-}e_i + \gamma_1 gender_i + \gamma_2 age_i + \gamma_3 income_i + \gamma_4 education_i + \gamma_5 marital\ status_i + \gamma_6 Big\text{-}Five + \varepsilon_i$

The following empirical model tests hypotheses 2 and 3:

$ls_i = \alpha + \beta_1 leisure\text{-}a_i + \gamma_1 gender_i + \gamma_2 age_i + \gamma_3 income_i + \gamma_4 education_i + \gamma_5 marital\ status_i + \varepsilon_i$

where leisure-a_i is the variable referring to the index/specific leisure activities. This model is regressed one by one for each index/activity.

Lastly, the empirical model below tests for the last hypotheses (4-8) that embed the moderating effect of personality:

$ls_i = \alpha + \beta_1 leisure\text{-}a_i + \beta_2 Big\text{-}Five_i + \beta_3\{leisure\text{-}a_i \times Big\text{-}Five_i\} + \gamma_1 gender_i + \gamma_2 age_i + \gamma_3 income_i + \gamma_4 education_i + \gamma_5 marital\ status_i + \varepsilon_i$

Where: {leisure-a_i x Big-Five$_i$} is the interaction term

For each activity the personality traits will be estimated separately first and then the estimation will also be conducted with all personality interactions included in the model.

The main relationship between the dependent, independent and moderating variables and the earlier formed hypotheses are graphically represented in the following figure:

Figure 1 – Conceptual model
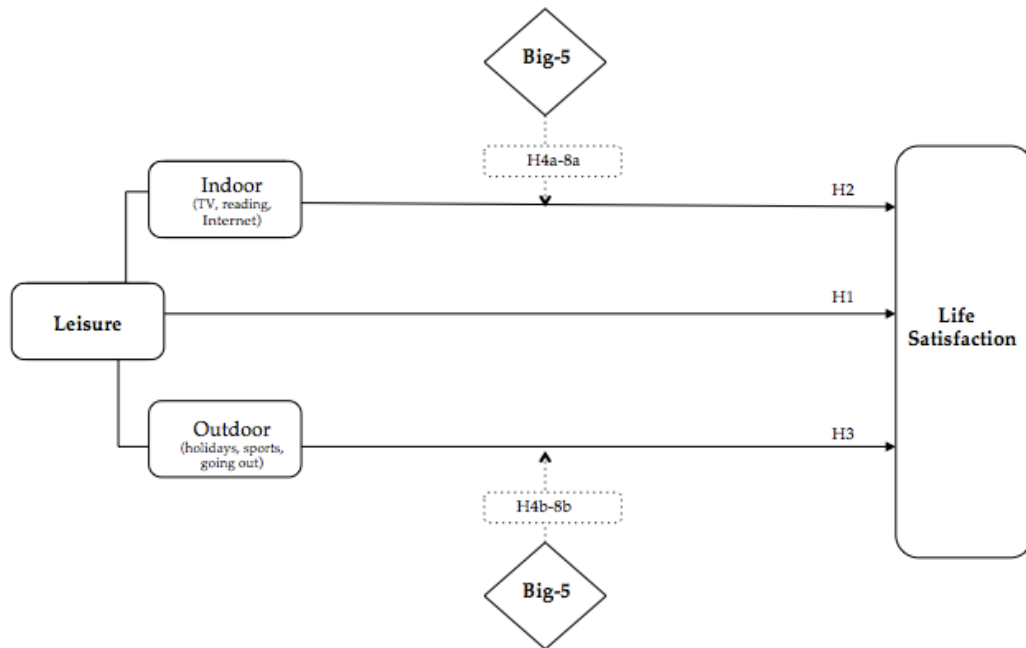
4. Results

This chapter provides the findings on the hypotheses. The first sub-sections consist of the description statistics of the data and the correlational matrix of the variables. In the sub-sections that follow the results of the regression analyses are presented.

4.1 Descriptive statistics

The dataset used in this thesis comprises observations on leisure, subjective well-being, personality, and socio-demographic variables for the year 2012 (wave 5) of LISS Panel Data. Table 5 provides an overview of the summary statistics of the relevant variables. There are in total 3,771 observations in the dataset.

Table 5 – summary statistics

Variable	Observations	Mean	Std.Dev.	Min	Max
Life satisfaction	3,771	7.484487	1.394936	0	10
Sports	3,771	2.038531	2.920459	0	24
Holidays	3,771	3.92628	2.507998	0	12
TV	3,771	15.79411	15.92755	0	168
Reading	3,771	2.756298	5.690679	0	77
Out	3,771	1.418722	3.002909	0	28
Internet	3,771	6.302174	9.2277	0	168
Extraversion	3,771	33.02042	6.705899	13	50
Agreeableness	3,771	38.70034	4.834535	20	50
Conscientiousness	3,771	36.75656	5.419156	19	50
Neuroticism	3,771	25.92363	6.825992	10	50
Openness	3,771	34.9642	5.019542	17	50
Gender	3,771	1.538319	.4985956	1	2
Age	3,771	44.28984	17.2478	15	90
Income	3,771	3282.827	5534.934	0	139744
Education	3,771	3.459029	1.539267	1	6
Marital status	3,771	2.673827	1.869822	1	5

The construct that is used in this thesis to proxy subjective well-being, life satisfaction has a mean close to it 7.48, which indicates that individuals are on average satisfied with their lives. Looking at the leisure data, individuals in the dataset spend on average 2.04 hours a week on sports, 15.79 hours a week on watching TV, 2.77 hours a week on reading, 1.42 hours a week on outdoor activities and 6.30 hours a week on using Internet from their homes. Furthermore, they go on average 3.93 times a year on holidays.

4.2 Correlations

Table 6 provides the correlations between life satisfaction, leisure activities and the personality traits. Overall the correlations of the variables with life satisfaction are all significant and positive, except for Internet usage and the trait neuroticism. Internet usage and neuroticism have both a negative correlation with life satisfaction (p-value<0.1). Furthermore, the trait neuroticism shows the strongest, albeit negative correlation with life satisfaction. Among the activities the highest positive correlation with life satisfaction is for holidays, followed by sports. The correlation between the independent variables seems not high, which indicates that multicollinearity is not present. The full correlation matrix can be found in Appendix A.

Table 6 – Correlation matrix

	LS	Sports	Holiday	TV	Reading	Going out	Internet	E	A	C	N	O
LS	1											
Sports	0.132***	1										
Holiday	0.181***	0.288***	1									
TV	0.0425**	0.119***	0.233***	1								
Reading	0.0653***	0.0691***	0.193***	0.106***	1							
Out	0.0673***	0.272***	0.249***	0.0439**	0.0718***	1						
Internet	-0.0373*	0.0711***	0.219***	0.124***	0.0707***	0.177***	1					
E	0.153***	0.0584***	-0.0105	-0.0183	0.00836	0.139***	0.00271	1				
A	0.111***	0.0366*	0.0475**	-0.00738	0.0910***	0.0600***	-0.0516**	0.346***	1			
C	0.149***	0.0477**	0.132***	0.0564***	0.0749***	-0.0606***	-0.0654***	0.0650***	0.246***	1		
N	-0.367***	-0.0860***	-0.0985***	-0.00354	-0.0815***	-0.00980	0.0326*	-0.218***	-0.0666***	-0.209***	1	
O	0.00949	0.0221	0.0249	-0.116***	0.0737***	0.0314	0.0837***	0.369***	0.216***	0.225***	-0.191***	1

* p<0.05, ** p<0.01, *** p<0.001

4.3 Regression results

4.3.1 Leisure engagement and life satisfaction

In this sub-section the results of the regression analyses are presented. In order to test the first hypothesis, which states that leisure engagement is positively related to subjective well-being, life satisfaction as the dependent variable is first regressed against the independent variable leisure engagement, which is an index variable created out of all leisure activities in the dataset indicating the average time spent on these activities. In the second step, the regression is extended by the specification of leisure involvement (low involvement as reference category). Lastly, personality variables are added into the extended regression. The results are shown in table 7.

The coefficient of leisure involvement indicates a positive relationship between leisure engagement and life satisfaction (column 1). From the table it can further be inferred that individuals that engage in one hour of leisure report 0.1029 times higher life satisfaction than people who do not, ceteris paribus (p-value< 0.01). This is consistent with previous findings (Ateca-Amestoy, Gerstenbluth, Mussio, & Rossi, 2014). The involvement degree of leisure (column 2) shows that individuals having a medium involvement report 0.2525 times higher life satisfaction than individuals having a low involvement in leisure. Individuals that are highly involved in leisure activities report 0.1729 times higher life satisfaction than the lowly involved individuals. All these effects are significant (p-value <0.01). Addition of personality variables to the regression in column 3 does not have an effect on the significance of the leisure involvement variable. It remains positive and highly significant.

