Which values are similar? Introducing new methodologies to map the structure of human values and value-expressive behaviours

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Summary

This research provides the first direct assessment of human values and value-expressive behaviours based on their conceptual meaning. Chapter 1 provides a brief history of the study of human values and dissects the dominant contemporary theory of values, the Theory of Basic Human Values, proposed by Shalom Schwartz. I also discuss methodological approaches used to assess the structure of human values, and the nature of concepts and categorization. In Chapter 2, seven studies containing data from nine samples in two countries (United Kingdom and Brazil) asked participants to compare the meaning of different values found within Schwartz's influential quasi-circumplex model of values. Different methods were used across the studies, including direct similarity judgment tasks, pile sorting, and spatial arrangement. The results of these diverse conceptual assessments corresponded to spatial configurations that are broadly convergent with Schwartz's model, both between and within participants. In Chapter 3, four studies were conducted using British samples, asking participants to make direct comparisons between value-expressive behaviours and different levels of mental representations of values (e.g., value types, higher order values). Some of the methods used in Chapter 2 were also used for these studies. It was an open question whether the structure from Schwartz's value model would be replicated by the spatial plane composed of value-expressive behaviours. The spatial configurations from these studies broadly converged with Schwartz's structure, and also provided a novel point of view of how values and behaviours are related based on how people interpret them. Finally, in Chapter 4, I discuss the contributions of this research, its implications, limitations, and future directions.

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Chapter 1: General Introduction

Values are a common topic in daily life and across different situations. People frequently cite the importance of these abstract ideals, such as freedom, creativity, equality, power, and tradition. For instance, in an organizational context, it is common to see the employers trying to identify values that best describe their companies' work (e.g., efficiency, social responsibility, security). In an educational context, teachers try to inform their young students about the values that are crucial for proper conduct in society (e.g., respect, tolerance, equality). Also, politicians frequently argue that they uniquely promote particular values (e.g., devout, family security, social order), in an attempt to attract individuals to their ideas. At home, parents try to better educate their children regarding the values that are commonly acceptable and endorsed among their culture (e.g., protecting the environment, honouring of elders, respect for tradition). In these domains, values are treated as essential guidelines to attitudes and behaviour, which require thought and contemplation.

There is an increasing interest in understanding the role of human values in our lives. This interest can be seen across different areas of social science, such as philosophy, sociology, anthropology, and psychology. In this thesis, I focus on the contributions of values to psychology, an area in which their properties and structural associations have been widely studied through extensive research (Gouveia, 2013; Rokeach, 1973; Schwartz, 1992). In psychology, human values can be understood as desirable, *trans-situational* goals that vary in importance (Schwartz, 1992). Values are considered as a set of fundamental principles that transcend specific situations and are influenced by several factors, such as culture, genetics, family, and peers (Döring, Daniel, & Knafo-Noam, 2016; Gouveia, 2013; Schermer, Vernon, Maio, & Jang, 2011). Values play a crucial role in understanding various sociopsychological variables (e.g., attitudes, judgments, choices, attributions, actions), and are an important determinant to

understanding and predicting human behaviour (Bardi & Schwartz, 2003; Rokeach, 1973).

Values have been implicated as a key influence on a wide range of psychological relevant variables, including political orientation (Caprara, Schwartz, Capanna, Vecchione, & Barbaranelli, 2006; Cohrs, Moschner, Maes, & Kielmann, 2005), pro-environmental behaviour (Bouman, Steg, & Kiers, 2018; Evans et al., 2013; Milfont & Gouveia, 2006), personality traits (Fischer & Boer, 2015; Kajonius, Persson, & Jonason, 2015; Parks-Leduc, Feldman, & Bardi, 2015), well-being (Boer, 2017; Sagiv & Schwartz, 2000), need for cognition (Coelho, Hanel, & Wolf, 2018), and antisocial behaviour (Seddig & Davidov, 2018).

Crucially, however, researchers have paid relatively little attention to how individuals interpret and understand values. Studies have assessed how values are configured in a spatial plane being based on how individuals endorse them – or to what extent they consider different values as important to their lives (e.g., Gouveia, Milfont, & Guerra, 2014; Sagiv & Schwartz, 2000; Schwartz et al., 2012). It is undoubtedly important to see how the endorsed values relate one to the other, but assessing how individuals interpret and group values is a vital topic to address, especially due to their abstract nature. These abstract ideals arise from abstractions or generalizations from previous experiences. When introduced to new items, our cognitive system allows a classification regarding similarities to previously seen items (Smith, 1989). While there is a sophisticated understanding of how categorization processes apply to natural categories such as shapes and animals (Delorme, Richard, & Fabre-Thorpe, 2010; Landau, Smith, & Jones, 1988; Sigala & Logothetis, 2002), there is a lack of understanding of how categorization processes apply to abstract ideals like values. Therefore, even if we do not endorse two values at the same level, they can be

considered as similar based on their content, and how we interpret them. For instance, one can highly endorse the value "pleasure" and not necessarily see the value "mature love" as something important, while still can consider that these values are highly similar when considering their concepts. The central aim of this thesis is to develop our understanding of how these categorizations based on conceptual representations apply to human values.

The present chapter starts with a brief history of the study of human values, discussing some of the main precursors (e.g., Kluckhohn, Parsons, Maslow), the main theories developed for both cultural (Hofstede and Inglehart), and individual (Rokeach and Gouveia) perspectives, and the dominant contemporary theory of values, the Theory of Basic Human Values proposed by Shalom Schwartz. Specifically, I will discuss his circular structure of values, measures developed over the years to assess values, cross-cultural comparisons, and the associations of values to a range of constructs (e.g., attitudes, well-being), including relations between values and behaviours in particular. Next, I discuss methodological approaches used to assess the structure of human values, focusing on Multidimensional Scaling, a technique that provides spatial representations based on the similarities\dissimilarities of objects. The chapter then discusses the nature of concepts and categorization, highlighting their relevance to the present research. Finally, I give an outline of the empirical chapters.

Human Values

Although discussions about human values can be traced back to the ancient Greek philosophers (Maio, 2010), in this thesis I focus on the contemporary understanding of values in psychology. To provide a better understanding of their contemporary treatment, it is important to cover some important previous contributions that helped to develop current perspectives. Specifically, I briefly present the

contributions of Thomas and Znaniecki, Talcott Parsons, Clyde Kluckhohn, and Abraham Maslow.

Precursors.

Thomas and Znaniecki.

Thomas and Znaniecki (1918) are responsible for one of the first works in psychology encompassing values. These researchers presented a systematic discussion of the value concept and discussed its relation to other psychological variables, such as attitudes. These authors introduced the concepts of attitudes and values in "*The Polish Peasant in Europe and America*", a treatise that described the researchers' analysis of personal documents written by Polish immigrants who moved to the United States in the 20th century. In their work, attitudes were described as a subjective orientation that determines the meaning for things – any predisposition of an individual towards an object. Values were defined as any empirical data endowed with meaning and accessible to the members of a social group. This work was a useful impetus to future (and necessary) distinctions between values and attitudes: while attitudes are directed towards a specific object (e.g., positive\negative attitudes towards political leaders), values are general beliefs (e.g., endorsing the values "social order", "national security"), and are evaluated through their importance (Rokeach, 1973). Furthermore, while attitudes can be both positive and negative, values are characteristically positive constructs (Hitlin & Piliavin, 2004).

Talcott Parsons.

Parsons is mainly known for developing Social Action Theory. This theory aimed to explain human behaviour in modern society, considering different areas (e.g., anthropology, sociology, psychology), with diverse aims. However, Parsons (1951) also made a significant contribution to the development of values research. Parsons

postulated that, without shared values, social life would be hardly possible. After introducing the concept of motivated action, Parsons defined a value as "*an element of a shared symbolic system which serves as a criterion or standard for selection among the alternatives of orientation which are intrinsically open in a situation*" (p. 12). Thus, the concept proposed by Parsons introduced the idea that a value represents an underlying motivational goal (Schwartz & Bilsky, 1987).

Clyde Kluckhohn.

The anthropologist Kluckhohn (1951) defined value orientations as "*a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action*" (p. 395), "(…) *influencing behavior, of nature, of man's place in it, of man's relation to man, and of the desirable and nondesirable as they may relate to man-environment and interhuman relations"* (p. 411). This definition embraced values as principles common to social groups, presenting an influence on human behaviour. Therefore, Kluckhohn treated values as a) *a concept*, such that values are abstract and cannot be directly observed, only inferred through behaviour; b) *explicit or implicit*, such that not all values can be verbalized; c) *characteristic of an individual or a group*, being able to be converted into something deprived of the personality of each one; d) *about the desirable*, such that values are not considered as something desired, but principles aspired to by the people; and e) *influence the choice of the modes, means* (instrumental values) *and ends* (terminal values) of action. This view inspired current conceptions of values as positive, desirable, and appreciated by people (Schwartz, Verkasalo, Antonovsky, & Sagiv, 1997).

Abraham Maslow.

Finally, the work of Maslow on the hierarchy of needs resonates through contemporary research on values. For Maslow (1943, 1954, 1971), human needs represent deficiencies of the organism, and these needs can arise in physiological, psychological, or social levels. These needs are relatively universal (the difference is how they are fulfilled in different cultures), neutral or positive, and established through a hierarchical system (physiological, safety, social, self-esteem, self-actualization). When more basic needs are fulfilled (e.g., physiological needs), relatively higher-order (less basic) needs can be considered (e.g., self-actualization). Therefore, Maslow (1943, 1954, 1971) draws attention to the intrinsic relations between our environment and human needs, which has implications for understanding the way in which values express psychological needs. As our needs are changing over time after their fulfillment, our values may change in parallel.

Differences between human values and attitudes, morality, norms, and personality traits

The authors discussed above provided important precursors to seminal contemporary research on values. In the 1950s and 1960s, values become increasingly popular in research (e.g., Allport, Vernon, & Lindzey, 1960). From the 1970s onwards, researchers increasingly focused on elaborating the psychological nature of values and on the cross-cultural measurement values, resulting in the development of diverse value models (Gouveia, 2013; Hofstede, 1980; Inglehart, 1977; Rokeach, 1973; Schwartz, 1992, 2006). However, before discussing these models, it is important to first distinguish between human values and other concepts that are sometimes conflated, such as attitudes, morality, norms, and personality traits.

These variables are hierarchically related to each other. If we consider the three-level model of personality (McAdams & Pals, 2006), the first level refers to dispositional traits, being defined as "*broad individual differences in behavior, thought, and feeling that account for general consistencies across situations and over time*" (p. 212). At this level, we can identify variables such as personality traits. The second level, named characteristic adaptations, refers to "*more specific motivational, social cognitive, and developmental variables that are contextualized in time, situations, and social roles*" (p. 212). At this level, we can find human values and morality. Finally, the third level, named integrative life narratives, refers to "*Internalized and evolving life stories that reconstruct the past and imagine the future to provide a person's life with identity*" (p. 212). At this level we can place attitudes and norms.

Attitudes can be defined as an "*overall evaluation of an object that is based on cognitive, affective, and behavioural information*" (Maio & Haddock, 2015, p. 4), and they vary in terms of valence (positive or negative) and strength (less or more). Hierarchically speaking, values underlie our attitudes (Schwartz, 2012). We tend to evaluate things positively or negatively, according to whether they are promoting or threatening our values. For instance, if an individual strongly endorses stimulation values, it is likely that s\he will present positive attitudes towards exciting activities (e.g., parachuting, snowboarding).

Morality, as operationalised through Graham and Haidt's moral foundation theory (Graham, Haidt, & Nosek, 2009; Graham et al., 2011), is based on intuitions and judgements of what people should and should not do, and what is right and wrong. Thus, moral foundations have a stronger intuitive and normative focus than values (Feldman, 2018). While there are meaningful correlations between values and the five moral foundations (Boer & Fischer, 2013; Feldman, 2018), they are empirically distinct

(Feldman, 2018). Haidt, Graham and Joseph, 2009) argued based on McAdams and Pals (2006) three-level model of personality that moral foundations and values are both based on the same level (level 2).

Norms are patterns or rules that socially guide our behaviours as part of a group (Schwartz, 2012). They are more externally guided than values (Rokeach, 1973), and vary on how much we agree or disagree that we should act in a certain way (Schwartz, 2012). For instance, the two demands "we should listen to the elderly", and "we should say thank you to express gratitude" express norms. The values we endorse will influence the level of agreement that we have with such norms. For the prior examples, a high endorsement of values such as "politeness" would result in a high agreement with the norms.

Finally, both personality traits and human values are key concepts in the psychological literature. However, their differentiation is somewhat more difficult than the prior constructs. Traits are broad descriptions of stable patterns of behaviour, whereas values are stable life goals and abstract ideals (Parks-Leduc et al., 2014). That is, traits refer to "*tendencies to show consistent patterns of thought, feelings, and actions across time and situations*" (Schwartz, 2012, p. 16). Therefore, values may be shaped by our traits (cf. McAdams and Pals, 2006). Indeed, a recent longitudinal study including over 11,000 people from the Netherlands found that traits predict values better over time than values do traits (Fetvadjiev & He, in press). For instance, “responsible” can be seen as a personality trait, as it describes patterns of behaviour, but it can also be seen as a human value, if seem as a life goal.

Cultural and individual level perspectives of values.

In psychological research, values have been studied through a cultural and individual view. In the cultural perspective, human values can vary in systematic ways

between nations and cultures, and this perspective compares the scores of different cultures and countries. This perspective was extensively researched by Hofstede (1980), Inglehart (1977), and more recently, Schwartz (2006). The psychological perspective characterizes value priorities of individuals, in which values guide their attitudes and behaviour and explain individual differences. The main theoretical models of the psychological perspective were elaborated by Rokeach (1973), Gouveia (2003), and Schwartz (1992).

The cultural and individual levels of values are described below. Because this thesis focuses on the individual-level, specifically on Schwartz's model, I will discuss his individual-level model in more detail. Nonetheless, I briefly describe the cultural perspective because it is a useful background for understanding the individual-level perspective.

Cultural perspective.

The cultural perspective on human values seeks to test theoretical structures or value dimensions in a pancultural way. The values are used to explain differences across countries. Within this perspective, two researchers stand out for their large contributions: Hofstede and Inglehart.

Geert Hofstede.

Hofstede's (1980) Cultural Dimensions Theory considers values as central elements defined by the culture in which the individuals live. He defined values as "*broad tendencies to prefer certain states of affairs over others"* (Hofstede, 1991, p. 35). In his theory, culture is "*the collective programming of the mind that distinguishes the members of one group or category of people from another*" (Hofstede, 2001, p. 9). Thus, culture guides individuals in their interactions – that is, as a collective

phenomenon that partially determines how the individual will behave in society. In other words, the culture in which individuals live is essential to shape their values.

Hofstede's (1980) attempted to map cultural differences in values. To address this goal, data were collected in 72 countries, consisting of 116,000 IBM employees. His model distinguished four value dimensions, which were later increased to five (Hofstede, Hofstede, & Minkov, 2010): *power distance*, representing the extent to which members in the bottom of the social hierarchy accept that power is not fairly distributed; *masculinity - femininity*, representing differences in value endorsement between genders; *uncertainty avoidance*, representing society's tolerance for ambiguity, or how people embrace or avoid the unexpected; and *individualism-collectivism*, highlighting how individuals from a society feel responsible or independent from others. The fifth dimension was later found in data from Hong Kong: *time orientation*, referring to how society tends to seek immediate gratification or to invest for the future (Hofstede et al., 2010).

