

Towards Healthy Lifestyle

Personal values and health-related motive orientations in relation to exercise behaviour

> Master Thesis University of Twente Department of Behavioral Sciences Master Communication Studies Track Marketing Communication

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"A healthful lifestyle is a way of life. It's how you live your life every day when you're committed to taking care of yourself."

> The basic components of a healthful lifestyle include: • A balanced & nutritious diet • Daily exercise/activity • Activities that relieve/manage stress • Adequate restorative sleep



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ABSTRACT

Background: The central goal of this study is to improve understanding of habitual exercise behaviour. First, personal values are linked to individual's health-related motive orientations (HRMO), and may offer insights into how to promote better any health-related behaviour (e.g., healthy eating, regular exercise, or stress-relieving activities). Second, this paper addresses the effects of personal values on habitual exercise behaviour via two mediators, HRMO and attitude toward exercising, and may provide deeper understanding of the underlying motivations of individuals for regular exercise. Third, this study investigates the independent effects of HRMO on exercise behaviour via attitude toward exercising, checking also if these relationships are moderated by individual's regulatory focus.

Method: Data were collected through an online survey. Respondents were not randomly selected, but instead, a link to the questionnaire was posted in two popular social networks in May 2013. An initial sample of 266 respondents provided a total of 186 usable questionnaires. Personal values were measured with Portrait Values Questionnaire (Schwartz et al., 2001), health-related motive orientations with HRMO Scale (Geeroms et al., 2008b), habitual exercise behaviour with Leisure-Time Exercise Questionnaire (Godin & Shephard, 1997), and regulatory focus with General Regulatory Focus Measure (Lockwood, Jordan, & Kunda, 2002). This study used a least squares regression-based path analytical framework to investigate the effects of all independent variables on attitude toward exercising and self-reported exercise behaviour.

Results: Respondents embracing different higher-order values (i.e., Openness to change, Conservation, Self-transcendence, and Self-enhancement) also had different health-related motive orientations (HRMO). 'Openness to change' and 'Self-transcendence' higher-order value types were positive predictors of regular exercise behaviour via *energy* health motive and attitude toward exercising (i.e., mediators). The other two higher-order value types were not related to exercise behaviour. When looking at the independent effects of HRMO (i.e. predictors) on exercise behaviour, we found that *energy, enjoyment, emotional well-being, social responsibility, physical well-being, achievement* and *outward appearance* health motives were related to exercise behaviour, and these relationships were mediated by positive attitude toward exercising. However, the moderating role of regulatory focus was not confirmed in this study.

Conclusions: Our findings suggest that segmenting individuals on the basis of their prioritized values and relating specific health-related motivations to each value type might be a very useful strategy for social marketing communication design. We propose that instead of promoting 'improved health' as the main motivation to engage in healthy behaviours, communication might be more meaningful and persuasive if it emphasizes the immediate benefits that will be most compelling to the distinct value types (e.g., increased vitality, stress reduction, enjoying life, focus at work). When promoting participation in exercise behaviour to 'Openness to change' and 'Self-transcendence' value types, the focus should be on the '*energizing*' effect of regular exercising along with the benefits that are congruent with these values. To promote regular exercise to the other two value types, 'Conservation' and 'Self-enhancement', we recommend the use of value activation strategies by exposing individuals to value-relevant verbal and visual messages. Segmenting a population based simply on health-related motive orientations might be very useful for understanding exercise behaviour.

Keywords: healthy lifestyle, exercise behaviour, personal values, health-related motive orientations, social marketing

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ANOVA	Analysis of Variance
BCa	Bias Corrected and Accelerated
BIS/BAS	Behavioural Inhibition System / Behavioural Activation System
CI	Confidence Interval
ESS	European Social Survey
FCM	Food Choice Motives
FRL	Food-related Lifestyle
GRFM	General Regulatory Focus Measure
HRMO	Health-related Motive Orientations
LTEQ	Leisure-Time Exercise Questionnaire
MDS	Multidimensional Scaling
PCA	Principal Component Analysis
PVQ	Portrait Values Questionnaire
QOL	Quality of Life
RF	Regulatory Focus
RFT	Regulatory Focus Theory
RFQ	Regulatory Focus Questionnaire
SVS	Schwartz Value Survey
ТРВ	Theory of Planned Behaviour

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1 INTRODUCTION

Since the establishment of the health benefits of exercise, one of the major goals of modern societies has been to promote physical activity across the life span. Research has shown that regular exercise reduces the risk of hypertension, obesity, osteoporosis, depression, cardio-vascular disease, cancer (see Warburton, Nicol, & Bredin, 2006). It also improves self-esteem (Sachs, 1984) and reduces life stress (Brown, 1991). Despite the numerous benefits, a large portion of the population does not perform sufficient physical activity (Duncan, Hall, Wilson & Jenny, 2010) and this might be harmful for their well-being. Social marketing could play an important role in the promotion of regular involvement in physical activities and a healthy lifestyle in general.

1.1 Research Context

Social marketing is one of many tools available for changing behaviour. The term "social marketing" was first used by Kotler and Zaltman (1971) to refer to the application of commercial marketing principles in the context of socially desirable goals. Moreover, these principles provide "intelligent solutions" to important social problems (Hastings & Saren, 2003). Encouraging consumers to lead healthier lives is a complex social issue, which calls for such "intelligent solutions". According to the World Health Organization (WHO, 2011), the fundamental causes of obesity and overweight are increased unhealthy food intake and decreased physical activity. Despite their understandings and intentions, people often do not maintain healthful behaviors. Since knowledge alone seems not enough to change people's behaviour, transformative consumer researchers apply marketing techniques and tools to enhance individual and collective well-being (Mick, 2006).

Besides its usefulness in commercial marketing areas, the significance of audience segmentation have been acknowledged in social marketing as well, especially for designing tailored health marketing campaigns that are responsive to the individual needs and motives of the target audience (Forthofer & Bryant, 2000). The modest success of public health campaigns in the recent past may be due to a disregard of the possibility that the total population consists of a number of subgroups with distinct need patterns that should be targeted (Albrecht & Bryant, 1996). According to Scammon and colleagues (2011), what has been proven to work when it comes to transforming consumer behaviour are segmentation strategies and tailored health information. However, there is a call for research in the field and many important questions still need to be answered. What are the most effective segmentation strategies (e.g., segments based on differences in consumer's knowledge, understanding, beliefs, motivation, or needs)? How can benefits and risks be presented to stimulate optimal consumer decisions about healthy behaviours? What type of information do different consumers relate to that will result in optimal processing and persuasion? The present research will address these issues in an attempt to shed more light on the topic of interest, which in broad terms is 'how to stimulate healthy lifestyle and enhance individual and collective well-being'.

1.2 Research Focus

During the years, numerous models and theories have been extensively used by researchers to gain more knowledge of consumer understanding and decision making related to health. Among all the models and theories available, it appears that the Theory of Planned Behaviour (TPB) (Ajzen, 1985, 1991) has been the most widely used psychological model for prediction of health intentions and behaviours. The TPB postulates that an individual's behaviour is influenced by beliefs, norms, attitudes and intentions. It is commonly believed that human values, which are abstract concepts or beliefs representing desired goals or end-states (Rokeach, 1968; Schwartz & Bilsky, 1987), guide behaviour through attitudes or motives that may easily vary over time and place (Ponjanheimo, Paasovaara, Luomala, & Sandell, 2010). By contrast, personal values are relatively stable constructs in people's lives that guide the selection or evaluation of behaviour and control specific situations (Schwartz, 1992). This makes values worth studying in general and of particular interest for this study.

The concept of values has received considerable research attention in cross-cultural social science, but also in the field of consumer behaviour and marketing research (Grunert & Juhl, 1995). Generally accepted is that even though personal values can guide behaviour, values cannot predict behaviour directly, which is in agreement with the TPB. Therefore, some kind of motivational or attitudinal construct is usually invoked as a mediator between values and behaviour (Brunsø, Scholderer, & Grunert, 2004). In the field of food choices, several studies suggest that the impact of values may operate via closely related concepts like food-related lifestyle, involvement or attitudes (Brunsø et al., 2004; De Boer, Hoogland, & Boersema, 2007; Grunert & Juhl, 1995). Brunsø et al. (2004) demonstrated that values influence people's motives, driving the way people perceive and experience food in their everyday life. De Boer et al. (2007) focused their research on mediators of the relationship between broad universalistic values and meat choices. These authors built on Higgins's Regulatory Focus Theory (RFT) (Higgins, 1997) that distinguishes between two motivational systems, termed promotion and prevention. They found that most of the basic human values were to a certain extent related to the direction of the food choice motives (promotion- vs. preventionoriented). Grunert and Juhl (1995) investigated the explanatory power of values for environmental attitudes and the relationships between attitudes and buying of organic foods. More recently, Ponjanheimo et al. (2010) suggested that values are linked to food choice motives and to some extent liking. Their study showed that consumers who embrace opposite values had different food choice motives as well. Traditional consumers were more concerned about their food and health than the hedonistic consumers.

The studies presented above demonstrate that personal values of individuals are linked to some mediating constructs, and that relationships are plausible and largely follow the expected direction and pattern in predicting behaviours. A lot of research has been done to show that personal values influence individual's food choices through motives and attitudes related to food, and it seems that the 'healthy food' topic has merited serious research interest in the last ten years. However, we thought it would be interesting to assess if other aspects of healthful behaviour are prone to determination by value systems. Since most of the studies we found relate personal values to the food domain, we decided to investigate the influence of human values in a different behavioural domain, which is exercise behaviour. Motivating healthy food choices is only the first component of a healthy lifestyle. The second component is regular physical activity and exercise behaviour. The high prevalence of obesity in the recent years has increased interest in interventions promoting regular physical activity among the general population. It is well known that physical exercises are very important for maintaining physical fitness and overall health and wellness. Given the numerous benefits associated with regular exercise activities and the fact that most of the health-related research on values has been done to predict food choices, the present study explored the possibility that personal values are linked to and can predict exercise behaviour.

First, it was essential for this study to obtain more insight into how the notion of physical well-being can be worked out in terms of values that people find important in their lives. Understanding how different types of motivation contribute to exercise behaviour is the second step in identifying ways to increase exercise activities among individuals. Geeroms, Verbeke and Kenhove (2008b) have proposed a segmentation approach based on fundamental motivation variables that influence people's health behaviors. Health-related motive orientations (HRMO) are defined as the psychological meanings that people have different health and that motivate healthy behaviours. The authors suggested that people have different health-oriented goals and needs, which may explain differences in health-related behaviours. HRMO can be considered as abstract or superordinate goal orientations that provide the motivation for pursuing good health. In their turn, HRMO might be connected to the basic life values that people have (Lindholm, 1997).

Second, Geeroms et al. (2008b) introduced these HRMO as relevant segmentation variables in the food choice behavioral context and proposed that a better understanding of the factors that motivate individuals to perform healthy behaviours could help to design more effective nutrition campaigns and health advertising. Thus, HRMO can be successfully utilized in social marketing. The authors called for more research to validate their newly developed Health-related Motive Orientations Scale and recommended future studies to examine this scale for relationships with other concepts (e.g., life values, personality traits, etc.) and within different behavioral contexts. Given that health is an important motivator of exercise behaviour and following Geeroms et al.'s recommendation, we decided to investigate how personal values and health-related motive orientations relate to each other, and whether both simultaneously influence exercise behaviour. Building on the promising findings of the studies presented above, this research examined the potential benefits of applying value and motive segmentation strategies in the understanding of habitual exercise behaviour. This knowledge might be crucial for the success of social marketing campaigns designed to promote increased physical activity and exercise behaviour among the general population.

1.3 Research Aim and Objectives

The overall aim of this research is to advance an understanding of the impact of personal values and health-related motive orientations on habitual exercise behaviour. The individual research objectives are as follows:

- Explore how personal values influence individual's health-related motive orientations (HRMO);

- Assess the relationships between personal values, HRMO, attitude toward exercising and exercise behaviour as important constructs included in our conceptual model for predicting habitual exercise behaviour;

- Investigate the independent effects of HRMO on habitual exercise behaviour via attitude;

- Examine the direction of HRMO, following Higgins's (1997) regulatory focus distinction between promotion-oriented and prevention-oriented motivational goals (which is further explained in the next chapter), in order to check for potential interaction effects between HRMO and individual's regulatory focus on habitual exercise behaviour;

- Formulate recommendations for social marketing communication and initiatives that target exercise behaviour, based on the empirical findings of the present research.

1.4 Research Value

There is a growing concern that the dietary and physical activity patterns of contemporary societies need improvement. By adopting a multidimensional perspective on health, the study at hand provides new insights into the nature of differences in health perception among individuals embracing different personal values. These insights might be useful for the efforts to promote better physical activity and exercise habits among distinct segments of the general population through targeted marketing communications.

An important implication for social marketing might be the realization of the huge potential of considering value- and motive-specific consumer groups throughout the development of social products and marketing planning activities to promote exercise behaviour. Since the products of social marketing are primarily (intangible) ideas (Scammon et al., 2011), the core social product in this study is the underlying benefit of being healthy and the recommended behaviour of interest is exercising regularly. Performing the recommended behaviour offers the individual a way to achieve the core benefit - maintaining good health. In social marketing there is often no monetary cost, but there is a substantial nonmonetary cost involved in adopting the recommended behaviour, which is to engage in effortful activities in this case. Deeper understanding of consumer subgroups, segmented on the basis of their distinct value priorities and motivations for pursuing good health, will provide social marketers with genuine knowledge of the different approaches they may use when target the different subgroups. The assumption made is that creating tailored marketing communication, which is congruent with the personal values and health motives of the specific subgroups, will most probably result in an optimal information processing, more favourable attitude and increased exercise activity.

1.5 Research Overview

This master thesis consists of five chapters of which the Introduction is the first one. In the second chapter, Theoretical Background, the theoretical foundation of the current study is outlined. First, working definitions of all the constructs of interest are given along with

relevant previous research. Next, the links between the constructs in relation to the current research are explicated. The chapter concludes with a conceptual model and hypotheses, which serve to guide the research direction. The third chapter, Research Method, explains in details the methodology chosen to fulfil the objectives of this study. In chapter four, Results, all findings are reported along with their interpretation. The Discussion is the last chapter, which presents the conclusions made along with implications for marketing communication. In addition, limitations of the current study are discussed and recommendations for further research are given.

2 THEORETICAL BACKGOUND

2.1 Human Values

Researchers frequently draw on the concept of human values to shed more light on the attitudes and behavior of individuals, and the functioning of organizations and societies (Schwartz, Melech, Lehmann, Burgess, Harris, & Owens, 2001). The significance of values for behaviour lies in their function as the most abstract type of social cognitions that help an individual to understand the interpersonal world (Grunert & Juhl, 1995). Rokeach (1973) defined human values as guiding principles in one's life, which are tied to the self-concept and around which other less important beliefs are organized, emphasizing the centrality of the value concept. Schwartz (1992) adopted this view of values as criteria (i.e., guiding principles) and suggested a conceptual definition that incorporates five formal features of values: "Values are concepts or beliefs, pertain to desirable end states or behaviours, transcend specific situations, guide selection or evaluation of behaviour and events, and are ordered by relative importance" (p. 4).

To make possible the application of the concept of values in the social sciences, Schwartz proposed a systematic *Theory of the Content and Structure of Basic Human Values* (Schwartz, 1992, 1994), which has been empirically validated in more than sixty countries during the years (Schwartz, 2003). This theory distinguishes ten basic human values and specifies the dynamics of conflict and congruence among them, which give rise to a circular structure of value relations. The ten motivationally distinct values have been recognized by individuals in diverse cultures, suggesting a universal character of basic human values and the structure of relations among them. However, individuals and groups do not attribute the same relative importance to these values. For instance, a person could find a certain value (e.g., tradition or universalism) very important in his/her life, but for another person the same value could be not important at all. People in general hold a set of values, but the priority they give to different values varies across individuals. That is, individuals have different value "priorities" (Schwartz, 2009).

2.1.1 Basic types of values

The theory of basic human values (Schwartz, 1992, 2003) classifies values according to the type of motivational goal they represent. Ten motivationally distinct values are derived from three universal types of human needs: biological needs, social co-ordination needs, and needs related to survival and welfare of groups. These ten basic value types include 56 core values recognized among different cultures. Each basic value can be defined in terms of the central motivational goal it expresses. Definitions of ten motivational types of values in terms of their goals are presented below:

POWER: Social status and prestige, control or dominance over people and resources; ACHIEVEMENT: Personal success through demonstrating competence according to social standards; HEDONISM: Pleasure and sensuous gratification for oneself;

STIMULATION: Excitement, novelty, and challenge in life;

SELF-DIRECTION: Independent thought and action; choosing, creating, exploring;

UNIVERSALISM: Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature;

BENEVOLENCE: Preservation and enhancement of the welfare of people with whom one is in frequent personal contact (the 'in-group');

TRADITION: Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self;

CONFORMITY: Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms;

SECURITY: Safety, harmony, and stability of society, of relationships, and of self.

2.1.2 Structure of value relations

Schwartz's value theory (1992, 2003) not only identifies ten basic values, but goes further in explaining the integrated structure of dynamic relations among them. The circular structure of the ten value domains represents a motivational continuum, which depicts the conflicts and congruities among the values postulated by the theory (see Figure 1). The circular arrangement of the values demonstrates that actions in pursuing any of the basic values have consequences that are congruent with some values but conflicting with others. For instance,



Figure 1. Theoretical structure of relations among ten motivational types of values (Schwartz, 2003)

the pursuit of pleasure and self-indulgence (hedonism values) is congruent with the pursuit of novelty and change (stimulation values), but in conflict with the pursuit of conformity values, such as obedience and self-discipline. In contrast, pursuing conformity values is congruent with pursuing tradition values like respect and devotion. That is, the closer two values in either direction around the circle, the more complementary their underlying motivations are; and the other way around, the more distant two values are in the circle, the more competing underlying motivations they have.

The relationships among the basic values can be summarized with two orthogonal dimensions in an integrated structure composed of four higher-order value types (see Figure 1). On the first dimension, the higher-order type **'openness to change'**, which combines *stimulation* and *self-direction* values, contrasts the higher-order type **'conservation'** that combines *security*, *conformity* and *tradition* values. This dimension captures the conflict between values that motivate people "to follow their own intellectual and emotional interests in unpredictable and uncertain directions (openness) versus to preserve the status quo and the certainty it provides (conservation)" (Schwartz & Boehnke, 2004, p. 236). The second dimension places the higher-order type that combines *power* and *achievement* values, i.e. **'self-enhancement'**, in opposition to the one combining *universalism* and *benevolence* values, i.e. **'self-transcendence'**. Both of the former values motivate people to pursue their own personal interests even at the expense of others (self-enhancement), whereas both of the latter values motivate people to "transcendence) (p. 236).

The theoretical model places *hedonism* between 'openness to change' and 'selfenhancement'. The reason is that this basic value shares some elements of both higher-order types of values. However, in 75% of more than 200 samples studied by Schwartz (2003), hedonism appears closer to 'openness to change'. Besides, *tradition* and *conformity* values are placed in a single block because they share the same broad motivational goal – to subordinate the self in favour of expectations imposed by the society. *Conformity* is located toward the centre and *tradition* toward the periphery of the structure, which signifies that the conflict between *tradition* value and the opposing value (*hedonism*) is stronger (Schwartz, 2009).

Although the theory discriminates among basic types of values, it postulates that, at a more basic level, values form a continuum of related motivations. The nature of the continuum is clarified by noting the shared motivational emphases of adjacent value types (Schwartz, 1994). The shared emphases of the adjacent values that connect the four higher-order value types in the structure are as follows: *achievement* and *hedonism* – both focus on self-centered satisfaction; *hedonism* and *stimulation* – both entail a desire for affectively pleasant arousal; *self-direction* and *universalism* – both express reliance upon one's own judgment and comfort with the diversity of existence; *benevolence* and *conformity* – both call for normative behavior that promotes close relationships; *benevolence* and *tradition* – both promote devotion to one's ingroup; *security* and *power* – both stress avoiding or overcoming the threat of uncertainties by controlling relationships and resources.

The most significant modification of the value theory, applied by researchers, has been the simplification of the structure by grouping the original ten basic values into four broader, higher-order value types (i.e., 'openness to change' vs. 'conservation' and 'self-enhancement' vs. 'self-transcendence') and using them to predict behaviour and attitudes (Schwartz & Boehnke, 2004). The continuum idea implies that the array of value items can be partitioned into as many or as few categories as is optimal for researchers' purposes. What is important is that the same circular structure of value relations has emerged across different countries and measurement instruments during the years. People all over the world experience a conflict when pursuing 'openness to change' vs. 'conservation' value types. They also experience aa conflict when pursuing 'self-enhancement' vs. 'self-transcendence' value types (Schwartz, 2009). However, Schwartz (1992, 1994) attributes no substantial meaning to the higher-order value types and treats them merely as a way to describe the value structure more simply, when finer distinctions are not needed.