When looking at the control variables, one can see that females are less satisfied with their lives then their male counterparts. After adding personality variables as controls, this result changes in females being more satisfied than males. Women are in general found to have higher life satisfaction then men. Related to their social roles, females are more open to express their inner feelings (Wood, Rhodes, & Whelan, 1989). The results in all three regressions are however insignificant. Ageing is found to encourage more positive feelings and emotional stability (Carstensen, et al., 2011). A 1-year increase in age increases life satisfaction in the first two regressions, but after including personality variables, this effect changes and becomes negative. The effect of age on life satisfaction is however similar to the effect of gender not significant. The categories under the variable marital status show a negative relationship with life satisfaction and indicate that individuals who are a widow/widower, separated, divorced, or have not been married before are less satisfied with their lives than individuals who are married (the reference category). This effect is significant for all categories (p-value<0.05). This is consistent with earlier research arguing that marriage has a positive effect on life satisfaction (Frijters, Haisken-DeNew, & Shields, 2004). Income is positively associated with life satisfaction and the effect is significant (p-value<0.01). Regarding the personality traits, except for openness to experience and neuroticism all traits have a positive and significant effect on life satisfaction.

Table 7 – Regression A

Life satisfaction	N= 3,771 F(13, 3757)= 23.60 R-squared= 0.0599 (1)	N= 3,771 F(14, 3756)= 22.47 R-squared= 0.0625 (2)	N= 3,771 F(19, 3751)= 45,90 R-squared= 0.2044 (3)
Leisure involvement	0.1029*** (0.0277)		
Medium involvement		0.2525*** (0.0529)	0.2194*** (0.0502)
High involvement		0.1729*** (0.0561)	0.1672*** (0.0512)
Gender			
Female	-0.0500 (0.0444)	-0.0475 (0.0445)	0.0215 (0.0433)
Age	0.0014 (0.0017)	0.0013 (0.0017)	-0.0020 (0.0016)
Marital Status			
Separated	-1.5944*** (0.1691)	-1.6089*** (0.1818)	-1.5526*** (0.2075)
Divorced	-0.7348*** (0.1138)	-0.7300*** (0.1139)	-0.7243*** (0.1073)
Widow or widower	-0.7800*** (0.1563)	-0.7602*** (0.1550)	-0.7767*** (0.1455)
Never been married	-0.4753*** (0.0585)	0.4774*** (0.0583)	-0.3878*** (0.0527)
Income	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
Education			
Intermediate secondary education	-0.2656*** (0.0984)	-0.2734*** (0.0981)	-0.3209*** (0.0913)
Higher secondary education	-0.3132*** (0.1051)	-0.3256*** (0.1048)	-0.2417** (0.0950)
Intermediate vocational education	-0.0641 (0.0922)	-0.0842 (0.0922)	-0.1633* (0.0844)

Higher vocational education	-0.0313 (0.0915)	-0.0462 (0.0912)	-0.1454* (0.0840)
University	0.0749 (0.0990)	0.0650 (0.0989)	-0.0673 (0.0905)
Extraversion			0.0191*** (0.0035)
Openness to experience			-0.0317*** (0.0055)
Agreeableness			0.0201*** (0.0049)
Conscientiousness			0.0166*** (0.0040)
Neuroticism			-0.0694*** (0.0033)
Constant	7.5927*** (0.1266)	7.6798*** (0.1179)	8.7244*** (0.2807)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model including only leisure engagement and control variables; (2) Model 1 extended with leisure involvement classifications; (3) Model 2 extended with personality control variables

4.3.2 Leisure activities and life satisfaction

Hypotheses 2 and 3 were formed to test for the main effect of specific leisure activities. The results for these regressions are presented below in table 8. The full table is attached in Appendix B.

Hypothesis 2 stated that indoor activities such as reading, watching TV and using Internet have a negative association with life satisfaction. The first column looks at the effect of indoor activities using the indoor leisure index. The effect of indoor activities using the index shows a positive sign, albeit insignificant. When the activities watching TV, reading and Internet usage are added simultaneously in the regression, the effects of these activities on life satisfaction become highly significant (column 2). Both watching TV and reading show positive effects on life satisfaction. These effects remain significant after adding control variables (column 3). Hypothesis 2 seems to be true for watching TV and using Internet when looking at the coefficients when all leisure activities are included in the model (column 6). Both have a negative sign. Reading however shows a positive relation with life satisfaction. The result of watching TV is not significant and remains insignificant even after adding the control variables. The negative relationship of Internet usage is stronger compared to watching TV and reading and is highly significant (p-value<0.01). After adding the control variables, it decreases slightly in strength, but it remains highly significant (p-value<0.01).

Hypothesis 3 stated that outdoor activities have a positive relationship with life satisfaction. Unlink the indoor index; the outdoor index indicates a positive and significant effect (column 4). Outdoor

activities have positive coefficients in all models. There is a positive relationship between holidays and life satisfaction (p-value>0.01) even after adding the control variables into the equation. Sports engagement has the second-strongest positive relationship with life satisfaction (after holidays). This effect is highly significant (p-value<0.01). After adding the control variables, the coefficient increases slightly, while the effect remains highly significant (p-value<0.01). In the case for the variable going out that denotes activities, such as visiting the cinema and theatre, it has also a positive relationship with life satisfaction, but this relationship becomes stronger and significant only after adding the control variables.

Overall, hypothesis 2 is rejected and hypothesis 3 is accepted.

Table 8 – Regression table B

Life satisfaction	N= 3,771 F(13, 3757)= 23.41 R-squared = 0.0565 (1)	N= 3,771 F(3, 3767)= 11.28 R-squared = 0.0077 (2)	N= 3,771 F(15, 3755)= 21.41 R-squared = 0.0606 (3)	N= 3,771 F(13, 3757)= 34.73 R-squared = 0.0820 (4)	N= 3,771 F(3, 3767)= 50.85 R-squared = 0.0396 (5)	N= 3,771 F(15, 3762)= 32.27 R-squared = 0.0894 (6)	N= 3,771 F(6, 3764)= 30.72 R-squared = 0.0472 (7)	N= 3,771 F(18, 3752)= 28.10 R-squared = 0.0931 (8)
Indoor index	0.0179 (0.0276)							
TV		0.0036*** (0.0014)	0.0028** (0.0014)				0.0000 (0.0014)	-0.0008 (0.0014)
Reading		0.0158*** (0.0037)	0.0140*** (0.0041)				0.0080** (0.0033)	0.0067* (0.0036)
Internet		-0.0071*** (0.0024)	-0.0040** (0.0023)				-0.0128*** (0.0028)	-0.0088*** (0.0026)
Outdoor index				0.2637*** (0.0242)				
Holidays					0.0861*** (0.0096)	0.0558*** (0.0099)	0.0918*** (0.0098)	0.0621*** (0.0102)
Sports					0.0408*** (0.0080)	0.0436*** (0.0078)	0.0398*** (0.0081)	0.0429*** (0.0079)
Going out					0.0025 (0.0070)	0.0290*** (0.0072)	0.0075 (0.0069)	0.0303*** (0.0073)

Constant	7.7088***	7.4284***	7.7860***	7.2811***	7.0594***	7.3917***	7.0904***	7.4678***
	(0.1261)	(0.0359)	(0.1206)	(0.1254)	(0.0461)	(0.1201)	(0.0488)	(0.1225)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model including the indoor index and control variables; (2) Model including only indoor leisure activities added simultaneously into the regression; (3) Model 2 extended with control variables; (4) Model including the outdoor index and control variables; (5) Model including only outdoor activities added simultaneously into the regression; (6) Model 5 extended with control variables; (7) Model including all leisure activities; (8) Model 7 extended with control variables

4.3.3 Moderating effect personality

In order to examine which personalities benefit more from the specific leisure activities the moderating effect of personality is analysed in this sub-section. The data on the Big-Five personality traits are dichotomized prior to conducting the estimations based on the 50th percentile of each trait. The results for the moderating effect of the personality traits on the relationship between leisure activities and life satisfaction are subdivided according to the specific leisure activities. In each table columns denoted with the numbers (1) till (5) show the results of regressions that have included only the respective trait in the interaction for each of the five traits. The column denoting the number (6) presents the results for interactions including all personality traits in the regression simultaneously.

4.3.3.1 Indoor activities

Watching TV

Below in table 9 the regression results for the moderating effect of personality on the relationship between watching TV and life satisfaction is presented. The full table can be found in Appendix C. As found previously in table 8 the main effect of watching TV on life satisfaction is statistically insignificant in the model where all personality traits are included simultaneously (column 6). However the p-value associated with this effect is 0.1, therefore it should be noted that it is narrowly insignificant.

The main effect of watching TV is clearly significant for the models including openness to experience (column 2), agreeableness (column 3) and conscientiousness (column 4). These models suggest that watching TV has a positive effect on life satisfaction and the traits openness to experience (2), agreeableness (3) and conscientiousness (4) moderate this effect negatively. This means that individuals that possess a high score on these traits derive less life satisfaction from watching TV. The moderating effects of openness to experience and agreeableness are however not significant. The moderating effect of conscientiousness is significant and also remains significant when all traits are regressed simultaneously. This means that individuals scoring high on conscientiousness derive less life satisfaction from watching TV.

The moderating effect of openness to experience is not significant in the separate regression (column 2), but it becomes significant after adding all interaction terms in the regression (column 6), implying that watching TV has a positive effect on life satisfaction when the openness to experience score is

low. There is also a significant interaction term for neuroticism and watching TV (column 5), while the main effect of watching TV on life satisfaction is insignificant. This suggests that watching TV has a positive effect on life satisfaction when the score on neuroticism is high.

Extraversion has a positive moderation on the positive effect of watching TV on life satisfaction, but both effects are not significant. The positive moderation of extraversion becomes significant in the regression with all personality interactions.