Hofstede contributions are considered some of the most important to values research. Not only did his work yield a theory that emphasizes the study of human values at a cultural level, it introduced the duality of individualism and collectivism, which remains one of the most important topics in social, organizational, and cross-cultural psychology. In fact, *individualism-collectivism* is a conceptual dimension now evident in decades of research (Kagitçibasi, 1987; Oyserman, Coon, & Kemmelmeier, 2002). However, even though Hofstede's (1984) model offered these relevant advances in the study of values, his model was criticized for the lack of a theoretical basis to justify the initial model (McSweeney, 2002). The theory was described only in further research. Also, his survey was criticized for not being a psychometrically adequate instrument to determine cultural differences, as some of its items are more sensitive to

one culture than other (Schwartz, 1999). Another critique regards Hofstede's assumption that individualism tends to appear after the economic development of a society (Gouveia, 2013). With the possession of more resources, individuals are capable of pursuing their own goals in life (Hofstede, 2001). However, this assumption is controversial, as many contemporary societies mix both individualist and collectivist elements (Sinha & Tripathi, 1994).

Ronald Inglehart.

Inglehart (1977), author of "*The Silent Revolution*", proposed a theoretically driven model, different from Hofstede. Based on Maslow's (1954) hierarchy of needs, Inglehart incorporated in his model the cultural aspects of human values. Two main assumptions can be seen in his theory (Inglehart, 1977; Knutsen, 1990): the *scarcity hypothesis*, which suggests that people tend to prioritize needs that are short in supply; and the *socialization hypothesis*, in which individuals are guided by socialization processes through their development.

To assess values, Inglehart (1991) analyzed data from various countries. These data were collected over 17 years, which allowed him to portray generational changes and compare cultures. He suggested that values are organized hierarchically in a unidimensional continuum, from materialistic to post-materialistic (Inglehart, 1977): *materialism* concerns the most basic security and physiological needs (e.g., physiological and security); and *post-materialism* refers to higher needs (e.g., intellectual, self-esteem, self-realization), which emerge after the satisfaction of materialistic needs. In sum, materialistic societies encompass cultures that do not fulfil their basic needs, while the post-materialistic countries are considered more developed, with enough conditions to fulfil the basic needs. This idea is consistent with Maslow's (1954) hierarchy, with individuals tending to strive for higher needs after their basic

needs are fulfilled. Thus, the transition from a materialist to a post-materialistic orientation is a shift to greater human emancipation (Inglehart & Welzel, 2010). Also, when observing the results through time, Inglehart pointed out that the changes are gradual in societies. In other words, values are influenced by changes through generations, first emphasizing physical and economic security, and further with a higher emphasis in values of self-expression, subjective well-being, and concern regarding the quality of life (Inglehart & Baker, 2000).

However, Inglehart's (1977) theory is questioned regarding the strength of evidence for the assumption that materialism prevails in societies that do not meet their basic needs and that societies with more financial resources have post-materialist characteristics. The influence of financial resources in this change has not been directly assessed (Kidd & Lee, 1997). Also, the idea of assessing human values in a unidimensional continuum has been criticized, because both materialistic and postmaterialistic values are often seen in the same culture (Gouveia, 2013). Finally, Inglehart misses out on various important values that emerged later in Schwartz's (1992) theory, such as power and benevolence (Dobewall & Rudnev, 2014; Hanel, Litzellachner, & Maio, 2018). Despite these limitations, Inglehart's theory persists as one of the most influential study of values on a cultural level.

Individual-level perspective.

The psychological perspective characterizes value priorities at an individual level, in which values guide people's attitudes and behaviour. The main theoretical models in this perspective were elaborated by Rokeach, Gouveia, and Schwartz. Rokeach and Gouveia's contributions are important to understanding human values at the individual level, but Schwartz's model has been subjected to substantially more empirical scrutiny and received abundant support in these tests. I will discuss the

conceptualization of values according to Rokeach and Gouveia, and then discuss Schwartz's (1992) model in more detail.

Milton Rokeach.

One of the most influential contributions to the contemporary study of human values is Rokeach's (1973) book "*The nature of human values*". Rokeach conceptualized values as "*an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence ... along a continuum of relative importance*" (1973, p. 5). His model is based on five assumptions: (1) the number of values of a person is relatively small; (2) the values are the same but have different degrees of importance; (3) the values are organized into value systems; (4) the antecedents of values can be determined by the culture, society, institutions, and personality of each person; and (5) the manifestations of values can be observed in all social phenomena that may be considered important to study. Also, Rokeach (1981) emphasized the role of values in guiding human behaviour, acting like a criteria for judging the self, others, or specific situations.

Rokeach (1973) divided values into two types: *terminal*, representing desirable end-states of existence (e.g., equality, pleasure, freedom), and *instrumental*, representing desirable modes of behaviour (e.g., honesty, love, logic). Based on this division, he was one of the first authors to propose a measure for human values, the *Rokeach Value Survey* (RVS). The measure is still one of the most extensively used measures of values worldwide.

Rokeach's main contributions include: (1) the synthesis of concepts and ideas from different perspectives (e.g., anthropological, philosophical, sociological), resulting in a transdisciplinary approach; (2) discussions of differences between human values

from other concepts such as attitudes and traits; (3) a specific definition and a value system; (4) one of the first instruments for measuring human values as a specific construct; and (5) articulation of the centrality of values in the cognitive system of individuals (Gouveia, Martínez, Meira, & Milfont, 2001). Despite being very influential, many limitations led to newer models. For instance, as recognized by Rokeach, the list of values was created through intuition, undermining the strength of the theoretical contribution. Also, Rokeach did not test whether his values fall into a meaningful structure or can otherwise be combined to reflect similarities and differences between values. Finally, his samples consisted mostly of American university students, which limits the cross-cultural generalizability of his findings (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010).

Valdiney Gouveia.

More recently, Gouveia (2003, 2013) developed the Functional Theory of Human Values, which is based on Maslow's (1954) hierarchy of needs. Gouveia understands values as psychological aspects that transcend specific situations, are desirable, relatively stable, and have the functions of guiding human behaviour and cognitively representing human needs (Gouveia, 2013).

The Functional Theory assumes that values can be ordered along two dimensions: goals and needs. The first dimension outlines personal, central, and social goals. The second dimension distinguishes between survival and thriving needs. Taken together, this model presents the six subfunctions in a 3x2 structure (Gouveia et al., 2014; Maslow, 1954): (1) *excitement*, representing the physiological need for variety and pleasure; (2) *promotion*, typical in individuals that have a materialistic orientation and cherish their own personal benefits; (3) *suprapersonal*, representing the need of aesthetics, cognition, and self-actualization; (4) *existence*, representing the basic

conditions for individuals' biological and physiological survival; (5) *interactive*, with values that are essential in regulating, establishing, and maintaining interpersonal relationships; and (6) *normative*, representing survival needs through social goals of security and control.

Although Gouveia's model is relatively new, I mention it because of its relevance to Schwartz's model and the potential for Gouveia's model to attract more research attention in subsequent years. Nonetheless, the model has not yet received a great deal of empirical attention and there are substantive conceptual overlaps between it and Schwartz's model, below, which has received a great deal of attention in research worldwide.

Theory of Basic Human Values

Overview.

The Theory of Basic Human Values, developed by Schwartz (1992), is the most widely cited model of values. It is a powerful theoretical perspective that is empirically supported with data from 80 nations around the world (Schwartz et al., 2012). In his theory, Schwartz (1992, 2012) states six main characteristics of values. First, values *are beliefs linked to affect*; thus, individuals can feel aroused if a value is threatened, and happy if they can enjoy it (e.g., something compromising\enhancing the individuals' *authority* or their *self-respect*). Second, values *refer to desirable goals*, motivating individuals to pursue their objectives (e.g., search for *social justice, a world at peace, or equality*). Third, values *transcend specific actions and situations*, thus they are not directly linked to one goal (e.g., *influential*, which can be used for political speeches and for peer interactions). Fourth, values *serve as standards or criteria*, helping to raise awareness regarding the actions (e.g., *protecting the environment*, which helps to increase the quality of life). Fifth, values *are ordered by importance*, as a system of

priorities that helps to characterize individuals. Sixth, *the relative importance of multiple values guides action* (e.g., *an exciting life* and *independent*, when planning a trip alone to Alaska). Schwartz's model postulates a universal, circular organization of human values in a space defined by contrasting motivations, as shown in Figure 1.

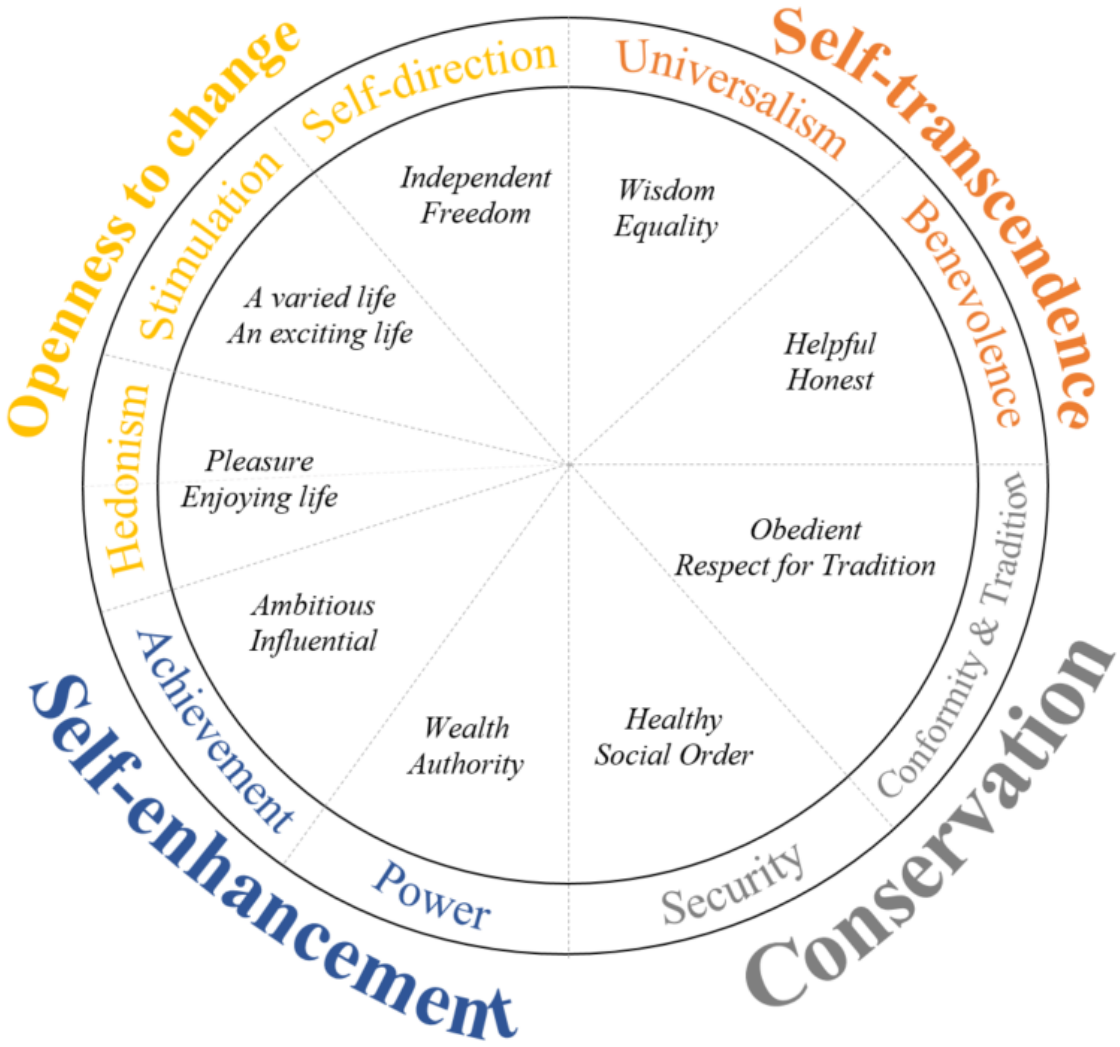

Figure 1. Schwartz's model of human values (examples of values in *italic*).

The original version of this model included 57 values divided into ten value types (Schwartz, 1992): (1) universalism (e.g., *equality*, *social justice*), representing "*understanding, appreciation, tolerance, and protection for the welfare of all people and for nature*" (p. 12), (2) benevolence (e.g., *helpful*, *responsible*), representing the "*preservation and enhancement of the welfare of people with whom one is in frequent personal contact*" (p. 11) (3) conformity (e.g., *obedient*, *self-discipline*), referring to the

"*restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms*" (p. 9), (4) tradition (e.g., *humble, respect for tradition*), referring to "*respect, commitment, and acceptance of the customs and ideas that one's culture or religion impose on the individual*" (p. 10), (5) security (e.g., *national security, social order*), encompassing "*safety, harmony, and stability of society, of relationships, and of self*" (p. 9), (6) power (e.g., *authority, wealth*), reflecting the "*attainment of social status and prestige, and control or dominance over people and resources*" (p. 9), (7) achievement (e.g., *ambitious, successful*), representing "*personal success through demonstrating competence according to social standards*." (p. 8), (8) hedonism (e.g., pleasure, enjoying life), referring to "*pleasure or sensuous gratification for oneself*" (p. 8), (9) stimulation (e.g., *a varied life, an exciting life*), encompassing "*excitement, novelty, and challenge in life*" (p. 8), and (10) self-direction (e.g., *creativity, choosing own goals*), referring to "*independent thought and action - choosing, creating, exploring*" (p. 5). An eleventh value type was proposed, spirituality, but it did not emerge distinctly from other value types in most cultures. Research has shown that these 10 value types can be reliably differentiated across samples from different countries (Bilsky et al., 2011; Schwartz, 1992; Schwartz & Sagiv, 1995).

These ten value types are positioned in relation to two bipolar motivation dimensions, as can be seen in Figure 1. One of the dimensions is *openness to change versus conservation*, with self-direction, hedonism, and stimulation values opposing security, conformity, and tradition values. Openness to change values emphasize independent action, thought, and feeling, whereas conservation values emphasize self-restriction, order, and resistance to change. The second dimension is *self-enhancement versus self-transcendence*, with power and achievement values opposing universalism and benevolence values. Self-enhancement includes values that focus on promoting

self-interest, whereas self-transcendence includes values that express concern for the welfare of others. These four quadrants (also known as high-order values) can also be divided regarding their focus. Self-transcendence and conservation values present a social focus, or how the individuals socially relate to and affect others, while self-enhancement and openness to change values have a personal focus, therefore regulating how individuals express their personal interests and characteristics (Schwartz et al., 2012).

Of importance, Schwartz et al. (2012) further proposed a refined theory of basic values, aiming to provide greater heuristic and explanatory power. The new structure proposed 19 value types. Some of the original value types were further "divided" (e.g., power into dominance and resources; security into societal and personal). Gouveia and colleagues (2014) asserted that the proposition of new value types is a flaw from Schwartz's theory, reflecting an indecisiveness and lack of parsimony. Nevertheless, the original value structure proposed by Schwartz is well-established cross-culturally, with coherent empirical support (Maio, 2010), and its widespread use makes it a suitable focus of examination for understanding value structure in the present thesis.

Measurement.

Several scales were developed over the past decades to assess the values specified in the Theory of Basic Human Values (Schwartz, 1992). The first proposed measure was the *Schwartz Values Survey* (SVS; Schwartz, 1992), which includes 57 value items. Participants rate the importance of these value items as guiding principles in their lives. Each value is followed by a phrase to clarify its meaning (e.g., *An exciting life* - stimulating experiences). Analyses across over 70 nations showed evidence for partial measurement invariance, showing that individuals from different countries\cultures understand and answer the measure in a similar way (Spini, 2003).

A shorter version of the SVS was then developed, but focusing on the value types instead of the value items. Thus, the Short SVS is composed of only ten items (Lindeman & Verkasalo, 2005). Each value type is followed by examples of value items, making it easier to comprehend their meaning (e.g., *Power* - social power, authority, wealth). Although the short version has not yet been used widely in research, analysis of this scale have again supported the circular structure proposed by Schwartz (Lindeman & Verkasalo, 2005).