The arrangement of basic human values in a motivational continuum has important implications for predicting and understanding the relations of values to other constructs. This integrated structure makes it possible to investigate how whole systems of values relate to other constructs such as attitudes, opinions, and behaviour (Schwartz, 2003). That is, if a particular value relates positively to another construct under investigation, the values compatible with this value are likely to be positively related to that construct too, whereas the antagonistic values in the structure are expected to be negatively related to it.

2.1.3 Relating values to other constructs and behaviour

Personal values have been studied widely in psychological research, but in transformative research the studying of the relationships between values and, for example, food choice motives or attitudes is a rather young field of research. Recently, Ponjanheimo et al. (2010) revealed significant value-dependent differences in food choice motives, concern about food and health, and liking of different types of rye bread between consumers. In this study, participants were divided into three groups, traditional, hedonistic and control, on the basis of their responses to the Schwartz Value Survey (SVS) (Schwartz, 1992). Participants' food choice motives (FCM) and health concern were assessed, and correlations between values and motives were measured. The researchers found that *traditional* consumers were more concerned about food and health in general. 'Familiarity', 'natural content' and 'health' food choice motives were positively correlated with traditional values. In contrast, 'mood' and 'price' motives were positively linked to hedonistic values, whereas 'natural content' and 'health concern' were negatively correlated with hedonism. In addition, universalism values had positive and high correlation with 'natural content' and 'ethical concern', and in turn, negative association with 'mood' and 'price' food choice motives. The relationships found were logical and followed the expected direction, which confirms the usefulness of the value structure of Schwartz (2003) when relating values or whole systems of values to other constructs, i.e. food choice motives and health concern in this study, in order to understand and predict specific attitudes and behaviours.

Similarly, Brunsø et al. (2004) have studied the relationships between the theoretically assumed structure of value relations in the Schwartz's (1992, 1994) value theory and another construct, i.e. food-related lifestyle (FRL). The FRL construct has been proposed earlier as a mediator linking a set of values to a set of food-related behaviours (Brunsø & Grunert, 1995).

In this study, most of the relationships between the FRL scales and the value domains followed the predicted pattern, providing insight into the way values influence people's food-related lifestyle. For example, significant positive relationships were found between the value domain *universalism* and the FRL scales 'health' (e.g., no additives) and 'organic products' (e.g., natural ingredients). Furthermore, the opposing value domains *power* and *security* were negatively related to the organic and health-related FRL scales, showing the compatible and conflicting motivations that underlie the distinct value domains.

Both studies presented above have brought compelling evidence that the trade-off among multiple competing values is what guides people's food-related attitudes and behaviours. Generally, values might influence most if not all motivated behaviour. However, values guide actions when they are important to the actor and also relevant in a given context. People tend to behave in a way that promote their higher priority values versus lower priority values (Schwartz, 1992, 2009), that is, they follow their personal value 'priorities'. To sum up, Schwartz's value theory provides a fruitful framework for linking personal values to other constructs that enriches our understanding of value-behaviour relationships. In the present study, we looked for meaningful relationships between value 'priorities' of individuals and their health-related motive orientations in order to predict habitual exercise behaviour.

2.2 Health Motives

Health beliefs or concerns have been identified as important determinants of attitudes toward healthy eating (Sun, 2008) and important motivators of people's food choice behavior such as organic food consumption (Schifferstein & Oude Ophuis, 1998), preference for drinking yoghurt (Ponjanheimo & Sandell, 2009), and preference for rye bread (Ponjanheimo et al., 2010). However, from a multifaceted perspective on health, the possibility that differences in health perception between individuals may exist has not been extensively researched yet (Geeroms et al., 2008a, 2008b). Recently, Geeroms and colleagues have acknowledged that several subgroups may exist within a population, which differ in their motivation for pursuing good health. They suggested that the personal meanings people assign to health may account for significant behavioural differences in fruit and vegetable intake (2008b) and ready meal consumption (2008a).

A number of previous studies (e.g., Hughner & Kleine, 2004; Lindholm, 1997) have supported the conceptualization of health as a multidimensional construct, i.e. health constitutes a state of complete physical, mental and social well-being, not merely the absence of sickness and physical or mental weakness. Geeroms et al. (2008b) have adopted this multidimensional approach to health, by considering several psychosocial health motive dimensions beyond the level of physical health only. Based on exploratory investigation (i.e., qualitative and desk research), the authors were able to identify at least six health-related motive dimensions referring to the various ways in which people may perceive health: health is *energy*, health is *emotional well-being*, health is *social responsibility*, health is *physical well-being*, health is *achievement*, and health is *outward appearance*. These six interpretations of health were translated in a series of health statements used for the development of the Health-related Motive Orientation (HRMO) Scale. Correspondingly, six health constructs that represent the identified health motive dimensions under-lied this newly developed scale. The researchers went beyond previous conceptualization literature by introducing these health-related motive orientations as relevant segmentation variables in the food choice behavioral context (i.e. fruit and vegetable consumption). Therefore, HRMO can be considered as domain-specific motivational constructs, which relate to people's reasons for maintaining good health and influence specific attitudes and behaviours (Olsen, Scholderer, Brunsø & Verbeke 2007).

In another study that relates HRMO to ready meal consumption behaviour (Geeroms et al., 2008a), two additional motivational aspects of health were identified as important, based on literature review, i.e. health is *enjoyment* and health is *autonomy*. These two health-related motives were added to the six health constructs that under-lied the initial HRMO scale and, as a result, eight health constructs under-lied this slightly modified version of the HRMO scale. The eight health constructs were used as the basis for identifying health-related motive segments. This study confirmed the usefulness of the HRMO segmentation approach, by identifying five distinct segments of consumers that interpret health differently and consequently showed different ready meals consumption patterns. Below, we provide a brief description of the five segments.

1. Energetic experimenters – These people perceive health mainly in terms of *energy* and vitality. What is important to them is to live an active life, to experience adventure, to keep their body in good condition and to have the energy to do different things in life.

2. Harmonious enjoyers – Members of this segment interpret health in terms of *emotional well-being* and *enjoyment*. They are involved with emotional health. The most important health associations for them are: feeling good mentally, having close friends, keeping up good social contacts, but also enjoying life, being spontaneous and cheerful.

3. Normative carers – Within the third segment, the meaning of health is understood as a *social responsibility* and these people are mainly concerned with *physical well-being* and security. Important health-related motive orientations for them are to share time with and live in harmony with their family, and to take care of other family members' health. In addition, normative carers are heavily concerned about the physical aspects of health such as: having no physical health problems, respecting public health norms, protecting the body against harmful influences and feeling secure in life.

4. Conscious experts – Conscious experts perceive health as *outward appearance* and *achievement*. They deal with health in a very self-conscious manner, by focusing on their own body and strongly emphasizing the control over their own health. Members of this segment do not need advice from others to manage their health in the best possible way. As opposed to the other segments, important aspects of feeling healthy for them are to stay slim, to look good, to self-manage their physical appearance, but also to be successful, powerful and ambitious in life.

5. Rationalists – Members of the last segment focus on the functional aspects of health and interpret health mainly in terms of *autonomy*. Rationalists are concerned with organizing life and finding the right balance between career and family. For them being healthy means to work functionally, to organize and control life, and to perform their job their own way.

Energetic experimenters and conscious experts showed more positive attitudes and beliefs toward ready meals consumption compared to the other three segments, i.e. harmonious enjoyers, rationalist and normative carers. Also, the penetration rate and the consumption frequency levels were significantly higher among the former segments. Geeroms et al. (2008a) explained these findings with the individualistic versus altruistic health perception of the different segments. More specifically, these five segments revealed a health-related motive structure that could be summarized in two bipolar dimensions, which represent interpersonal (individualistic vs. altruistic) and intrapersonal (emotional vs. functional) perceptions of health (Geeroms et al., 2008b). What is important for our investigation is that the interpersonal dimension (individualistic vs. altruistic) of the HRMO structure is comparable to the higher-order value dimension ('self-enhancement' vs. 'self-transcendence') of the Schwartz's value model.

In the present study we have introduced the health-related motive orientations in a different behavioural context, i.e. physical activity and exercising. We logically linked the four higher-order value types (Schwartz, 1992) to the eight health constructs that represent people's HRMO, expecting to find meaningful relationships between the four broad value types and the different motivations for maintaining good health. Our goal was not to identify segments solely on the basis of the HRMO, but rather to check if these eight health constructs can be considered mediators of the potential effects of personal values on exercise behaviour. That is, we assumed that health-related motive orientations mediate the relationship between personal values and exercise behaviour in the present investigation.

In the studies of Geeroms et al. (2008a, 2008b), the focus was not set on the direction of the HRMO but rather on the different types of health motives that may exist among individuals. In this study, the direction of the HRMO was assessed by following Higgins's regulatory focus theory (1997) that distinguishes between promotion-oriented and prevention-oriented motivational goals. We classified health-related motive orientations into promotion-vs. prevention-oriented, by linking them to the higher-order value types and taking due account of the motivational structure of Schwartz's value theory (1992, 2003); 'openness to change', which combines self-direction, stimulation and hedonism values, is promotion-oriented, whereas 'conservation' that combines security, conformity and tradition values is prevention-oriented. The different functions of promotion and prevention focus make it interesting for this study to try to distinguish between two different types of health-related motivational goals. The next subchapter explains the rationale behind classifying people's HRMO into promotion vs. prevention-oriented ones.

2.3 Promotion vs. Prevention Regulatory Focus

Involvement and attitudes (or the specific combinations of both) are often considered as the pre-decisional processes that mediate the relationship between broad human values and specific behaviours (e.g., Brunsø et al., 2004; Grunert & Juhl, 1995). Following this approach, De Boer et al. (2007) suggested that involvement in food can be separated into promotion-oriented and prevention-oriented motivational goals (Higgins, 1997) that mediate the impact of values on meat choices. Consumers who endorse universalistic values are low on meat and

prefer meat produced according to organic or free-range standards. This effect is mediated by prevention-oriented food choice motives and motive-congruent attitudes. The findings of this study confirmed that most of the basic human values were related to the direction of the food choice motives. It appears that the motivational focus could also matter.

Research into health involvement may significantly benefit from Higgins's *Regulatory Focus Theory* (Higgins, 1997; Higgins, Friedman, Harlow, Idson, Ayduk, & Taylor, 2001). According to this theory, all goal directed behaviour is regulated by two distinct motivational systems, promotion and prevention, which underlie approach orientation and avoidance orientation, respectively. People are motivated to approach desired end-states, which could be either promotion-focus advancement, aspirations and accomplishments or prevention-focus responsibilities, safety and protection. Accordingly, people's involvement in health can be separated into distinct motivational goals: a promotion orientation may include all personal motivation that emphasize the importance of exercise behaviour as a positive force in life, whereas a prevention orientation may emphasize appropriate ways to ensure protection and avoid health threats through exercising regularly.

Further, the regulatory focus literature indicates that promotion versus prevention focus is a fairly stable personality characteristic that influences one's strategies and feelings in decision making (Higgins, 1997). A person who is more promotion focused will quite consistently regulate his/her behaviour towards positive outcomes and desired end states, viewing the decision with eagerness to accomplish his/her goals. In contrast, a person with prevention focus will regulate his/her behaviour away from negative outcomes, being vigilant toward the decision not to make mistakes. Importantly, although any specific goal may be pursued with either a promotion or prevention focus, some goals are more compatible with a particular self-regulatory strategy, resulting in a higher level of "fit". Higgins's (2000) theory of regulatory fit proposes that people experience "regulatory fit" when the manner in which they work toward a goal matches their predominant regulatory orientation (i.e., eagerness fit with a promotion focus, whereas vigilance fit with a prevention focus), and this congruency increases the motivational strength of goal pursuit. In addition, numerous experiments have shown that, if there is a fit between one's manner of engagement in an activity and regulatory focus, the value of an activity to a person increases (Spiegel, Grant-Pillow, & Higgins, 2004). We thought that this could be of particular interest for our understanding of the value-motivebehaviour relationship. Furthermore, regulatory focus can be measured as an individual difference or primed by the situation or message (Keller, 2006). In the present study, regulatory focus was measured as an individual difference. We assumed that a congruency (i.e., "regulatory fit") between direction of the health-related motive orientations (promotionvs. prevention-oriented) and predominant regulatory focus of an individual increases the motivational strength of goal pursuit, resulting in higher involvement in habitual exercise activities.

2.4 Attitude toward Exercising

According to social cognitive theories, attitudes are important predictors of human behavior (Ajzen, 1985). Attitudes represent people's perceptions, beliefs, judgments, and cognitions (Triandis, 1971). In the Theory of Planned Behaviour (TPB), attitudes are conceptualized as stemming from a person's beliefs regarding behaviour and its consequences. In turn, attitudes shape an individual's behavioural intentions and ultimately actions (Ajzen, 1991; Ajzen & Fishbein, 1980). Although the conceptualization of these factors may differ somewhat across theories, the central role of attitudes is highlighted in most leading theories aimed at explaining health behaviours (Nelson, Benson, & Jensen, 2010).

Further, attitude toward exercise was found to be a positive predictor of exercise behavior (Theodorakis, 1994). Exercise motivations were the most important reasons for exercise participation along with attitude toward exercising. Also, several studies have shown that young people's exercise-related attitudes are linked to their current physical activity (e.g., Dishman et al., 2006; Motl et al., 2002; Sallis, Prochaska, & Taylor, 2000). Recently, Graham and colleagues found that adolescents with more favorable attitudes toward sports, exercise, and fitness engaged in approximately 30%–40% more weekly moderate-to-vigorous physical activity than those with less favorable attitudes (Graham, Sirard, & Neumark-Sztainer, 2011).

In accordance with the TPB, attitude toward exercising is included as an important mediating construct in the present study too. We assumed that attitude toward exercising mediates the relationship between personal values and exercise behaviour, as well as the relationship between health-related motive orientations and exercise behaviour.

2.5 Exercise Behaviour

An important component of a healthy lifestyle is the engagement in regular physical activity. In addition, various long-term health benefits have been linked with regular exercise. According to Caspersen, Powel, and Christenson (1985), 'physical activity', 'exercise' and 'physical fitness' are terms that describe different concepts and are often confused with one another. These authors offered simple definitions for researchers to distinguish them conceptually. Physical activity is defined "as any bodily movement produced by skeletal muscles that results in energy expenditure" (p. 126). Leisure-time physical activity can be divided into categories such as sports, conditioning exercises, household tasks, or other activities. In order to sustain life everyone performs physical activity, but of course the amount is largely subject to personal choice. Although 'exercise' has been interchangeably used with 'physical activity', these terms are not synonymous. Exercise is "a subcategory of physical activity that is planned, structured, and repetitive, and has as a final or an intermediate objective the improvement or maintenance of physical fitness" (p. 128). Both physical activity and exercise involve any bodily movement that expends energy and are measured by kilocalories (kcal) ranging continuously from low to high. Moreover, they are positively related to physical fitness as the frequency, intensity and duration of movements increase. Physical fitness is the "set of attributes that people have or achieve that relates to the ability to perform physical activity" (p. 129), and these attributes are most often grouped in

either health- or skill-related components (Caspersen et al., 1985).

In addition to the health benefits of regular exercise mentioned earlier, research has shown that exercise intensity makes a difference. In their study, which examines the links between physical activity and fatness in adolescents, Gutin, Yin, Humphries, and Barbeau (2005) have shown that lower per cent body fat was related to vigorous intensity exercise but not to moderate intensity exercise. It appears that in order to achieve the health benefits associated with physical activity it is important to exercise regularly and at an appropriate intensity. Furthermore, recent research has examined how motivation affects decisions to engage in exercise activities of varying frequency, intensity, and duration, by employing selfdetermination theory as a conceptual framework (Duncan, Hall, Wilson, & Jenny, 2010). Duncan and colleagues found that exercise-related motivation varies according to the amount of exercise an individual undertakes. In a similar manner, Lustyk, Widman, Paschane, and Olson (2004) investigated the effect of exercise frequency, intensity, and volume along with exercise motives on quality of life (QOL) reports. They observed significant differences between high-frequency exercisers and individuals who exercise less frequently, with the active group scoring higher on 'health', 'helping', and 'community-related' QOL reports. Yet another study aimed at identifying which superordinate-level goals predict the most exercise participation over time (Segar, Eccles, & Richardson, 2011). The highest participation was found among individuals with 'quality of life' superordinate goals, whereas the lowest participation was found among individuals who reported 'weight and appearance' goals to be the most important for them. Overall, these studies demonstrate that people's involvement in exercise activities, assessed by three basic characteristics of exercise behaviour, i.e. frequency, intensity and duration, can vary across individuals (i.e., low to high) with different types of behavioural regulations, exercise motivations or superordinate-level goals.

In the present research we chose to assess habitual exercise behaviour by looking at these three basic characteristics of this behaviour: frequency, intensity, and duration. These were methodically identified by Godin and Shephard (1985, 1997), who developed a self-explanatory query of usual leisure-time exercise habits, i.e. Godin Leisure-Time Exercise Questionnaire (LTEQ). Since the LTEQ serves good the purposes of this study and has been found to be valid and reliable when compared to objective measures of physical activity (Jacobs, Ainsworth, Hartman, & Leon, 1993), it is the instrument chosen to measure self-reported habitual exercise behaviour.

2.6 Conceptual Model and Hypotheses

The approach used in this study conforms to recent work on multiple determinants of behaviour, in which personal values and motivational orientations are two factors that may influence individuals' attitudes and behaviours. First, we expected that individuals having different value priorities might have different motivations for pursuing good health. Hence, meaningful relationships could be proposed between personal values, health-related motive orientations, attitude toward exercising and exercise behaviour (see Figure 2 below).



Figure 2. Conceptual model for predicting exercise behaviour

The first set of hypotheses refers to the relationships between four higher-order value types (Schwartz, 1992, 2003) and eight health constructs that represent people's health-related motive orientations (Geeroms et al., 2008a).

People who prioritize 'openness to change' value type emphasize independent action, thought and feeling, and readiness for new experience. They show intrinsic interest in novelty and mastery and a desire for pleasant arousal. It is logical to believe that these people associate health with 'living an active life', 'practicing sports', 'keeping the body in good condition' and 'experience adventure in life'. Based on this logical assumption, we derived our first hypothesis:

<u>Hypothesis 1A:</u> Individuals who give priority to the higher-order value **openness to change**, which comprises stimulation, self-direction and hedonism values, will perceive health mainly in terms of *energy*.

People who prioritize 'self-transcendence' value type put emphasis on enhancement of others and transcendence of selfish interests. They believe in a world of beauty and are broadminded, responsible, and concerned for the welfare and interests of others (close or distant), and for nature. We assume that these people are involved mainly with emotional health. The most important health associations for them are 'feeling good mentally', 'taking time to relax', 'keeping up good social contacts', but also 'enjoying life' and 'being spontaneous and cheerful'. This assumption was the basis of our next hypothesis:

<u>Hypothesis 1B:</u> Individuals who give priority to the higher-order value **self-transcendence**, which comprises universalism and benevolence values, will perceive health mainly in terms of *emotional well-being* and *enjoyment*.

For people who prioritize 'conservation' value type, self-restriction and resistance to change are guiding principles in their lives. They are mainly focused on preserving existing social arrangements that give certainty in life, protecting order and harmony in relationships, and keeping family security and healthiness. We believe that these people health-related motives are to 'share time with family' and 'take care of other family members' health'. They are also concerned with the physical aspects of health like 'having no physical health problems', 'protecting their body against harmful influences' and 'feeling secure in life'. Therefore, we stated our next hypothesis:

<u>Hypothesis 1C:</u> Individuals who give priority to the higher-order value **conservation**, which comprises tradition, conformity and security values, will perceive health mainly in terms of *social responsibility* and *physical well-being*.

People who prioritize 'self-enhancement' value type emphasize pursuit of self-interests, social esteem and superiority. They are ambitious and capable, actively demonstrating successful performance and preserving a dominant position within their social system. It is logical to believe that these people deal with health in a very self-conscious way, by focusing on their own body and stressing their ability to manage their own health. We assumed that for these people it is important to maintain good health in order to be successful in life and follow their ambitions. Other important aspects of health are to 'look good', 'stay slim'. Also, they are concerned with organizing and controlling life and be able to work functionally. Thus, our next hypothesis states:

<u>Hypothesis 1D:</u> Individuals who give priority to the higher-order value **self-enhancement**, which comprises power and achievement values, will perceive health mainly in terms of *achievement*, *outward appearance* and *autonomy*.