Table 9 – Moderating effect on TV-life satisfaction

Life satisfaction	N= 3,771 F(15, 3755)= 22.28 R-squared= 0.0699 (1)	N= 3,771 F(15, 3755)= 21.07 R-squared= 0.0577 (2)	N= 3,771 F(15, 3755)= 23.02 R-squared= 0.0646 (3)	N= 3,771 F(15, 3755)= 24.54 R-squared= 0.0659 (4)	N= 3,771 F(15, 3755)= 40.78 R-squared= 0.1228 (5)	N= 3,771 F(23, 3747)= 29.34 R-squared= 0.1397 (6)
TV	0.0013 (0.0025)	0.0040** (0.0019)	0.0040* (0.0022)	0.0053** (0.0022)	0.0022 (0.0017)	0.0052 (0.0032)
TV*highE	0.0019 (0.0029)					0.0056* (0.0030)
TV*highO		-0.0032 (0.0028)				-0.0053* (0.0030)
TV*highA			-0.0022 (0.0027)			-0.0021 (0.0029)
TV*highC				-0.0061** (0.0026)		-0.0065** (0.0025)
TV*highN					0.0016** (0.0026)	0.0004 (0.0029)
Constant	7.5750*** (0.1283)	7.6784*** (0.1242)	7.6416*** (0.1236)	7.6520*** (0.1219)	8.0433*** (0.1118)	7.8735*** (0.1288)

Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Reading

Table 10 provides the results for the activity reading. The full table can be found in Appendix D.

The traits that moderate the relationship between reading and life satisfaction (negatively) are extraversion and conscientiousness. Both effects remain negative and significant in the separate

regressions as well as in the regression in which all interaction terms are included. This means that individuals that score high on extraversion and conscientiousness derive less life satisfaction from reading. Agreeableness and neuroticism have both positive moderating effect on the positive effect of reading on life satisfaction, but they are not significant.

Additionally, in the separate regression the traits openness to experience (column 2) also has a negatively moderating effect. This implies that reading has a positive effect on life satisfaction and a high score on openness to experience negatively moderates this effect. Individuals scoring high on openness to experience therefore derive less life satisfaction from reading.

Table 10 – Moderating effect on reading-life satisfaction

Life satisfaction	N= 3,771 F(15, 3755)= 23.79 R-squared= 0.0734 (1)	N= 3,771 F(15, 3755)= 21.95 R-squared= 0.0594 (2)	N= 3,771 F(15, 3755)= 24.05 R-squared= 0.0661 (3)	N= 3,771 F(15, 3755)= 25.28 R-squared= 0.0689 (4)	N= 3,771 F(15, 3755)= 41.94 R-squared= 0.1234 (5)	N= 3,771 F(23, 3747)= 28.93 R-squared= 0.1418 (6)
Reading	0.0257*** (0.0065)	0.0166*** (0.0060)	0.0125** (0.0054)	0.0239*** (0.0066)	0.0055 (0.0040)	0.0279*** (0.0086)
Reading*highE	-0.0210*** (0.0077)					-0.0232*** (0.0080)
Reading*highO		-0.0048** (0.0077)				0.0023 (0.0083)
Reading*highA			0.0016 (0.0075)			0.0036 (0.0070)
Reading*highC				-0.0219*** (0.0082)		-0.0211*** (0.0068)
Reading*highN					0.0117 (0.0083)	0.0077 (0.0089)
Constant	7.5792*** (0.1188)	7.7630*** (0.1201)	7.7146*** (0.1170)	7.7304*** (0.1167)	8.0771*** (0.1119)	7.9247*** (0.1157)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Consistent with the findings on watching TV, the results for reading also show a positive effect of this activity on life satisfaction. Individuals scoring high on extraversion do not benefit from reading. This result also holds for conscientious people. As expected the preference for high arousal does not incite

reading for individuals scoring high on extraversion. The negative moderation of conscientiousness deserves further attention. Individuals scoring high on the conscientiousness trait were expected to benefit from reading, as this activity characterized by structure. However, this might also relate to the genre of the books read. The study of Kraaykamp & Van Eijk (2005) for example demonstrate that conscientiousness is positively related to reading popular novels, while it is negatively related to reading literary content that are considered difficult.

Internet usage

Table 11 provides the results on the moderating effect of personality on the relationship between Internet usage and subjective well-being. The full table can be found in Appendix E. Whereas the main effect of Internet usage on life satisfaction had proven earlier to be statistically significant, after adding the interaction terms (both separately and simultaneously) this effect has lost its significance. The negative effect of using Internet on life satisfaction is only found when the trait agreeableness is added into the model separately (column 3). The findings suggest that Internet usage deteriorates life satisfaction. The positive moderation of agreeableness indicates that this effect is reinforced. Therefore, Internet usage leads to less life satisfaction for individuals scoring high on agreeableness.

In column 2, the interaction term between openness to experience and using Internet shows a significant negative result, indicating that the effect of Internet usage on life satisfaction is positive when the score on openness to experience is low. Similar to this in column 6, neuroticism has a significant negative effect, while the main effect of Internet usage on life satisfaction is insignificant. This also indicates that the effect of Internet usage on life satisfaction is positive when the score on neuroticism is low.

Openness to experience was expected to positively (negatively) moderate the negative (positive) relationship of using Internet and life satisfaction, which implies that the trait openness to experience makes the effect on life satisfaction worse. In this case, the trait openness to experience has indeed a negative and significant coefficient. For the traits agreeableness and neuroticism it was hypothesized that these traits moderate the (negative) relationship between Internet usage and life satisfaction negatively. This is the case for neuroticism when it is regressed separately, albeit insignificant. The moderating effect of neuroticism becomes significant when all interactions are added into the model. The main effect is however insignificant, indicating that using Internet has a positive effect on life satisfaction when neuroticism is low. In the case of agreeableness, it has a positive moderation effect on the negative effect of Internet usage on life satisfaction. Therefore, individuals scoring high on openness to experience, agreeableness and neuroticism do not benefit from using Internet at home.

Extraversion moderates the negative effect of using Internet positively in the separate regression (column 1) and moderates the positive effect of using Internet positively in the simultaneous regression (column 6). The results are however not significant. For conscientiousness it is the other way around: it moderates the negative effect of using Internet negatively in the separate regression (column 4) and moderates the positive effect of using Internet negatively in the simultaneous regression (column 6). The results are insignificant.

Table 11 – Moderating effect on Internet usage-life satisfaction

Life satisfaction	N= 3,771 F(15, 3755)= 22.45 R-squared= 0.0695 (1)	N= 3,771 F(15, 3755)= 21.24 R-squared= 0.0580 (2)	N= 3,771 F(15, 3755)= 24.24 R-squared= 0.0681 (3)	N= 3,771 F(15, 3755)= 24.38 R-squared= 0.0642 (4)	N= 3,771 F(15, 3755)= 41.93 R-squared= 0.1218 (5)	N= 3,771 F(23, 3747)= 29.71 R-squared= 0.1443 (6)
Internet	-0.0055 (0.0049)	0.0050 (0.0046)	-0.0080*** (0.0029)	-0.0012 (0.0025)	-0.0008 (0.0023)	0.0055 (0.0056)
Internet*highE	0.0047 (0.0053)					0.0045 (0.0051)
Internet*highO		-0.0116** (0.0053)				-0.0164*** (0.0056)
Internet*highA			0.0230*** (0.0049)			0.0255*** (0.0057)
Internet*highC				-0.0025 (0.0054)		-0.0085 (0.0054)
Internet*highN					-0.0026 (0.0048)	-0.0103** (0.0049)
Constant	7.6183*** (0.1304)	7.6832*** (0.1275)	7.7159*** (0.1206)	7.7247*** (0.1199)	8.0609*** (0.1141)	7.8938*** (0.1265)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

4.3.3.2 Outdoor activities

Holidays

The results for the moderation effect of personality on the relationship between holidays and life satisfaction are presented in table 12. The full table can be found in Appendix F. In all regressions holidays has a significant positive effect on life satisfaction.

Neuroticism is the only trait that shows a significant positive moderating effect in both the separate as well as the simultaneously conducted regressions. This indicates that individuals scoring high on neuroticism derive more life satisfaction from going on holidays. Extraversion and conscientiousness on the other hand have a negative moderation effect on holidays. In the case of conscientiousness this effect is not significant when all interaction terms are regressed simultaneously. Overall, the negative moderation on the positive main effect indicates that individuals scoring high on extraversion and conscientiousness derive less life satisfaction from going on holidays.

Openness to experience has a negative moderation effect in the separate regression (column 2) and a positive moderation effect in column (6). Both effects are however not significant. Agreeableness negatively moderates the effect of holidays on life satisfaction, but this effect is also insignificant.