An ostensibly less cognitively complex measure was also developed, the Portrait Values Questionnaire (PVQ; Schwartz et al., 2001). Unlike the SVS, the PVQ relies on indirect comparisons. Participants compare themselves to fictional characters (gender matched) on 40 short verbal portraits, saying how similar they think s\he is to them. These portraits highlight values that are important to the characters' lives (e.g., *It is important to him/her to be rich. S/He wants to have a lot of money and expensive things*). This measure is intended to be more concrete than the SVS, enabling similar interpretations across participants from different backgrounds. However, a shorter version of the PVQ has been developed, the PVQ-21, composed of 21 items (Schwartz, 2003). Two other shorter versions of the PVQ-40 were also proposed, composed of 10 (Ultrabrief version) and 20 (Brief) items (Sandy, Gosling, Schwartz, & Koelkebeck, 2017). Unlike the short form of the SVS, the PVQ-21 is widely used, being frequently included in the *European Social Survey* (ESS; Bilsky et al., 2011).

Other methods are less frequently used. One example is the Best-Worst Refined Values Scale (BWVr). To complete this scale, participants use a forced choice method to order the values' importance as guiding principles in their lives (Lee et al., 2016). Another example is an implicit measure of values, based on the well-known Implicit Association Test (Greenwald, Nosek, & Banaji, 2003). This test has been adapted to

assess achievement and benevolence values (Dentale, Vecchione, Gebauer, & Barbaranelli, 2018) and favorability toward power over universalism values (Souchon, Maio, Hanel, & Bardin, 2017). In theory, these implicit approaches tap spontaneous favorability to values rather than thoughtful judgments of value importance, enabling the implicit measures to predict more spontaneous aspects of attitudes and behaviour (Souchon et al., 2017). Nonetheless, these measures have yet to be deployed across diverse research and cultural contexts.

Value structure.

A crucial element of Schwartz's model is that values express different motivational synergies and conflicts. For example, achievement values (e.g., personal success) are adjacent to power values (e.g., dominance), because of a similar underlying motivation to self-enhance. Conversely, achievement is opposed to benevolence values (preserving and enhancing the welfare of the in-group), because the underlying motivations of these two sets of values (benefit the self-versus benefit others) are putatively in conflict. Similar reasoning applies to the dimension containing conservation and openness to change values, wherein value types on the opposing poles express conflicting motivations (protect the status quo versus seeking change), and adjacent value types share common motives. In sum, the model predicts that adjacent values are more likely to be similar in importance for a given individual than orthogonal values, which may be less similar in importance than opposing values. However, it is unclear whether this pattern holds for every group of people. For example, for medical practitioners to be successful, they presumably need to consider the opposing values achievement and benevolence to be high in importance (in order to help more patients). This leads to one interesting question regarding the circular structure and its assumptions of synergies and conflicts: is it possible that values seen as opposing share

more in common than they presumably do? I will return to this issue later in the introduction.

This motivational continuum is one of the main reasons for the popularity of Schwartz's model. These motivational relations help to make inferences about values and external variables, such as behaviours and attitudes. If one external variable exhibits a strong positive correlation with one of the value types, then the circular model predicts that correlations should become progressively less positive (and then perhaps more negative) moving around the circular model from adjacent value types through orthogonal value types to opposing value types (Schwartz, 1992). For example, when interpersonal cooperation is measured using an experimental game, cooperation is positively associated with the importance that people attach to benevolence values, at best weakly related to most openness and conservation values, and negatively associated with the importance they attach to power values (Schwartz, 1996). The resulting pattern of correlations follows a sine wave across the motivational continuum: it first increases (correlations with a value type and its adjacent values), then decreases (correlating with opposing values), and finally increases again (completing the circle, returning to the adjacent values) (e.g., Boer & Fischer, 2013; Hanel, Zacharopoulos, Mégardon, & Maio, 2017; Schwartz, 1992).

To assess the structure of human values, one of the most powerful and frequently used techniques is called Multidimensional Scaling (MDS). MDS provides a spatial representation based on similarities\dissimilarities between objects. The data can be provided from different methods, such as intercorrelations of items and ratings of similarities (Borg, Groenen, & Mair, 2012). The similarities\dissimilarities allow generalization and discrimination between the objects being considered, with the MDS analysis providing their positions across a spatial plane. For instance, suppose we want

to assess the similarities between the music styles played by Radiohead, Pink Floyd, Led Zeppelin, Aerosmith, and Taylor Swift. Radiohead and Pink Floyd are known for their more progressive sound and experimentation with different arrangements through their albums, while Led Zeppelin and Aerosmith rooted their sound on hard rock, typically associated with heavy beats and powerful riffs and vocals. In contrast, Taylor Swift plays pop music – a softer sonority and mainly with romantic lyrics. If we assess the similarities between these artists, it is likely that the MDS would generate a spatial plane where the prog and hard rock bands would be clustered in separate groups, but next to each other, while the pop singer would be further away from them. In sum, MDS allows us to visualize the relations between variables based on how close they are to each other (perceived similarity), reducing potentially complex data to Cartesian spatial planes. Items that are positioned more closely together into the spatial representation can be interpreted as more similar, whereas those that are positioned further apart are more dissimilar (Hout, Papesh, & Goldinger, 2013).

As previously mentioned, there are several methods that can be used to collect data, develop a "proximity matrix" (i.e., a matrix that contains all the similarities between the pairs of items), and finally perform Multidimensional Scaling. These include a range of indirect methods, where scores are not calculated from participants' direct comparisons of items, but are inferred from data such as response times in categorisation tasks (Hout et al., 2013). In this thesis, my empirical studies focus on the direct methods, which ask participants to compare items (Hout et al., 2013). For instance, participants can be asked to organize the items in groups\piles, based on how similar they judge these items to be (Yeh et al., 2014), such that more similar items are placed together in a group\pile. Another example of a direct method is a Spatial Arrangement (SpAM), technique developed by Goldstone (1994), in which participants

have to drag-and-drop the items on a screen, with their proximity indicating greater similarity and greater distance indicating greater dissimilarity (Koch, Imhoff, Dotsch, Unkelbach, & Alves, 2016). Another simple method to assess similarities is to present two items at a time to participants (e.g., *How similar are Pink Floyd and Aerosmith?)* (Hout et al., 2013). Also, basic intercorrelations of items can indicate similarities, with higher correlations showing higher similarity (Borg et al., 2012).

In values research, Smallest Space Analysis (SSA; Guttman, 1968), another name given to Multidimensional Scaling, has been widely used to assess the structure of Schwartz's theory (e.g., Schwartz, 1992; Schwartz & Sagiv, 1995). The SSA uses the intercorrelation between all value items, one to the other, to plot them into a two-dimensional space, also providing partitions that help to identify regions. As stated by Schwartz (1992, p. 45), "*the partition lines in the SSAs represent conceptually convenient decisions about where one type of motivation ends and another begins*". Recent research also assessed the structure of values using other types of MDS (Bilsky et al., 2011; Fontaine et al., 2008; Schwartz et al., 2012).

As previously mentioned, when assessing Schwartz's (1992) value structure, research has relied mainly on participants' ratings of value importance. MDS plots the intercorrelations between each value item's importance. These ratings are crucial for tapping the motivational aspects of values, which is a key aspect of what is meant by values (because of their motivational significance to the self). Nonetheless, similarities and differences in motivational content between values are built on people's understanding of values as concepts, and these conceptual representations have not been directly examined. We know which values are strongly endorsed by different groups or cultures, and how they are generally distributed across a spatial plane, but if we assess how individuals judge values based on the similarity of their content, would we see the

same relations? For instance, if we assess value importance, an individual can see creativity as important, but not wealth. However, if we ask about the similarities between their content, a person might see them as extremely similar, because, for example, creativity may help entrepreneurs to increase profit. Because values arise from abstractions or generalizations from previous individuals' experience, it is vital to examine their conceptual content and check if the similarities between these concepts generate a different spatial plane. Making these conceptual comparisons would help to either strengthen values theory or provide suggestions for improvement.

Value structure cross-culturally.

The circular structure has been extensively supported with results from different countries, gender, age groups, and sample types (Bilsky et al., 2011; Borg, Bardi, & Schwartz, 2017; Hanel et al., 2018; Schwartz, 1992, 2012; Schwartz & Sagiv, 1995; Struch, Schwartz, & Kloot, 2002), either as independent research (e.g., cultural validations, correlational research), or as part of large datasets (e.g., European Social Survey). Examples of independent studies that assessed values' structure can be found in many countries, such as Germany (Schmidt, Bamberg, Davidov, Herrmann, & Schwartz, 2007), Brazil (Tamayo & Porto, 2009; Tamayo & Schwartz, 1993), and Spain (Paez & De-Juanas, 2015). The structure was also replicated in research assessing how individuals' perceive the values of members of their own family, and from the country and city in which they live (Hanel et al., 2018). The structure has also been widely replicated using large datasets. For example, across 38 countries (using the SVS), the structure was replicated (Fontaine et al., 2008). Using data from the European Social Survey, the structure was replicated using 71 national samples from 32 countries (using the PVQ-21; Bilsky et al., 2011). Thus, the evidence broadly supports the universality

of Schwartz's model, with results consistently reproducing the structure and its features of conflicting and congruent values.

Some small deviations from the original structure were also found across different groups. For instance, considering 88 samples from 40 countries, Schwartz and Sagiv (1995) aimed to identify the culture-specifics of value content and structure. The motivational continuum was replicated cross-culturally, but results indicated that 13 of the 57 values were highly inconsistent in their positions in the circular model (e.g., *self-respect, inner harmony, meaning in life*), fluctuating through adjacent value types. On average, results indicated that 16% of the values diverged from their theoretical original position. With the European Social Survey data (Bilsky et al., 2011), deviations were found in 42 out of 71 samples (from 32 countries), always involving value types that are adjacent to each other - either reversing their order around the circle (e.g. universalism peripheral to benevolence; Italy), or mixing them (e.g., conformity and tradition together; Norway). Several explanations were raised to clarify these differences, such as sample differences (e.g., general population vs student population), the meaning attributed to the values cross culturally, and the developmental status of the country (Fontaine et al., 2008). Still, it is important to highlight that these deviations do not influence the overall structure across nations, which retains its main features.

In sum, the PVQ and SVS have been used in hundreds of studies, in diverse samples (e.g., religiously, culturally, geographically), and in 82 countries around the world (Schwartz, 2012). These studies provided strong evidence for the structure cross-culturally, with the value types emerging as expected in at least 90% of the samples. Some small deviations occur in some cultures (e.g., value types from the same higher order merging; Bilsky et al., 2011; Schwartz & Sagiv, 1995), but do not influence the whole structure.

Values and other variables.

As previously mentioned, values have an important role in predicting various important psychological variables. These associations were assessed through a range of studies over the years. Some relevant findings are summarized in a meta-analysis examining the associations between personality traits and values (n = 9.935, from 14 countries): the results showed the strongest correlations between openness traits and conservation values, and agreeableness traits and self-transcendence values (Fischer & Boer, 2015). In another meta-analysis examining personality traits and human values across 60 studies, it was found that more cognitively based traits (e.g., openness to experience, agreeableness) present a stronger relation to values than more emotionally based traits (e.g., extraversion, emotional stability) (Parks-Leduc et al., 2015).

The association between values and well-being has also been studied over the years. Boer (2017) examined how cultural factors and environmental threats could facilitate\inhibit the influence of personal values on affective experiences. The results indicated that the influence of values on affective well-being is culturally and environmentally constrained, with cultural factors moderating the impact of threats on the associations between the variables. Maio (2016) and Schwartz and Sortheix (2018) pointed out three theoretical perspectives regarding the relations between values and well-being. The first perspective aims to explain the direct relations between well-being and values. The second perspective aims to assess if the congruence between people's values and the ones endorsed by their peers are a determinant for their subjective well-being. Finally, the third perspective aims to understand if the achievement of value-related goals serves as a source for greater well-being.

Values are also frequently associated with attitudes. For instance, I led a study that assessed relations between human values and attitudes towards drugs, alcohol, and

marijuana (Coelho et al., 2018). Results indicated reliable associations between excitement (stimulation, hedonism) and normative (tradition, conformity) values and favorable vs unfavorable attitudes towards these substances, respectively. When assessing the relations between values and attitudes towards genetically modified and organically grown food products, results showed that individuals who rated power values as more important rated genetically modified food more positively, and organically grown food more negatively (Dreezens, Martijn, Tenbült, Kok, & de Vries, 2005). Also, individuals who rated universalism values as more important were more positive toward organically grown food.

The previously mentioned variables are just a few in a range of psychological phenomena that have been associated with human values. However, this thesis has yet to consider the links between values and overt human behaviour. Analogous to long-standing research on relations between attitudes and behaviour, researchers have recognized the role of values in predicting behaviour (Gouveia et al., 2014; Rokeach, 1973), while recognizing the use of values as post-hoc rationalizations for behaviour (Eiser, 1987; Haidt, 2001; Kristiansen & Hotte, 1996). The implications of values for human behaviour have been seen in different activities, such as voting (Caprara et al., 2006), work (Schwartz, 1999), and environmental conservation (Evans et al., 2013; Schultz et al., 2005).

However, despite the long-standing interest in value-behaviour connections, empirical studies of these connections are far fewer than one might expect (Fischer, 2017). One explanation for this paucity is that value-behaviour connections do not occur specifically from one value to one behaviour: multiple values may influence any given behaviour in a complex interplay. Diverse values influence a range of behaviours across situations (Schwartz, 1992). This complexity makes any examination of values

and behaviour inherently multifaceted. Consequently, a vital first step in examining value-behaviour relations is to consider their diverse theoretical interconnections, because behaviours can relate to multiple values.

Consider behaviours related to the value of *freedom*. This value can be expressed when animal-rights activists are trying to save animals trapped in zoos or circuses, and when striving for a region's independence from a perceived occupier. Both examples, however, can also express different values. Saving animals may also help to *protect the environment*, and regional independence may be perceived as a threat to values of *peace* or *national security*. In theory, many values can relate to any single behaviour, regardless of whether we are looking at influences of values on the behaviour or influences of behaviours on values. Therefore, to provide a robust assessment of how these relations occur, a key puzzle is knowing *a priori* which values link to which behaviours. These value-behaviour associations are relevant for the present thesis, and will be discussed further in Chapter 3.

Concepts and Categorization

When facing something new, it is a natural human impulse to interpret it as part of a category (Goldstone, Kersten, & Carvalho, 2012). Our cognitive system supports the classification of new objects in terms of concepts, placing them together with previously encountered items. In other words, we cognitively assess if the new object is similar to old ones (Hahn & Chater, 1997). For instance, when trying an exotic type of meat (e.g., crocodile, snakes) for the first time, we might associate its taste to something we have had in the past (e.g., chicken). A concept can therefore be understood as a "*mental representation of a class or individual and deals with what is being represented and how that information is typically used during the categorization*" (Smith, 1989, p. 502). According to Goldstone et al. (2012), concepts work as a filter that help to

provide informative or diagnostic ways to structure the world. In other words, concepts attribute meaning to things, allowing a better understanding and differentiation between the objects. The authors mention several crucial features of concepts. For instance, it is possible to generalize our experiences with an object to others from the same group. Concepts also help to facilitate communication by sharing common concepts, discriminating between stimuli, and generating an infinity variety of thoughts, based on their combined cognitive elements.

Despite their obvious connection, it is important to distinguish between concept and category. While a concept refers to an idea or notion that is mentally assimilated by an individual regarding a specific thing (e.g., a dog, a shark, a flower), a category refers to a set of these things that are grouped together (Goldstone et al., 2012). For instance, the concept of Italian cuisine is whatever mental representation of Italian food, while its category is consisted by all dishes that can be classified as from the Italian cuisine in the real world. As another example, in school concepts help children to attribute a meaning to mathematical terms (e.g., adjacent angle, acute angle, obtuse angle), which they organize in a way that makes sense to them (e.g., geometry, trigonometry). The process of how these ideas are stored and organized by individuals is known as conceptual representation (Markman, 2006).