Further, it is assumed that attitude toward exercising mediates the relationship between personal values and exercise behaviour (see Figure 2). Health-related motive orientations (HRMO) also mediate the relationship between personal values and exercise behaviour. In our conceptual model, HRMO shape exercise behaviour directly as well as indirectly through attitude toward exercising.

<u>Hypothesis 2</u>: Personal values influence exercise behaviour through attitude toward exercising.

<u>Hypothesis 3:</u> Personal values influence exercise behaviour through health-related motive orientations.

<u>Hypothesis 4</u>: Health-related motive orientations influence exercise behaviour directly as well as indirectly through attitude toward exercising.

In addition, following Higgins's (2000) theory of regulatory fit, we assumed that a congruency between direction of the health-related motives and predominant regulatory focus of an individual increases the motivational strength of goal pursuit, resulting in increased exercise behaviour. According to our conceptual model, the effect of HRMO on exercise behaviour is mediated by attitude toward exercising and moderated by individual's regulatory focus.

<u>Hypothesis 5:</u> Regulatory focus moderates both the direct effect of health-related motive orientations on exercise behaviour and the indirect effect of health-related motive orientations on exercise behaviour through attitude toward exercising. If there is a regulatory fit between the direction of the HRMO and the regulatory focus of an individual (both classified as promotion- or prevention-oriented), increased exercise behaviour is expected as an outcome.

To check the hypotheses presented above, we first classified health-related motive orientations (measured with Health-related Motive Orientation Scale) into promotion-oriented and prevention-oriented motivational goals. Second, we explored the relationships between higher-order values (measured with the Portrait Values Questionnaire) and health-related motive orientations. Based on the scientific findings presented in this chapter, we expected that people with different value priorities might have different motivations for pursuing good health. Third, we assessed the relationships between higher-order values, health-related motive orientations, attitude toward exercising and exercise behaviour (measured with the Godin Leisure-Time Exercise Questionnaire). Next, we investigated the potential effect of individual's regulatory focus (measured with the General Regulatory Focus Measure) on attitude toward exercise behaviour. The next chapter, Research Method, explains the methodology chosen to test all hypothesised relationships.

3 RESEARCH METHOD

3.1 Participants and Procedure

To meet the objectives of the present study, a consumer survey was undertaken by using an online survey method. The very high degree of Internet penetration enabled us to test our hypotheses in an online survey among people with Internet access and accounts in two of the most popular social network sites (i.e., Facebook and LinkedIn). A link to the questionnaire was posted in diverse groups on Facebook and LinkedIn during a two-week period in May 2013. The research was positioned as a 'Healthy Lifestyle Survey' that aims at better understanding of what stimulates healthy lifestyle and exercise behaviour. An initial sample of 266 participants was collected, from which 80 respondents were eliminated because of incomplete responses on key variables, thus yielding a final sample of N = 186 (valid response rate of 70%).

3.2 Measures

The questionnaire employed represents a battery of different self-report instruments that measure the independent and dependent variables of interest. Some of the measures were shortened due to unacceptable length of the questionnaire or slightly modified to better serve the purposes of the current study. In the beginning of the survey, respondents were asked to provide some background information, i.e. gender, age, education and relationship status.

3.2.1 Independent measures

Portrait Values Questionnaire (PVQ)

Schwartz (1992) proposed that value priorities should be assessed through individuals' selfreports of the importance they attribute to basic human values, as the common method used in survey research. Schwartz Value Survey (SVS) has become the most elaborated and welldeveloped instrument for measuring universal human values, and until recently, all studies using the value theory employed this method of measurement. However, to assess individual's value priorities in the present study, we decided to use the Portrait Values Questionnaire (PVQ) (Schwartz, 2003; Schwartz, Melech, Lehmann, Burgess, & Harris, 2001), which is a recently developed version of the SVS designed to measure the same ten basic human values. The reasons behind our decision are several. First, the full length of the SVS scale (57 items) was unacceptable for the present study. Second, this instrument presents the concept of values outside of any specific context and requires a high level of abstract thinking, which makes SVS not suitable for less educated respondents for example. Therefore, Schwartz and colleagues have developed the PVQ, which is shorter, more concrete and contextualized, less abstract and less complex to handle for respondents than the earlier value survey. This makes the PVQ suitable for use with different segments of the population. In addition, the designers of the European Social Survey (www.europeansocialsurvey.org) have

chosen the value theory and the PVQ as the value scale (21 items) to be included in the survey.

To avoid abstract descriptions of values, we used the PVQ method that presents universalistic values and their various counterparts as portraits of people (Schwartz, 2003; Schwartz et al., 2001). Each portrait consists of two sentences describing a person in terms of a value that is important to him or her. The male and female versions of the portraits make it easier for a person to recognize his or her value priorities in a psychologically meaningful way. Respondents were asked to compare 21 portraits to themselves and to rate on a 6-point Likert scales 'how much like you' the person is, ranging from "1 = Not like me at all" to "6 = Very much like me" (see Appendix A).

Health-related Motive Orientation (HRMO) Scale

A shorter version of the HRMO scale, recently developed by Geeroms et al. (2008a, 2008b), was used to measure people's health-related motive orientations. The original scale consists of 45 items, which represent 8 health constructs. The first 15 items are concerned with health more explicitly, i.e. the meaning of health, whereas the other 30 items are implicit, focusing on perceived consequences of a bad health. We decided to leave out 15 of the implicit items in order to balance the number of explicit and implicit items in the scale. The total number of items used was 30 (see Appendix B). Respondents rated the items on a 7-point Likert scales going from "1 = Completely disagree" to "7 = Completely agree".

General Regulatory Focus Measure (GRFM)

A shorter version of the GRFM (Lockwood, Jordan, & Kunda, 2002) was used to measure predominant regulatory focus. This Promotion/Prevention Scale was created as a direct measure of regulatory focus that assesses chronic promotion and prevention goals directly, by emphasizing success and failure at academic goals of undergraduate students. The original Promotion/Prevention Scale comprises 18 items from which we decided to leave out 8 items. Some of the items were very similar and others were explicitly assessing 'academic success and failure' or 'major goals at school', which were not so relevant for our study. As a result, respondents indicated the extent to which they endorse 10 items relevant to promotion and prevention goals on a 7-point Likert scales ranging from "1 = Very untrue of me" to "7 = Very true of me" (see Appendix C).

For our measure of regulatory focus, we created a measure of promotion goal strength and a measure of prevention goal strength by averaging the items belonging to each of these subscales. On average, promotion goal strength (M = 5.13, SD = 1.12) was greater than prevention goal strength (M = 3.82, SD = 1.29), t(185) = 11.68, p < .001. The reliabilities of the subscales were very good, Cronbach's $\alpha = .77$ for the promotion scale and $\alpha = .79$ for the prevention scale. We were interested in examining the impact of the relative strength of each participant's promotion and prevention goals, so we created a measure of *predominant regulatory focus* by subtracting scores on the prevention goal subscale from scores on the promotion goal subscale. Higher scores on this measure reflect relatively greater promotion than prevention focus (Ranging from min -4.80 to max 4.80; M = 1.32, SD = 1.54).

3.2.2 Dependent measures

Attitude toward exercising

Attitude toward exercising was measured by a multi-item attitude construct comprising seven items (e.g., 'In my opinion exercising is a good habit', 'Exercise activities require too much effort' (reverse coded), 'I consider exercising important for me', etc.). The attitude statements were developed in line with previous survey research on exercise attitudes and behaviours (RoperASW, 2002). These items were rated by respondents on a 7-point Likert scales going from "1 = Completely disagree" to "7 = Completely agree" (see Appendix D). The seven-item scale (M = 5.42, SD = 1.01) had good reliability, Cronbach's $\alpha = .79$.

Exercise behaviour

First, habitual exercise behaviour was assessed with a slightly modified version of the Leisure-Time Exercise Questionnaire (LTEQ) (Godin & Shephard, 1997). This self-report measure has been used successfully across diverse populations and has reported test-retest reliability in adults of 0.74 (Pereira et al., 1997). The LTEQ is a one-week recall instrument that assesses vigorous, moderate and mild exercise separately. To assess vigorous (heart beats rapidly), moderate (not exhausting), and mild (minimal effort) exercise, respondents were asked to estimate how many times they participate in each activity for at least 15 minutes during a typical seven-day period (see Appendix E). Combining all three of these intensity levels creates a summary score. A total exercise summary score was obtained by multiplying each level by the METs (units of metabolic equivalence) that reflect its intensity (vigorous = 9; moderate = 5; mild = 3) and then summing the products of the separate components (i.e., *Weekly leisure activity score* = ($9 \times Vigorous$) + ($5 \times Moderate$) + ($3 \times Mild$). Higher scores indicate higher levels of exercise participation (Ranging from min .00 to max 52.00; M = 16.71, SD = 9.80).

Second, we asked respondents two additional questions about their sport activity (i.e., 'Do you consider yourself a sporty person?' and 'Can you estimate the amount of exercise you are doing at the moment?'). Respondents had to choose between five degrees of sportiness (i.e., "1 = Extremely sporty", "2 = Very sporty", "3 = Somewhat sporty", "4 = Slightly sporty", or "5 = Not at all sporty") for the first item, and between five ratings of the amount they exercise (i.e., "1 = Too much", "2 = A lot", "3 = Just enough", "4 = Little", "5 = Too little") for the second item (see Appendix E). Both items were reverse coded (M = 2.72, SD = .88).

Last, the total exercise score was standardized and combined with the two items about sport activity to form an index score, which was used in all further analyses. The composite measure was formed by averaging the exercise score and the two sport activity items. The inter-item correlations of the three items were high and the reliability of the new measure was good, Cronbach's $\alpha = .71$.

3.3 Statistical Procedures

Statistical analyses were performed using IBM SPSS Statistics 20 software. The present study calculated alpha coefficients (i.e., Cronbach's α) and inter-item correlations to determine the internal consistency of the scales regarding the measures of value priorities, health-related motive orientations, regulatory focus (promotion vs. prevention), attitude toward exercising and exercise behaviour. To interpret the results for the Schwartz value types, multidimensional scaling was performed and the configuration of items was examined in a two-dimensional space. Factor analysis served as the basis for validity examination of the health-related motive orientations (HRMO) scale. A correlation analysis was performed, by calculating Pearson's correlation coefficients for the relationships between higher-order values and HRMO subscales. Eight hierarchical regressions were used to test our first set of hypotheses (H1: A, B, C, D). In these eight equations, the four higher-order values were treated as the independent variables and regressed on the eight health-related motive orientations. To test the proposed conceptual model, we conducted several mediation analyses by PROCESS tool in SPSS (Hayes, 2013). The PROCESS tool uses an ordinary least squares or logistic regression-based path analytical framework for estimating direct and indirect effects in simple and multiple mediator models, interactions in moderation models along with simple slopes analysis, and conditional direct and indirect effects in mediated moderation or moderated mediation models. Bootstrap methods were implemented for inference about indirect effects in both unmoderated as well as moderated mediation models.

4 RESULTS

Table 1

4.1 Demographic Profile of Respondents

The majority of respondents (67.7%) were between the ages of 20 and 29. Male (51.6%) and female (48.4%) were almost equally represented in the sample. Almost all respondents were highly educated (97.8%). With regard to relationship status, people who have a partner in life (56.5%) were slightly more compared to singles (43.5%).

Demographic profile of resp	ondents $(N = 186)$)		
Variable	Frequency	Valid percentage (%)		
Gender				
Male	96	51.6		
Female	90	48.4		
Age				
<20	10	5.4		
20-29	126	67.7		
30-39	25	13.4		
40+	25	13.4		
Education				
Lower (age <18)	4	2.2		
Higher (age >18)	182	97.8		
Relationship status				
Single	81	43.5		
Relationship / married	105	56.5		

4.2 Preliminary Analysis of Scales

4.2.1 Personal values questionnaire (PVQ)

To test the structure of relations between value priorities we used methods recommended by Schwartz (2003). That is, the PVQ instrument can be used simply as a way to measure ten motivationally distinct values by yielding ten scores each of which can be associated with other variables. The total score for each basic value is obtained by calculating the mean of the items that index it (i.e., an index of a distinct basic value). For less refined distinctions among values, it is possible to form four total scores, one for each of the higher-order value types (i.e., an index of a higher-order value).

Following Schwartz, we first calculated an index for each higher-order value; 'openness to change' was measured by the mean of self-direction, stimulation and hedonism items, 'self-transcendence' by the mean of benevolence and universalism items, 'conservation' by the mean of conformity, security and tradition items, and 'self-enhancement' by the mean of power and achievement items. We obtained good internal reliabilities for the four higher-order value scales, since they have sufficient number of items and are also conceptually

meaningful constructs. Descriptive statistics and alpha coefficients of the four value scales are provided in the table below:

Higher-order Value Type	Items (n)	Mean	SD	Cronbach's a
Self-transcendence	5	4.81	.73	.67
(benevolence, universalism)				
Openness to change	6	4.46	.76	.72
(self-direction, stimulation, hedonisi	m)			
Self-enhancement	4	3.92	.96	.72
(power, achievement)				
Conservation	6	3.73	.83	.67
(conformity, tradition, security)				

As can be seen in Table 2, the most important higher-order value reported by respondents was self-transcendence (M = 4.81), followed by openness to change (M = 4.46) and selfenhancement (M = 3.92), respectively, while the least important one was conservation (M = 3.73).

Second, we calculated an index for each of the ten motivationally distinct basic values. Given that nine values are measured by only two items and the tenth value (i.e., universalism) is measured by three, we could not expect high internal reliabilities for the two item indexes. Different criteria recommended by Schwartz (2003) were used instead. Descriptive statistics and alpha coefficients of the ten basic value types are provided in the table below:

Distinct Basic Value	Items (n)	Mean	SD	Cronbach's α
Benevolence	2	4.86	.91	.68
Universalism	3	4.79	.83	.52
Self-direction	2	4.77	.93	.54
Hedonism	2	4.42	.98	.70
Achievement	2	4.28	1.15	.74
Stimulation	2	4.20	1.13	.72
Security	2	4.00	1.09	.54
Tradition	2	3.70	1.08	.25
Power	2	3.56	1.08	.50
Conformity	2	3.47	1.16	.62

Table 3 Descriptive statistics and alpha coefficients of the 10 basic value types (N = 21)

As can be seen in Table 3, the most important basic value reported by respondents was benevolence (M = 4.86), followed by universalism (M = 4.79) and self-direction (M = 4.77), the latter with almost identical mean score, while the least important basic value was

conformity (M = 3.47), followed by *power* (M = 3.56). These findings make sense, since benevolence and universalism values comprise the 'self-transcendence' higher-order value, which was found to have the highest score among respondents. In addition, all three most important basic values are adjacent value types in the structure that have shared motivational emphases: *benevolence* and *universalism* both are concerned with enhancement of others and transcendence of selfish interests, and *self-direction* and *universalism* both express reliance upon one's own judgment and comfort with the diversity of existence. Moreover, *power*, which was rated low by respondents, directly opposes *universalism*, which was rated high, confirming the conflict between these basic values in the motivational structure of relations.

Regarding the criteria used to evaluate an internally reliable index of each basic value type, one way is to consider the whole continuum of values by performing multidimensional scaling and examining the configuration of items in a two-dimensional space (2 dimensions are usually sufficient to obtain a good representation of the associations) (Davison, 1983). Multidimensional scaling (MDS) is a multivariate technique that aims to reveal the structure of a data set by plotting points in one or two dimensions. MDS simultaneously represents each value as a point in the multidimensional space. The distances between the points reflect the empirical relations among the values. The more similar two values are conceptually, the higher the inter-correlation between their importance ratings, hence, the more closely they are located in the space. The value items intended to operationalize each basic value should form a distinct region in the space. This can be checked by placing boundaries around the items, but with only two items indexing a value, this may not always be that simple. A possible approach to define a region is that a line joining the two items for the same value should not cross a line joining the items from any other value. If the items do indeed form a region, reflecting their own inter-correlation, they can be treated as an acceptable index for a basic value type (Schwartz, 2003).

Following Schwartz's recommendations, we examined the structure of relations among values using multidimensional scaling by PROXSCAL (in SPSS 20). In the first MDS analysis performed (see Figure 1F, Appendix F), we used the total scores for the four higher-order value types and we were able to reproduce their opposing positions (Openness to Change vs. Conservation, and Self-transcendence vs. Self-enhancement) in a two-dimensional space, in accordance with the value theory. Ratio MDS with simplex initial configuration was used, because it resulted in the smallest stress (i.e., the measure of 'fit). The stress value for a two-dimensional solution was 0.01, indicating a relatively 'perfect' fit (Kruskal, 1964). However, in the spatial arraying presented in Figure 1F, Self-transcendence was located slightly closer to Openness to Change than to Self-enhancement, which suggests that Self-transcendence would correlate better with Openness to Change than with Self-enhancement.

In the next run of multidimensional scaling, we used the total scores for the ten basic values and we confirmed the discrimination of basic value types into four distinct regions that represent each of the four higher-order value types (Openness to change, Conservation, Self-transcendence and Self-enhancement), largely but not completely in accordance with the theory (see Figure 2F, Appendix F). Ratio MDS with simplex initial configuration was used. The stress value for the two-dimensional solution was 0.05, indicating a 'good' fit (Kruskal's

criteria). In the pattern depicted in Figure 2F, a small deviation of the Security score can be seen, i.e. the security value was situated low in the Self-enhancement quadrant instead of the Conservation one.

In the next step of the analysis, we included the 21 single value items, which resulted in the pattern depicted in Figure 3F (Appendix F). This analysis provided a satisfactory ordering of the value items in the two-dimensional space. The stress value for the two-dimensional solution was 0.07, indicating a relatively 'good' fit, according to Kruskal (1964). All single items were situated in the right quadrants, representing the four higher-order value regions, in accordance with Schwartz's structural theory. Furthermore, we defined the ten distinct value regions by placing lines between the two items that index each of the nine values, and by placing boundaries around the three items indexing the tenth value, i.e. *universalism*. After examining the configuration of the value items in a two-dimensional space, using Schwartz's criteria, we confirmed that they can be treated as **an acceptable index for a basic value type**. Hence, all ten basic values were measured as motivationally distinct values in our sample.

"Configurational verification" is one approach (Davison, 1983) for testing the model, if one is interested in validating the value model itself. The value model specifies the structure of relations among value items at various levels of detail. Each of these can be tested. Simplest is the discrimination of value items into those that serve individual interests and those that serve collective interests. Next is the discrimination of the four higher-order value types. Next is the discrimination of the ten basic values. Finally, is the positioning of the ten basic values according to the theorized structure (see Figure 1). We were mainly interested in the discrimination of items into the four higher-order values and we were able to partition the total space into four distinct regions of value items that represent each of the four higher-order values (see Figure 3F). With 21 items and four classifications, the criterion of 16 correct placements is reasonable, and in our case we had 21 correct placements. The next two discriminations were also confirmed in our sample. The horizontal axis of the twodimensional solution presented in Figure 3F partitioned the total space into two distinct regions of value items that serve individual interests (self-direction, stimulation, hedonism, achievement and power) and collective interests (benevolence, conformity and tradition). With 16 items and two classifications, we had 16 correct placements with a criterion of 14 correct placements as a reasonable level of certainty. Moreover, we were able to partition the total space into ten distinct regions of value items that include the items intended to measure each of the ten basic values. The joint lines between the items that index the same value defined the distinct regions of the ten basic values in our two-dimensional model (See Figure 3F). With 21 items and ten classifications, we identified 10 distinct regions with a criterion of certainty of at least 8 distinct regions. To sum up, Schwartz's value theory (1992, 2003) had a general confirmation in the present study and the PVQ instrument, which was chosen to measure the value construct, operationalized the theory of basic human values very well. Based on the preliminary analysis of the PVQ scale performed above, we concluded that this instrument, which has a sound evidence of its predictive validity based on studies in many different countries (see Schwartz, 2003), can be considered a reliable and valid method for measuring value priorities in this study. Therefore, we used the four index scores obtained for each higher-order value type (see Table 2) in all further analyses.
4.2.2 Health-related motive orientations (HRMO) scale

With the aim of refining the HRMO scale, the present study conducted preliminary factor analysis. The main goal of the analysis was to combine items into eight subscales according to the original theory of Geeroms et al.'s (2008a). The 30 items of our shortened version of the HRMO scale (see Appendix B) were factor analysed by using the method of maximum likelihood with varimax rotation. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .803 ('great' according to Kaiser, 1974). The overall significance of the correlation matrix was p < .001 with the value of Bartlett's test of sphericity = 2493.12. This result indicated that factor analysis was appropriate for the data matrix. Eight factors had eigenvalues greater than Kaiser's criterion of 1 and in combination explained 54.79% of the variance. We retained 8 factors that represent the different motivations for pursuing good health: *energy, emotional well-being, enjoyment, social responsibility, physical well-being, outward appearance, achievement,* and *autonomy.* Reliabilities of six health subscales were satisfactory as they ranged from .66 to .76 However, two of the eight subscales, i.e. *emotional well-being* and *physical well-being*, had relatively low reliabilities, Cronbach's $\alpha = .55$ and $\alpha = .58$, respectively (see Table 4).