Table 12 – Moderating effect on holidays-life satisfaction

Life satisfaction	N= 3,771 $F_{(15, 3755)}=$ 27.01 R-squared= 0.0956 (1)	N= 3,771 $F_{(15, 3755)}=$ 25.03 R-squared= 0.0771 (2)	N= 3,771 $F_{(15, 3755)}=$ 26.65 R-squared= 0.0839 (3)	N= 3,771 $F_{(15, 3755)}=$ 28.04 R-squared= 0.0848 (4)	N= 3,771 $F_{(15, 3755)}=$ 43.72 R-squared= 0.1395 (5)	N= 3,771 $F_{(23, 3747)}=$ 30.89 R-squared= 0.1591 (6)
Holidays	0.1309*** (0.0136)	0.0898*** (0.0136)	0.0910*** (0.0128)	0.1022*** (0.0131)	0.0453*** (0.0111)	0.0948*** (0.0204)
Holidays*E	-0.0918*** (0.0177)					-0.0834*** (0.0181)
Holidays*O		-0.0153 (0.0179)				0.0263 (0.0184)
Holidays*A			-0.0190 (0.0178)			-0.0018 (0.0173)
Holidays*C				-0.0469*** (0.0179)		-0.0269 (0.0175)
Holidays*N					0.0570*** (0.0176)	0.0439** (0.0181)

Constant	7.1368***	7.4428***	7.3983***	7.4049***	7.9156***	7.6204***
	(0.1310)	(0.1309)	(0.1288)	(0.1261)	(0.1146)	(0.1409)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Sports

The findings on the moderating effect of personality traits on the relationship between sports and life satisfaction are reported in table 13. The full table can be found in Appendix G. The interaction effects presented in column 6 demonstrate that all personality types moderate the positive effect of sports on life satisfaction.

From the separate regression in the table it can be concluded that extraversion (1) and conscientiousness (4) negatively moderate the relationship between sports and life satisfaction, while neuroticism (5) positively moderates it. The effects remain even after regressing all interaction terms simultaneously (6). These results indicate that extraverts and conscientiousness people are less satisfied with their lives when engaging in sports, while individuals scoring high on neuroticism derive more satisfaction when engaging in sports.

Openness to experience has a negative coefficient in the separate regression, which is not significant. It does however become positive and significant when all personality traits are regressed simultaneously, indicating that openness to experience moderates the effect of sports on life satisfaction positively. Similarly, agreeableness has an insignificant interaction term in the separate regression. This positive insignificant interaction becomes significant when all personality traits are regressed together. Therefore, individuals scoring high on openness to experience and agreeableness benefit from engaging in sports.

Table 13 – Moderating effect on Sports-life satisfaction

Life satisfaction	N= 3,771 F(15, 3755)= 38.18 R-squared= 0.0879 (1)	N= 3,771 F(15, 3755)= 37.50 R-squared= 0.0750 (2)	N= 3,771 F(15, 3755)= 40.40 R-squared= 0.0806 (3)	N= 3,771 F(15, 3755)= 35.96 R-squared= 0.0849 (4)	N= 3,771 F(15, 3755)= 53.78 R-squared= 0.1347 (5)	N= 3,771 F(23, 3747)= 38.30 R-squared= 0.1529 (6)
Sports	0.0802*** (0.0094)	0.0637*** (0.0102)	0.0561** (0.0105)	0.0881*** (0.0087)	0.0374*** (0.0093)	0.0482*** (0.0127)
Sports*high E	-0.0338** (0.0145)					-0.0302** (0.0137)
Sports*high O		-0.0012 (0.0016)				0.0283* (0.0146)
Sports*high A			0.0121 (0.0145)			0.0314** (0.0139)
Sports*high C				-0.0543*** (0.0145)		-0.0591*** (0.0140)
Sports*high N					0.0371** (0.0146)	0.0279** (0.0139)
Constant	7.4000*** (0.1195)	7.5612*** (0.1220)	7.5341*** (0.1179)	7.4998*** (0.1177)	7.9320*** (0.1128)	7.7916*** (0.1189)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Overall, the results indicate that individuals scoring high on openness to experience, agreeableness and neuroticism benefit from engaging in sports. Individuals scoring high on extraversion and conscientiousness on the other hand derive less life satisfaction from engaging in sports.

Visiting cinema/theatre, going out, dining out

Table 14 provides the results on the moderating effects of personality on the relationship between visiting cinema/theatre and life satisfaction. The full table is available in Appendix H.

Only neuroticism and agreeableness seem to moderate the relationship between visiting cinema/theatre and life satisfaction positively. The interaction for agreeableness is however not

significant. This implies that individuals scoring high on neuroticism benefit more from visiting cinema/theatre in terms of life satisfaction.

All other traits demonstrate significant negative moderation effects in the separate regressions, indicating that individuals scoring high on extraversion, openness to experience, and conscientiousness derive less life satisfaction from visiting cinema/theatre. The result for conscientiousness is the only one that remains significant when all interaction terms are regressed simultaneously.

Table 14 – Moderating effect on going out-life satisfaction

Life satisfaction	N= 3,771 F(15, 3755)= 24.64 R-squared= 0.0802 (1)	N= 3,771 F(15, 3755)= 24.53 R-squared= 0.0707 (2)	N= 3,771 F(15, 3755)= 26.14 R-squared= 0.0754 (3)	N= 3,771 F(15, 3755)= 27.19 R-squared= 0.0795 (4)	N= 3,771 F(15, 3755)= 43.55 R-squared= 0.1335 (5)	N= 3,771 F(23, 3747)= 31.66 R-squared= 0.1491 (6)
Going out	0.0711*** (0.0134)	0.0684*** (0.0080)	0.0489*** (0.0109)	0.0705*** (0.0075)	0.0318*** (0.0069)	0.0535*** (0.0162)
Going out*highE	-0.0293* (0.0149)					-0.0251 (0.0160)
Going out*highO		-0.0318** (0.0132)				-0.0083 (0.0144)
Going out*highA			0.0070 (0.0127)			0.0176 (0.0138)
Going out*highC				-0.0489*** (0.0142)		-0.0454*** (0.0149)
Going out*highN					0.0437*** (0.0136)	0.0398*** (0.0140)
Constant	7.4510*** (0.1212)	7.5715*** (0.1224)	7.5684*** (0.1187)	7.5503*** (0.1189)	7.9550*** (0.1129)	7.8095*** (0.1197)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

4.3.2.7 Summary of results

This sub-section provides a short summary on the regression results regarding the moderating effect of personality traits. For the trait extraversion, Hypothesis 4a formulated that extraversion moderates the negative relationship between indoor activities and subjective well-being positively. In the case of watching TV and reading the hypothesis has to be rephrased into: extraversion moderates the positive relationship between indoor activities and subjective well-being negatively. This is the case for reading, but not the case for watching TV. The results for using Internet are not significant. Hence, hypothesis 4a is rejected. Hypothesis 4b stated that extraversion moderates the positive relationship between outdoor activities and subjective well-being positively. The results are not supporting this hypothesis. Therefore hypothesis 4b is also rejected.

In the case of openness to experience, hypothesis 5a stated that openness to experience moderates the negative relationship between indoor activities and subjective well-being positively. Again, in the case of watching TV and reading the hypothesis is rephrased into: openness to experience moderates the positive relationship between indoor activities and subjective well-being negatively. This is indeed the case. Hence, hypothesis 5a is accepted. Hypothesis 5b stated that openness to experience moderates the positive relationship between outdoor activities and subjective well-being positively. The results are insignificant for holidays. The hypothesis is confirmed in the case of sports, but is not confirmed in the case of visiting cinema/theatre. Therefore, hypothesis 5b is rejected.

Hypothesis 6 looked at the effect of the trait agreeableness. Hypothesis 6a indicated that agreeableness moderates the negative relationship between indoor activities and subjective well-being negatively. The results for watching TV and reading were not significant. In the case of using Internet, it is not confirmed. Therefore, hypothesis 6a is rejected. Hypothesis 6b indicated that agreeableness moderates the positive relationship between outdoor activities and subjective well-being negatively. The results for holidays and outdoor activities are insignificant. For sports, the hypothesis is not confirmed. This means that hypothesis 6b is also rejected.

For the trait conscientiousness, hypothesis 7a expected conscientiousness to moderate the negative relationship between indoor activities and subjective well-being negatively. In the case of a positive relationship it was therefore expected to moderate it positively. This is however not the case for watching TV. Therefore hypothesis 7a is not confirmed for watching TV and reading. The results are not significant for using Internet. Hence, hypothesis 7a is rejected. Hypothesis 7b expressed that conscientiousness moderates the positive relationship between outdoor activities and subjective well-being positively. In all cases, the hypothesis is not confirmed. Hence, 7b is also rejected.

Lastly, for neuroticism hypothesis 8a stated that Neuroticism moderates the negative relationship between indoor activities and subjective well-being negatively. Again, in the case of a positive relationship it is therefore expected to moderate is positively. This is the case for watching TV. For reading and using Internet there are no significant results. Therefore, hypothesis 8a is accepted. Hypothesis 8b stated that neuroticism moderates the positive relationship between outdoor activities and subjective well-being negatively. In all cases, the hypothesis is not confirmed. Hence, hypothesis 8b is rejected.

Table 15 – Results of hypothesis testing

Hypothesis	Accepted/Rejected
4a	Rejected
4b	Rejected
5a	Accepted
5b	Rejected
6a	Rejected
6b	Rejected
7a	Rejected
7b	Rejected
8a	Accepted
8b	Rejected

5. Discussion

This thesis intended to shed more insight into the relationship between leisure and subjective well-being through the investigation of the moderating effect of the Big-Five personality traits. Previous studies have found that there exist a relationship between leisure and subjective well-being. The findings are however ambiguous. These studies have treated the personality traits as important variables affecting the choice for leisure and the overall happiness levels. Recently, there is a resurgent trend in the literature treating personality traits as moderators to explain the strength or direction of the effect discovered. This thesis aimed to reflect this further on the relationship of leisure and subjective well-being.