Many theories from the categorization literature (*Prototype Theory*; *Examplar Theory*), are specified in terms of similarity (Medin & Schaffer, 1978; Minda & Smith, 2001; Murphy, 2004). Thus, when presented with a putative new instance of a category, the similarity of that instance to the relevant representations (e.g., a single prototype, a set of examples) is used as a basis for assigning that instance to a category (Medin & Schaffer, 1978; Minda & Smith, 2001; Murphy, 2004; Oden, 1987).

Conceptual representation of values and behaviours.

One possible explanation for why people from different countries endorse or interpret values in a different way is that values might have different (and implicit) meanings (Maio, 2010). That is, people attach different meanings to the same values. Because values are abstract concepts (Maio, 2016), understanding their mental representations as concepts and categories can help to understand their varied meaning. For example, when asked to group values that represent the welfare of others, it is likely that an individual whom was exposed to different situations wherein the value *equality* was related to others' well-being (e.g., fair income distribution, respect in workplace regarding people's differences) will group this value with other values that promote the welfare of others, such as *social justice*, *helpful*, and *honest*. Alternatively, an individual may have experiences that relate a particular value to motives associated with the opposing value domain in Schwartz's theory. For instance, some individuals might think of *wealth*, a self-enhancement value, as similar to self-transcendence values (e.g., *equality*, *social justice*) due to past experiences that pair *wealth* with motives to help others, perhaps as a result of engaging in a profession that pairs the person's livelihood with success in helping others (e.g., earning money to save lives as a doctor, saving money to work abroad as a volunteer). Thus, even if Schwartz (1992) predicts that two values possess opposing underlying motivations, these might be mentally represented together if the individual's experiences relate the opposing values. The use of similarity judgments to make categorizations might benefit value research, which can deeply explore the mental representations of values based on their content, and consequently be useful for theory development.

An important question is whether value structure based on conceptual similarities is empirically distinct from importance ratings. For instance, the values of

freedom and national security are in opposing areas in Schwartz's structure, due to putatively opposing motivations. However, freedom and national security are often combined in political rhetoric, wherein defense advocates stress the role of a strong-armed forces and intelligence service in protecting freedoms, while critics of national security measures (e.g., intelligence data monitoring) stress threats to personal freedoms. Such differences make it important to discover how people conceptualize such abstract ideals.

There is also a theoretical distinction between conceptual and motivational similarity. Regardless of whether or not individuals consider a pair of values to be highly similar, people can interpret them as high or low in importance as guiding principles in their lives. That is, the values may share low or high conceptual similarity, while sharing low or high motivational force. Therefore, focusing on more direct comparisons (e.g., similarity ratings) regarding their meaning enables a more direct probe of values' role in human concept categorization, and the results can be useful for theory development. The assessment of conceptual similarities between values will be examined in Chapter 2.

An interesting and important offshoot of this research question is the potential to learn more about links between values and behaviour. One of the main reasons of the popularity of human values is their ability to predict human behaviour, with extensive research investigating the link between values and behaviour (Bardi & Schwartz, 2003; Roccas & Sagiv, 2017). However, behaviours can be influenced by more than one value at time (Bardi & Schwartz, 2003; Schwartz, 2013), and behaviours are also influenced by many other variables (e.g., social norms, practical constraints). For example, an individual who is constantly presenting new project ideas can be seen as valuing both *intelligence* and *creativity*, values from different dimensions in Schwartz's

model. These influences can complicate predictions about value-behaviour relations, because it is not known *a priori* how different values (e.g., intelligence, creativity) relate to the same behaviour (e.g., new project ideas) and how much this depends on the motivational and conceptual similarities between values.

The role of values as concepts and categories may be important for better understanding the link between values and behaviours, particularly given how multiple values can influence the same behaviours (Bardi & Schwartz, 2003; Roccas & Sagiv, 2017). When plotting values and behaviours together, prior research has examined correlations between value importance and the frequency with which related behaviours were performed (for more information, see chapter 3; Bardi & Schwartz, 2003; Schwartz & Butenko, 2014). However, a critical limitation of this approach is that, as noted above, individuals may judge the same behaviours as expressing different values. For instance, an individual in a vibrant winter sports community might believe that snowboarding fulfils the values of stimulation and tradition, but not hedonism, because the person does not enjoy snowboarding. This pattern would make it difficult to detect a sinusoidal pattern of relations between Schwartz's values and this behaviour, because the mental representations of these values include the behaviour in surprising ways.

This complexity can be reduced if we learn about how people conceptually map value-relevant behaviours alongside the values. Specifically, if we ask people to rate similarities between value-relevant behaviours, will we obtain the same conceptual mappings as found for the values themselves? Where would the behaviours fall in relation to the values that they are intended to serve? Can behaviours be represented in the same space as the values? Or is the space defining behaviours fundamentally different? It is important to consider that in addition to values, behaviours are under varied influences (e.g., norms, perceived control; Fishbein & Ajzen, 1975). It is an

open question whether or not spatially mapping behaviours that are generated through human values would exhibit the same circular pattern as seen for the values themselves. If not replicated, this finding would show that even the most closely related behaviours have determinants (e.g., goals, abilities) that are not isometric with the motivations underpinning values in the abstract (perhaps due to the non-value relevant other factors that shape behaviour). In contrast, if behaviours that are prototypical of values *do* exhibit the same circular pattern, then this finding would support the model and suggest that any departures from sinusoidal patterns in value-behaviour relations stem largely from atypicality in the mental representation of the particular behaviours within the values. This thesis explores these possibilities.

Overview of the thesis

This thesis aims to assess the structure of human values through their conceptual representations, using MDS analysis of multiple structural assessments. In addition, I assess a behavioural structure for values (generated from Schwartz's value types). Each aim is addressed in a separate empirical chapter.

In Chapter 2, I present seven studies from nine samples that were collected across two countries (seven from the United Kingdom, two from Brazil). In these studies, I examined Schwartz's value structure by asking participants to make comparisons across different value levels (e.g., value items, value types, value dimensions), and using different methods (e.g., direct comparisons, pile sorting, Spatial Arrangement). The work in Chapter 2 appears in Coelho, Hanel, Johansen and Maio (2018).

In Chapter 3, I present four studies using British samples. In these studies, I assess the relations between behaviours and mental representations of values (using

different levels: value types and dimensions). An overview of the empirical studies can be seen in Table 1.1.

Table 1.1.

Overview of empirical studies

	Brief Description	Countries (Samples)
Chapter 2		
Study 1	Participants performed direct comparisons between 16 value items from Schwartz's model.	UK (109)
Study 2	Participants performed direct comparisons between the 10 value types from Schwartz's model.	UK (111) Brazil (69)
Study 3	Participants performed direct comparisons between all 57 value items and the 10 value types from Schwartz's model.	UK (156)
Study 4	Participants performed direct comparisons between all 57 value items and the four high order values from Schwartz's model.	UK (107)
Study 5	Participants were asked to position all 57 value items into the two dimensions from Schwartz's model.	UK (167) Brazil (86)
Study 6	Participants were asked to group all 50 value items into groups\piles, based on their similarities.	UK (129)
Study 7	Participants performed a Spatial Arrangement task, developing a structure based on how similar they interpreted the 57 value items are to them.	UK (152)
Chapter 3		
Study 8	Participants rated how related are a set of 40 behaviours to the respective value types from which they were originated.	UK (105)
Study 9	Participants performed direct comparisons between the 40 behaviours and Schwartz's 10 value types.	UK (123)
Study 10	Participants were asked to position the 40 behaviours among Schwartz's two dimensions.	UK (113)
Study 11	Participants were asked to perform direct comparisons between all 40 behaviours, one to another.	UK (131)

Finally, in Chapter 4, I summarize the results across both empirical chapters and discuss the conclusions that hold across them. I will highlight what the results mean for our understanding of the mental representations of values, and how these mental representations connect to different behaviours. Little attention has been given to how individuals interpret and understand values, which is vital because of their abstract nature. Hence, the novelty of these studies can provide important evidence regarding how individuals mentally represent the values, which will help to reach a deeper understanding of them. Also, because of the influence of multiple values on a single behaviour, it has been difficult to link values to behaviour *a priori*. Therefore, mapping behaviours using their similarities to mental representations of values might help address this problem. Finally, I will also discuss the limitations of the current designs, and describe potential directions for future research.

Chapter 2: Conceptual Representations of Human Values

As abstract concepts, values can be construed in diverse ways that have implications for how we use them as self-regulatory devices (see Maio, 2016) and as tools to justify or explain our behaviour (e.g., Eiser, 1987; Kristiansen & Zanna, 1988). To some extent, progress in understanding these construals has been made by models distinguishing between motives expressed by values (see e.g., Gouveia et al., 2014; Hofstede, 1980; Inglehart, 1977; Rokeach, 1973; Schwartz et al., 2001), while articulating their connections to human attitudes (Maio, Olson, & Bernard, 2006) and actions (Hitlin & Piliavin, 2004). Research has also shown how value differences are related to idiosyncratic social experiences and the socio-cultural context of each person (Gouveia et al., 2014), in addition to biological and neurological factors (Leszkowicz, Linden, Maio, & Ihssen, 2017; Schermer et al., 2011; Zacharopoulos et al., 2016; Zahn et al., 2009). However, despite these advances, research has not examined the crucial question of how people *conceptually* map their values. Value studies have focused on motivational representations of values and side-stepped the issue of conceptual similarity and diversity. The present chapter provides the first direct empirical examination of people's conceptual representations of values using tasks that explicitly ask about mental representations of values.

To assess how human values are structurally related, a test that is frequently used to assess conceptual representations has instead been used to examine the motivational interrelations between values. Specifically, the motivational relations have been tested by subjecting correlations between ratings of value importance to Multidimensional Scaling (MDS) (e.g., Bilsky et al., 2011). Using MDS analysis of value correlations (see Figure 2.1 for an example), Schwartz's (1992) circular structure of values has been found in common space plots of correlations between value ratings in different samples (e.g., students, teachers, clinicians) from around the world. Data

from the UK and Brazil are particularly relevant here because they are sites for data collection in my research. For instance, in the UK, Bilsky et al. (2011) found support for the circular structure across three representative samples. The structure was also replicated in Brazil (Sambiase et al., 2010; Tamayo & Porto, 2009; Tamayo & Schwartz, 1993), although some minor deviations emerged. For example, some value types merged (e.g., hedonism and stimulation, Tamayo & Schwartz, 1993; stimulation and self-direction, Sambiase et al., 2010), or swapped positions (e.g., stimulation and benevolence; Tamayo & Porto, 2009). Consistently, the value types universalism and benevolence tended to occupy the same region across studies in Brazil. Fontaine et al. (2008) point to several possible explanations for deviations in values structure, including sample differences (e.g., general population and student sample), the meaning attributed to values cross-culturally, and national development.

The structure has also been presented in data describing the perceived values of other people (e.g., perceived familial and societal values) and in a variety of assessment techniques (e.g., self-reports, response latencies; Fontaine et al., 2008; Hanel et al., 2018; Pakizeh, Gebauer, & Maio, 2007; Schwartz, 1992, 1994; Schwartz & Boehnke, 2004). For more information regarding these structural studies using MDS, please see Chapter 1.

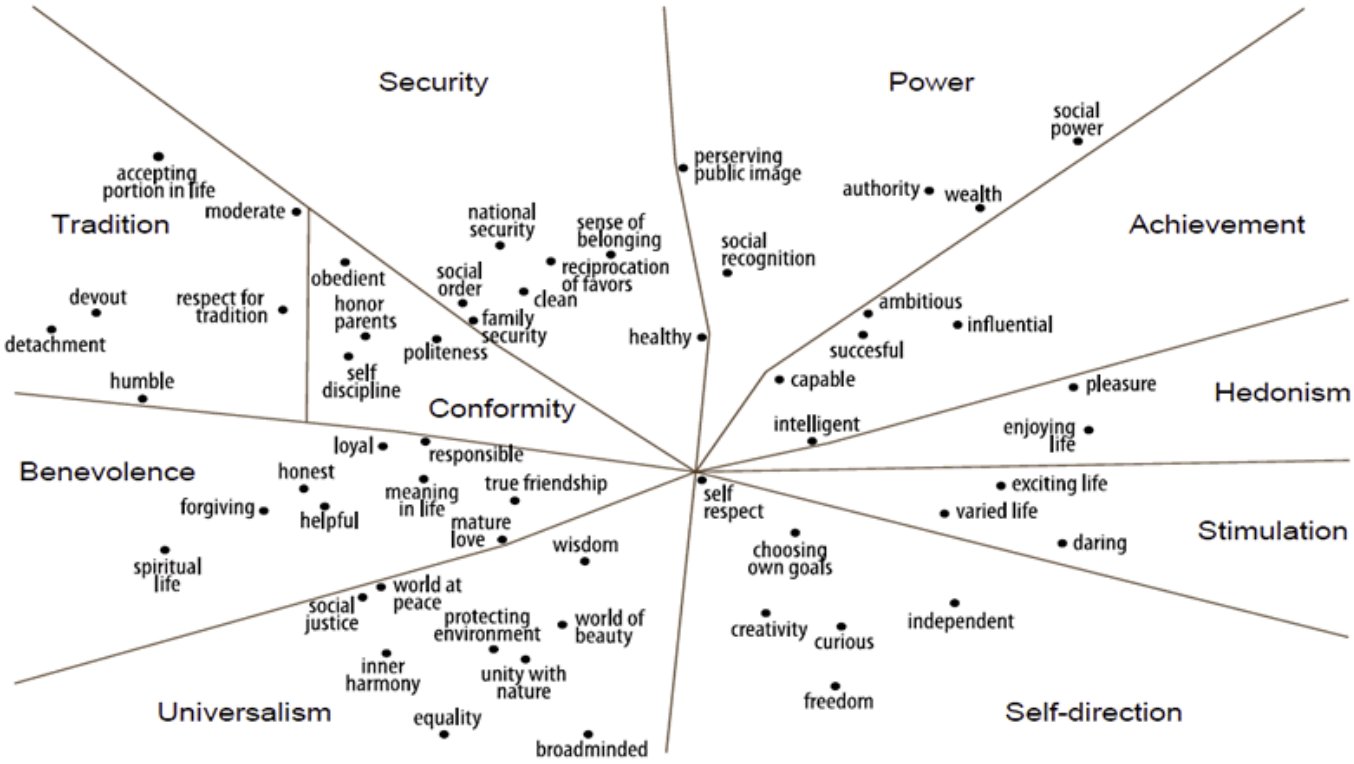

Figure 2.1. An example of MDS applied to human values (from Schwartz, 1992). Values that are placed more distant from the centre are typically "more abstract, less close to one's self-concept, and less often implicated in daily interaction" (Levy, 1985, cited in Schwartz et al., 2012, p. 678).

Notwithstanding this support for Schwartz's model, MDS is more commonly used to analyse people's explicit judgments of the conceptual similarity of objects (Borg et al., 2012), with these judgments providing a spatial representation wherein item proximity can be interpreted as an indicator of conceptual similarity: similar items are positioned more closely together than dissimilar items (Hout et al., 2013). The focus on more direct comparisons of the abstract concepts enables a more direct probe of their role in human concept categorization, because human value concepts arise from abstractions or generalisations from previous experiences. Thus, when presenting different pairs of value concepts to individuals, people are able to make categorizations based on their understanding of these values.