On the basis of the factor analysis and the reliability analysis of the eight multiple-item subscales, we decided to eliminate one item that did not perform that well from the *emotional well-being* subscale, rerun the analysis with 29 items and compare the results. The reliability of the subscale improved, Cronbach's $\alpha = .62$, but the results of the factor analysis (KMO = 0.802; Bartlett's test of sphericity = 2304.65; Cumulative variance explained = 54.38%) convinced us not to leave out the particular item (i.e., Implicit 7).

Health construct	Mean	SD	Items (n)	Item labels ^a + rotated factor loadings	Eigenvalues	% of variance	Cronbach's α
1. Health = Enjoyment .	5.96	1.03	3	Imp ^b 6 (.67), Imp9 (.69), Imp15 (.74)	3.28	10.94	.76
2. Health = Emotional Well-being	5.73	.91	4	Exp2 (.55), Exp8 (.66), Exp11(.55), Imp7 (.04)	2.85	9.51	.55
3. Health = Outward_Appearance	4.83	1.09	4	Exp1 (.59), Exp6 (.58), Exp12 (.50), Exp14 (.59)	2.26	7.54	.69
4. Health = Achievement	5.07	1.35	3	Imp3 (.77), Imp10 (.56), Imp13 (.56)	2.04	6.79	.75
5. Health = Autonomy	5.66	.94	4	Imp1 (.14), Imp5 (.14), Imp8 (.55), Imp14 (.95)	1.63	5.45	.70
6. Health = Social Responsibility	5.35	1.13	4	Exp5 (.22), Exp10 (.38), Imp2 (.65), Imp12 (.72)	1.62	5.39	.71
7. Health = Physical Well-being	5.28	.89	4	Exp4 (.43), Exp13 (.16), Exp15 (.44), Imp4 (.48)	, 1.42	4.72	.58
8. Health = Energy	5.74	.96	4	Exp3 (.33), Exp7 (.67), Exp9 (.69), Imp11 (.18)	1.34	4.46	.66

Table 4

Summary exploratory factor analysis results for the HRMO scale and descriptive statistics of the eight health constructs (N = 186)

^a For the full text item labels see Appendix B.

^b Imp = implicit item; Exp = explicit item.

Our decision to keep thirty items was based also on the fact that we had already used a shortened version of the original HRMO scale and this could explain the lower factor loadings of some of the items and the lower reliabilities of the emotional well-being and physical well-being subscales. To sum up, the factor structure of the HRMO scale proposed by Geeroms et al. (2008a) had a general confirmation in the current study, even with only 30 items instead of the original 45. Item scores were summed and averaged to represent the corresponding eight health constructs. These composite construct measures were used in all further analyses.

As can be seen in Table 4, the most highly-rated health motivation in our sample was *enjoyment* (M = 5.96), followed by *energy* (M = 5.74) and *emotional well-being* (M = 5.73), respectively, while the least important health-related motivation was *outward appearance* (M = 4.83). Given that 73% of our respondents were under the age of 30, it is not surprising that the most important motivations for good health among them are *enjoyment*, *energy* and *emotional well-being*. Young people are looking for fun in their lives, they want to feel good and enjoy the moments they share with friends or family. They are full of energy and have active lives. *Outward appearance* was not that important health-related motive in our sample.

4.3 Correlation Analysis of Values and Health-related Motive Orientations

To classify the health-related motive orientations (HRMO) into promotion-oriented and prevention-oriented motivational goals, we tested their directional differences by correlating the eight health subscales scores with the four higher-order value scores. Because there is no standard procedure to differentiate promotion- and prevention-oriented motives, we calculated Pearson's correlation coefficients for these relationships (see Table 5). We took due account of the motivational structure of Schwartz's value theory. 'Openness to change' (combining self-direction, stimulation and hedonism) is promotion-oriented value, whereas 'conservation' (combining security, conformity and tradition values) is prevention-oriented value.

The correlation analysis showed that energy (r = .54), outward appearance (r = .36), emotional well-being (r = .33), enjoyment (r = .29), and achievement (r = .24) are positively correlated with 'openness to change', and these correlations were highly significant (p < .01). Energy and enjoyment were negatively correlated with 'conservation', however, the correlations were not significant. *Physical well-being* (r = .40), *social responsibility* (r = .29), and *autonomy* (r = .21) had highly significant positive correlations with the 'conservation' value type (p < .01). However, social responsibility was also positively correlated with the other three higher-order value types, 'self-transcendence' (r = .29), 'openness to change' (r = .23) and 'self-enhancement (r = .19). This could mean that people giving priority to all four types of values are strongly motivated to maintain good health in order to share time with their families and be able to take care of them. What emerged from the correlation analysis is that 5 HRMO, i.e. energy, outward appearance, emotional well-being, enjoyment and achievement, can be classified as promotion-oriented since they were positively linked to 'openness to change' value type, whereas the other 3 HRMO, i.e. physical well-being, social responsibility and autonomy, can be classified as prevention-oriented, since they were positively linked to 'conservation' value type. We classified social responsibility as a prevention-oriented motive, because of its stronger relationship with 'conservation' compared

Value types			Health	-related motiv	ve orientat	tions				Value	e types	
	Energy	SocResp	PhysWeBe	EmoWeBe	Enjoy	Achieve	Auton	OutAppear	Openness	Conserva	Transcend	Enhance
Openness to change	.535**	.233**	.038	.327**	.289**	.240**	.115	.355**	1.000	176*	.341**	.153
Conservation	046	.292**	.395**	.015	056	.165*	$.210^{**}$.159*	176*	1.000	.135	.308
Self-transcendence	.302**	.288**	.270**	.392**	.281**	017	$.162^{*}$	$.144^{*}$.341*	.135	1.000	044
Self-enhancement	.069	.192**	.215**	028	.010	.423**	.229**	.231**	.153*	.308**	044	1.000
[*] p < .05 (2-tailed), ^{**} p <	.01 (2-taile	(þí										

Legend: Energy = Energy; SocResp = Social Responsibility; PhysWeBe = Physical Well-being; EmoWeBe = Emotional Well-being; Enjoy = Enjoyment; Achieve = Achievement; Auton = Autonomy; OutAppear = Outward Appearance; Openness = Openness to Change; Conserva = Conservation; Transcend = Self-transcendence; Enhance = Self-enhancement

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Table 5

to 'openness to change'.

Looking at the links between the two value types that oppose each other on the second dimension, 'self-enhancement' versus 'self-transcendence', and health-related motive orientations was the next step in our correlation analysis. Achievement (r = .42), outward appearance (r = .23), autonomy (r = .23), physical well-being (r = .22) and social responsibility (r = .19) showed highly significant positive correlations with 'self-enhancement' (p < .01). The latter three health-related motivations were positively correlated with the 'conservation' value type too. In contrast, emotional well-being had a negative, but not significant correlation with 'self-enhancement'. Moreover, emotional well-being (r = .39), social responsibility (r = .29), enjoyment (r = .28) and physical well-being (r = .27) were positively related to 'self-transcendence', whereas achievement was negatively but not significantly related to this value type. The correlations found were largely in line with our expectations. The results of the correlation analysis performed were used as a preliminary analysis of the first set of hypotheses, which tested the relationships between higher-order value types and health-related motive orientations.

Further, we were interested how the higher-order values relate to each other (see Table 5). 'Openness to change' was negatively correlated with 'conservation' (r = .18), but positively related to 'self-transcendence' (r = .34) and 'self-enhancement' (r = .15). This can be explained with the circular arrangement of the values in the motivational continuum; 'conservation' opposes 'openness to change' in the circular structure, whereas 'self-transcendence' and 'self-enhancement' are adjacent to 'openness to change' values. Though, they were both positively correlated to 'openness to change', only the correlation with 'self-transcendence' was highly significant (p < .01). In contrast, 'conservation' was positively correlated with 'self-enhancement' (r = .31, p < .01). 'Self-enhancement' and 'self-transcendence' had negative correlation as expected, but it did not reach significance. To wrap up, all the correlations between the higher-order value types followed the right pattern when moving in a clockwise direction through the value structure: 'openness to change' and 'self-transcendence' had strong positive correlation, the same for 'conservation' and 'self-enhancement'.

4.4 Predicting Health-related Motive Orientations from Values

Studying the relationships between higher-order value types and health-related motive orientations was the first objective of the present study. Multiple regression analyses were conducted to test whether the four value types significantly predict respondents' motivations for pursuing good health. To examine the first set of hypotheses (see H1: A, B, C, D), we used eight hierarchical regressions. The four higher-order values were treated as the independent variables and regressed on the eight health-related motive orientations. In addition, previous research suggested that demographic variables, such as gender and age, were statistically associated with individuals' health motives (Geeroms et al., 2008a, 2008b), so we entered them into the first step of the eight hierarchical regressions to hold constant any influences these variables might have had on the results. Education and relationship status were not significantly correlated with the main variables in this study and they were excluded from the

analyses. Table 6 (p. 40) summarizes the results of these eight hierarchical regression equations. Gender (dummy code) and age were used as controls in all analyses and were entered in the *first step*. In the *second step*, adding the four higher-order values as predictors contributed a significant amount of incremental variance to the predictions of health-related motive orientations, ΔR^2 ranging from 9% to 28%. All reported regression coefficients are standardized.

We tested our first hypothesis (see H1A) by regressing *energy* health motive on the personal characteristics (Step 1) in combination with the four higher-order values (Step 2). The results of the regression indicated that three predictors explained a significant proportion of variance ($R^2 = .34$, p < .01) in *energy* scores. It was found that 'openness to change' significantly predicted *energy* motivation, along with age and gender. Among eight health-related motive orientations, *energy* had the best predictability ($\beta = .49$) from the higher-order value 'openness to change', fully supporting hypothesis 1A.

To test the next hypothesis (see H1B), we regressed the health-related motives emotional well-being and enjoyment on the same predictors. In the first regression equation, emotional *well-being* was significantly predicted by 'self-transcendence' ($\beta = .27$) and 'openness to change' (β = .23), along with age and gender. The four predictors explained 25% of the variance (p < .01) in the model. Similarly, *enjoyment* was significantly associated with 'selftranscendence' ($\beta = .20$) and 'openness to change' ($\beta = .20$), but not with age or gender. These two predictors explained significant proportion of variance ($R^2 = .14$, p < .01) in the model. Enjoyment was an equally important motivation for people who give priority to both value types, regardless of age or gender. In addition, emotional well-being and enjoyment were negatively related to 'self-enhancement', but these scores did not reach significance. The results of the two regression analyses showed that both health motivations were statistically predicted not only by 'self-transcendence', but also by 'openness to change' value type, partially supporting hypothesis 1B. However, these results were in line with the structural theory of Schwartz, since these two are adjacent value types in the motivational continuum, which had a strong positive correlation (r = .34) in the present study. In favour of our hypothesis, emotional well-being had the best predictability from the higher-order value 'selftranscendence'. Enjoyment was positively related with equal strength to both 'openness to change' and 'self-transcendence', and this finding could be explained with the place of the hedonism value in our sample. Hedonism was situated more toward the centre and between stimulation and self-direction basic value types, closer to 'self-transcendence' higher-order value rather than closer to 'self-enhancement', as in the original theory. However, certain variability is not unusual in the case of hedonism (Schwartz, 2003).

The next hierarchical regressions analyses tested whether 'conservation' value type significantly predicts respondents' *physical well-being* and *social responsibility* health-related motivations (see H1C). The results of the first regression indicated that three predictors explained 26% of the variance (p < .01) in *physical well-being* scores. It was found that 'conservation' (β = .31) and 'self-transcendence' (β = .21), along with age, were significant predictors of *physical well-being* as a motivation for pursuing good health. In the second regression equation, *social responsibility* was significantly predicted by 'conservation' (β = .25), but also 'openness to change' (β = .19), along with age and gender. These four

(Hypotheses 1A, B, C, D) $(N =$: 186))		:	•					
Independent variables							Health	n-related mo	otive orie	ntations						
	Energ	3y	Enjoy	ment	Emoti Well-I	onal being	Social Respo	nsibility	Physic Well-l	al Deing	Achie	vement	Autono	my	Outward Appeara	l nce
	1^{a}	2	-	2		2	1	2	1	2		2	1	2	1	2
Gender	.17*	$.13^{*}$.07	04	.24**	.19**	.23**	.18**	11.	.06	.06	.04	.13	10	.21**	.17**
Age	.20**	.15*	$.18^*$.14	.20**	.13*	.31**	.28**	.23**	.21**	.05	60.	.14*	13	.18**	.16**
Openness to Change		.49		$.20^{*}$		$.23^{**}$		$.19^{*}$		02		$.24^{**}$	·	.06		$.36^{**}$
Self-transcendence		.10		.20*		.27**		.14		.21**		11	•	10		04
Conservation		.01		.02		.02		.25**		.31**		.11	•	13		.17*
Self-enhancement		.01		06	·	05		.11		.15		.36**	·	19^*		.13
R^{2}	.06	.34	.03	.14	.08	.25	.13	.29	.06	.26	.01	.23	.03	12	.07	.24
ΔR^2	.06	.28	.03	H.	.08	.16	.13	.16	.06	.20	.01	.23	.03	60	.07	.17
ΔF	5.88**	18.56^{**}	3.20^*	5.63^{**}	8.37** 9).58**	13.79^{**}	10.01^{**}	5.96^{**}	12.00^{**}	0.48]	3.27**	3.08* 4.	.67**	6.39** 10	0.00^{**}
<i>Note.</i> Dummy code (gender: m $p < .05$ (2-tailed), ** $p < .01$ (2- a Step 1: Age and gender; Step	lale = 0, 1 -tailed) 2: Openi	female = ness to c	: 1) hange,	self-tran	scendenc	e, conse	ervation, s	self-enhance	ement							

Table 6 Summary of results for hierarchical regression analyses of health-related motive orientations on higher-order value types and personal characteristics

Master Thesis Communication Studies Ivana Dacheva predictors explained a significant proportion of variance ($R^2 = .29$, p < .01) in the model. Hypothesis 1C was partially supported. *Physical well-being* and *social responsibility* had the best predictability from the 'conservation' value type, in favour of our hypothesis. However, physical well-being was also positively associated with 'self-transcendence', which is not unusual since these two higher-order values are also adjacent values in the motivational continuum. The shared motivational emphases of the basic value types that connect these two higher-order values in the continuum are 'call for normative behavior that promotes close relationships' (i.e., shared meaning of conformity and benevolence) and 'promoting devotion to one's ingroup' (i.e., the shared meaning of tradition and benevolence). These shared meanings provided logical explanation of the results of the regression analysis used to predict physical well-being motivation. Respondents who were directed by 'conservation' and 'selftranscendence' values were concerned with the physical aspects of health, because for them it was important to preserve the status quo, i.e. stay in good health, and the security it provides, but also to promote the welfare of others, close or distant. In the regression of social responsibility, the finding that this score was positively associated not only with 'conservation', but also with 'openness to change', which opposes 'conservation' in the continuum, was a kind of unexpected. Though, the positive relationship between social responsibility and 'openness to change' was significant only on alpha level of .05. This finding could be explained with the significant positive correlation of social responsibility with all four higher-order value types (see Table 5) in our sample. This means that people, who give priority to 'conservation' or 'openness' value types, both are motivated to maintain good health in order to share time and live in harmony with their families, and also to be able to take care of them.

We tested the last hypothesis (see H1D), which referred to the relationships between higher-order values and the last three health-related motives, with three regression equations. In the first equation, *achievement* motive was regressed on the personal characteristics in combination with the four higher-order value types. The results showed that only two predictors explained a significant proportion of variance ($R^2 = .23$, p < .01) in achievement scores. 'Self-enhancement' significantly predicted *achievement* motivation ($\beta = .36$), as did 'openness to change' ($\beta = .24$). In addition, *achievement* was negatively related to 'selftranscendence', but this score did not reach significance. These findings are logical, since both predictors are adjacent values in the structure, and indicate that for people who follow their own intellectual and emotional interests even at the expense of others, *achievement* is a very important motivation for pursuing good health. Next, we regressed the *autonomy* health motive on the same predictor variables and found that 'self-enhancement' was the only significant predictor ($\beta = .36$) in the model, as hypothesised. 'Self-enhancement' also explained a significant proportion of variance in *autonomy* scores, $(R^2 = .19, p < .05)$. In the last regression equation, outward appearance was regressed on value types, age and gender, and the results indicated that four predictors explained 24% of the variance (p < .01) in the model. It was found that 'openness to change' ($\beta = .36$) and 'conservation' ($\beta = .17$), along with age and gender, are significant predictors of *outward appearance* motivation for being in good health, although the relation with 'conservation' was significant only on alpha level of .05. Our assumption that *outward appearance* is predicted by 'self-enhancement' value type was not confirmed. It appeared that the best predictor of this health-related motivation is 'openness to change', and partially 'conservation'. Hypothesis 1D is only partially confirmed. In favour of our hypothesis, *achievement* and *autonomy* motivations had the best predictability from the 'self-enhancement' value type. However, *outward appearance* should be classified, along with *energy*, as an important health-related motivation for people who give priority to 'openness to change' value type.

4.5 Test of Proposed Path Model

The second objective of this study was to assess the relationships between personal value priorities, health-related motive orientations, attitude toward exercising and exercise behaviour (see Figure 2). To test hypotheses 2, 3 and 4, we used more contemporary approach to mediation analysis by using the *PROCESS* tool in SPSS (Hayes, 2013). This tool uses Lambert's mediation model (Lambert, Negash, Stillman, Olmstead, & Fincham, 2012) by estimating the *indirect effect(s)* rather than through Baron and Kenny's (1986) style mediation analysis. The focus is entirely on the *indirect effect* (Kenny, 2013), and the only requirement to establish mediation is to find that this effect is significant by a bootstrap test or by the Sobel test. To test hypothesis 5, we used Edwards and Lambert's (2007) moderated mediation model. *PROCESS* estimates both, the *conditional indirect effect* and the *conditional direct effect*, both of interest for the present study.

4.5.1 Simple and multiple mediation analyses

• Attitude toward exercising – a mediator of the effect of values on exercise behaviour (Hypothesis 2)

Our second hypothesis states that the relationship between higher-order values and exercise behaviour is mediated by *attitude toward exercising*. The mediation model of Lambert's et al.'s (2012) used in the present study suggests that the relationship between values and exercise behaviour isn't a direct effect but operates through positive attitude toward exercising (see Figure 3 below). For this hypothesis to be true, by following Baron and Kenny's (1986) causal step approach to mediation: (1) values should predict exercise behaviour in the first place (path c); (2) values should also predict attitude toward exercising (path a); (3) attitude toward exercise behaviour should be smaller when attitude toward exercising is included in the model than when it isn't. The letters represent the unstandardized regression coefficients for the relationships denoted by the path.

By looking at Lambert et al.'s (2012) mediation model (Figure 3B), we can distinguish between the *direct effect* of values on exercise behaviour, which is the relationship between them controlling for attitude toward exercising (path c'), and the *indirect effect*, which is the effect of values on exercise behaviour through attitude (path ab). In this approach to mediation analysis, the effect of values on exercise behaviour (c) represents only the *total effect*, but not the effect 'to be mediated', and can be expressed as the sum of the direct and



Figure 3. (A) Diagram of a basic relationship. *X* affects *Y*. (B) Diagram of a mediation model (Lambert et al., 2012). *X* is hypothesized to exert an indirect effect on *Y* through *M*.

indirect effects (c = c' + ab) (Figure 3A). *PROCESS* uses 1000 bootstrap samples and computes bias corrected and accelerated confidence intervals around the indirect effect, which allows us to simply report the degree of mediation observed in the data. To evaluate the size of the indirect effect, we used Preacher and Kelley's (2011) kappa-squared (k^2), as an effect size measure for simple mediation in this study. In addition, the significance of the indirect effect was assessed with Sobel test.

Table 7 (p. 44) shows the results of the four simple mediation analyses (i.e., mediation processes involving only one mediating variable), conducted to test our second hypothesis. In each mediation model we used one of the four higher-order value types (i.e., openness to change, self-transcendence, conservation, and self-enhancement) as a predictor variable, attitude toward exercising as the mediator, and exercise behaviour as the outcome variable.