Consistent with earlier research on leisure and subjective well-being, this thesis also finds that leisure engagement has a positive effect on life satisfaction. Engaging in leisure activities results in higher life satisfaction among individuals compared to individuals that do not engage in leisure activities. Outdoor activities lead to higher life satisfaction, while indoor activities do not indicate a clear effect. This is also found in the separate effects of specific leisure activities on life satisfaction, which show different patterns. Whereas indoor activities watching TV and reading have a positive effect on life satisfaction, another activity that is labelled under this category: Internet usage shows a negative effect on life satisfaction. In 2011, the Netherlands was in the top three countries using social media in the European Union (Van den Bighelaar & Akkermans, 2013). The high usage of Internet for social purposes indicates that spending time on Internet in free time results in less time for social interaction in real life and therefore less subjective well-being (Nie & Hillygus, 2002). Regarding the positive effect of watching TV, previous researches conducted in other countries have found negative effects of watching TV on life satisfaction. This study however has found that Dutch people derive more life satisfaction from watching TV. Consistent with the findings of Depp et al. (2010) who have found that only watching TV as a leisure activity has a detrimental effect on life satisfaction, the results of this study can be related to the fact that Dutch people also spend time engaging in other leisure activities that might incorporate real social interactions and that this therefore allows them to derive more life satisfaction.

Next to watching TV and reading, holidays have a positive effect on life satisfaction even after a year time, as the question in LISS survey is formulated asking the subjects how many trips they have undertaken in the past year. The significant positive result of holidays on life satisfaction suggests that individuals highly appreciate going on holidays and it significantly affects their life satisfaction a year later. The findings also confirm that sports and outdoor activities have a positive effect on life satisfaction.

The main argument in this thesis was however that there is no one-size-fits-all effect of leisure activities. Individuals experience leisure activities differently and therefore the relationship between leisure and subjective well-being varies according to the personality traits. Furthermore, in the literature certain personality traits are expected to engage more in certain leisure activities. The hypotheses on the moderation effect of personality were based on this, and it was expected that these individuals would also report higher life satisfaction. This is not confirmed for every activity and/or

trait. This is because leisure is a multidimensional concept, which makes it difficult to find a clear-cut answer.

The results suggest that individuals scoring high on extraversion benefit less from reading, holidays, sports and visiting cinema/theatre. As expected the preference for high arousal does not incite reading for individuals scoring high on extraversion. Visiting cinema/theatre are passive activities, and extraverts are expected to engage in active leisure (Barnett, 2006; Lu & Argyle, 1994). This is however contradictory with the results derived for sports and holidays, which indicate that extraverts do also not benefit from these activities. Individuals scoring high on openness to experience benefit less from reading, using Internet and visiting cinema/theatre, they do however benefit from engaging in sports. Individuals scoring high on the agreeableness trait benefit even less from using Internet in their free time and benefit more from engaging in sports. Individuals scoring high on neuroticism derive a higher life satisfaction from all activities labelled under outdoor activities. It was previously mentioned that cinema attendance has a therapeutic effect, decreasing anxiety. This might be an explanation why individuals scoring high on neuroticism benefit from visiting cinema/theatre. The study of Nawijn et al. (2010) has shown that only relaxed holidays result in higher happiness levels. This might also explain why neurotics derive more life satisfaction, while extraverts derive less life satisfaction from holidays. Individuals scoring high on conscientiousness derive less life satisfaction from both indoor and outdoor activities. The organized, structured nature of this trait might benefit more from serious leisure. This could be investigated further.

Also, Internet usage is negatively related to life satisfaction. Spending time on Internet is argued to be deteriorating subjective well-being, especially if it leads to further isolation. Furthermore, the specific actions undertaken online are not specified in this study. Mainly social interactions are found in previous research to be relevant in producing a positive effect of Internet on subjective well-being. This can be explored further in future studies. Regarding the positive effect of watching TV and reading it can be argued that the theory of Newman et al. (2014) is true when it comes to these activities being undertaken to compensate for high-demanding jobs. Further research can develop this argument by including job characteristics of individuals.

6. Conclusion

The implication of this research is that leisure engagement increases subjective well-being. This suggests that encouraging individuals towards engagement in leisure activities is beneficial for Governments, as subjective well-being is argued to have spill-over effects towards other domains of life. Especially, activities classified as outdoor activities are found to have a significant positive effect. The Dutch government is already promoting cultural and sports activities. This study confirmed the effectiveness of these measures on subjective well-being.

Overall the thesis does not found a conclusive answer to the posed question of which personalities benefit more from which leisure activities, as leisure remains a multidimensional concept that is difficult to elucidate. The thesis has however found indications that in some cases personality traits moderate the relationship between specific leisure activities and subjective well-being. These results have implications on the effectiveness of drawing individuals towards certain leisure activities. The leisure industry and the Dutch government can use the results to tailor interventions to achieve maximum results.

Nevertheless, it is important to note that the results are not conclusive, and there might be different effects when other countries are considered or other variables are added as controls or moderators. In fact, the major drawback of this study is its focus on only data of one year. Considering multiple years may also alter results. Additionally, it is also possible that there are other moderating effects taking place in the relationship between leisure and subjective well-being. Obviously, personality traits are argued to be a major predictor of subjective well-being, it remains however only one determinant of subjective well-being. Therefore, further research can look at the possible moderating effects of circumstantial factors such as income, marital status and education and analyse the similarities and differences between the moderations of capabilities and circumstances.

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Appendices

Appendix A

	LS	Sports	Holiday	TV	Reading	Going out	Internet	E	A	C	N	O	Gender	Age	Marital status	Income	Education
LS	1																
Sports	0.132***	1															
Holiday	0.181***	0.288***	1														
TV	0.0425**	0.119***	0.233***	1													
Reading	0.0653***	0.0691***	0.193***	0.106***	1												
Out	0.0673***	0.272***	0.249***	0.0439**	0.0718***	1											
Internet	-0.0373*	0.0711***	0.219***	0.124***	0.0707***	0.177***	1										
E	0.153***	0.0584**	-0.0105	-0.0183	0.00836	0.139***	0.00271	1									
A	0.111***	0.0366*	0.0475**	-0.00738	0.0910***	0.0600***	-0.0516**	0.346***	1								
C	0.149***	0.0477**	0.132***	0.0564***	0.0749***	-0.0606***	-0.0654***	0.0650***	0.246***	1							

N	-0.367***	-0.0860***	-0.0985***	-0.00354	-0.0815***	-0.00980	0.0326*	-0.218***	-0.0666***	-0.209***	1							
O	0.00949	0.0221	0.0249	-0.116***	0.0737***	0.0314	0.0837***	0.369***	0.216***	0.225***	-0.191***	1						
Gender	-0.0330*	-0.0417*	-0.00623	0.0133	0.0585***	0.0135	-0.0605***	0.0147	0.323***	0.0779***	0.209***	-0.117***	1					
Age	0.0797***	-0.0596***	0.106***	0.249***	0.245***	-0.232***	-0.125***	-0.123***	0.0589***	0.246***	-0.133***	-0.126***	-0.0572***	1				
Marital Status	-0.176***	0.0422**	-0.154***	-0.112***	-0.0688***	0.229***	0.111***	0.0669***	-0.0354*	-0.193***	0.112***	0.106***	0.0347*	-0.539***	1			
Income	0.0724***	-0.00840	0.0437**	0.0262	-0.000295	-0.00242	-0.0345*	0.0352*	-0..00857	0.00974	-0.0417*	0.0375*	-0.0277	0.0483*	-0.0637***	1		
Education	0.0681***	0.0270	0.160***	-0.105***	0.0583***	-0.0565***	0.0208	0.0240	0.0444**	0.167***	-0.130***	0.240***	-0.0376*	0.0381*	-0.110***	0.0112	1

$* \ p<0.05, ** \ p<0.01, *** \ p<0.001$

Appendix B

Life satisfaction	N= 3,771 F(13, 3757)= 23.41 R-squared= 0.0565 (1)	N= 3,771 F(3, 3767)= 11.28 R-squared= 0.0077 (2)	N= 3,771 F(15, 3755)= 21.41 R-squared= 0.0606 (3)	N= 3,771 F(13, 3757)= 34.73 R-squared= 0.0820 (4)	N= 3,771 F(3, 3767)= 50.85 R-squared= 0.0396 (5)	N= 3,771 F(15, 3762)= 32.27 R-squared= 0.0894 (6)	N= 3,771 F(6, 3764)= 30.72 R-squared= 0.0472 (7)	N= 3,771 F(18, 3752)= 28.10 R-squared= 0.0931 (8)
Indoor index	0.0179 (0.0276)							
TV		0.0036*** (0.0014)	0.0028** (0.0014)				0.0000 (0.0014)	-0.0008 (0.0014)
Reading		0.0158*** (0.0037)	0.0140*** (0.0041)				0.0080** (0.0033)	0.0067* (0.0036)
Internet		-0.0071*** (0.0024)	-0.0040** (0.0023)				-0.0128*** (0.0028)	-0.0088*** (0.0026)
Outdoor index				0.2637*** (0.0242)				
Holidays					0.0861*** (0.0096)	0.0558*** (0.0099)	0.0918*** (0.0098)	0.0621*** (0.0102)
Sports					0.0408*** (0.0080)	0.0436*** (0.0078)	0.0398*** (0.0081)	0.0429*** (0.0079)
					0.0025	0.0290***	0.0075	0.0303***