The focus on similarity ratings affords a closer look at the conceptual representations of the meaning of the values, without scrutiny of the aforementioned

motives. This analysis can be important for theory development, as was recently illustrated by Koch et al. (2016). These investigators applied multidimensional scaling to similarity judgements in the context of Fiske, Glick, and Xu's (2002) highly influential model of stereotype content and found that the model can be improved with an added dimension.

This ability to tap meaning judgments is vital for models of values because of the *abstract* nature of value concepts. Many theories of values, including Schwartz's perspective, recognize the importance of diverse affective, cognitive, and behavioural components of values (see also Rokeach, 1973), which are also directly tied to specific contexts and actions that people use in mental representations of values (Maio, 2010). A number of experiments have shown that the concrete cognitive content (i.e., beliefs, arguments) that people provide for values makes a difference in how values relate to subsequent action (e.g., Maio, Hahn, Frost, & Cheung, 2009; Maio, Olson, Allen, & Bernard, 2001). Therefore, it is important to consider whether the cognitive categorizations of values yield different interrelations between them than is showed through analysis of motivational compatibility, as showed through analysis of correlations between value importance ratings.

It is possible that the relations between values as inferred from value-concept assessments, such as similarities, may be different from those inferred from motive endorsement. For example, some values might be more conceptually related to opposing or adjacent value types, depending on individuals' mental representations of the values. Indeed, prior research by Pakizeh et al. (2007) noted empirical differences between conceptual similarity and similarities in value importance judgements. These researchers found only a modest association between participants' judgments of the semantic similarity of pairs of values and discrepancies in value importance ($r = -.26$, p

< .001). However, Pakizeh et al. did not attempt to map conceptual representations of values using the similarity judgments and test whether the circular structure of values held in these representations.

Fortunately, the use of similarity and categorization judgments in MDS is well-suited to revealing conceptual representations with relatively high precision. This precision arises because the MDS matrix provides similarity judgments for *all* pairs of items, generating a spatial map of values based on a more direct task. This approach allows a within-subject assessment of the value space, because participants directly compare the similarities between values. In contrast to reliance on between-subject covariance in value importance judgements, this approach generates a more valid plane because each participant provides more data, explicitly considering the relations of each item (e.g., value) to all other items, rather than merely using a single set of between-participant correlations to furnish the proximity data.

Prior research supports the utility of this within-person approach. Across 17 European countries, Gollan and Witte (2014) replicated the circular structure. The proposed structure was also found within-persons across countries (e.g., United Kingdom, United States, Iran), and across value measures (e.g., Schwartz values survey, portrait values questionnaire;(Borg et al., 2017). However, these studies relied on importance ratings to assess the motivational structure of Schwartz's model, while my studies assess conceptual categories through direct comparisons.

The Present Research

Unlike the past research using value correlations, the aim of my research was to provide a direct analysis of conceptual representations of values by applying MDS analyses (Studies 1, 2, 3, 4, 6, and 7) and common space plots (Study 5) to different categorization tasks. These methods were applied to similarity judgements of values

through seven studies and nine samples across two countries (seven samples from UK, two from Brazil). Furthermore, I assessed all three conceptual levels in Schwartz's model of values. That is, I asked participants to make comparisons involving specific values, value types, and value dimensions. In Study 1, participants judged the similarity between specific values from Schwartz's model. In Study 2, participants judged the similarities of the ten value types, and, in Study 3, participants were asked to compare all 57 values from Schwartz's theory to the 10 value types. In Study 4, participants compared how similar the value items are to the four high order values. Study 5 elicited judgments of the meaning of values by asking participants to position the human values along Schwartz's two motivational dimensions. To provide an even more diverse assessment, Studies 6 and 7 assessed the structure of all value items with a pile sorting task and a Spatial Arrangement task. Together, these methods provided the first assessment of values based on their perceived similarities.

Finally, I assessed the fit between the data and the locations in Schwartz's model using a Procrustean superimposing approach (Peres-Neto & Jackson, 2001). Study 1 describes how this analysis works. This method can be applied to the outcome of a MDS, such as the axes of a spatial configuration, but also on an individual level, as I demonstrate in Study 7.

Study 1

The purpose of this study was to use similarity judgments between values to derive a MDS spatial plane describing conceptual representations of the values. Specifically, I aimed to test whether my approach would reproduce the circular structure, using a subset of all 57 values in Schwartz's model. Comparing all 57 values from Schwartz's model would yield 1,596 comparisons, which would require a long period of time, leading to boredom or loss of concentration. Consequently, my first

study asked participants to consider only 16 values, which were selected as being well-spaced among all the quadrants from Schwartz's (1992) theory. The relations between all values in Schwartz's model were investigated using different methods in Studies 6 and 7.

Method

*Participants***.** Participants were 109 psychology students (n = 93 women; n = 16 men; M_{age} = 19.78; SD = 3.05), who took part in exchange for course credit.

Materials and procedure. Participants were asked to rate the similarity of 16 values (e.g., social order) across the four higher-order value quadrants in Schwartz's model, using items from the Schwartz Value Survey (SVS, 1992). The values in the self-enhancement quadrant were wealth, ambition, intelligent, and preserving my public image; the values in the self-transcendence quadrant were social justice, helpful, and equality; the values in the conservation quadrant were obedient, respect for tradition, national security, and social order; the values in the openness to change quadrant were independent, self-respect, exciting life, pleasure, and freedom.

Participants were presented with one value and then asked to rate how similar they personally thought this value was to a list of other values. This rating was made using a sliding scale from 0 (*completely different*) to 100 (*extremely similar*). They were instructed to click on the slider and move it towards the rating that more accurately indicated the answer that best described the similarity between the pair of values. Participants began by comparing one value with the other 15 values on one screen, and then a new screen appeared. The new screen asked participants to compare another of the 15 values with the other 14 values, and so on until just two values were remaining for comparison, with a total of 120 comparisons between values. Value items appeared

in alphabetical order (ambition, equality, exciting life, and so on…). One example of the task can be seen in Figure 2.2.

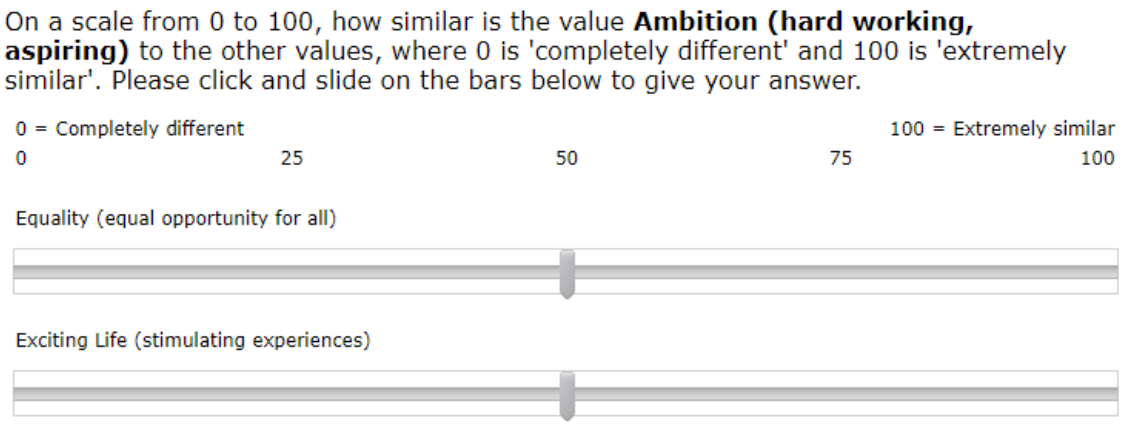

Figure 2.2. Example of task (Study 1).

Results and Discussion

MDS methodology. The means of all 120 comparisons were calculated, creating a half-matrix dataset, also known as a triangular matrix. Next, an ordinal MDS on the half-matrix was performed using the PROXSCAL algorithm. This algorithm creates a geometric representation of the data, respecting the proximity of the items (Hout et al., 2013). The Torgerson configuration was selected as the initial configuration. This configuration is also known as classical MDS and aims to create a two-dimensional representation of high-dimensional data (Brandes & Pich, 2007). Two-dimensional representations were chosen for this and the further studies, based on scree plots of their Stress-I values across four different configurations (From one to four dimensions). A graphic with these scree plots is available in the appendix. The Stress-I was used to indicate the model's goodness of fit, considering the difference between the input proximities and output distances in the Cartesian plane (Jaworska & Chupetlovska-Anastasova, 2009). Lower values indicate a better model fit. In all of my studies using MDS, I employed the cut off values proposed by Sturrock and Rocha (2000); these cut-offs consider the number of points and dimensions presented in the analyses. The cut-

offs were generated after analysing 587,200 random matrices, and the final results match those obtained by Spence and Ogilvie (1973). For this study, with 16 values in two dimensions, a Stress-I lower than .24 is recommended. Therefore, my results indicate a good model fit using this criterion (Stress-I = .14; cf. Figure 2.3). I also tested the stress-per-point of the model – the extent to which each one of the values contributes to the total stress. That is, I considered the normalized raw stress ($\sqrt{n.r.s}$ = Stress-I) scores. In this study, self-respect and wealth were the values with higher individually stress. The full stress-per-point table for this and further studies are available on the Appendix (p. 134).

However, these indices indicate only how well the data can be characterized in a two-dimensional space and not whether the data are consistent with the specific two-dimensional space in Schwartz's proposed structure. The data could fit into a two-dimensional space with values positioned very differently from Schwartz's model. To assess this fit to Schwartz's model, we used Procrustes analysis ("Protest"; Peres-Neto & Jackson, 2001), which tests the degree to which two sets of points align. Specifically, Protest "compares two ordinations using symmetric Procrustes analysis" (Oksanen, 2015) by minimizing the sum-of-squared differences through re-scaling the configurations to a common size, mirror reflecting (if necessary), and rotating (Peres-Neto & Jackson, 2001). In other words, using Protest in my studies compared the theoretical spatial arrangement of values from Schwartz's model with the spatial arrangements in my data, and assessed how good their alignment was. Protest is also known as an analysis of congruence (Oksanen, 2015).

To perform the analysis, I needed two configurations whose congruence we assessed through superimposition. The data were one configuration, and hypothetical coordinates for Schwartz's (1992) model were the other configuration. I specified the

coordinates of Schwartz's model by approximating them through visual inspections to the MDS output coordinates from Schwartz (1992). For example, the four self-enhancement values were expected to be on x (axis) = 0 and y (axis) = 0.5, and the four conservation values on x = 0.5, and y = 0, as shown in Figure 3. For a better visualization, I also used the convex hull (the dashed lines connecting the values) in Figure 2.3, which provides the smallest convex set of values to each higher order value. This method was also applied to the spatial planes derived in the other studies I conducted. Note that it is not necessary to match the starting coordinates to the model fit, because the protest function rotates and mirror reflects the coordinates if necessary, but some starting configurations that are in line with Schwartz's model are needed. Further, I focused on fit to the four higher order values rather than breaking the analysis down to the 10 value types because I was only interested in a fit to the overall model rather than small deviations within each value type.

Data were analysed with the R package "vegan" (version 2.5-1; Oksanen et al., 2018), which has a Protest function based on Peres-Neto and Jackson (2001). The Protest returns a correlation-like effect size and estimates its statistical significance. Although the correlation-like effect size, which is called "correlation in a symmetric Procrustes rotation", is often labelled as *r* (e.g., Oksanen, 2015), I will refer to it as r_m to avoid confusion with the Pearson's correlation coefficient *r*. Larger correlations imply a better fit, and significant results indicate a match between the two sets of points. Procrustes Rotation assumes that two different configurations with the same number of points are being compared. In our case, however, these points are from different levels: My data is from the value item level, while the hypothetical configurations use coordinates from the four higher order values. This difference regarding the nature of the points means that I did not expect to find a perfect fit, because the values items of

one higher order value were not all expected to be in the same position. For Study 1, the fit of the data to the model was significant: $r_m = .86$, $p \leq .001$.

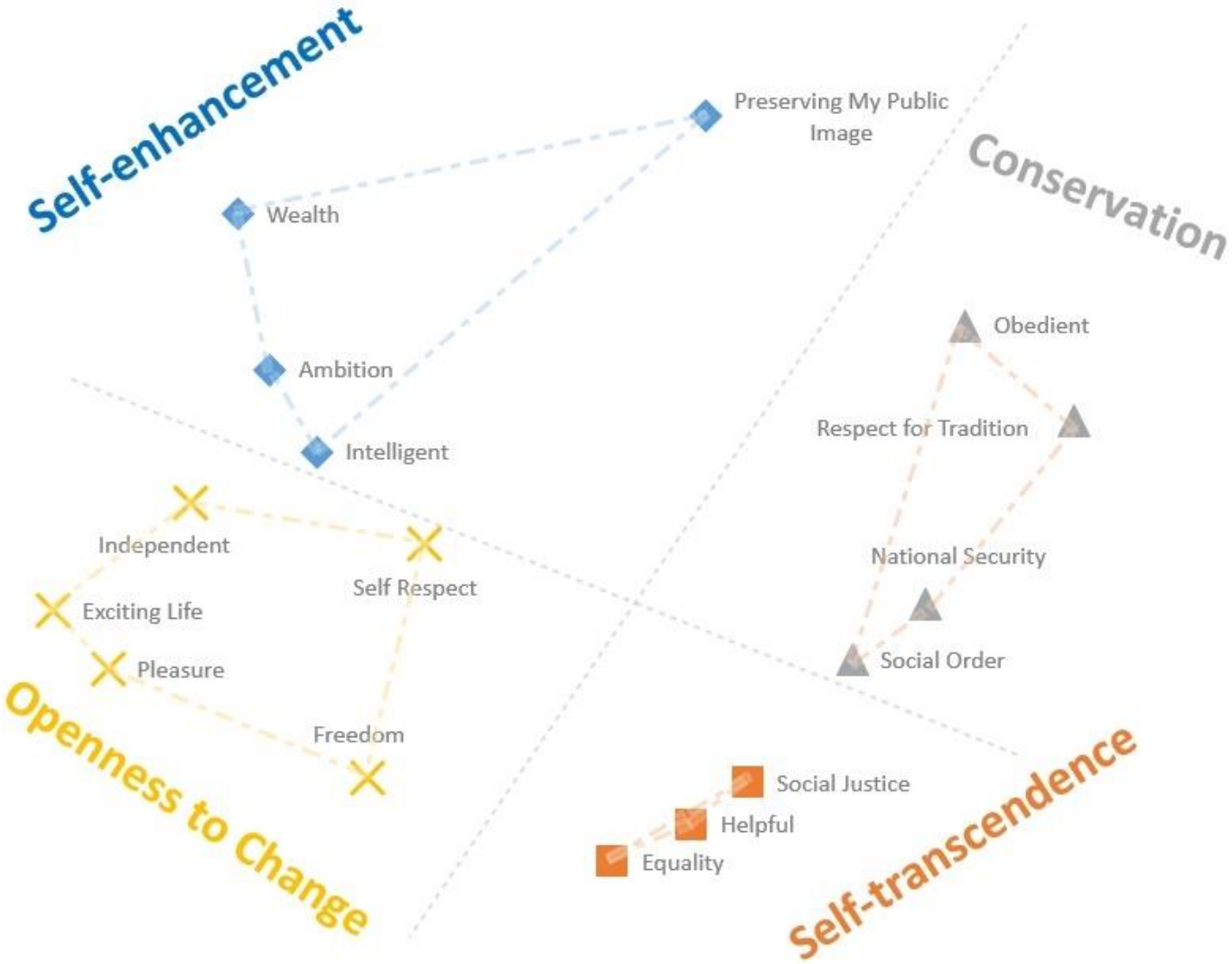

Figure 2.3. Structure based on similarity judgements between value items (Study 1). Self-enhancement (filled diamonds), self-transcendence (squares), openness to change (hollow diamonds), and conservation (triangles). Convex hull: dashed lines connecting behaviour groups.