The first analysis showed that there is a positive effect of 'openness to change' on exercise behaviour (b = .17, p = .036), when the mediator is not present in the model. Likewise, the effect of 'openness to change' on attitude toward exercising was significant (b = .24, p = .019). There was a stronger positive effect of attitude toward exercising on exercise behaviour (b = .47, p < .001). When 'openness to change' and attitude toward exercising were both included in the model, the *direct effect* of 'openness' on exercise behaviour decreased to non-significant (b = .05, p = .364), whereas the *indirect effect* of 'openness' on exercise behaviour through attitude toward exercising reached significance, b = .11, 95% BCa CI [0.02, 0.21]. All coefficients were positive and in the predicted direction. A significant proportion of variance in exercise behaviour was explained by this model ($R^2 = .383$, p < .001). In addition, Sobel test showed the indirect effect to be significant (Sobel z = 2.28, p = .022). This represents over medium effect, $k^2 = .123, 95\%$ BCa CI [.030, .220], following Preacher and Kelley's criteria (2011). Put another way, attitude toward exercising is a mediator of the relationship between 'openness to change' value type and exercise behaviour. Moreover, we reported this first mediation found to be a 'complete mediation' or 'full mediation', which is the gold standard in current practice (Baron & Kenny, 1986; Kenny, 2013). Complete mediation is the case in which the predictor (openness to change) no longer affects the outcome (exercise behaviour) after the mediator (attitude toward exercising) has been controlled and so the direct effect (c') is no longer significantly different from 0. To sum

Table 7			
Summary of results for simple mediation analyses predicting 'e	exercise behaviour' via	a 'attitude toward exercising'	(N = 186) (Hypothesis 2)

						Dir	ect effe	ct Ind	irect ef	fect ^b				
	Path ^a								<u> </u>		Sobel		Effec	xt size
Predictor	с	p	а	р	b	р	c'	р	ab	95% BCa CI	z	р	k^2	95% BCa CI
Openness to Change	0.17	.036	0.24	.019	0.47	.000	0.05	.364	0.11	[0.022, 0.210]	2.28	.022	.123	[.030, .220]
Self-transcendence	0.09	.411	0.32	.001	0.49	.000	-0.07	.441	0.16	[0.077, 0.270]	3.19	.001	.174	[.082, .267]
Conservation	-0.03	.687	0.03	.715	0.48	.000	-0.04	.371	0.02	[-0.084, 0.096]	0.36	.716	.022	[.000, .069]
Self-enhancement	-0.04	.494	-0.11	.167	0.48	.000	0.01	.780	-0.05	[-0.129, 0.025]	-1.37	.171	.079) [.005, .185]

^a The letters denoting the paths represent the unstandardized regression coefficients for the relationships denoted by the path.

^b The confidence interval for the indirect effect and the size of this effect is a BCa bootstrapped CI based on 1000 samples.

All significant regression coefficients and Sobel *z* for the indirect effect are in bold font.

up, respondents who give priority to 'openness to change' value type exercise more and more regularly when they hold a positive attitude toward exercising. Both approaches to testing mediation, i.e. Baron and Kenny's (1986) and Lambert et al.'s (2012), yielded identical results, fully supporting our second hypothesis.

Second, we tested whether 'self-transcendence' influences exercise behaviour via attitude toward exercising. The basic relationship (c) between 'self-transcendence' and exercise behaviour did not reach significance (b = .09, p = .411). However, 'self-transcendence' significantly predicted attitude toward exercising (b = .32, p = .001) and attitude toward exercising significantly predicted exercise behaviour (b = .49, p < .001). Both regression equations resulted in strong positive coefficients, showing that when priority to 'selftranscendence' value increases, attitude toward exercising also increases, and when the attitude is more positive exercise behaviour increases as well. When both 'self-transcendence' and attitude toward exercising were included in the model, they explained 38.5% of the variance in exercise behaviour (p < .001). The *direct effect* of 'self-transcendence' was nonsignificant (b = -.07, p = .441), whereas the *indirect effect* of 'self-transcendence' on exercise behaviour was significant, b = .16, 95% BCa CI [0.08, 0.27]. Also, the Sobel test was significant (Sobel z = 3.19, p = .001) and the size of the indirect effect was relatively large, $k^2 = .174$, 95% BCa CI [.082, .267]. This indicates a mediating effect of attitude toward exercising on the relationship between 'self-transcendence' and exercise behaviour, with one qualification. The first condition of mediation proposed by Baron and Kenny (1986) was not satisfied, 'self-transcendence' value did not statistically predict exercise behaviour (path c). However, some authors (e.g., Collins, Graham, & Flaherty, 1998; MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002, Zhao, Lynch, & Chen, 2010) have argued that a significant total effect of X on Y (path c) is not necessary for mediation to occur. Most alternative approaches to test mediation hypotheses focus not on the individual paths in the mediation model, but instead on the product path ab (i.e., the *indirect effect*), under the logic that this product is equal to the difference between the *total* and the *direct effect* (ab = c - c'). The Sobel test (Sobel, 1986), also called the 'product-of-coefficients' approach, involves computing the ratio of *ab* to its estimated standard error (SE), and a significant *p* value for this ratio supports the hypothesis of mediation.

In this second mediation analysis, the results of both approaches to testing hypotheses in mediation showed slightly different results. Since, we used PROCESS tool by SPSS to test the hypothesised mediations, we had chosen for Lambert et al.'s (2012) approach of estimating the indirect effect and the Sobel test. It is interesting to note that the positive coefficient for the relationship between 'self-transcendence' and exercise behaviour became negative, when attitude was included in the model. In this case, the *direct effect* (path c') was opposite in sign to the *indirect effect* (path *ab*), something that MacKinnon, Fairchild, and Fritz (2007) refer to as 'inconsistent mediation' or 'competitive mediation' (Zhao et al., 2010). The explanation is that the mediator acts like a suppressor variable and also the total effect of 'selftranscendence' on exercise behaviour is likely to be very small because the direct and the indirect effects tend to cancel each other out (Kenny, 2013). If the direct path (c') was found to be significant in this second mediation analysis, it would simply represent the 'unexplained' part of the value-behaviour relationship. According to Zhao and colleagues, this unexplained direct path can be the reflection of an alternative mediator, and the sign of this path gives a clue for the sign of the omitted indirect path. However, the negative direct effect of 'self-transcendence' on exercise behaviour did not reach significance. Therefore, we reported the second 'full' or 'complete mediation' found in the present study - selftranscendence value had effect on exercise behaviour only through positive attitude toward exercising. These findings are in line with the Theory of Planned Behaviour (Ajzen, 1985), which postulates that even though values can guide behaviour, values cannot predict behaviour directly. They can guide behaviour through some kind of attitudinal or motivational construct invoked as a mediator (e.g., Brunso et al., 2004, Ponjanheimo et al., 2010). We concluded that attitude toward exercising is a mediator of the relationship between selftranscendence value type and exercise behaviour, fully in line with our second hypothesis.

The next two simple mediation analyses we ran, with 'conservation' and 'selfenhancement' as predictors of exercise behaviour via attitude, did not show any significant relationships except for the one between attitude and exercise behaviour (path *b*). Including attitude toward exercising in the models resulted in two equal positive coefficients, (b = .48, p < .001), confirming that attitude is a very strong predictor of exercise behaviour itself. Considering the fact that this study is of exploratory nature, and as far as we know, it is the first one to investigate the explanatory power of personal values in relation to exercise behaviour, it was not expected that all four higher-order values would be related to exercise behaviour. Instead, our findings provided some initial insight into which values can be considered predictors of exercise behaviour through attitude toward exercising. To wrap up, our second hypothesis was confirmed for two of the four higher-order values, 'openness to change' and 'self-transcendence', as significant predictors of increased exercise behaviour via positive attitude toward exercising. The other two value types, 'conservation' and 'selfenhancement', did not show any significant *direct* or *indirect* effects on exercise behaviour, and it was concluded that they are not related to exercise behaviour in the present study. • *Health-related motive orientations (HRMO) – mediators of the effect of values on exercise behaviour (Hypothesis 3)*

The third hypothesis states that the relationship between personal values and exercise behaviour is mediated by *health-related motive orientations*. To test this hypothesis, we used a design, which has received less attention in the methodological literature, and involves simultaneous mediation by multiple variables, or multiple mediation design (see Figure 4). Preacher & Hayes (2008) proposed that investigating multiple mediation should involve two parts: (1) testing the *total indirect effect*, or deciding whether the set of mediators transmits the effect of X on Y, and (2) investigating the *specific indirect effect* associated with each supposed mediator to determine to what extent specific M variables mediate the effect of X on Y, conditional on the presence of other mediators in the model.

Figure 4 depicts a multiple mediation model with eight mediators (M_{1-8}) . Figure 4A represents the total effect of X on Y (path c). Figure 4B represents both the direct effect of X on Y (path c') and the indirect effects of X on Y via the 8 mediators. The *specific indirect effect* of X on Y via mediator *i* is defined as the product of the two unstandardized paths linking X to Y via that mediator a_ib_i . The *total indirect effect* of X on Y is the sum of the specific indirect effects, $\sum_i (a_ib_i)$ and it can also be calculated as c - c'. The total effect of X on Y is the sum of the direct effect and all specific indirect effects: $c = c' + \sum_i (a_ib_i)$.



Figure 4. (A) Diagram of a basic relationship. *X* affects *Y*. (B) Diagram of a multiple mediation design (Preacher & Hayes, 2008). *X* is hypothesized to exert an indirect effects on *Y* through $M_1, M_2, ..., M_8$

The causal steps approach can be used to determine whether or not c - c' represents a mediation effect in the multiple mediation context, but as noted earlier, the requirement that c be significant is not always considered necessary for mediation to occur. It is possible, for example, for one variable (M_1) to act as a mediator, and for a second (M_2) to act as a suppressor (see MacKinnon et al., 2000). Consequently, M_1 and M_2 may show indirect effects that cancel out. Although it is easy to understand this extension of the causal steps approach, it suffers from the same shortcomings it has when used in the single mediator context, and for this reason, the causal steps approach is of little utility in the multiple mediator context (Preacher & Hayes, 2008).

Bootstrapping is superior to the the causal steps strategy and is the preferred method for assessing *total* and *specific indirect effects* in multiple mediator models (see Preacher & Hayes, 2008). This interpretation of the mediation analysis does not focus at all on the statistical significance of a and b paths, as it is required using the causal steps method. Instead, emphasis is placed almost entirely on the direction and size of the *indirect effects*. Bias-corrected and accelerated (BCa) bootstrapping provides the most powerful and reasonable method of obtaining confidence limits for *specific indirect effects* (see Williams & MacKinnon, 2008).

Table 8 (p. 48) shows the results of four multiple mediation analyses conducted to test our third hypothesis. In each mediation analysis we used one of the four higher-order value types (i.e., openness to change, self-transcendence, conservation, and self-enhancement) as a predictor variable, health-related motive orientations (HRMO) as the mediators operating in parallel, and exercise behaviour as the outcome variable.

With the first multiple mediation analysis, we tested whether 'openness to change' value type significantly predicts exercise behaviour through the eight health-related motives. The total indirect effect was significant, b = .27, 95% BCa CI [0.153, 0.392], which confirmed that the set of HRMO variables mediate the effect of 'openness to change' on exercise behaviour (i.e., there was an overall mediating effect). The specific indirect effect of 'openness' on exercise behaviour via energy motivation was the only significant one from the set of proposed mediators, b = .27, 95% BCa CI [0.146, 0.418]. Sobel test showed this specific indirect effect to be highly significant (Sobel z = 3.68, p < .001). This multiple mediation model explained a significant proportion of variance in exercise scores ($R^2 = .20$, p < .001). In addition, the total effect of 'openness' on exercise behaviour also reached significance (b = .17, p = .036). Given the results of this analysis, we concluded that HRMO can be considered mediators of the relationship between 'openness to change' and exercise behaviour. Particularly, the energy motivation mediated this relationship, showing that people, who give priority to 'openness to change' value type and are motivated to maintain good health in order to have energetic lives full of vitality, exercise more and more regularly. These findings are in line with our third hypothesis, but also with hypothesis 1A.

The second analysis of multiple mediation showed that the *total indirect effect* of 'self-transcendence' value type on exercise behaviour through the set of health-related motive orientations was not significant, b = .10, 95% BCa CI [-0.020, 0.235]. According to Preacher and Hayes (2008), a significant total indirect effect is not a prerequisite for investigating specific indirect effects. It is entirely possible to find specific indirect effects to be significant

Table 8Summary of results for	or multiple mediation analy	ses pred	icting '	exercise	behavi	our' vi	a 'health	-related	motive orientatic	ons' (N	= 186) (Hypothe	esis 3)		
		Total e	ffect		Direct	effect			Indirect ef	fects ^a				
Predictor	Mediator	с	t	р	c,	t	d	$\frac{Total}{\sum (a,b)}$	i) 95% BCa CI	Specif a _i b _i	ic 95% BCa CI	Sohel Z	р	R^2
Openness to Change	Energy Enjoyment Emotional Well-being Social Responsibility Physical Well-being Achievement Autonomy Outward Appearance	0.17	-1.09	.036	-0.10	-1.01	.278	0.27	[0.153, 0.392]	0.27 0.02 0.03 0.00 0.00 0.01 0.01 0.01	[0.146, 0.418] [-0.035, 0.108] [-0.117, 0.028] [-0.039, 0.062] [-0.039, 0.008] [-0.029, 0.008] [-0.077, 0.003] [-0.047, 0.070]	3.68 0.54 -0.81 0.07 -0.24 0.47 -0.92 0.25	.000 .590 .942 .811 .642 .357 .357	.197
Self-transcendence	Energy Enjoyment Emotional Well-being Social Responsibility Physical Well-being Achievement Autonomy Outward Appearance	0.09	0.82	.411	-0.01	-0.10	918	0.10	[-0.020, 0.235]	0.15 0.02 -0.04 0.00 0.00 0.00 0.00	[0.058, 0.270] [-0.029, 0.099] [-0.142, 0.055] [-0.060, 0.063] [-0.062, 0.036] [-0.062, 0.036] [-0.023, 0.011] [-0.023, 0.013] [-0.023, 0.039]	2.58 0.50 -0.90 0.04 -0.38 -0.08 -1.04 0.04	.010 .620 .972 .972 .937 .299 .971	191.
Conservation	Energy Enjoyment Emotional Well-being Social Responsibility Physical Well-being Achievement Autonomy Outward Appearance	-0.03	-0.40	.687	0.03	0.44	.662	-0.06	[-0.163, 0.029]	-0.02 0.00 0.00 -0.02 -0.02 0.01 0.01	[-0.098, 0.036] [-0.029, 0.005] [-0.029, 0.009] [-0.046, 0.062] [-0.096, 0.037] [-0.021, 0.045] [-0.021, 0.045] [-0.024, 0.008]	-0.61 -0.32 -0.14 0.05 -0.50 0.35 -1.14 0.02	.539 .746 .888 .888 .958 .958 .118 .730 .256 .983	191.
Self-enhancement	Energy Enjoyment Emotional Well-being Social Responsibility Physical Well-being Achievement Autonomy Outward Appearance	-0.04	-0.69	.494	-0.07	-1.03	.307	0.03	[-0.076, 0.123]	$\begin{array}{c} 0.03\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.02\\ -0.02\\ 0.00\end{array}$	[-0.026, 0.091] [-0.013, 0.016] [-0.007, 0.031] [-0.022, 0.004] [-0.045, 0.020] [-0.039, 0.103] [-0.076, 0.007] [-0.077, 0.040]	$\begin{array}{c} 0.81\\ 0.04\\ 0.25\\ 0.15\\ 0.15\\ -0.34\\ 0.71\\ -1.10\\ 0.20\end{array}$.419 .969 .885 .885 .733 .478 .478 .838	.196
^a The confidence interval The letters denoting the All significant regressic	for the indirect effect and the paths represent the unstandar on coefficients and Sobel z for	size of th dized regr the indire	is effect ession c ect effec	is a BC ² coefficier t are in b	a bootstra its for th old font.	tpped C e relatio	I based oi nships de	n 1000 sa noted by	mples. the path.					

in the presence of a nonsignificant total indirect effect. The specific indirect effect of 'selftranscendence' on exercise behaviour through *energy* motivation reached significance, b = .15, 95% BCa CI [0.058, 0.270]. Also, the Sobel test for this specific indirect effect was significant (Sobel z = 2.58, p = .010). The model predicted 19% of the variance in exercise behaviour (p < .001). Moreover, the total effect of 'self-transcendence' on exercise behaviour did not reach significance (b = .09, p = .411), but as we already explained above, a significant total effect (path c) is not necessary for mediation to occur. To sum up, the relationship between 'self-transcendence' and exercise behaviour is mediated by energy health-related motive, which also supports our third hypothesis. However, this finding contradicts to some extent what we found when tested hypothesis 1A, i.e. 'openness to change' was the only significant predictor of 'energy' motivation for pursuing good health. When values and HRMO were linked to a particular health-related behaviour, energy was the only significant mediator of the effects of 'openness to change' and 'self-transcendence' value types on exercise behaviour. A possible explanation is that *energy* motive had a strong positive correlation with 'openness to change', but it also correlated positively with 'selftranscendence' value type (see Table 5).

The results of the next two multiple mediation analyses we ran, with 'conservation' and 'self-enhancement' as predictors of exercise behaviour via health-related motive orientations, did not show any significant *direct* or *indirect effects* on exercise behaviour. Both of these higher-order values had no connection to exercise behaviour in our sample and these findings were in line with what we found when testing the previous hypothesis (H2). Our third hypothesis was confirmed for two of the four higher-order value types, 'openness to change' and 'self-transcendence', as significant predictors of increased exercise behaviour via *energy* motivation for pursuing good health. *Energy* was the most important health-related motivation that can be considered mediator of the effect of values on exercise behaviour in the present study.

• Direct and indirect effect of health-related motive orientations (HRMO) on exercise behaviour via attitude toward exercising (Hypothesis 4)

Our next hypothesis states that health-related motive orientations influence exercise behaviour directly as well as indirectly through attitude toward exercising. To test this hypothesis we used again Lambert et al.'s (2012) mediation model of simple mediation (see Figure 5B below). The only conceptual difference with hypothesis 2 is that this time we were interested also in the *direct effect* of HRMO on exercise behaviour, rather than only in the *indirect effect* through M (path ab). This means that we also looked for significant *total effect* of X on Y (path c), when the mediator was not present in the model (see Figure 5A).

Table 9 (p. 50) shows the results of eight simple mediation analyses conducted to test our fourth hypothesis. In each mediation model we used one of the eight health-related motive orientations as a predictor, attitude toward exercising as the mediator, and exercise behaviour as the outcome. First, we found that *energy* and *outward appearance* health-related motivations are significant predictors of exercise behaviour, when attitude toward exercising (the mediator) was not included in the model (see Figure 5A). The *total effect* of *energy* on



Figure 5. (A) Diagram of a basic relationship. *X* affects *Y*. (B) Diagram of a mediation model (Lambert et al., 2012). *X* is hypothesized to exert an indirect effect on *Y* through *M*.

exercise behaviour was highly significant (b = .34, p < .001) and the model explained 17% of the variance in exercise scores (p < .001). Similarly, *outward appearance* predicted exercise behaviour (b = .14) and significant proportion of variance was explained by this model ($R^2 = .04$, p = .013). It should be noted that the value of R^2 for *outward appearance* was rather small when compared to the proportion of variance explained by the *energy* model. The other six health-related motive orientations did not show significant *total effect* on exercise behaviour in the present study. Therefore, *energy* and *outward appearance* motives for pursuing good health were the only *direct predictors* of exercise behaviour, when attitude toward exercising was not part of the model (see Figure 5A). Respondents who were motivated by these health-related motivations showed increased exercise behaviour regardless of their attitude toward exercising. Second, when looking at Table 9 we could see that all HRMO significantly predicted attitude toward exercising (path *a*), except for *autonomy*, which was the only motive that did not reach significance (b = .10, p = .213). The best

Builling of results for shipe	meana	iion unu	ijses pi	culetin	5 ener		nuvioui	, iu ui	intude t	e mara exercising	5 (11 –	100)	(II)po	
						Dire	ect effec	t Ind	lirect ef	fect				
	Path ^a										Sobe	1	Effect	t size
Predictor	С	р	a	р	b	p	c'	р	ab	95% BCa CI	z	p	k^2	95% BCa CI
Energy	0.34	.000	0.62	.000	0.44	.000	0.06	.355	0.27	[0.193, 0.371]	5.40	.000	.307	[.226, .412]
Enjoyment	0.10	.120	0.23	.000	0.48	.000	-0.01	.898	0.11	[0.061, 0.229]	3.63	.000	.167	[.091, .253]
Emotional Well-being	0.08	.287	0.17	.032	0.48	.000	-0.01	.883	0.08	6 [0.004, 0.195]	2.10	.036	.115	[.011, .206]
Social Responsibility	0.07	.186	0.23	.000	0.49	.000	-0.04	.434	0.11	[0.051, 0.181]	3.45	.001	.184	[.085, .278]
Physical Well-being	0.04	.503	0.22	.006	0.49	.000	0.07	.216	0.11	[0.031, 0.201]	2.68	.008	.149	[.048, .248]
Achievement	0.06	.134	0.12	.050	0.48	.000	0.01	.814	0.06	[0.004, 0.137]	1.93	.050	.114	[.019, .207]
Autonomy	0.00	.970	0.10	.213	0.48	.000	-0.05	.243	0.05	[-0.032, 0.163]	1.24	.217	.077	[.003, .182]
Outward Appearance	0.14	.013	0.29	.000	0.48	.000	0.00	.953	0.14	[0.071, 0.210]	3.97	.000	.211	[.109, .303]

Summary of results for simple mediation analyses predicting 'exercise behaviour' via 'attitude toward exercising' (N = 186) (Hypothesis 4)

^a The letters denoting the paths represent the unstandardized regression coefficients for the relationships denoted by the path.