Going out		(0.0070)	(0.0072)	(0.0069)	(0.0073)
Gender					
Female	-0.0477	-0.0682	-0.0463	-0.0414	-0.0591
	(0.0445)	(0.0449)	(0.0439)	(0.0439)	(0.0443)
Age	0.0022	-0.0000	0.0026	0.0026	0.0015
	(0.0017)	(0.0018)	(0.0017)	(0.0017)	(0.0018)
Marital status					
Separated	-1.6071***	-1.6094***	-1.7604***	-1.7342***	-1.7437***
	(0.1617)	(0.1552)	(0.1445)	(0.1531)	(0.1495)
Divorced	-0.7279***	-0.7274***	-0.7119***	-0.6987***	-0.6868***
	(0.1139)	(0.1137)	(0.1136)	(0.1130)	(0.1133)
Widow or Widower	-0.7820***	-0.7570***	-0.6832***	-0.6731***	-0.6431***
	(0.1580)	(0.1554)	(0.1543)	(0.1582)	(0.1574)
Never been married	-0.4604***	-0.4757***	-0.4908***	-0.4683***	-0.4660***
	(0.0584)	(0.0586)	(0.0573)	(0.0582)	(0.0583)
Income	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Education					
Intermediate secondary education	-0.2749***	-0.2601***	-0.2591***	-0.2689***	-0.2630***
	(0.0985)	(0.0985)	(0.0979)	(0.0982)	(0.0986)
Higher secondary	-0.3166***	-0.2875***	-0.3661***	-0.3671***	-0.3445***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
education	(0.1055)		(0.1056)	(0.1033)		(0.1030)		(0.1037)
Intermediate vocational education	-0.0830 (0.0925)		-0.0738 (0.0915)	-0.0904 (0.0904)		-0.0914 (0.0903)		-0.0905 (0.0908)
Higher vocational education	-0.0507 (0.0919)		-0.0327 (0.0914)	-0.1093 (0.0893)		-0.0946 (0.0902)		-0.0899 (0.0913)
University	0.0593 (0.0994)		0.0599 (0.0991)	-0.0453 (0.0973)		-0.0159 (0.0984)		-0.0298 (0.0995)
Constant	7.7088*** (0.1261)	7.4284*** (0.0359)	7.7860*** (0.1206)	7.2811*** (0.1254)	7.0594*** (0.0461)	7.3917*** (0.1201)	7.0904*** (0.0488)	7.4678*** (0.1225)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model including the indoor index and control variables; (2) Model including only indoor leisure activities added simultaneously into the regression; (3) Model 2 extended with control variables; (4) Model including the outdoor index and control variables; (5) Model including only outdoor activities added simultaneously into the regression; (6) Model 5 extended with control variables; (7) Model including all leisure activities; (8) Model 7 extended with control variables

Appendix C

Life satisfaction	N= 3,771 F(15, 3755)= 22.28 R-squared= 0.0699 (1)	N= 3,771 F(15, 3755)= 21.07 R-squared= 0.0577 (2)	N= 3,771 F(15, 3755)= 23.02 R-squared= 0.0646 (3)	N= 3,771 F(15, 3755)= 24.54 R-squared= 0.0659 (4)	N= 3,771 F(15, 3755)= 40.78 R-squared= 0.1228 (5)	N= 3,771 F(23, 3747)= 29.34 R-squared= 0.1397 (6)
TV	0.0013 (0.0025)	0.0040** (0.0019)	0.0040* (0.0022)	0.0053** (0.0022)	0.0022 (0.0017)	0.0052 (0.0032)
Extraversion	0.2881*** (0.0650)					0.1345** (0.0641)
Openness		0.0815 (0.0643)				-0.0911 (0.0644)
Agreeableness			0.2843*** (0.0639)			0.1970*** (0.0647)
Conscientiousness				0.3470*** (0.0618)		0.2701*** (0.0607)
Neuroticism					-0.7631 (0.0630)	-0.7081*** (0.0674)
TV*highE	0.0019 (0.0029)					0.0056* (0.0030)

TV*highO		-0.0032				-0.0053*
		(0.0028)				(0.0030)
TV*highA			-0.0022			-0.0021
			(0.0027)			(0.0029)
TV*highC				-0.0061**		-0.0065**
				(0.0026)		(0.0025)
TV*highN					0.0016**	0.0004
					(0.0026)	(0.0029)
Gender						
Female	-0.0523	-0.0470	-0.1241***	-0.0706	0.0680	-0.0199
	(0.0442)	(0.0449)	(0.0458)	(0.0442)	(0.0444)	(0.0462)
Age	0.0027	0.0018	0.0015	0.0008	0.0015	0.0013
	(0.0017)	(0.0018)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
Marital status						
Separated	-1.5507***	-1.5997***	-1.6511***	-1.5574***	-1.6634***	-1.6571***
	(0.1785)	(0.1583)	(0.1521)	(0.1396)	(0.1301)	(0.1281)
Divorced	-0.7539***	-0.7321***	-0.7515***	-0.7136***	-0.7516***	-0.7478***
	(0.1139)	(0.1137)	(0.1147)	(0.1125)	(0.1099)	(0.1101)
Widow or Widower	-0.7380***	-0.7700***	-0.7666***	-0.7652***	-0.8676***	-0.8154***
	(0.1577)	(0.1576)	(0.1569)	(0.1583)	(0.1494)	(0.1485)
Never been married	-0.4789***	-0.4649***	-0.4631***	-0.4481***	-0.3947***	-0.3855***
	(0.0579)	(0.0582)	(0.0579)	(0.0582)	(0.0558)	(0.0552)

Income	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Education						
Intermediate secondary education	-0.2869***	-0.2697***	-0.2823***	-0.3046***	-0.2878***	-0.3217***
	(0.0983)	(0.0990)	(0.0981)	(0.0978)	(0.0959)	(0.0964)
Higher secondary education	-0.3184***	-0.3053***	-0.3160***	-0.3475***	-0.2982***	-0.3062***
	(0.1062)	(0.1066)	(0.1058)	(0.1062)	(0.1022)	(0.1020)
Intermediate vocational education	-0.8514	-0.0815	-0.0811	-0.1242	-0.1532*	-0.1578*
	(0.0923)	(0.0915)	(0.0915)	(0.0917)	(0.0885)	(0.0899)
Higher vocational education	-0.0834	-0.0453	-0.0546	-0.0999	-0.1077	-0.1390
	(0.0929)	(0.0911)	(0.0914)	(0.0908)	(0.0893)	(0.0903)
University	0.0459	0.0624	0.0660	0.0056	-0.0660	-0.0751
	(0.1003)	(0.0998)	(0.0991)	(0.999)	(0.0952)	(0.0958)
Constant	7.5750***	7.6784***	7.6416***	7.6520***	8.0433***	7.8735***
	(0.1283)	(0.1242)	(0.1236)	(0.1219)	(0.1118)	(0.1288)

Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Appendix D

Life satisfaction	N= 3,771 F(15, 3755)= 23.79 R-squared= 0.0734 (1)	N= 3,771 F(15, 3755)= 21.95 R-squared= 0.0594 (2)	N= 3,771 F(15, 3755)= 24.05 R-squared= 0.0661 (3)	N= 3,771 F(15, 3755)= 25.28 R-squared= 0.0689 (4)	N= 3,771 F(15, 3755)= 41.94 R-squared= 0.1234 (5)	N= 3,771 F(23, 3747)= 28.93 R-squared= 0.1418 (6)
Reading	0.0257*** (0.0065)	0.0166*** (0.0060)	0.0125** (0.0054)	0.0239*** (0.0066)	0.0055 (0.0040)	0.0279*** (0.0086)
Extraversion	0.3723*** (0.0496)					0.2879*** (0.0510)
Openness		0.0277 (0.0523)				-0.1943*** (0.0540)
Agreeableness			0.2396*** (0.0518)			0.1480*** (0.0512)
Conscientiousness				0.3151*** (0.0508)		0.2211*** (0.0489)
Neuroticism					-0.7593*** (0.0507)	-0.7138*** (0.0514)
Reading*highE	-0.0210*** (0.0077)					-0.0232*** (0.0080)
Reading*highO		-0.0048** (0.0077)				0.0023 (0.0083)

Reading*highA		0.0016				0.0036
		(0.0075)				(0.0070)
Reading*highC			-0.0219***			-0.0211***
			(0.0082)			(0.0068)
Reading*highN					0.0117	0.0077
					(0.0083)	(0.0089)
Gender						
Female	-0.0624	-0.0592	-0.1323***	-0.0780*	0.0600	-0.0237
	(0.0442)	(0.0451)	(0.0459)	(0.0443)	(0.0446)	(0.0462)
Age	0.0017	0.0009	0.0008	-0.0005	0.0014	0.0004
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)
Marital status						
Separated	-1.5908***	-1.6101***	-1.6644***	-1.5256***	-1.6650***	-1.6290***
	(0.1643)	(0.1509)	(0.1430)	(0.1351)	(0.1254)	(0.1422)
Divorced	-0.7488***	-0.7276***	-0.7539***	-0.7016***	-0.7442***	-0.7336***
	(0.1135)	(0.1139)	(0.1141)	(0.1120)	(0.1093)	(0.1087)
Widow or Widower	-0.7675***	-0.7803***	-0.7719***	-0.7622***	-0.8741***	-0.8479***
	(0.1551)	(0.1562)	(0.1559)	(0.1569)	(0.1486)	(0.1455)
Never been married	-0.4921***	0.4773***	-0.4742***	-0.4684	-0.3955***	-0.3960***
	(0.0582)	(0.0585)	(0.0581)	(0.0583)	(0.0560)	(0.0551)
Income	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Education