The conceptual arrangement of human values from the similarity judgment task resembled the spatial plane in Schwartz's (1992) analysis of value importance ratings. The values that were predicted to be on opposing sides of the value circle were in opposition in all cases, and most of the values serving related motives appeared near each other in the plots. Overall, then, the application of MDS to the similarity ratings

showed a conceptual representation matching the motivational patterns elucidated in Schwartz's model.

Nonetheless, a few exceptions were noted. First, if we compare the spatial planes displayed in Figure 1 to the one from Schwartz (1992) studies, it can be noticed that some values changed position with other values that belong to the same higher-order value type, resulting in minor deviations: pleasure (a hedonism value) switched places with independent and self-respect (self-direction values). In addition, there was an alteration in adjacent motivational value types: the security values changed position with tradition\conformity. Again, this change occurred in the same higher order values. Thus, the conceptual map does not differ substantially from the motivational patterns in in Schwartz's model at the level of values. This conclusion is further assessed in Studies 6 and 7 using different methods. In the next study, I aim to check these patterns through a focus on the lower-order value types.

Study 2

The aim of Study 2 was to evaluate conceptual representations of values using similarity judgments between each of the 10 value types in Schwartz's (1992) model (e.g., stimulation, benevolence). That is, participants were asked to compare the value types, rather than individual value items, resulting in a total of 45 comparisons between the 10 value types. This was a smaller set of comparisons than in Study 1, but it enabled examination of the conceptual representation of values at the level of value type, instead of focusing only on a small number of specific values in each type. This study also evaluated culturally distinct samples, one in in United Kingdom and the other in Brazil.

Method

*Participants***.** British participants included individuals from a community research panel who took part in exchange for a prize draw and undergraduate psychology students who took part for course credit. They responded to an Instructional Manipulation Check (IMC; (Oppenheimer, Meyvis, & Davidenko, 2009), which is a task created to see if participants spend time reading instructions, and two "test items" (e.g., “please, rate everything 'extremely'”) within the study. In total, 11 participants failed (four students and seven from general population) the IMC twice and were excluded[1] from the analysis, leaving 111 participants in the sample (n = 84 women; n = 27 men), with a mean age of 23.54 (SD = 8.99). Brazilian participants were recruited from the general population, with nine of them failing the IMC twice and/or both test items, resulting in a final sample of 69 (n = 34 women; n = 34 men; 1 missing; M_{age} = 32.15, SD = 13.39).

Materials and procedure. In this task, participants were instructed to rate the similarities between the ten value types (e.g., benevolence, achievement) taken from Schwartz's (1992). Specifically, they rated how similar they personally thought two value types were, using a slider scale, ranging from 0 (*not at all*) to 100 (*extremely*). One pair was presented at a time and in a random order. Participants rated similarity by clicking on the slider and move it towards the rating that best indicated their opinion regarding the similarity of the items. All the value types were followed by a short definition (e.g., *Universalism* [*Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature*]), in order to make all value types clear to participants. An example of the task can be seen in Figure 2.4.

[1] These exclusions did not affect the findings, neither in this study or the others.

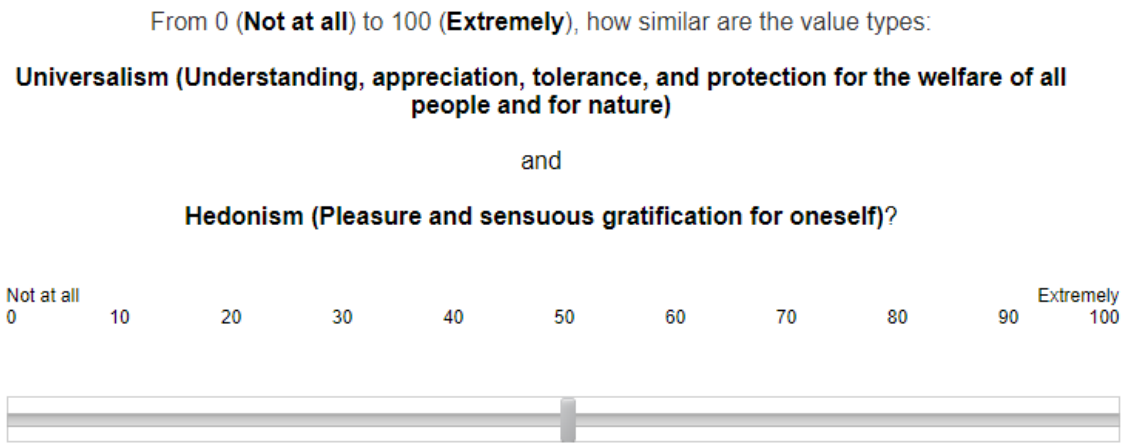

Figure 2.4. Example of task (Study 2).

Results and Discussion

As in Study 1, two half-matrix datasets containing the means of all comparisons were created. Again, ordinal MDSs were performed on each half-matrix, using the PROXSCAL algorithm with Torgerson configuration. With 10 values, a Stress lower than .13 is recommended (Sturrock & Rocha, 2000). Results indicated a good fit in both samples (UK, Stress-I = .04, r_m = .89, $p \leq .001$; BR, Stress-I = .05, r_m = .92, $p \leq .001$). The values types that contributed most to the model stress were conformity and security in UK, and security and hedonism in Brazil.

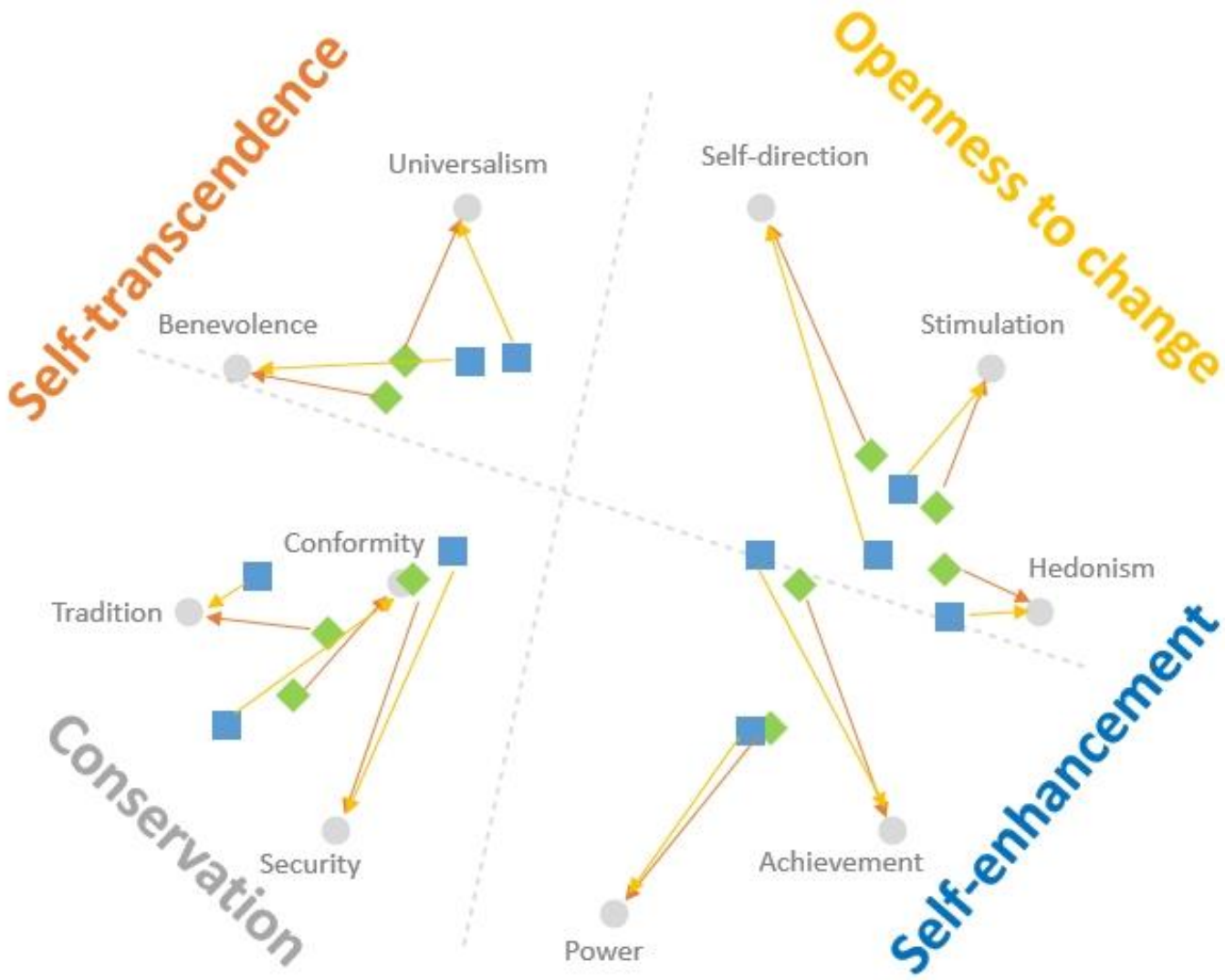

Figure 2.5. Value types along two dimensions (Study 2). *Note*: Green diamonds represent my UK sample; blue squares represent my Brazilian sample; Grey circles represent value type positions expected from Schwartz's model.

As can be seen in Figure 2.5, some small deviations were noted. For instance, security positioned adjacent to power, instead of proximal to self-transcendence value types. These deviations do not affect the overall structure, with the value types from the same higher-order value positioned broadly in the same space (e.g., self-transcendence values: universalism and benevolence). Also, the opposing higher order values were again in opposite positions (self-enhancement\self-transcendence and conservation\openness to change), supporting Schwartz's model. Thus, the two-dimensional spatial plane retained the separation and ordering of the higher order value types (Bilsky et al., 2011). In the next study, I mixed the levels of abstraction in values

considered in Studies 1 and 2, performing direct similarity judgments tasks between value items and value types.

Study 3

The prior studies used a limited number of value comparisons (up to 120) per participant to prevent participant fatigue. Study 3 examined similarity judgments between all 57 values and the 10 value types. This required 570 comparisons, which is far more than the number of comparisons made in the prior studies. Thus, to attenuate participant fatigue, these comparisons were divided into two blocks, with each participant responding to half of the randomly selected items, resulting in a total of 285 comparisons. The answers were further aggregated across participants, forming a single matrix based on the means between each pair of items.

Method

*Participants***.** Participants were 181 psychology students, who took part in exchange for course credits. Participants answered the IMC (Oppenheimer et al., 2009) and five "test items" (e.g., "*please, rate everything extremely*"), which were added in a random location among the other items. Participants who failed the IMC twice and/or two or more test items were excluded from the analyses. In total, twenty-five participants were excluded from the analyses. The remaining sample contained 156 participants (n = 144 women; n = 12 men), and the sample's mean age was 19.59 years (SD = 2.38).

Materials and procedure. Participants were asked to rate the similarity between each of the 57 human values (e.g., *equality*, *freedom*) and the 10 value types (e.g., stimulation, conformity) from Schwartz's (1992) theory. In this study, participants were presented with all 57 values, one by one, and compared each one to five randomly selected value types. Participants rated the similarity of each pair using a slider scale,

ranging from 0 (*not at all*) to 100 (*extremely*). They moved a slider towards the score that best represents the extent to which they personally think each pair is similar. See Figure 2.6 below for one example of the task.

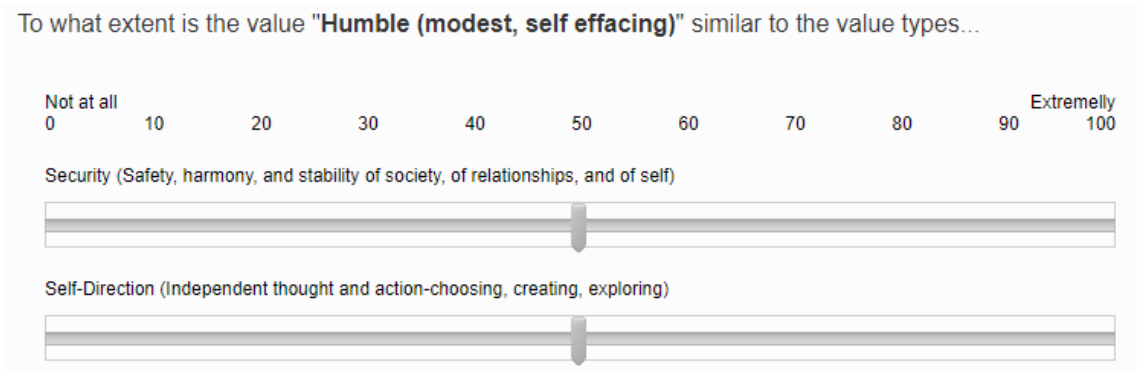

Figure 2.6. Example of task (Study 3).

Results and Discussion

First, the means of all comparisons were calculated, creating a full matrix (*value items* x *value types*). Next, an ordinal MDS (PROXSCAL) was performed, using the Torgerson configuration. The resulting Stress-I of .10 indicated a good model fit (recommended lower than .37, for 57 objects; Sturrock & Rocha, 2000). Privacy and sense of belonging contributed most to the stress. Protest indicate a good fit to Schwartz model: $r_m = .80$, $p \leq .001$. Figure 2.7 shows the spatial plane of the human values according to their similarities to the value types. Overall, there were high similarities between the value items and their expected or adjacent value types. As in the prior studies, the spatial plane still retained the correct separation and ordering of the higher order value types (Bilsky et al., 2011).

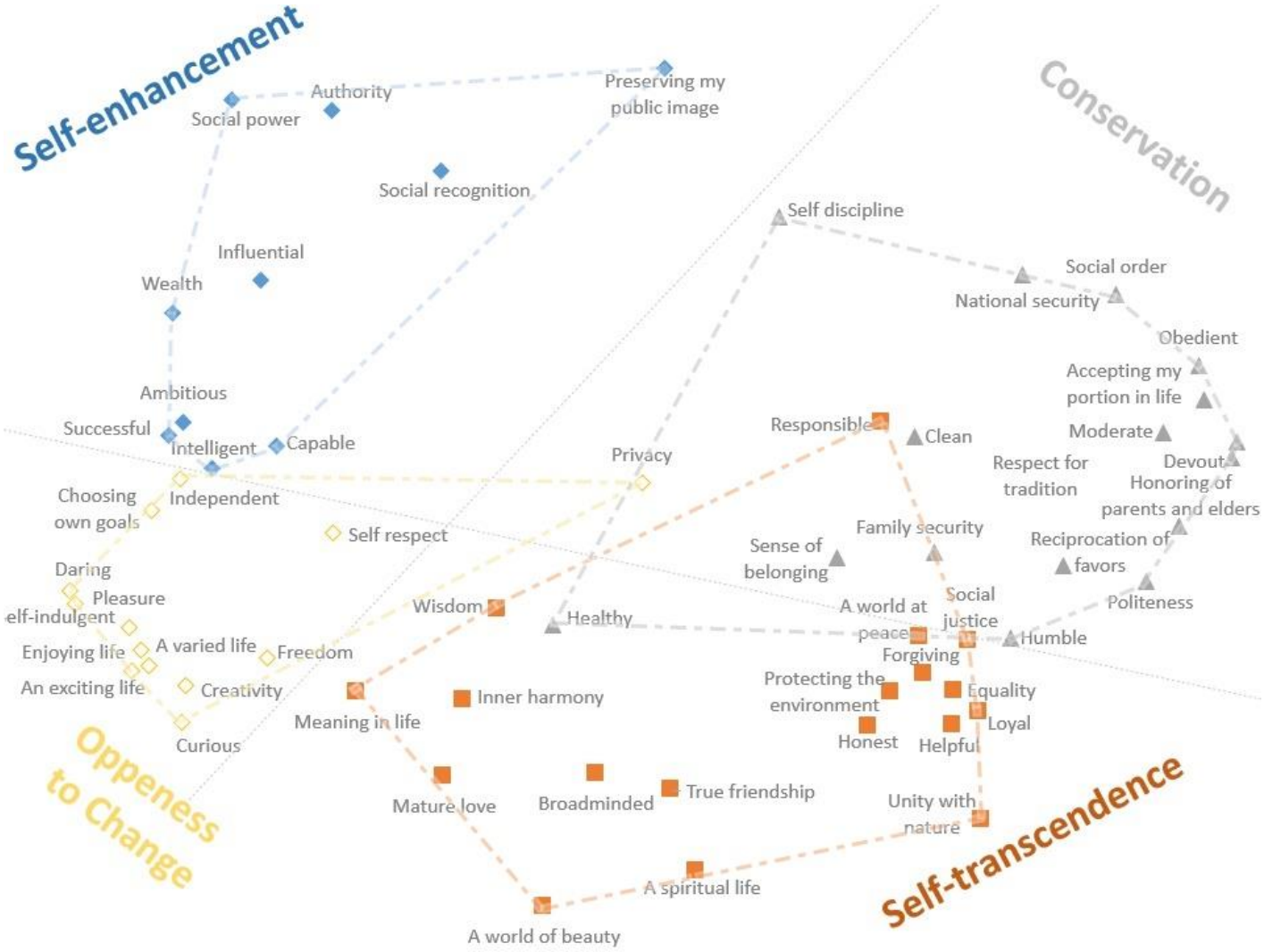

Figure 2.7. Value positions according to their similarities to the value types (Study 3).