^b The confidence interval for the indirect effect and the size of this effect is a BCa bootstrapped CI based on 1000 samples.

All significant regression coefficients and Sobel *z* for the indirect effect are in bold font.

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Table 9

predictor of attitude toward exercising was *energy* motivation (b = .62, p < .001). In all eight mediation analyses performed, attitude toward exercising showed a strong positive relationship to exercise behaviour (path b), with regression coefficients b ranging from .44 to .49 (p < .001). The *indirect effects* of the eight health-related motives on exercise behaviour via attitude (path ab) were all significant, with the exception of *autonomy*, b = .05, 95% BCa CI [-0.032, 0.163]. The significance of the indirect effects was also confirmed by the results of Sobel tests. Moreover, the measure of the size of the indirect effects, kappa-squared (k^2), showed that *energy* and *outward appearance* have large indirect effects on exercise behaviour, $k^2 = .307$, 95% BCa CI [.226, .412] and $k^2 = .211$, 95% BCa CI [.109, .303]. The size of the indirect effect of the other five health-related motive orientations was larger than what is considered as a medium effect (k^2 around .09), following Preacher and Kelley's criteria (2011). *Autonomy* was the only motive that was not related to attitude toward exercise behaviour itself in our sample. A significant proportion of variance in exercise behaviour was explained by all eight models, R^2 ranging from 38% to 39%.

In contrast, the *direct effects* of HRMO on exercise behaviour, when attitude toward exercising was included in the models (path c^2), were all not significant. In four of the eight mediation analyses performed, the coefficients for the direct effect (path c) became even negative when attitude (the mediator) was included (path c'). In these four cases, the *direct* effect (path c') was opposite in sign to the *indirect effect* (path ab), something that we have already seen when testing hypothesis 2. The explanation is the same; the mediator acts like a suppressor variable and the direct and the indirect effects tend to cancel each other out (Kenny, 2013). Nevertheless, all negative or positive direct paths (c') did not reach significance, showing that HRMO influence exercise behaviour through attitude toward exercising. These findings indicated a mediating role of attitude toward exercising on the relation between seven out of eight HRMO and exercise behaviour. To sum up, the first assumption of hypothesis 4, which states that health-related motive orientations predict exercise behaviour directly (when attitude is not part of the models), was confirmed only for two HRMO, i.e. energy and outward appearance. The second assumption of hypothesis 4, which states that health-related motive orientations predict exercise behaviour indirectly through positive attitude toward exercising, was confirmed for all HRMO, except autonomy. As a result, we reported seven 'complete mediations'; energy, enjoyment, emotional wellbeing, social responsibility, physical well-being, achievement and outward appearance had positive effect on exercise behaviour via positive attitude toward exercising.

It can be seen from the above analyses that, most of the health-related motive orientations were significant predictors of exercise behaviour via attitude toward exercising when values were not included in the model. Apparently, when HRMO were tested as *mediators* of the relationship between values and exercise behaviour, only the mediating role of *energy* motivation was confirmed (see H3). In contrast, when HRMO were tested as *predictors* of exercise behaviour, all of them (except *autonomy*) showed significant positive indirect effects via attitude toward exercising (see H4). The findings that seven out of eight HRMO were

positively linked to exercise behaviour might have important public health implications on their own. Consequently, these implications are discussed in the last chapter of the present study.

4.5.2 Moderated mediation analyses

 Regulatory focus (RF) – a moderator of the direct and indirect effect of health-related motive orientations (HRMO) on exercise behaviour via attitude toward exercising (Hypothesis 5)

Our last hypothesis states that *regulatory focus* moderates both the direct and the indirect effect of health-related motive orientations on exercise behaviour via attitude toward exercising (see Figure 2). To be more specific, we expected that a regulatory fit between the direction of the HRMO and the predominant regulatory focus of an individual would result in increased exercise behaviour as an outcome. To test this hypothesis we used one of Edwards and Lambert's (2007) moderated mediation models, termed *first stage and direct effect moderation model*, which lays the foundation for models that combine moderation of direct and indirect effects (see Figure 6). Recent treatments of the analysis of moderated mediation models focus on the estimation of interactions between the moderator and the pathways that define the direct and indirect effect (e.g., Edwards & Lambert, 2007; Preacher, Rucker, & Hayes, 2007). Preacher et al.'s approach emphasizes the estimation of *conditional indirect effect effect* – the values of indirect and direct effect conditioned on values of the moderator.

In path analytic terms, our model suggests that the path a_1 linking HRMO (X) to attitude toward exercising (M), which is the first stage of the indirect effect of HRMO on exercise behaviour (Y), varies across levels of regulatory focus (W), i.e. *first stage moderation*. In addition, the direct effect (path c_1 ') of HRMO on exercise behaviour also varies as a function of the moderator, i.e. *direct effect moderation*. Predominant regulatory focus (the moderator) was measured as an individual difference variable and respondents were classified as promotion or prevention-oriented. As explained in the Methodology section, we created a measure of predominant regulatory focus by subtracting scores on the prevention goal subscale from scores on the promotion goal subscale. Higher scores on this measure reflect relatively greater promotion focus, whereas lower scores reflect relatively greater prevention focus. *PROCESS* tool performs simple slopes analysis, by working out the regression



Figure 6. Diagram of a direct effect and first stage moderation model (Edwards & Lambert, 2007). The first stage of the indirect effect of *X* on *Y* varies as a function of *W* and the direct effect of *X* on *Y* also depends on *W*.

equations for the predictor and the outcome at low, high, and average levels of the moderator (i.e., it uses 1 standard deviation above and below the mean value of the moderator). In this way, we were able to compare if the relationships between HRMO and exercise behaviour change at different levels of predominant regulatory focus.

Looking at Edwards and Lambert's (2007) model (see Figure 6), we can distinguish between the *conditional indirect effect* of HRMO on exercise behaviour through attitude toward exercising, expressed by the equation $(a_1 + a_3W)b$, and the *conditional direct effect* of HRMO on exercise behaviour, expressed by the equation $c_1' + c_3'W$. The bootstrap method has been used to test indirect effects in our mediated models regarding hypothesis 2, 3, and 4. It can also be extended to models that combine mediation and moderation (see MacKinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002). Similarly, bootstrapping was applied to the assessment of the conditional indirect effects in this study. The confidence intervals for the indirect effects and the sizes of these effects are 95% BCa bootstrapped CI based on 1000 samples.

Table 10 shows the results of eight moderated mediation analyses conducted to test our last hypothesis. In each model we used one of the HRMO as a predictor variable, exercise behaviour as the outcome, attitude toward exercising as the mediator, and predominant regulatory focus (RF) as the moderator. The predictor and the moderator were centered at their mean by *PROCESS* tool (Hayes, 2013). Moderation is shown by a significant interaction effect between the predictor and the moderator in predicting attitude toward exercising (path a_3) and exercise behaviour (path c_3 ').

The results of the first analysis showed that there is no significant interaction effect between *energy* motivation and regulatory focus on attitude toward exercising (b = .00, p = .910), indicating that this relationship is not moderated by regulatory focus. Nevertheless, the *conditional indirect effect* of energy on exercise behaviour via attitude was significant at

Table 10

Summary of results for mediation analyses predicting 'exercise behaviour' via 'attitude toward exercising' and are moderated by 'regulatory focus' (N = 186) (Hypothesis 5)

	Path ^a			Intera	ction	1 ^b							Interac	ction 2		
Predictor	a_1	t	р	<i>a</i> ₃	t	р	b	t	p	c_1 '	t	р	c_3 '	t	р	R^2
Energy	0.61	7.34	.000	0.00	0.11	.910	0.44	7.07	.000	0.04	0.58	.561	-0.07	-2.96	.004	.405
Enjoyment	0.21	3.34	.001	0.02	1.03	.306	0.48	10.17	.000	-0.02	-0.35	.729	-0.02	-0.55	.583	.386
Emotional Well-being	0.13	1.65	.100	0.01	0.26	.796	0.48	9.81	.000	-0.02	-0.31	.755	-0.01	-0.36	.720	.382
Social Responsibility	0.20	3.14	.002	0.03	0.95	.342	0.49	9.65	.000	-0.06	-1.14	.254	-0.02	-0.84	.402	.389
Physical Well-being	0.19	2.35	.020	-0.01	-0.32	.749	0.48	10.06	.000	-0.06	-1.15	.251	-0.02	-0.71	.478	.389
Achievement	0.10	1.56	.122	0.02	0.41	.686	0.47	9.84	.000	0.01	0.18	.856	0.00	0.07	.941	.381
Autonomy	0.08	0.92	.360	0.05	0.89	.374	0.47	9.99	.000	-0.05	-1.20	.231	0.04	1.29	.199	.391
Outward Appearance	0.26	3.84	.000	-0.01	-0.08	.940	0.47	9.49	.000	0.00	0.01	.990	0.00	0.00	.999	.381

^a The letters denoting the paths represent the unstandardized regression coefficients for the relationships denoted by the path. ^b Interaction = predictor x moderator

All significant regression coefficients are in bold font.

Master Thesis Communication Studies Ivana Dacheva all three values of the moderator: at RF of -1.54, b = .27, [0.184, 0.373], at RF of 0.00, b = .27, [0.186, 0.375], and at RF of 1.54, b = .27, [0.167, 0.404]. The non-significant interaction effect resulted in three positive coefficients that predicted exercise behaviour with equal strength, confirming only the indirect effect of energy on exercise behaviour via attitude, which we already found when testing the previous hypothesis (H4). In contrast, the second interaction of interest, the one between energy and regulatory focus on exercise behaviour, reached significance (b = -.07, p = .004). To interpret the moderation effect found, we examined the *conditional direct effect* of energy on exercise behaviour at low, mean, and high values of the moderator. When regulatory focus is prevention-oriented (at RF value of -1.54), there is a significant positive relationship between energy and exercise behaviour (b = .058, p = .040). At the mean RF value of 0.00, the relationship is non-significant (b = .04, t = 0.58, p = .561), and when the focus is promotion-oriented (at RF value of 1.54), there is also a non-significant negative relationship between energy and exercise behaviour (b = .07, t = -0.86, p = .394). Overall, this *first stage and direct effect moderation model* explained a total of 41% variance in exercise scores (p < .001).

The results of the simple slopes analysis above showed that a positive direct relationship between energy health-related motive and exercise behaviour only emerges in respondents with predominant prevention focus in our sample. These findings were unexpected and seemed to contradict our fifth hypothesis, since energy is a promotion-oriented motive and it supposed to increase exercise behaviour in promotion-oriented individuals due to a regulatory fit. We found the opposite instead – energy motivation predicted increased exercise behaviour only for prevention-oriented respondents, showed by the significant positive coefficient for the first regression (at RF value of -1.54. The coefficients were with reversed signs to what was expected. To sum up, the direct relationship between energy and exercise behaviour was moderated by regulatory focus only for respondents with predominant prevention orientation, whereas the indirect relationship through attitude toward exercising was highly significant but not conditional on values of the moderator. The conclusion drawn is that energy motivation positively predicts exercise behaviour in prevention-oriented people, regardless of the lack of fit between this promotion-oriented motive and their prevention focus.

With the second moderated mediation analysis, we tested whether *enjoyment* motivation interacts with regulatory focus to predict exercise behaviour directly and indirectly through attitude toward exercising. The first interaction effect was non-significant (b = .02, p = .306), indicating that there is no moderation of the relationship between enjoyment and attitude toward exercising. Like in the case of energy motivation, the *conditional indirect effect* of enjoyment on exercise behaviour via attitude reached significance at all three levels of regulatory focus, which again confirms only the positive indirect effect that we found when testing hypothesis 4. Nevertheless the conditionality of this effect was not statistically confirmed, we found three significant positive coefficients that followed the expected pattern, growing in explanation power from low (prevention focus) to high (promotion focus) levels of the moderator: at RF of -1.54, b = .09, [0.009, 0.201], at RF of 0.00, b = .10, [0.047, 0.181], and at RF of 1.54, b = .12, [0.047, 0.207]. Since enjoyment is considered a promotion-oriented motivation, these findings support to some extent our fifth hypothesis. The second interaction between enjoyment and regulatory focus in predicting exercise behaviour directly

was non-significant (b = -.02, p = .583), showing that this relationship is not conditioned on the moderator. The *conditional direct effect* of enjoyment on exercise behaviour at all values of regulatory focus did not reach significance either, confirming that there is not a significant direct relationship between enjoyment motivation and exercise behaviour in general. Overall, the model predicted a significant proportion of variance in exercise behaviour ($R^2 = .386$, p < .001). The conclusion is that enjoyment motivation predicts increased exercise behaviour only indirectly through positive attitude and this effect is not moderated by regulatory focus, although we found a slight trend in the expected direction.

Next, we tested whether the interaction of *emotional well-being* motive and regulatory focus predicts attitude toward exercising and we found that this effect is non-significant (b = .01, p = .796). Similarly, the second interaction between emotional well-being and regulatory focus in predicting exercise behaviour directly did not reach significance either (b = .01, p = .720). The conclusion made is that there is no moderation effect of regulatory focus on the direct or the indirect relationship between emotional well-being and exercise behaviour. In addition, both the *conditional indirect* and the *conditional direct effects* were non-significant at all levels of the moderator. The model predicted 38% of variance in exercise scores (p < .001). To sum up, regulatory focus did not moderate the direct and indirect (via attitude) relationship between emotional well-being motivation and exercise behaviour.

The results of the next analysis showed that the interaction effect between *social* responsibility and regulatory focus on attitude toward exercising is not significant (b = .03, p = .342). This is an indication that regulatory focus does not moderate this relationship. However, the conditional indirect effect of social responsibility on exercise behaviour via attitude was significant at all three values of the moderator: at RF of -1.54, b = .08, [0.005, 0.157], at RF of 0.00, b = .10, [0.037, 0.170], and at RF of 1.54, b = .12, [0.032, 0.210], which only confirms the significant positive indirect effect found when testing hypothesis 4. Looking at the second interaction of interest, the one between social responsibility and regulatory focus in predicting exercise behaviour directly, we found no significant interaction effect (b = -.02, p = .402). The direct relationship between social responsibility and exercise behaviour was not conditioned on the levels of the moderator and all conditional direct effects were non-significant. A significant proportion of variance in exercise behaviour was explained by the model ($R^2 = .389$, p < .001).

With the fifth moderated mediation analysis, we tested whether *physical well-being* motivation interacts with regulatory focus to predict exercise behaviour directly and indirectly. The first interaction effect did not reach significance (b = -.01, p = .749), indicating that there is no moderation of the relation between physical well-being and attitude toward exercising. The *conditional indirect effect* of physical well-being on exercise behaviour via attitude was significant only for the mean and the high value of the moderator: at RF of 0.00, b = .09, [0.020, 0.188] and at RF of 1.54, b = .08, [0.003, 0.188], whereas at the low value of the moderator (RF of -1.54) the relationship was non-significant, b = .10, [-0.002, 0.228]. These findings supported the positive indirect effect found when testing our previous hypothesis, but they did not support the assumption that these effects are conditional on the predominant regulatory focus of the respondents. Nevertheless the predictability of exercise

behaviour did not change significantly at different values of the moderator, the coefficients followed the expected pattern, decreasing in explanation power from low (prevention focus) to high (promotion focus) levels of the moderator. Physical well-being is a preventionoriented motive and this trend supports to some extent hypothesis five. The second interaction between physical well-being and regulatory focus in predicting exercise behaviour directly was also non-significant (b = -.02, p = .478), showing that this relationship is not moderated by regulatory focus. The conditional direct effect of physical well-being on exercise behaviour was not significant for the low and the mean value of regulatory focus: at RF of -1.54, b = -.03, t = -0.30, p = .767; at RF of 0.00, b = -.06, t = -1.15, p = .251, whereas at the high value of the moderator, RF of 1.54, the relationship was marginally significant, b = -.10, t = -1.60, p = .110. Overall, the model explained 39% of the variance in exercise behaviour (p < .001). For promotion-oriented respondents, there is a marginally significant negative relationship between physical well-being and exercise behaviour, which is in line with our fifth hypothesis. These results indicate that promotion-oriented people exercise less when motivated by physical well-being motive due to the lack of fit between their regulatory focus and this prevention-oriented motivation for pursuing good health.

Moving to the next health-related motivation, *achievement*, we found two non-significant relationships; b = .02, p = .686, for the interaction between achievement and regulatory focus on attitude toward exercising, and b = .00, p = .941 for the interaction between achievement and regulatory focus on exercise behaviour. The conclusion made is that there is no moderation effect of regulatory focus on the direct or the indirect relationship between achievement and exercise behaviour. In addition, both the *conditional indirect* and the *conditional direct effects* were non-significant at all levels of the moderator.

With the next analysis performed, we tested whether the interaction of *autonomy* motive and regulatory focus predicts attitude toward exercising and we found that this effect is nonsignificant (b = .05, p = .374). The *conditional indirect effect* at all levels of the moderator was also non-significant, indicating no moderation or mediation to occur. The second interaction between autonomy and regulatory focus in predicting exercise behaviour directly did not reach significance (b = .04, p = .199). However, the *conditional direct effect* at the low value of the moderator (at RF of -1.54) was marginally significant (b = .12, t = -1.70, p = .091). The effects at the other two values of regulatory focus were non-significant: at RF of 0.00, b = -.05, t = -1.20, p = .231, and at RF of 1.54, b = .01, t = 0.18, p = .861. The model predicted a significant proportion of variance in exercise behaviour ($R^2 = .391$, p < .001). The results indicated that the relationship between autonomy motivation and exercise behaviour only emerges in people with prevention orientation and this relationship is negative. We concluded that there is a trend that prevention-focused people exercise less when motivated by autonomy health-related motivation, which is not in line with our fifth hypothesis since autonomy is a prevention-oriented motivation.

With the last moderated mediation analysis, we tested whether *outward appearance* motive interacts with regulatory focus to predict exercise behaviour directly and indirectly via attitude toward exercising. The first interaction effect was non-significant (b = .00, p = .940), indicating that there is no moderation of the relationship between outward appearance and attitude toward exercising. The *conditional indirect effect* was significant at all levels of

regulatory focus: at RF of -1.54, b = .13, [0.021, 0.233], at RF of 0.00, b = .13, [0.059, 0.198], and at RF of 1.54, b = .12, [0.021, 0.228], which again confirmed the large indirect effect found when testing our fourth hypothesis. We concluded that the indirect relationship between outward appearance and exercise behaviour is not moderated by predominant regulatory focus. Similarly, the second interaction was highly non-significant (b = .00, p = .999) and the *conditional direct effect* at all levels of regulatory focus was non-significant too. The direct and the indirect relationship between outward appearance and exercise behaviour are not moderated by regulatory focus.

In sum, the results of the eight moderated mediation analyses conducted to test our last hypothesis showed that predominant regulatory focus does not interact with health-related motive orientations in predicting exercise behaviour directly or indirectly through attitude toward exercising, not supporting our fifth hypothesis. The only exception was the significant direct interaction of energy and regulatory focus on exercise behaviour. It was found that energy health-related motivation along with predominant prevention orientation positively predicts exercise behaviour, which contradicts the assumption we made about the congruency between the direction of the health-related motivations and individual's predominant regulatory focus (i.e., 'regulatory fit'). In order to explain the non-significant interaction effects between health-related motive orientations and predominant regulatory focus on exercise behaviour, we looked for possible explanation in several directions.