Intermediate secondary education	-0.2752***	-0.2640***	-0.2708***	-0.2833***	-0.2821***	-0.3093***
	(0.0979)	(0.0988)	(0.0984)	(0.0981)	(0.0964)	(0.0964)
Higher secondary education	-0.3338***	-0.3264***	-0.3345***	-0.3589***	-0.3212***	-0.3169***
	(0.1036)	(0.1045)	(0.1041)	(0.1042)	(0.1007)	(0.0997)
Intermediate vocational education	-0.0711	-0.0830	-0.0809	-0.1160	-0.1557*	-0.1395
	(0.0911)	(0.0909)	(0.0911)	(0.0914)	(0.0887)	(0.0890)
Higher vocational education	-0.0784	-0.0554	-0.0643	-0.1084	-0.1209	-0.1333
	(0.0905)	(0.0896)	(0.0907)	(0.0902)	(0.0889)	(0.0878)
University	0.0185	0.0314	0.0272	-0.0194	-0.0964	-0.0713
	(0.0974)	(0.0979)	(0.0971)	(0.0980)	(0.0938)	(0.0938)
Constant	7.5792***	7.7630***	7.7146***	7.7304***	8.0771***	7.9247***
	(0.1188)	(0.1201)	(0.1170)	(0.1167)	(0.1119)	(0.1157)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Appendix E

Life satisfaction	N= 3,771 F(15, 3755)= 22.45 R-squared= 0.0695 (1)	N= 3,771 F(15, 3755)= 21.24 R-squared= 0.0580 (2)	N= 3,771 F(15, 3755)= 24.24 R-squared= 0.0681 (3)	N= 3,771 F(15, 3755)= 24.38 R-squared= 0.0642 (4)	N= 3,771 F(15, 3755)= 41.93 R-squared= 0.1218 (5)	N= 3,771 F(23, 3747)= 29.71 R-squared= 0.1443 (6)
Internet	-0.0055 (0.0049)	0.0050 (0.0046)	-0.0080*** (0.0029)	-0.0012 (0.0025)	-0.0008 (0.0023)	0.0055 (0.0056)
Extraversion	0.2901*** (0.0548)					0.1910*** (0.0559)
Openness		0.1014* (0.0579)				-0.0710 (0.0600)
Agreeableness			0.1061* (0.0558)			0.0027 (0.0587)
Conscientiousness				0.2676*** (0.0539)		0.2109*** (0.0549)
Neuroticism					-0.7196*** (0.0551)	-0.6415*** (0.0558)
Internet*highE	0.0047 (0.0053)					0.0045 (0.0051)
Internet*highO		-0.0116** (0.0053)				-0.0164*** (0.0056)

	(1)	(2)	(3)	(4)	(5)	(6)
Internet*highA			0.0230*** (0.0049)			0.0255*** (0.0057)
Internet*highC				-0.0025 (0.0054)		-0.0085 (0.0054)
Internet*highN					-0.0026 (0.0048)	-0.0103** (0.0049)
Gender						
Female	-0.0550 (0.0445)	-0.0493 (0.0451)	-0.1120** (0.0459)	-0.0738* (0.0445)	0.0673 (0.0446)	-0.0109 (0.0462)
Age	0.0030* (0.0017)	0.0027 (0.0017)	0.0022 (0.0017)	0.0012 (0.0017)	0.0021 (0.0017)	0.0020 (0.0017)
Marital status						
Separated	-1.5638*** (0.1749)	-1.6093*** (0.1541)	-1.6196*** (0.1525)	-1.5611*** (0.1374)	-1.6767*** (0.1246)	-1.6245*** (0.1491)
Divorced	-0.7508*** (0.1142)	-0.7390*** (0.1142)	-0.7578*** (0.1144)	-0.7100*** (0.1125)	-0.7496*** (0.1096)	-0.7785*** (0.1102)
Widow or Widower	-0.7339*** (0.1588)	-0.7927*** (0.1589)	-0.7689*** (0.1585)	-0.7741*** (0.1584)	-0.8757*** (0.1500)	-0.8502*** (0.1500)
Never been married	-0.4748*** (0.0579)	-0.4558*** (0.0580)	-0.4475*** (0.0578)	-0.4478*** (0.0583)	-0.3916*** (0.0558)	-0.3785*** (0.0550)
Income	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)

Education						
Intermediate secondary education	-0.2877***	-0.2733***	-0.2775***	-0.3000***	-0.2874***	-0.3080***
	(0.0983)	(0.0987)	(0.0983)	(0.0985)	(0.0964)	(0.0967)
Higher secondary education	-0.3198***	-0.3189***	-0.3115***	-0.3566***	-0.3079***	-0.2942***
	(0.1031)	(0.1035)	(0.1033)	(0.1040)	(0.0998)	(0.0984)
Intermediate vocational education	-0.0881	-0.0936	-0.0737	-0.1317	-0.1576*	-0.1510*
	(0.0916)	(0.0906)	(0.0912)	(0.0918)	(0.0886)	(0.0891)
Higher vocational education	-0.0872	-0.0576	-0.0655	-0.1061	-0.1187	-0.1320
	(0.0905)	(0.0893)	(0.0906)	(0.0909)	(0.0887)	(0.0882)
University	0.0330	0.0440	0.0590	-0.0050	-0.0815	-0.0644
	(0.0984)	(0.0982)	(0.0979)	(0.0987)	(0.0943)	(0.0947)
Constant	7.6183***	7.6832***	7.7159***	7.7247***	8.0609***	7.8938***
	(0.1304)	(0.1275)	(0.1206)	(0.1199)	(0.1141)	(0.1265)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Appendix F

Life satisfaction	N= 3,771 F(15, 3755)= 27.01 R-squared= 0.0956 (1)	N= 3,771 F(15, 3755)= 25.03 R-squared= 0.0771 (2)	N= 3,771 F(15, 3755)= 26.65 R-squared= 0.0839 (3)	N= 3,771 F(15, 3755)= 28.04 R-squared= 0.0848 (4)	N= 3,771 F(15, 3755)= 43.72 R-squared= 0.1395 (5)	N= 3,771 F(23, 3747)= 30.89 R-squared= 0.1591 (6)
Holidays	0.1309*** (0.0136)	0.0898*** (0.0136)	0.0910*** (0.0128)	0.1022*** (0.0131)	0.0453*** (0.0111)	0.0948*** (0.0204)
Extraversion	0.6721*** (0.0887)					0.5472*** (0.0909)
Openness		0.0942 (0.0911)				-0.2721*** (0.0925)
Agreeableness			0.3198*** (0.0915)			0.1752* (0.0897)
Conscientiousness				0.4175*** (0.0908)		0.2468*** (0.0892)
Neuroticism					-0.9301*** (0.0881)	-0.8425*** (0.0911)
Holidays*E	-0.0918*** (0.0177)					-0.0834*** (0.0181)
Holidays*O		-0.0153 (0.0179)				0.0263 (0.0184)

Holidays*A			-0.0190 (0.0178)			-0.0018 (0.0173)
Holidays*C				-0.0469*** (0.0179)		-0.0269 (0.0175)
Holidays*N					0.0570*** (0.0176)	0.0439** (0.0181)
Gender						
Female	-0.0524 (0.0436)	-0.0503 (0.0445)	-0.1282*** (0.0455)	-0.0756* (0.0438)	0.0627 (0.0441)	-0.0223 (0.0456)
Age	0.0023 (0.0017)	0.0015 (0.0017)	0.0013 (0.0017)	0.0004 (0.0017)	0.0017 (0.0017)	0.0013 (0.0017)
Marital status						
Separated	-1.5337*** (0.2200)	-1.6077*** (0.1875)	-1.6489*** (0.1781)	-1.5909*** (0.1674)	-1.6891*** (0.1382)	-1.6461*** (0.1587)
Divorced	-0.6779*** (0.1133)	-0.6572*** (0.1130)	-0.6801*** (0.1133)	-0.6496*** (0.1115)	-0.6855*** (0.1089)	-0.6963*** (0.1083)
Widow or Widower	-0.6391*** (0.1593)	-0.6615*** (0.1594)	-0.6632*** (0.1583)	-0.6596*** (0.1602)	-0.7832*** (0.1521)	-0.7552*** (0.1513)
Never been married	-0.4341*** (0.0573)	-0.4236*** (0.0578)	-0.4228*** (0.0574)	-0.4157*** (0.0576)	-0.3582*** (0.0555)	-0.3546*** (0.0545)
Income	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)