Only three of the 57 values were positioned in unexpected places: healthy, privacy, and responsible. In previous research, these values also emerged in inconsistent positions (e.g., Schwartz et al., 2012; Schwartz & Sagiv, 1995). For example, healthy can be often found next to hedonism, achievement, self-direction and, as in this case, benevolence (Schwartz, 1992).

Study 4

The results to this point yielded support for a model of values' semantic meaning that closely matches Schwartz's model. To further probe the reliability of this mapping, Study 4 asked participants to rate the similarities between Schwartz's (1992)

values and the four higher order values. As in Study 3, I attempted to attenuate participant fatigue by presenting them with a randomly chosen subsample composed of 30 of the 57 human values.

Method

*Participants***.** Participants were 126 individuals who were recruited online through Prolific Academic. However, 19 of these participants failed the IMC (Oppenheimer et al., 2009) twice and\or three test items, which were added in random parts of the main task. The remaining sample contained 107 participants (*n* = 57 women; *n* = 50 men), with a mean age of 37.11 years (SD = 12.56).

Materials and procedure. Participants were instructed to rate the similarities between Schwartz's human values (e.g., *authority*, *loyal*), and the four higher order values (e.g., *self-enhancement, conservation*). Participants were presented with one main value on the top of the screen, and then asked to rate the extent to which this value is similar to each of the four higher order values, using a slider scale from 0 (*not at all*) to 100 (*extremely*). Participants clicked and moved the slider towards the response option that best indicated their personal answer regarding the similarity of each pair. An example of the task can be seen below (Figure 2.8).

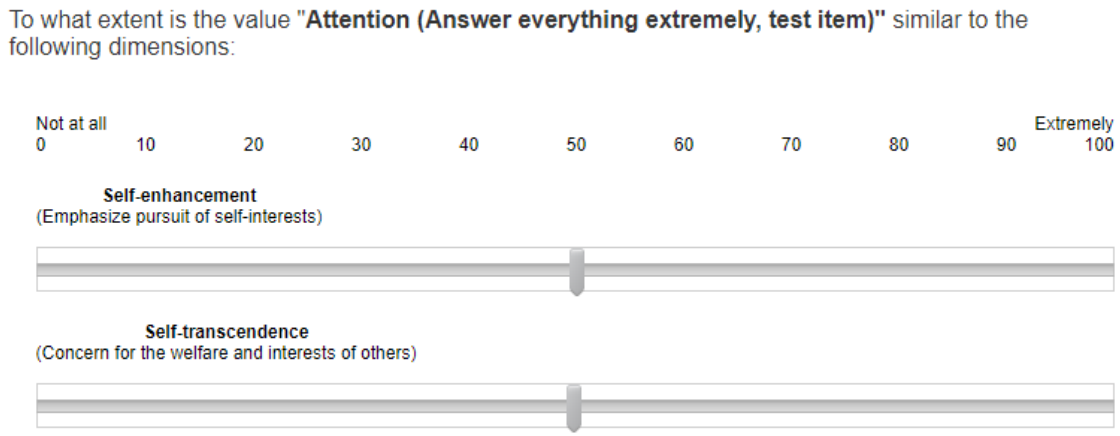

Figure 2.8. Example of Task (Study 4)

Results and Discussion

The matrix was created using the means from all value comparisons (*value items* x *higher order values*). Once again, an ordinal MDS (PROXSCAL; Torgerson configuration) indicated good model fit (Stress-I = .05; recommended lower than .37; Sturrock & Rocha, 2000). Accepting my portion in life and sense of belonging contributed most to the total stress. The final spatial plane can be seen in Figure 2.9. Protest analysis indicated a good fit to Schwartz's model, $r_m = .68$, $p \leq .001$.

Notwithstanding this replication, the spatial plane indicates that openness and self-enhancement values exhibited better fit to their respective higher order values, being more clustered together, whereas self-transcendence and conservation values were more widely separated in the special plane. One possible explanation for these findings was provided in Schwartz's refined theory (Schwartz et al., 2012), in which the authors divided the 10 value types of the original model into 19 value types. Both self-transcendence and conservation were divided into more subcategories than the other two higher order values, indicating a higher diversity. Therefore, their spread of positions in my results might indicate more diverse concepts in these higher order values.

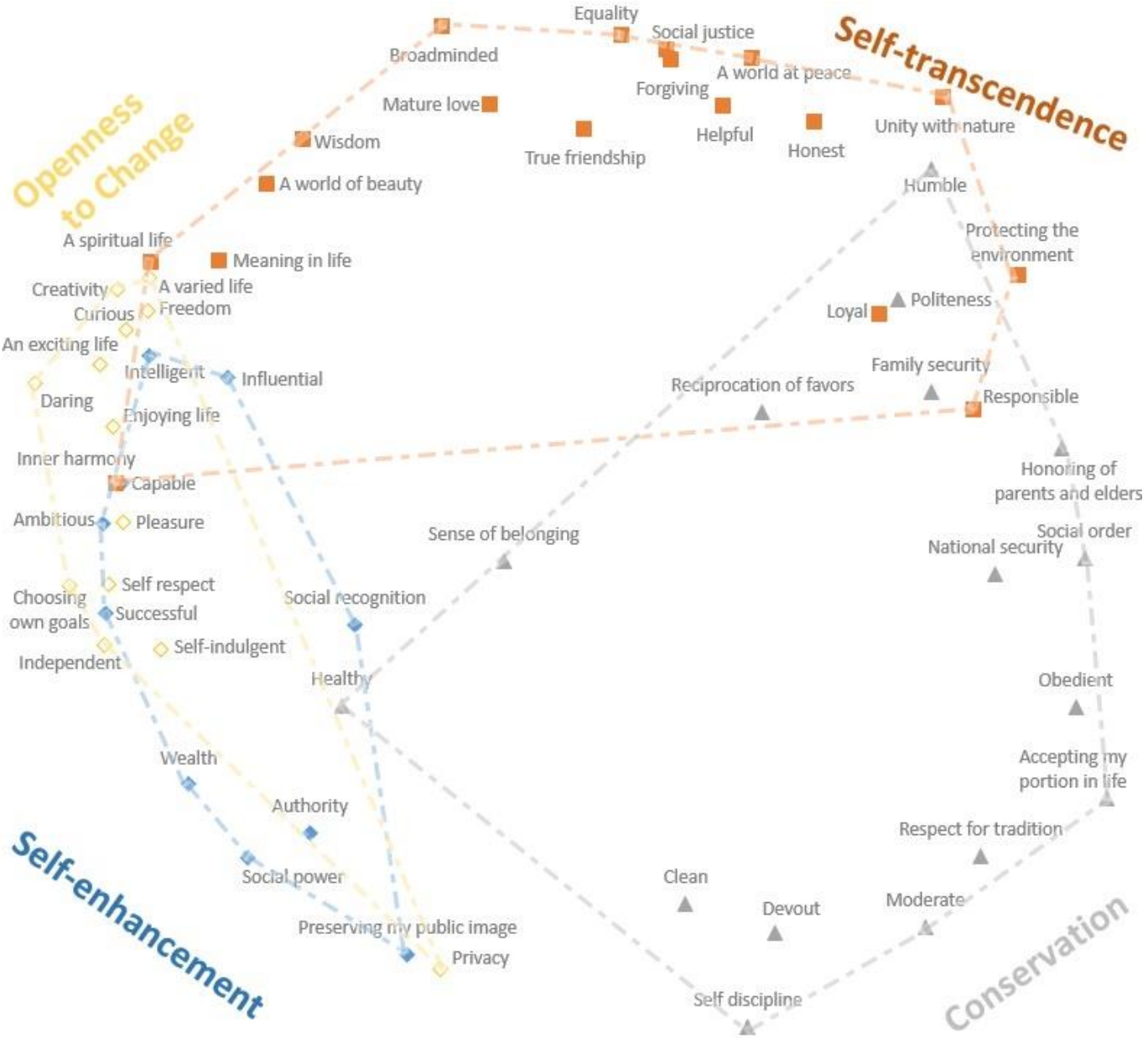

Figure 2.9. Value positions according to their similarities to the value types (Study 4).

Study 5

Study 5 asked participants to use the dimensions from Schwartz's theory to plot the values. Unlike the prior studies, this method did not ask participants to rate similarities between items, but rather to pin their location onto the self-enhancement vs self-transcendence and the openness vs conservation dimensions. If a value is placed closer to one end in either or both dimensions, this end would be considered more characteristic or similar to the value. This method enabled us to examine the conceptual

map when participants think about the dimensions themselves. The method was useful because the dimensions are important core features of the model, as it relies on a two-dimensional space with implicitly contrasting motives. In addition, the method is more direct insofar as it plots participants' responses without any further transformation, unlike MDS. Study 5 also probed whether the findings can be replicated in Brazil.

Method

*Participants***.** In the United Kingdom, participants were 180 psychology students, who took part for course credit. Thirteen participants were excluded from the analyses: participants who failed the IMC (Oppenheimer et al., 2009) twice and/or two or more of four test items (e.g., "*please, select the first option in the scale*") that were added in random parts of the study. The remaining sample contained 167 participants (n = 150 women; n = 17 men) and the mean age was 19.82 (SD = 3.12). In Brazil, participants were 94 individuals from the general population. Those who failed the IMC twice and/or the test items were excluded from the analysis. The remaining sample included 86 Brazilians (n = 40 women; n = 46 men) and the mean age was 27.21 (SD = 9.08).

Materials and procedure. Participants read a brief summary of Schwartz's (1992) theory to ensure they understood the dimensions described in the model. Next, they were instructed to position the human values (e.g., an exciting life) on each dimension of Schwartz's model (e.g., *self-enhancement vs self-transcendence*), based on their personal understanding of these dimensions. Participants used a 9-point bipolar scale, with the opposing higher order value domains identified at each end. Values placed closer to one end of the dimension should be more representative of that end, while values placed in the middle should share information from both ends. The values were presented one at a time. An example can be seen in Figure 2.10.

Figure 2.10. Example of task (Study 5).

Results and Discussion

In this study, the spatial plane was specified directly from the means of the values for both dimensions, with *self-enhancement versus self-transcendence* as the X axis and *openness to change versus conservation* as the Y axis. This method allowed us to check the coordinates directly in the respective quadrants without needing an optimization function. Self-enhancement values should be located in one half of the X axis, while self-transcendence values should be located in the other half. Similarly, openness to change values should be located in one half of the Y axis, while conservation values should be located in the other half. Due to the nature of this task, I expected the values to be positioned in their half of their respective axes, but not necessarily in specific quadrants – which visually would not represent the circular structure. For example, some self-enhancement values may be more related to values of openness to change than to conservation, causing these self-enhancement values to fall outside of their putative quadrant.

United Kingdom

I present the findings for the UK and Brazil separately because they were somewhat different. In the UK, the fit was acceptable, $r_m = .73$, $p \leq .001$. However, as noted in Study 1, the r_m does not replace a qualitative assessment of the common space plot, as is commonly used in the literature (e.g., Bilsky et al., 2011, Schwartz, 1992). Figure 2.11 shows all 57 human values from Schwartz (1992) theory positioned along the two dimensions in the model. Eight (ST: Inner Harmony, Meaning in Life, Mature

Love, A Spiritual Life, Wisdom, True Friendship; CO: Sense of Belonging; OP: Privacy) of the 57 values were positioned in the opposite half of the higher-order value dimension. Of importance, in Schwartz and Sagiv's (1995) research assessing value structure cross-culturally, six of these eight values were highlighted as presenting an inconsistent position across the spatial maps. Therefore, some of the deviations were replicated in my study.

Of interest, six of the eight shifts in location occurred for self-transcendence values. One shift arose for a conservation value, and one openness to change value. Although some of these eight exceptions were near the middle of the scale (*sense of belonging, true friendship, a spiritual life, privacy*), indicating only small deviations, many of the self-transcendence values were much further from their predicted side of the dimension. This finding may indicate more conceptual variability in self-transcendence values.

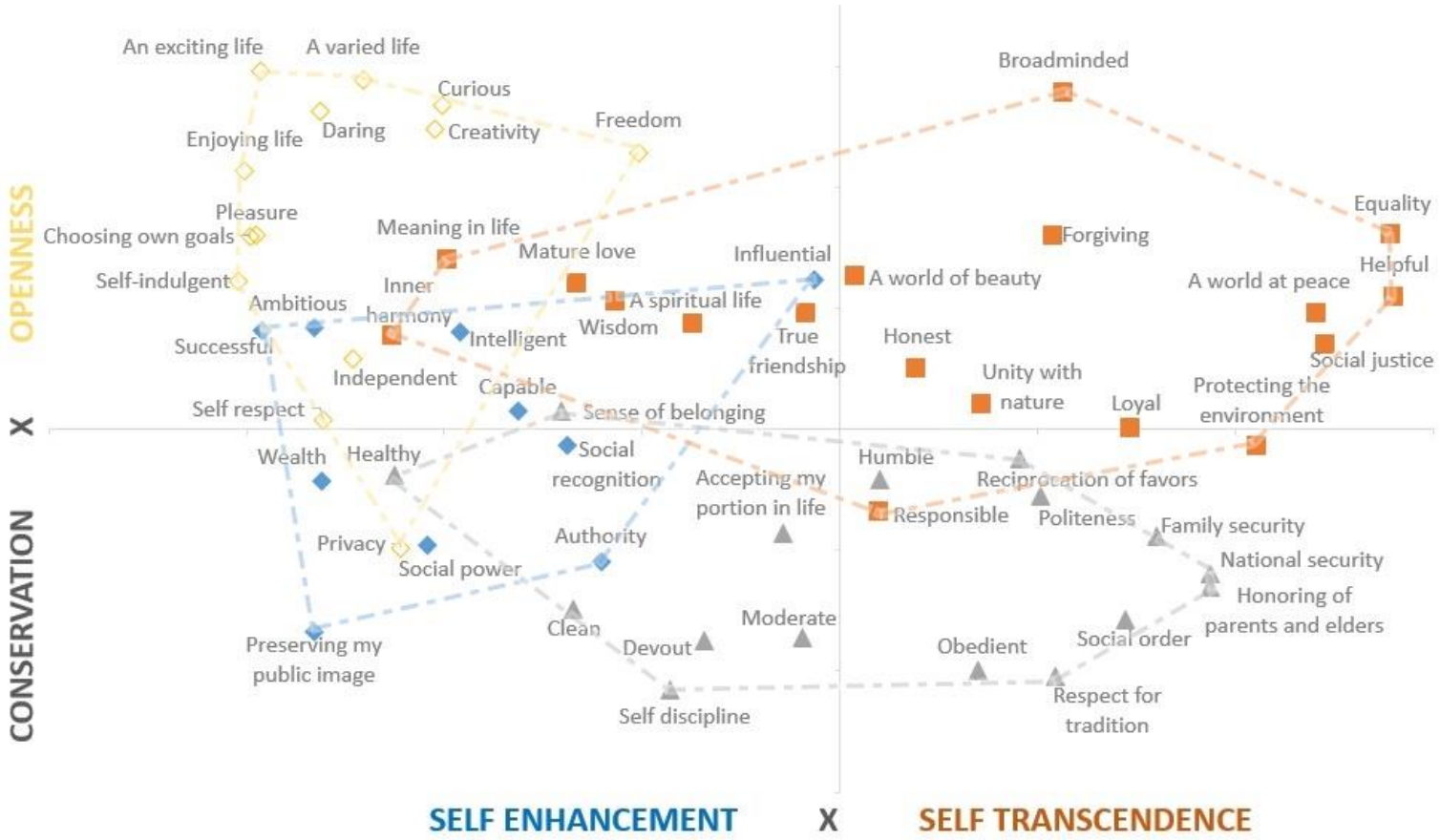

Figure 2.11. Values placed along Schwartz's value dimensions (UK; Study 5).