Although the approach we followed was similar to the one of De Boer et al. (2007), who showed that involvement in food can be separated into promotion-oriented and preventionoriented motivational goals that mediate the relationship between values and meat choices, there are some essential differences between their study and our study. The conceptualization of regulatory focus (RF) was identical in both studies, choosing for Higgins's Regulatory Focus Theory (1997), which clearly defines the concept of promotion-oriented and prevention-oriented motivational systems that regulate all goal directed behaviour. However, the operationalization of the concept of RF was different. In our study RF was measured as an individual difference variable with the GRFM (Lockwood et al., 2002), whereas in the study of De Boer and colleagues, the RF was not measured as an individual difference variable. Instead, the researchers developed a set of food choice motives that supposed to mediate the relationship between broad universalistic values and meat choices. The 11 items comprising the Food Choice Motives (FCM) scale were written in terms of positively worded portraits of people who show different degrees of involvement in food, both in promotion-oriented and prevention-oriented ways. These short portraits were formulated in a manner similar to the PVQ (Schwartz et al., 2001). To classify people into consumers with promotion- or prevention-oriented food choice motives, with high or low involvement in food, De Boer et al. (2007) conducted multidimensional scaling (MDS) analysis followed by principal component analysis (PCA) of the food choice motives. They found that, in a two dimensional space, the vertical dimension separates these 11 items into promotion-oriented motives (e.g., 'enjoying eating well') and prevention-oriented motives (e.g., 'preference for natural products'). The FCM component scores were correlated then with the value scales to test the directional differences between the food choice motives.

As can be seen from the above comparison, the measurement of the RF concept and the method chosen to test the assumptions made in both studies were completely different. The conclusion made is that the results from our study are not really comparable to the ones of De Boer and colleagues, since they did not include a separate measure of predominant RF in their study. We decided to measure RF as an individual difference variable because, according to the regulatory focus literature (see Higgins et al., 2001), promotion versus prevention focus is a fairly stable personality characteristic that influences one's strategies in decision making. For this reason, predominant RF was considered as a potential moderator of the effects of HRMO on exercise behaviour in our conceptual model (see Figure 2). Moreover, we went beyond the initial conceptualization of Higgins's RFT (1997), by looking for a 'regulatory fit' between the direction of HRMO and predominant RF of individuals. Higgins's (2000) theory of regulatory fit proposes that people's motivation during goal pursuit will be stronger when regulatory fit is higher. However, we did not found the expected moderating effects and we concluded that predominant RF is not a factor related to exercise behaviour. Further, when looking for possible explanations of these non-significant interaction effects, it was important to closely examine the reliability and validity of the RF measure used in the present study.

Methodologically, we considered two distinct scales that have been widely used to measure regulatory focus as an individual difference variable, i.e. the Regulatory Focus Questionnaire (RFQ) (Higgins et al., 2001) and the General Regulatory Focus Measure (GRFM) (Lockwood et al., 2002). Even though RFT (Higgins, 1997) has become ubiquitous and very useful in social psychology research, some questions remain about this construct and its measurement (Summerville & Roese, 2008). The confusion stems from the fact that this influential theory postulates two distinct conceptualizations of regulatory focus: the 'selfguide' definition and the 'reference-point' definition. The self-guide definition of RF distinguishes promotion and prevention in terms of the degree to which two possible selfguides are used for regulation; promotion emphasizes internal standards (an 'ideal-self' guide) whereas prevention emphasizes external or socially based standards (an 'ought-self' guide). The reference-point definition of RF is based on the end-state to which current goal progress is compared; promotion focus is regulation centred on the positive reference-point of a 'gain', whereas prevention focus is regulation focused on the negative reference-point of a 'loss'. Although the RFQ and the GRFM are both developed as measures of individual differences in RF, the RFQ focuses on the self-guide definition, whereas the GRFM focuses on the reference-point definition. On a conceptual level, these two definitions have raised the question if RF represents in fact two unique constructs, rather than a unitary construct (Summerville & Roese, 2008).

The RFQ measures regulatory focus by assessing individuals' subjective experiences of success at promotion and prevention tasks over the course of their lives (see Higgins et al., 2001). In contrast, the GRFM was created to assess chronic promotion and prevention goals directly, by emphasizing success and failure at academic goals in the present (see Lockwood et al., 2002). It originated in research on motivation and was tailored to a population of undergraduate students. The 18 items of this scale were designed to tap into the same theoretical construct of regulatory focus used by Higgins and colleagues. After careful examination of the items in both RF scales, we decided to choose the GRFM as the instrument

used to measure predominant RF in the present study. The GRFM scale was more relevant to our research purposes, less abstract, and easier to comprehend than the RFQ scale. In addition, we decided to use only 10 items from the original 18, for reasons explained in the previous chapter Research Method (see p. 34). Although the promotion and the prevention subscales both showed good internal reliabilities $\alpha = .77$ and $\alpha = .79$, the validity of the GRFM also needs to be assessed. Because of the non-significant results found, we were interested also in the construct validity of the RF measure chosen; if the GRFM actually measured what was intended to measure in this study, i.e. the predominant RF of our respondents and not some other construct instead.

The two self-report measures of RF (i.e., RFQ and GRFM) have been closely examined by Summerville and Roese (2008), who suggested that these scales are not measuring the same RF construct. To establish the concurrent validity of the GRFM, the researchers compared this method with the established RFQ method for measuring predominant RF. In three follow-up studies, they found that these two RF scales were largely uncorrelated and that GRFM was significantly associated with positive and negative affect, which violates the principal that regulatory focus is independent of affective valence (Idson, Liberman, & Higgins, 2000). In particular, promotion focus was associated with positive affectivity, whereas prevention focus was associated with negative affectivity. Moreover, the authors made a cautionary note for researchers to be aware that the GRFM, which is based on the reference-point definition of RF, functions much more as a measure of approach and avoidance (see BIS/BAS scale; Carver & White, 1994) rather than as the RFQ, which is based on the self-guide definition of RF. Consequently, Summerville and Roese (2008) suggested that these results raise questions about the validity of the GRFM. With regard to our study, this could mean that we possibly have measured another underlying construct, which is conceptually different from predominant regulatory focus. It could be that we measured individual differences in the sensitivity of two motivational systems: behavioural activation system (BAS) and behavioural inhibition system (BIS), which represents the distinct construct of approach and avoidance (see Carver & White, 1994) in social psychology. To sum up, given the existing evidence regarding issues with the validity of the GRFM presented above, we could not be sure if we actually measured the predominant regulatory focus of our respondents as intended. This could be a possible explanation of the non-significant results found when testing for a moderating effect of predominant RG (see H5).

When looking further for possible explanations, it is worth pointing out the limitation of GRFM as being a self-report measure, and thus, limited by the degree to which respondents have insight into their own motivations and experiences. We should also consider that even though a person is dominated by one type of regulatory focus, both types of regulatory orientations may coexist in an individual (Higgins, 2000) and one's current focus also depends on situational factors (Higgins, 1998; Lockwood et al., 2002; Shah & Higgins, 2001). Therefore, the current focus of the respondents, when filling in our online survey, might have been influenced by situational or contextual cues. Thus, we cannot be sure if we measured participant's predominant regulatory focus or the regulatory focus induced by the situation or the environment they were in. Certainly, there is no way to say this when RF is measured in a real environment, but only when RF is measured in a controlled experimental setting.

Moreover, experiments, in which RF is primed or induced by a message or a situation, have shown better results when looking for the beneficial effect of 'regulatory fit' on different goal-directed behaviours (e.g., Florack & Scarabis, 2006; Keller, 2006; Lockwood et al., 2002; Spiegel et al., 2004). A number of studies have demonstrated that a stronger test of 'regulatory fit' would require an independent manipulation of regulatory focus. Regardless of the different techniques used to induce promotion- vs. prevention-oriented RF (e.g., asking participants to describe personal experiences relevant to either promotion or prevention; providing participants with a list of positive / negative things that could happen during their holidays and asked them to indicate these things they would actively pursue / try to avoid) in these studies, the 'regulatory fit' effect found has been much stronger when RF was primed or induced. However, in the present study RF was not primed but measured as an individual difference, and probably this is the best explanation for the expected but not found 'regulatory fit' effects of health-related motive orientations (HRMO) and predominant RF on exercise behaviour. Our advice for researchers, who look for 'regulatory fit' effects on behaviour, is to better use a priming procedure of RF instead of measuring it as an individual difference variable. With this last remark to researchers, we ended the discussion of predominant regulatory focus considered a moderator in our conceptual model for predicting exercise behaviour. Due to the non-significant results found, the concept will not be discussed further.

5 DISCUSSION

The overall goal of this research was to examine whether personal values affect individual's exercise behavior. Specifically, whether or not this effect is mediated by health-related motive orientations and attitude toward exercising was investigated. The present study uncovered several important psychological factors for our understanding of health-related behaviours in general and exercise behavior in particular that were not yet incorporated in previous studies. In agreement with our conceptual model and in line with the Theory of Planned Behaviour (Ajzen, 1985, 1991), we were able to shed some light on the way in which personal values guide individual's exercise behaviour through health-related motive orientations and attitude toward exercising. This is the first study that demonstrates an approach to investigate simultaneously the effects of three distinct psychological factors, i.e. personal values, health-related motives and attitude toward exercising, on habitual exercise behaviour.

Exploring the relationships between values and health-related motive orientations was the first interest of the research at hand. We found that all four higher-order value types were related to the health-related motivations people might have, and the relations largely followed the predicted pattern. 'Openness to change' value type was positively linked with 'energy' motivation for pursuing good health, showing that for people who find a varied and exciting life guided by independent thought and action to be their main priority, having the energy and vitality to do different things in life was the most important health-related motivation. The second most important motivation for these people was 'outward appearance', indicating that for them good health means also maintaining good shape and looking good in general. 'Openness to change' also showed less strong positive relationships with 'achievement', 'emotional well-being', 'enjoyment' and 'social responsibility'. Moving to the next value type, 'self-transcendence', we found that it is positively related to 'emotional well-being' and 'enjoyment' motivations. This means that for people, who are broadminded and concerned for the welfare of others, close or distant, and for nature, the most important motivations for pursuing good health are to feel good mentally, to keep good social contacts and have close friends, but also to be light-hearted and enjoy life in general. The latter health-related motivations were also positively linked to 'openness to change', but these findings were not surprising given the high correlation found between the adjacent value types 'openness to change' and 'self-transcendence'. In addition, 'physical well-being' motive had a positive relationship with 'self-transcendence' value, showing that people who endorse this value type are concerned with the physical aspects of health too, i.e. they are motivated to stay in good health and feel secure, in order to promote the welfare of others, close or distant. The third higher-order value type 'conservation' showed strong positive relationships with 'physical well-being' and 'social responsibility' motivations for pursuing good health. People, who are guided by self-restriction and resistance to change in their lives and are focused on protecting order and harmony in relationships, are motivated to preserve their health against harmful influences and feel secure in life. They also want to share time and live in harmony with their families, and to keep family healthiness in general. 'Outward appearance' motive showed a weaker positive link to 'conservation' value type too, which means that these people are also

concerned to some extent with the way they look. The last value type 'self-enhancement' had a strong positive relationship with 'achievement', showing that for people who pursue their own personal interests even at the expense of others and actively demonstrate successful performance in their social circles, being ambitious and powerful is the most important motivation for pursuing good health. The second important health-related motivation for these people was 'autonomy', indicating that their health concerns are related to work functionality and ability to organize and control their lives.

We found significant and meaningful relationships between two motivational constructs, value priorities and HRMO, which haven't been combined in previous studies yet, and fulfilled the first objective. Studying which types of higher-order values are associated with which types of health-related motivations is an exciting area of research. The findings presented above lead to the conclusion that people with different value priorities have different motivations for pursuing good health. These psychological factors might be used for segmenting and profiling consumers in relation to any health-related behaviour targeted by social marketing or health advertising, but also advertising and branding of any healthy product or service. Theoretically, our study brings more evidence to current health-related research that investigates the value-behaviour link, which is not considered direct but mediated by some kind of motivational or attitudinal construct (e.g., Brunso et al., 2004; De Boer et al., 2007; Grunert & Juhl, 1995, Pohjanheimo et al., 2010). The findings from this emerging literature should provide more information on how, as a society, we can better promote any health-related behaviour, to better engage individuals and probably even convince them to incorporate these behaviours into their lifestyle.

From an applied perspective, our results suggest that segmenting individuals on the basis of their prioritized value types (i.e., Openness, Conservation, Self-transcendence, and Selfenhancement) and relating specific health-related motivations to each of the four value types might be a very useful strategy for social marketing communication design. Targeting the distinct underlying health motivations of the different value types, by delivering the 'right' message to the 'right' people, might increase the effectiveness of health-promoting communication. Each component of healthy lifestyle, i.e. nutritious diet, daily exercise, stressrelieving activities, and restorative sleep can be promoted differently to these value-motivebased segments. Let's imagine the following scenario: a company is interested in improving the well-being and quality of life of its employees in order to increase their productivity and creativity. The management of the company decides to try to engage employees in healthy activities that relieve stress (e.g., a yoga class and recreational swimming) and they hire a communications professional to help them design an effective communication campaign. After sending all employees a 'healthy survey' and based on the data gathered and analyzed, different types of engaging messages are created that aim at motivating each of the identified segments to participate, for instance, in a yoga class. A message targeted at employees who give priority to 'self-transcendence' value type and are motivated mainly by 'emotional wellbeing' and 'enjoyment' health motives would be: "The Friday evening yoga class is a relaxing and enjoyable activity at the end of a hard working week! It is a social experience and it brings together people who want to relieve stress and exercise at the same time. Every day, millions of people practice yoga to improve their health and overall well-being. So what are you waiting for? Take your colleagues or friends with you and join one of our classes together! You will be nicely surprised by the effect of our physical and spiritual practices on your mood, body condition, and anxiety levels. Be broadminded and accept our invitation!". This message would appear with targeted images of a yoga class, which represent the 'selftranscendence' theme (see Appendix G, Image 1G). A message targeted at employees who give priority to 'self-enhancement' value type and are motivated by 'achievement' and 'autonomy' health motives would be: "The Friday evening yoga class is a stress-relieving activity for busy professionals at the end of a hard working week! Ambitious people should know that creating a *successful life* and *career* involve a lot of hard work and energy invested. You need to find way to recharge your batteries and be in good shape constantly. If you want to manage your body and mind in the best possible way, our yoga class is for YOU. Yoga can be integrated into the exercise regimens of healthy individuals and provide them with innumerable benefits. Be self-conscious about your own health and overall well-being and accept our *special* invitation!". Image 2G represents the 'self-enhancement' theme visually. Next, a message targeted at employees who give priority to 'openness to change' value type and are motivated mainly by 'energy' and 'outward appearance' health motives would be: "The Friday evening yoga class is a stress-relieving and *energizing* activity at the end of a hard-working week! The practice of yoga increases vitality and energy, which achieves a healthy physical and mental state and tones the body from head to toe. If you want to look good and to keep your body and mind in good condition, our yoga class can help you to achieve these. You will be nicely surprised by the effect of our physical and spiritual practices on your mood, body condition, and anxiety levels. Are you curious and open to new experiences, then you should explore this opportunity and join the yoga class!". This message would appear with targeted images representing the 'openness to change' theme (see Image 3G). Finally, a message targeted at employees who give priority to 'conservation' value type and are motivated mainly by 'social responsibility' and 'physical well-being' health motives would be: "The Friday evening yoga class is a stress-relieving activity at the end of a hardworking week! It is a *harmonious* experience that brings people *together* to practice in a *calm* and secure environment. Yoga unifies physical and mental disciplines to achieve peacefulness of body and mind. Practicing yoga leads to improved physical condition, balance, flexibility and overall well-being, and alleviates health problems. Take your family with you and join one of our classes! You will be nicely surprised by the effect of our physical and spiritual practices on your mood, body condition, and *anxiety levels*. Be *responsible* and accept our invitation!". See Image 4G, which visually represents the 'conservation' theme.

The examples presented above illustrate one strategy how to segment a population based on individual value priorities and corresponding health-related motive orientations, and target the individual needs of the identified segments. When combined, values and health motives can provide deeper insight into the underlying motivations of individuals for any healthrelated behaviour. We propose that instead of promoting 'improved health' as the main motivation to engage in healthy behaviours, social marketing communication might be more meaningful and persuasive if it emphasizes the immediate benefits that will be most compelling to the distinct value types (e.g., stress reduction, increased vitality, focus at work, enjoying life). Due to time constraints, the online survey was not followed by an experimental study, as intended, which to test the potential effectiveness of different targeted health messages (like the ones presented above) that aimed at motivating each of these value types to start attending a yoga class or a recreational swimming for example. Future research should investigate if the different value segments will respond more favourably to targeted health-promotion communication, and presumably change their behaviour in the expected direction.

Our next research goal was to incorporate personal values, health-related motive orientations and attitude toward exercising into a conceptual model for predicting exercise behaviour. It is well known that behaviour can only be understood by identifying the broad motivational goals it is attached to (Carver & Scheier, 1998), and this research added to the existing literature by showing how motivationally distinct human values and health-related motive orientations influence healthy behaviour like exercising regularly. Theoretically, our study aimed to specify the main pre-decisional processes that mediate the impact of values on exercise behaviour.

First, we looked at the relationships between values and exercise behaviour via attitude toward exercising. The results of these analyses indicated the important mediating role of attitude toward exercising in our conceptual model, confirming that values can guide behaviour through some kind of attitudinal or motivational construct invoked as a mediator (e.g., Brunso et al., 2004; Ponjanheimo et al., 2010). We found compelling evidence that two of the higher-order values, 'openness to change' and 'self-transcendence', are related to exercise behaviour and these relationships are mediated by positive exercise-related attitude. Put another way, respondents who follow their own intellectual and emotional interests in unpredictable directions (openness to change) and respondents who transcend selfish concerns and promote the welfare of others, close and distant, and of nature (self-transcendence), have positive attitude toward exercising and exercise more and more regularly. In addition, 'openness to change' influenced exercise behaviour directly, when attitude was not included in the model, showing that this value type predicted increased exercise behaviour in respondents who prioritize it, even without considering the mediating effect of attitude. Giving priority to 'openness to change' was a sufficient condition for more regular exercising, but again, the role of attitude toward exercising should not be underestimated given the very strong positive link between attitude toward exercising and exercise behaviour found in the present study. These findings were also in line with the TPB (Ajzen, 1985, 1991).

In contrast, the other two higher-order values, 'conservation' and 'self-enhancement', were not related to attitude toward exercising and exercise behaviour. We wanted to compare the results with previous findings in the field, but unfortunately we were not able to find a study in the existing literature, which relates basic human values (Schwartz, 1992, 1994) to exercise behaviour. Moreover, both value types did not predict attitude (the mediator) on the first place. 'Self-enhancement' had a negative effect on attitude toward exercising, which did not reach significance, but still showed a possible trend that respondents, who are concerned about social status and recognition, and pursuing their own interests even at the expense of others, have more negative attitude toward exercising compared to respondents who give priority to 'self-transcendence' and 'openness to change' value types. Probably, 'self-enhancers' consider regular exercising as a good thing in general, but at the same time they believe that they do not have enough time to exercise regularly or these activities may

intervene with their main goal to become successful in life. Both 'self-enhancement' and 'conservation' values did not predict attitude toward exercising or exercise behaviour in our sample. Nevertheless, attitude was the only significant predictor of exercise behaviour in these models, indicating the strong positive effect of attitude toward exercising on exercise behaviour. These findings suggest that the exercise-related beliefs and attitudes of these value types should be targeted and improved. Although 'self-enhancement' and 'conservation' value types were not related to exercise behaviour, we should find ways to improve the attitude of these segments and engage them in more regular exercise activities. In other words, to make these individuals see exercising in a new light, by 'rebranding' it as a healthy activity that will fit perfectly within their lifestyles, and will bring them immediate and long term benefits that they value.

One possible way to achieve this goal might be to activate these segments' value priorities with value-relevant information. Because values central to the individual need to be activated in order to result in value-congruent behaviour (Verplanken & Holland, 2002). In their experimental study, Verplanken and Holland showed that participants who give priority to environmental (i.e., universalism) values, measured by the SVS (Schwartz, 1992), made more environmental friendly choices only when they were primed with value-relevant information. The researchers assumed that even though for some individuals a central (i.e., prioritized) value might be chronically accessible, for most people values need to be activated (e.g., primed, invoked) to exert an influence on behaviour. Values can be activated in two ways, they can be implied by the situation or by confronting a person with information emphasising a particular value. Ponjanheimo et al. (2010) embraced the idea of using value activation to stimulate individually important values. In their study, they evoked personal values of hedonistic and traditional participants prior to hedonic evaluation of rye breads, in order to achieve value-congruent behaviour. The value activation was conducted by exposing participants to verbal and visual (i.e., posters) messages appealing either to traditional or to hedonistic values. The value activation was successful and the results showed that traditional rye bread and its sensory characteristics fit better with traditional values than with hedonistic values, and that traditionalists evaluated the liking of all rye breads higher than the hedonists.