Education						
Intermediate secondary education	-0.3135*** (0.0969)	-0.2961*** (0.0990)	-0.3093*** (0.0977)	-0.3307*** (0.0973)	-0.3115*** (0.0956)	-0.3527*** (0.0937)
Higher secondary education	-0.3922*** (0.1017)	-0.3829*** (0.1032)	-0.3927*** (0.1026)	-0.4239*** (0.1025)	-0.3629*** (0.0994)	-0.3759*** (0.0973)
Intermediate vocational education	-0.1244 (0.0895)	-0.1268 (0.0901)	-0.1262 (0.0899)	-0.1685* (0.0902)	-0.1895** (0.0873)	-0.1946** (0.0864)
Higher vocational education	-0.1783** (0.0882)	-0.1420 (0.0889)	-0.1499* (0.0895)	-0.1997** (0.0886)	-0.1911** (0.0877)	-0.2286*** (0.0850
University	-0.0933 (0.0967)	-0.0699 (0.0981)	-0.0738 (0.0968)	-0.1164 (0.0978)	-0.1671* (0.0945_	-0.1716* (0.0930)
Constant	7.1368*** (0.1310)	7.4428*** (0.1309)	7.3983*** (0.1288)	7.4049*** (0.1261)	7.9156*** (0.1146)	7.6204*** (0.1409)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Appendix G

Life satisfaction	N= 3,771 F(15, 3755)= 38.18 R-squared= 0.0879 (1)	N= 3,771 F(15, 3755)= 37.50 R-squared= 0.0750 (2)	N= 3,771 F(15, 3755)= 40.40 R-squared= 0.0806 (3)	N= 3,771 F(15, 3755)= 35.96 R-squared= 0.0849 (4)	N= 3,771 F(15, 3755)= 53.78 R-squared= 0.1347 (5)	N= 3,771 F(23, 3747)= 38.30 R-squared= 0.1529 (6)
Sports	0.0802*** (0.0094)	0.0637*** (0.0102)	0.0561** (0.0105)	0.0881*** (0.0087)	0.0374*** (0.0093)	0.0482*** (0.0127)
Extraversion	0.3779*** (0.0553)					0.2816*** (0.0562)
Openness		0.0296 (0.0595)				-0.2332*** (0.0617)
Agreeableness			0.1975*** (0.0584)			0.0790 (0.0566)
Conscientiousness				0.3508*** (0.0556)		0.2749*** (0.0545)
Neuroticism					-0.7733*** (0.0560)	-0.7282*** (0.0555)
Sports*highE	-0.0338** (0.0145)					-0.0302** (0.0137)
Sports*highO		-0.0012				0.0283*

		(0.0016)				(0.0146)
Sports*highA			0.0121			0.0314**
			(0.0145)			(0.0139)
Sports*highC				-0.0543***		-0.0591***
				(0.0145)		(0.0140)
Sports*highN					0.0371**	0.0279**
					(0.0146)	(0.0139)
Gender						
Female	-0.0345	-0.0289	-0.0975**	-0.0542	0.0796*	0.0026
	(0.0438)	(0.4449)	(0.0456)	(0.0438)	(0.0441)	(0.0455)
Age	0.0034**	0.0027	0.0025	0.0015	0.0026	0.0022
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0016)
Marital status						
Separated	-1.7838***	-1.8079***	-1.8505***	-1.7138***	-1.8022***	-1.7963***
	(0.1123)	(0.1061)	(0.1006)	(0.1193)	(0.0987)	(0.1012)
Divorced	-0.7535***	-0.7324***	-0.7505***	-0.6927***	-0.7496***	-0.7324***
	(0.1128)	(0.1127)	(0.1130)	(0.1108)	(0.1087)	(0.1082)
Widow or Widower	-0.6924***	-0.7282***	-0.7223***	-0.7186***	-0.8346***	-0.7897***
	(0.1576)	(0.1579)	(0.1571)	(0.1585)	(0.1501)	(0.1484)
Never been married	-0.4861***	-0.4742***	-0.4698***	-0.4660***	-0.4046***	0.3954***
	(0.0569)	(0.0571)	(0.0568)	(0.0571)	(0.0552)	(0.0543)
Income	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***

(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Education					
Intermediate secondary education	-0.2637*** (0.0984)	-0.2465** (0.0992)	-0.2532** (0.0985)	-0.2593*** (0.0980)	-0.2666*** (0.0964)	-0.2909*** (0.0965)
Higher secondary education	-0.3265*** (0.1033)	-0.3192*** (0.1035)	-0.3207*** (0.1032)	-0.3374*** (0.1033)	-0.3162*** (0.1001)	-0.2913*** (0.0993)
Intermediate vocational education	-0.0826 (0.0907)	-0.0774 (0.0902)	-0.0711 (0.0906)	-0.1021 (0.0907)	-0.1438 (0.0879)	-0.1309 (0.0884)
Higher vocational education	-0.0893 (0.8999)	-0.0553 (0.0890)	-0.0547 (0.0902)	-0.0907 (0.0898)	-0.1145 (0.0883)	-0.1214 (0.0877)
University	0.0128 (0.0978)	0.0398 (0.0975)	0.0497 (0.0972)	0.0093 (0.0974)	-0.0744 (0.0937)	-0.0552 (0.0944)
Constant	7.4000*** (0.1195)	7.5612*** (0.1220)	7.5341*** (0.1179)	7.4998*** (0.1177)	7.9320*** (0.1128)	7.7916*** (0.1189)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables

Appendix H

Life satisfaction	N= 3,771 F(15, 3755)= 24.64 R-squared= 0.0802 (1)	N= 3,771 F(15, 3755)= 24.53 R-squared= 0.0707 (2)	N= 3,771 F(15, 3755)= 26.14 R-squared= 0.0754 (3)	N= 3,771 F(15, 3755)= 27.19 R-squared= 0.0795 (4)	N= 3,771 F(15, 3755)= 43.55 R-squared= 0.1335	N= 3,771 F(23, 3747)= 31.66 R-squared= 0.1491 (6)
Going out	0.0711*** (0.0134)	0.0684*** (0.0080)	0.0489*** (0.0109)	0.0705*** (0.0075)	0.0318*** (0.0069)	0.0535*** (0.0162)
Extraversion	0.3235*** (0.0506)					0.2268*** (0.0531)
Openness		0.0805 (0.0545)				-0.1447** (0.0558)
Agreeableness			0.2169*** (0.0524)			0.1227** (0.0529)
Conscientiousness				0.3189*** (0.0503)		0.2291*** (0.0491)
Neuroticism					-0.7794*** (0.0518)	-0.7431 (0.0520)
Going out*highE	-0.0293* (0.0149)					-0.0251 (0.0160)
Going out*highO		-0.0318** (0.0132)				-0.0083 (0.0144)

Going out*highA			0.0070			0.0176
			(0.0127)			(0.0138)
Going out*highC				-0.0489***		-0.0454***
				(0.0142)		(0.0149)
Going out*highN					0.0437***	0.0398***
					(0.0136)	(0.0140)
Gender						
Female	-0.0442	-0.0421	-0.1146**	-0.0715	0.0664	-0.0084
	(0.0441)	(0.0447)	(0.0457)	(0.0439)	(0.0441)	(0.0459)
Age	0.0046***	0.0039**	0.0036**	0.0028	0.0036**	0.0030*
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
Marital status						
Separated	-1.5671***	-1.6134***	-1.6505***	-1.5709***	-1.6948***	-1.6740***
	(0.1870)	(0.1643)	(0.1603)	(0.1457)	(0.1287)	(0.1356)
Divorced	-0.7907***	-0.7629***	-0.7864***	-0.7361***	-0.7783***	-0.7636***
	(0.1145)	(0.1144)	(0.1143)	(0.1125)	(0.1100)	(0.1098)
Widow or Widower	-0.7664***	-0.7914***	-0.7864***	-0.7918***	-0.8859***	-0.8514***
	(0.1564)	(0.1572)	(0.1563)	(0.1577)	(0.1489)	(0.1478)
Never been married	-0.5215***	-0.5102***	-0.5066***	-0.4958***	-0.4392***	-0.4238***
	(0.0583)	(0.0586)	(0.0585)	(0.0586)	(0.0561)	(0.0554)
Income	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Education						
Intermediate secondary education	-0.2815***	-0.2657***	-0.2775***	-0.2897***	-0.2828***	-0.3000***
	(0.0968)	(0.0977)	(0.0972)	(0.0969)	(0.0951)	(0.0960)
Higher secondary education	-0.3650***	-0.3642***	-0.3618***	-0.3933***	-0.3513***	-0.3513***
	(0.1025)	(0.1033)	(0.1035)	(0.1031)	(0.0996)	(0.0988)
Intermediate vocational education	-0.0702	-0.0675	-0.0706	-0.1037	-0.1417	-0.1324
	(0.0900)	(0.0901)	(0.0903)	(0.0907)	(0.0876)	(0.0886)
Higher vocational education	-0.0795	-0.0472	-0.0531	-0.0867	-0.1061	-0.1227
	(0.0891)	(0.0886)	(0.0900)	(0.0898)	(0.0881)	(0.0875)
University	0.0406	0.0619	0.0605	0.0230	-0.0744	-0.0541
	(0.0978)	(0.0981)	(0.0977)	(0.0984)	(0.0939)	(0.0944)
Constant	7.4510***	7.5715***	7.5684***	7.5503***	7.9550***	7.8095***
	(0.1212)	(0.1224)	(0.1187)	(0.1189)	(0.1129)	(0.1197)

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; (1) Model includes only the trait extraversion and control variables; (2) Model includes only the trait openness to experience and control variables; (3) Model includes only the trait agreeableness and control variables; (4) Model includes only the trait conscientiousness and control variables; (5) Model includes only the trait neuroticism and control variables; (5) Model includes all personality traits and control variables