Both studies presented above have demonstrated that the idea of value activation, by exposing individuals to value-relevant messages, actually works. We propose that it would be strategic to use value-activating verbal and visual messages (like the ones presented in the scenario above) to target the distinct value types, by emphasizing the exercise benefits that will be most compelling to them. Although 'self-enhancement' and 'conservation' value types were not related to exercise behaviour and attitude toward exercising in our study, we believe that targeted messages will activate these values in people who prioritize them, in real life situations. The expected results – these people might become more willing to engage in regular exercise activities and also change their attitude toward exercising into a more positive one. The reasoning behind is that people will be more willing to perform a particular behaviour, if it matches their personal value priorities and provides the desired benefits for each value segment. Future research should investigate the potential effectiveness of value-activating messages that promote some kind of sport or stress-relieving activity to the distinct value types, and examine the short-and long-term effects on the behaviour of interest.

Next, we looked at the relationships between values and exercise behaviour via healthrelated motive orientations (HRMO). The results of these analyses indicated that only one health-related motive, 'energy', can be considered a mediator of the relationships between personal values and exercise behaviour in this study. In particular, we found evidence that two of the higher-order values, 'openness to change' and 'self-transcendence', are related to exercise behaviour and these relationships are mediated by 'energy' motivation for pursuing good health. These results confirmed what we already found when testing for the mediating effect of attitude toward exercising, i.e. only these two value types were related to exercise behaviour, whereas the other two value types, 'conservation' and 'self-enhancement', were not related to exercise behaviour. Even though we changed the mediator in these models (HRMO instead of attitude toward exercising), we found similar results. A possible explanation for these findings might be the sample of respondents who took part in our online 'Healthy Lifestyle Survey'. Around 73% were under the age of 30, and almost all respondents were highly educated (98%). The sample was not a representative sample of the population. Instead, it consisted mainly of university students and young professionals who represent a very specific segment of the general population. Given the age of the respondents, it is not surprising that the most important motivations for being in good health for them were 'enjoyment', 'energy' and 'emotional well-being' (see Table 4).

Respondents, who find a varied and exciting life guided by independent thought and action to be their main priority (openness to change) and respondents who are broadminded and concerned for the welfare of others, close or distant, and for nature (self-transcendence), were both motivated by 'energy' health motive and reported increased exercise behaviour. Having the energy and vitality to do different things, living an active life (e.g., practicing sports) and looking for adventure in life, all describe the 'energy' motive, which is an important exercise-related motivation for respondents who endorse the later value types. These findings are not surprising given that 'energy' is the most relevant motivation among all HRMO, when someone thinks about exercising or practicing sports in general. 'Energy' health motive was positively correlated not only with 'openness to change', but also with 'self-transcendence' value type in this study (see Table 5). Because these two are adjacent value types in the motivational structure of Schwartz (1992) and are highly correlated in the present research, it is plausible that 'energy' is an important motivator of increased exercise behaviour also for respondents who give priority to 'self-transcendence'. When promoting participation in regular exercise to these value types, the focus should be on the 'energizing' effect of regular exercising along with the benefits that are the most compelling to 'openness to change' and 'self-transcendence'.

Furthermore, we assume that these value types most probably prefer different kinds of exercise activities or sports. Individuals who give priority to 'openness to change' values might be more inclined to practice individual sports, whereas individuals who give priority to 'self-transcendence' values might be more willing to participate in collective sports. The rationale behind this assumption is that 'openness to change' value type endorse values (i.e., self-direction, stimulation, hedonism), which serve individual interests, whereas 'self-transcendence' value type endorse values (i.e., benevolence and universalism), which serve collective interests. Accordingly, 'self-enhancement' is an individualistic value type, while

'conservation' is an altruistic (collective) value type. We already proved the discrimination of value items into those that serve individual interests and those that serve collective interests (see Figure 3F, Appendix F). Therefore, we propose that values that are central to the distinct segments might be reflected in their choice of sports and exercise activities. We should try to engage them in activities that match their value-motive profile (e.g., individual or collective sports, extreme or more relaxed sports, etc.), through targeted communication and value-activation strategies. Future research should explore this possibility in greater detail.

Exploring the direct relationships between health-related motive orientations (HRMO) and exercise behaviour, and the indirect ones via attitude toward exercising, was the last interest of the research at hand. We found that 'energy' and 'outward appearance' motives for pursuing good health were the only direct predictors of exercise behaviour from all eight HRMO. Respondents who were motivated by these two motives reported increased exercise behaviour, regardless of their attitude toward exercising. In other words, being motivated by 'energy' or' outward appearance' was a sufficient condition for respondents to exercise more and more regularly. It is important to note that the direct effect of 'energy' on exercise behaviour found was much stronger than the direct effect of 'outward appearance'. These findings are not surprising given that 'energy' is the most relevant motivation among all HRMO when someone thinks about exercising, and it had the strongest influence on exercise behaviour in this study. Furthermore, when exploring the relationships between values and HRMO (i.e., the first set of hypotheses), it was found that both 'energy' and 'outward appearance' motives were predicted by 'openness to change' value type (see Table 6). In addition, 'openness to change' was the only direct predictor of exercise behaviour from all four value types, when attitude was not part of the model (see Table 7). Giving priority to 'openness to change' value type was a sufficient condition for respondents to exercise more and more regularly. To sum up, the direct effects on exercise behaviour, found in this study, uncovered the important role of 'openness to change' value type, along with 'energy' and 'outward appearance' health-related motives, as significant predictors of regular exercise behaviour.

In comparison, when looking at the indirect relationships between HRMO and exercise behaviour via attitude toward exercising, we found that all health-related motive orientations, except 'autonomy', have positive indirect effect on exercise behaviour. 'Energy' and 'outward appearance' exerted the strongest indirect influence on exercise behaviour via exercise-related attitude. It is interesting to note that 'achievement' and 'autonomy' motives, which had the weakest indirect effect ('autonomy' has no effect) on exercise behaviour via attitude, were both predicted by 'self-enhancement' value type (see Table 6). As we already explained, it could be that 'self-enhancers' consider regular exercising as a good thing in general, but at the same time they believe that they do not have enough time to exercise regularly or these activities may intervene with their main goal to become successful in life. In addition, the corresponding health-related motivations of these people, 'achievement' and 'autonomy', had almost no relation to exercise behaviour. Again, the conclusion made is that the 'self-enhancement' value segment probably holds the wrong view of regular exercising. Their view and attitude need to be improved by strategic social marketing communication, which better relates to these people. The focus should be on the immediate benefits of regular exercising

that are relevant to their personal values, health motivations and life style in general. The same should be done for the 'conservation' value segment. A frequently activated value may shape the motivational processes and corresponding attitudes, resulting in a person's involvement in a value-congruent behaviour (De Boer et al., 2007). By using value activation strategies and emphasizing the related health motives in verbal and visual communication, we believe that the interest and involvement in exercise behaviour of both segments can be increased.

There is also one last point to be considered. On one hand, when HRMO were tested as mediators of the relationship between values and exercise behaviour, only the mediating role of 'energy' motivation was confirmed (see H3). On the other hand, when HRMO were tested as predictors of exercise behaviour, all of them (except 'autonomy') showed significant positive indirect effects via attitude toward exercising (see H4). The findings, that seven out of eight HRMO were positively related to exercise behaviour through exercise-related attitude, when values were not included in the model, give an indication for further research to explore the possibility of segmenting a population in relation to exercise behaviour based solely on their HRMO. As proposed by Geeroms et al. (2008b), "HRMO can be considered as domain specific motivational constructs, which relate to what health means for people and influence more specific beliefs, attitudes and behaviours" (p. 705). Accordingly, the researchers introduced HRMO as relevant segmentation variable that accounts for significant behavioural differences in fruit and vegetable intake (2008b) and ready meal consumption (2008a). In the present study we did not use HRMO as a segmentation variable, but as a mediating construct. Our goal was to explore the relationships between values and HRMO, and their simultaneous influence on exercise behaviour. However, the results of this study rather strongly support the assertion that health-related motive orientations have mediating (only 'energy') and independent (all HRMO except 'autonomy) effects on exercise behaviour. The direct and indirect relationships, between HRMO and regular exercise behaviour, make it interesting for future research to segment a population based on their HRMO and try to uncover behavioural differences between the identified segments.

Limitations and directions for further research

It is also important to note the limitations of the present study. Each limitation discussed is followed by a suggestion for further research.

An important limitation of this study is the sample of respondents who participated in the 'Healthy Lifestyle Survey'. Respondents were not randomly selected. They were approached through Internet (i.e., link to the survey was posted in diverse groups in the most popular social networking sites). This sampling method has yielded a sample that is biased to younger age and higher education. In essence, the sample consisted mainly of university students and young professionals, who represent a very specific segment of the general population. As a result, findings cannot be generalized outside of this specific demographic. This research was executed as a master's thesis assignment and due to time constraints it was not possible to take a representative sample of the Dutch population. However, we classified our respondents into four groups based on their individual mean scores on both value dimensions; 'openness

to change' vs. 'conservation' and 'self-transcendence' vs. 'self-enhancement', and compared the two individual scores on both dimensions for each respondent. In this way, we were able to group them into four groups; individuals who give priority to 'openness to change' and 'self-transcendence' (n = 99), individuals who give priority to 'openness to change' and 'selfenhancement' (n = 25), individuals who give priority to 'conservation' and 'selftranscendence' (n = 37), and individuals who give priority to 'conservation' and 'selfenhancement' (n = 12). The unequal distribution of respondents into groups of incomparable size did not allow us to use ANOVAs, in order to test for significant differences between the groups in relation to HRMO, attitude toward exercising and exercise behaviour. We relied on multiple regression analyses instead. Further research should take a representative sample of the population and we believe that the results will differ from what we found in the present study.

While this study did provide some insight into the links between values, health-related motive orientations, attitude toward exercising and exercise behaviour, the findings must be interpreted with some degree of caution because all exercise behaviour measures were taken by self-report. Using self-reported exercise data is another important limitation of this study because it is often over-reported by respondents (Sallis & Saelens, 2000). Further research should try to relate personal values and HRMO to actual exercise behaviour. For example, future experimental studies may investigate actual behavioural effects of targeted health-related messages, which promote regular exercising, by assessing their potential effectiveness in increasing real exercise behaviour.

The last limitation discussed concerns the HRMO scale (Geeroms et al., 2008a) and the GRFM scale (Lockwood et al., 2002) used in this study. Due to unacceptable length of our 'Healthy Lifestyle Survey', we needed to shorten these scales, by leaving out some items that were not so relevant to the investigation (in the case of GRFM), or by balancing the number of implicit and explicit items in the scale (in the case of HRMO). The GRFM was used to measure individual differences in regulatory focus in this study, but as we already discussed in the previous chapter, its validity is questionable. Our recommendation for researchers, who will look for 'regulatory fit' effects on exercise behaviour, is to use the RFQ (Higgins et al., 2001) to measure regulatory focus as an individual difference or, even better, to prime regulatory focus. We also used a shorten version of the HRMO scale and that could explain why two of the subscales had relatively low reliabilities. Nevertheless, the present study has successfully shown how the HRMO scale may be used to gain insight into people's reasons for exercising the way they do, and further work conducted along these lines will be very useful.

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Appendix A

Portrait Values Questionnaire

Below we briefly describe some people. Please read each description and think about how much each person is or is not like you.

How	much	is	this	person	like	you?

- Not like me at all
 Not like me
 A little like me
 - 4. Somewhat like me
 - ne 5. Like me
 - 6. Very much like me

1. Thinking up new ideas and being creative is important to him/her. He/she likes to do things in his/her own original way.

2. It is important to him/her to be rich. He/she wants to have a lot of money and expensive things.

3. He/she thinks it is important that every person in the world should be treated equally. He/she believes everyone should have equal opportunities in life.

4. It is important to him/her to show his/her abilities. He/she wants people to admire what he/she does.

5. It is important to him/her to live in secure surroundings. He/she avoids anything that might endanger his/her safety.

6. He/she likes surprises and is always looking for new things to do. He/she thinks it is important to do lots of different things in life.

7. He/she believes that people should do what they are told. He/she thinks people should follow rules at all times, even when no-one is watching.

8. It is important to him/her to listen to people who are different from him/her. Even when he/she disagrees with them, he/she still wants to understand them.

9. It is important to him/her to be humble and modest. He/she tries not to draw attention to himself/herself.

10. Having a good time is important to him/her. He/she likes to "spoil" himself/herself.

11. It is important to him/her to make his/her own decisions about what he/she does. He/she likes to be free and not to depend on others.

12. It's very important to him/her to help the people around him/her. He/she wants to care for their well-being.

13. Being very successful is important to him/her. He/she hopes people will recognise his/her achievements.

14. It is important to him/her that the government ensures his/her safety against all threats. He/she wants the state to be strong so it can defend its citizens.

15. He/she looks for adventures and likes to take risks. He/she wants to have an exciting life.

16. It is important to him/her always to behave properly. He/she wants to avoid doing anything people would say is wrong.

17. It is important to him/her to get respect from others. He/she wants people to do what he/she says.

18. It is important to him/her to be loyal to his/her friends. He/she wants to devote himself/herself to people close to him/her.

19. He/she strongly believes that people should care for nature. Looking after the environment is important to him/her.

20. Tradition is important to him/her. He/she tries to follow the customs handed down by his/her religion or family.

21. He/she seeks every chance to have fun. It is important to him/her to do things that give him/her pleasure.

Appendix B

Health-related Motive Orientations Scale

In this section you will be asked about your motivation for maintaining good health. Please read the statements carefully and indicate your level of agreement.

- 1. Completely disagree
- 5. Somewhat agree
- 2. Disagree
- 3. Somewhat disagree

Explicit items (Exp)

For me, health is mainly about...

- 1. Managing my body and appearance in the best possible way.
- 2. Emotional well-being, feeling good mentally.
- 3. Having the energy to do the things I want to do.
- 4. Protecting my body against harmful influences.
- 5. Living in harmony with my family.
- 6. Looking good.
- 7. Living an active life (practicing sports, etc.).
- 8. Keeping up good social contacts.
- 9. Keeping the body in a good condition (fitness, jogging, aerobics, etc.).
- 10. Taking care of other family members' health.
- 11. Taking time to relax and enjoy life.
- 12. Keeping nutritional intake strictly under control.
- 13. Respecting public health norms and prescriptions.
- 14. Staying slim.
- 15. Having no physical health problems.

Implicit items (Imp)

Because of health problems, it would be (extremely) bad not to be able anymore to...

- 1. Work functionally.
- 2. Share time with family.
- 3. Be successful.
- 4. Feel secure in life.
- 5. Perform my job my own way.
- 6. Be spontaneous.
- 7. Have close friends.
- 8. Organize and control life.
- 9. Be cheerful and light-hearted.
- 10. Be ambitious.
- 11. Experience adventure in life.
- 12. Care for my family.
- 13. Be powerful.
- 14. Get things under control.
- 15. Enjoy life.

- 6. Agree 7. Completely agree
- 4. Neither agree or disagree

Appendix C

Promotion/Prevention Scale

Please read the statements below and indicate how much they reflect your personality.

- 1. Very untrue of me
- 5. Somewhat true of me
- Untrue of me
 Somewhat untrue of me
- 6. True of me7. Very true of me
- 4. Neutral
- 1. I typically focus on the success I hope to achieve in the future.
- 2. I am anxious that I will fall short of my responsibilities and obligations.
- 3. I frequently think about how I can prevent failures in my life.
- 4. I often imagine myself experiencing good things that I hope will happen to me.
- 5. I often think about the person I would ideally like to be in the future.
- 6. I am more oriented toward preventing losses than I am toward achieving gains.
- 7. I frequently imagine how I will achieve my hopes and aspirations.
- 8. I often think about the person I am afraid I might become in the future.
- 9. I often imagine myself experiencing bad things that I fear might happen to me.
- 10. Overall, I am more oriented toward achieving success than preventing failure.

Appendix D

Attitude toward Exercising Scale

We are interested in your attitude toward exercise behaviour. Please read the statements below and indicate your level of agreement by circling the appropriate number.

- 1 Completely disagree
- 5 -Somewhat agree
- 2 Disagree 3 – Somewhat disagree
- 6 Agree 7 – Completely agree
- 4 -Neither agree or disagree

1. In my opinion exercising is a good habit.

2. I like exercising.

- 3. Exercise activities require too much effort.
- 4. I do not have enough time to exercise.
- 5. I consider exercising important for me.
- 6. Exercise activities are too boring.
- 7. In my opinion regular exercising is needed.

Appendix E

Godin Leisure-Time Exercise Questionnaire

1. During a typical **7-Day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your **free time** (write on each line the appropriate number).

Times Per Week a) VIGOROUS EXERCISE (HEART BEATS RAPIDLY) (e.g., running, jogging, hockey, football, rugby, boxing, squash, tennis (singles), basketball, judo, karate, cardio, rowing, roller skating, step aerobics, circuit weight training, vigorous swimming, vigorous long distance bicycling) b) MODERATE EXERCISE (NOT EXHAUSTING) (e.g., fast walking, baseball, body building, tennis (doubles), volleyball, badminton, easy swimming, easy bicycling, aerobics, ice-skating, popular and folk dancing, zumba)

c) MILD EXERCISE (MINIMAL EFFORT)

(e.g., easy walking, yoga, pilates, archery, fishing, bowling, horse-riding, golf)

2. Do you consider yourself a sporty person?

- 1 Extremely sporty
- 2 Very sporty
- 3 Somewhat sporty
- 4 Slightly sporty
- 5 Not at all sporty

3. Can you estimate the amount of exercise you are doing at the moment?

- 1 Too much
- 2 A lot
- 3-Just enough
- 4 Little
- 5 Too little

Appendix F

Multidimensional Scaling of Higher-order Value Types



Higher-order Value Types

Figure 1F. Positions of the 4 higher-order value scores in the multidimensional space (Model = ratio, normalized raw stress = .01)

Multidimensional scaling (MDS) was carried out to examine the configuration of the four higher-order value scores in a two-dimensional space. *Ratio* MDS, which is a special case of metrical scaling, was applied to these data. The method treats the distances as Euclidean distances and aims to achieve the closest degree of proportionality between the given distances and those fitted. The MDS solution achieved depends on the choice of initial configuration and the stress criterion used. The choice of initial configuration is determined by the stress (i.e., a measure of how good the fit is), sometimes called, the normalized stress. The configuration that results in the smallest stress should be chosen. PROXSCAL arrives at a solution that minimizes the Normalized Raw Stress.

We chose for *simplex* initial configuration, which is a classical scaling solution. The normalized raw stress value for the one-dimensional solution was 0.11, which according to Kruskal (1964) suggests a relatively 'poor' fit. The stress value for the **two-dimensional** solution was **0.01**, indicating a relatively 'perfect' fit. Other measures of fit to be considered are the Dispersion Accounted For (D.A.F.) and the *Tucker's Coefficient of Congruence* (T.C.C.). Values close to 1 indicate a 'great' fit. In our two-dimensional model, D.A.F = .995 and T.C.C. = .998 indicated a 'great' fit.

Multidimensional Scaling of Basic Value Types



Figure 2F. Positions of the 10 motivationally distinct basic value scores in the multidimensional space (model = ratio, normalized raw stress = .05; the arrow indicates a deviation from theoretical position)

Multidimensional scaling (MDS) was carried out to examine the configuration of the ten basic value scores in a two-dimensional space. *Ratio scaling* was applied to these data. The MDS solution was achieved by choosing for *simplex* initial configuration. The *normalized raw stress* value for the one-dimensional solution was 0.17, which on Kruskal's criterion suggests a 'poor' fit. The stress value for the **two-dimensional** solution was **0.05**, indicating **a 'good' fit**. In our two-dimensional model, D.A.F = .952 and T.C.C. = .976 were relatively close to 1, indicating also a 'good' fit.

Multidimensional Scaling of Single Value Items



Figure 3F. Positions of the 21 single value items in the multidimensional space (model = interval, normalized raw stress = .07; the lines indicate distinct regions in the space)

Multidimensional scaling (MDS) was carried out to examine the configuration of the 21 single value items in a two-dimensional space. *Ratio scaling* was applied to these data. The MDS solution was achieved by choosing for *simplex* initial configuration. The *normalized raw stress* value for the one-dimensional solution was 0.22, which on Kruskal's criterion suggests a 'poor' fit. The stress value for the **two-dimensional** solution was **0.07**, indicating **a relatively 'good' fit**. In our two-dimensional model, the other two measures of fit, D.A.F = .926 and T.C.C. = .963, indicated a relatively 'good' fit as well.

Appendix G

Yoga Message Images



Image 1G. 'Self-transcendence' theme with 'emotional well-being' and 'enjoyment' health motives







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Image 3G. 'Openness to change' theme with 'energy' and 'outward appearance' health motives

Image 4G. 'Conservation' theme with 'social responsibility' and 'physical well-being' health motives