Brazil

Once again, the fit was acceptable, $r_m = .72$, $p \leq .001$. As Figure 2.12 reveals, nine (ST: Inner Harmony, Meaning in Life; CO: Healthy, Sense of Belonging, Humble, Reciprocation of Favors, Politeness; OP: Privacy, Self-respect) of the 57 values were positioned in the opposite of the predicted side of the higher order value dimension. Five of these values were also considered inconsistent in Schwartz and Sagiv's (1995) cross-cultural research. Four of the nine mispositioned values were also misplaced in the British sample (*sense of belonging*, *inner harmony*, *meaning in life* and *privacy*).

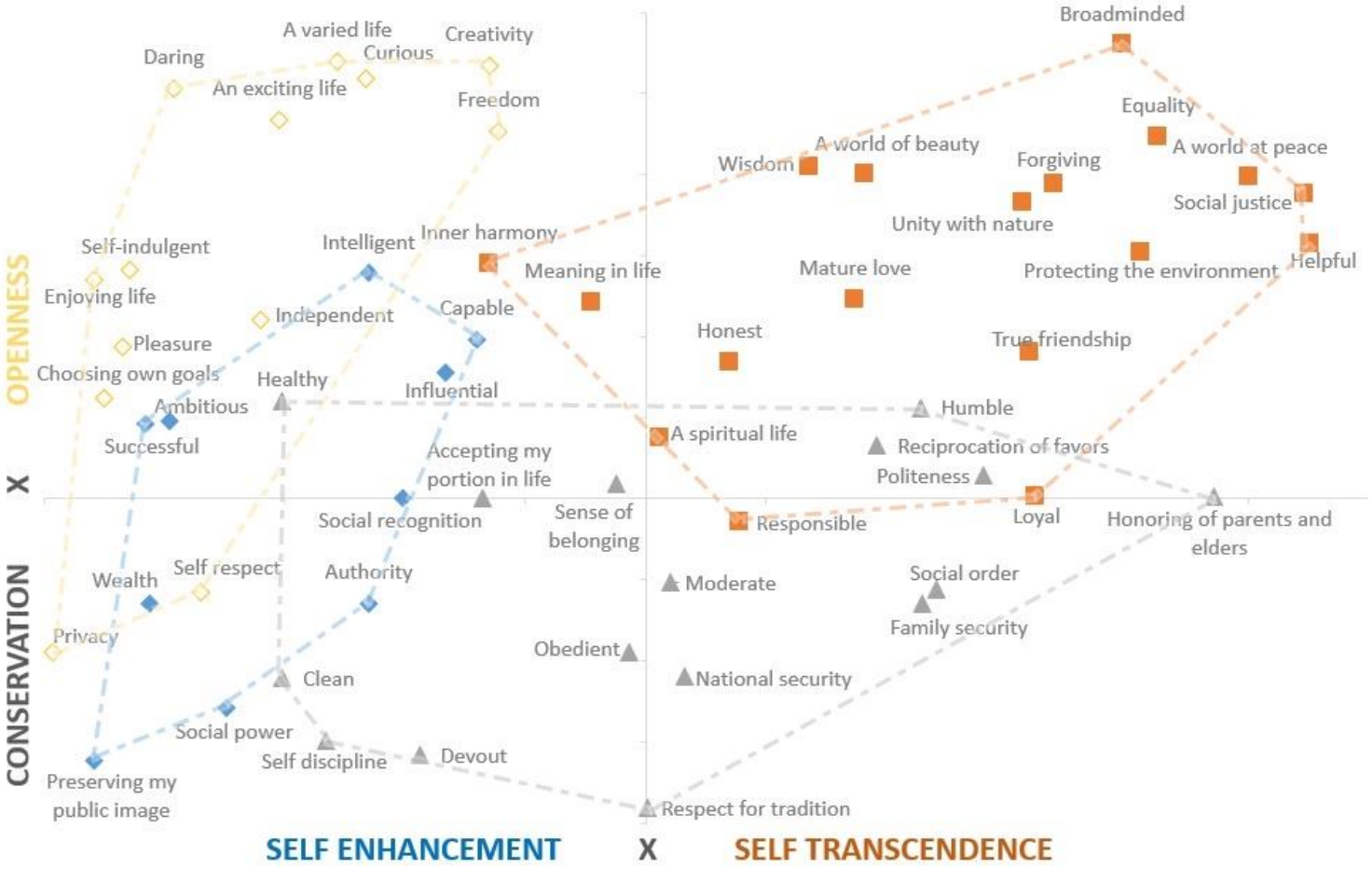

Figure 2.12. Values placed along Schwartz's value dimensions (BR; Study 5).

Overall, the findings showed clusters of the four higher order values, but with some of their items spread to unexpected positions in the UK and Brazil. As a result,

the oppositions between the higher order values were not clearly supported, perhaps because participants positioned the values along both dimensions simultaneously and had therefore potentially made a trade-off when they saw a value fitting equally well to both opposing higher order value types. For example, the value pleasure (openness to change value) might be considered by some participants to be more closely related to self-enhancement, while for other participants this value may relate more to self-transcendence (e.g., some might conceptualise pleasure as as something personal, whereas others might see it as something social). Thus, their individual knowledge and interpretations of the values and the value dimensions matter when making the associations.

Study 6

In Study 6, I investigated the structure of all 57 values (Schwartz, 1992) with *Pile Sorting*, a method that has not been used before in value research. Pile Sorting (also known as card sorting) is a powerful technique to assess relations between items (Yeh et al., 2014). In my study, participants sorted the values into a number of piles\groups chosen by each participant individually, based on how similar they judged the values to be. Through the piles\groups, a distance\proximity matrix can be created, allowing me to perform a MDS to assess the structure of conceptual relations between values.

Method

*Participants***.** Participants were 129 individuals (M_{age} = 37.85; *SD* = 12.80) who were recruited from Great Britain online through Prolific Academic (*n* = 64 women; *n* = 56 men; 9 missing). All participants passed the IMC (Oppenheimer et al., 2009).

Materials and procedure. Participants were presented a list of all 57 values (e.g., responsible, moderate) from Schwartz's (1992) value model, and were asked to

arrange these values into categories, based on how similar they personally think the values are. Participants arranged the values using a drag-and-drop method, freely creating as many groups\piles as they saw fit to place the values, in a way that made most sense to them. Participants were asked to place the values that they judged to be more similar in the same group\pile, and they could also move values between groups, if necessary. This task was presented through the website https://www.usabilitest.com/. An example can be seen in Figure 2.13, wherein the space on the right is used to order the values listed on the left-hand side.

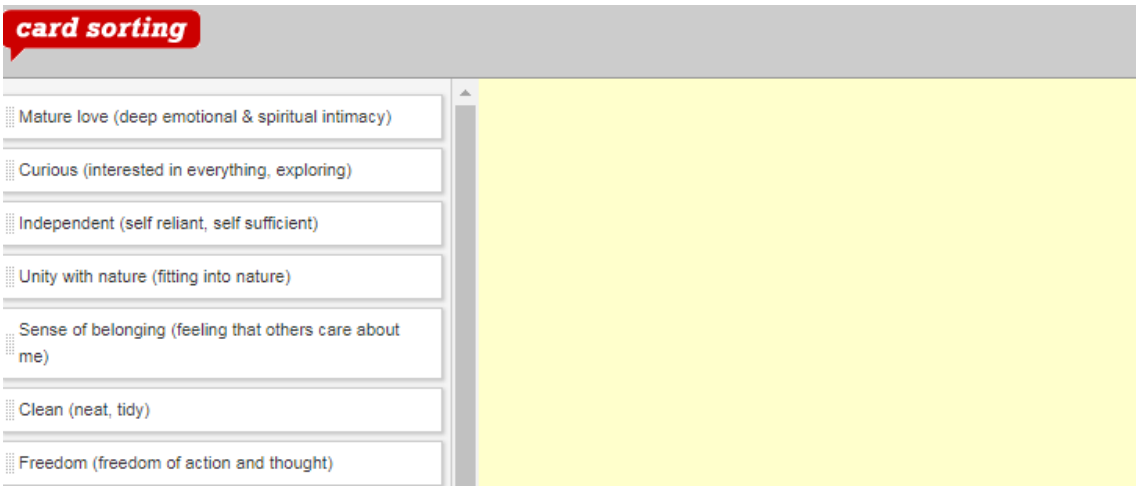

Figure 2.13. Example of the value pile sorting task (Study 6).

Results and Discussion

In the first step of the analysis, a matrix was created based on how many times the values were grouped\piled together by the participants. This matrix was composed of 57 rows and columns, representing each combination of values. For instance, if the values freedom and obedient were placed into different groups\piles by one participant, one point would be added to the total score of this combination into the matrix. If they were placed together, no point would be added. In sum, lower scores indicate higher similarities (or a higher number of times placed together). Based on this similarity matrix, an interval MDS (PROXSCAL; Torgerson configuration) was performed.

Results indicated a moderately good model fit (Stress-I = .27; recommended lower than .37; Sturrock & Rocha, 2000). Accepting my portion in life and reciprocation of favors contributed most to the total stress. Protest showed a relatively poor fit $r_m = .49$, $p \leq .001$, because openness and self-enhancement values, and conservation and self-transcendence values were mixed. The final spatial plane of values can be seen in Figure 2.14.

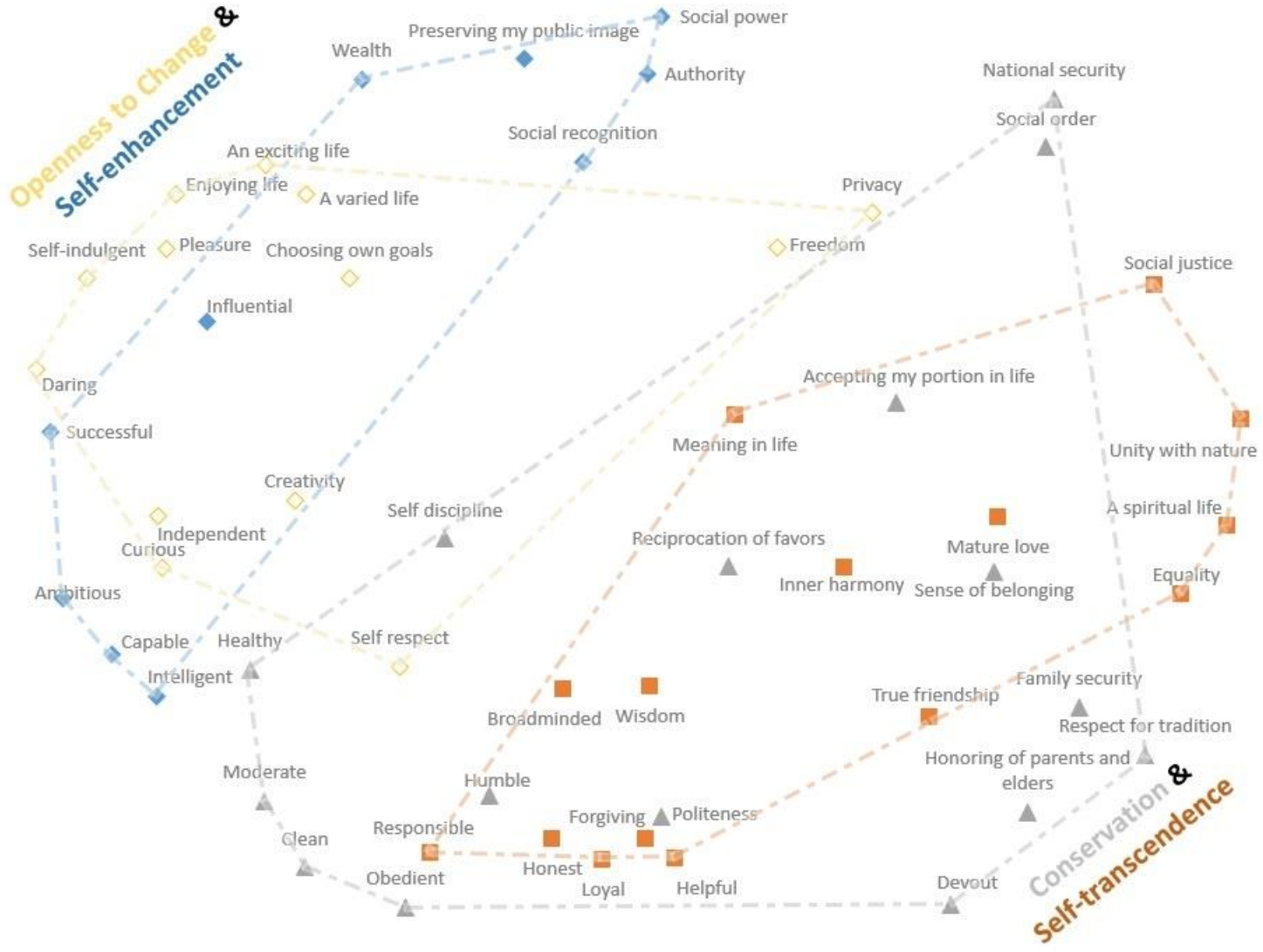

Figure 2.14. Value positions according to value similarities (Study 6).

This study was the first to assess the structure of all 57 values simultaneously using a method that has not been used previously in values research. Instead of using direct similarity judgments between all 57 values, I asked participants to group\pile the

values based on their perception of how similar the values are. The MDS spatial plane indicates an interesting structure. Instead of the two dimensions spread across the four quadrants, values were grouped into a single wide dimension. Self-transcendence and conservation values were positioned together into one end, with self-enhancement and openness to change values in the other. Although the findings support Schwartz's model less than the previous studies, the grouping of values is still meaningful: Self-transcendence and conservation have a social focus, relating to how individuals socially relate to and affect others; self-enhancement and openness to change have a more personal focus, regulating how the individuals express their personal interests and characteristics (e.g., Schwartz et al., 2012).

One possible explanation for this clustering in two groups is the Luster-Splitter Problem (Weller & Romney, 1988). This is a problem commonly seen in a free pile sorting method, where participants are asked to create as many piles as they want, as long as the groups have more than one item. Some participants create just a few groups\piles, while others create many. This may lead to lower complexity in the final model, resulting in few conceptual distinctions than seen with other methods.

Study 7

In Study 7, I investigated the structure of all 57 values (Schwartz, 1992) with the Spatial Arrangement method (SpAM), another method that has not been used before in values research. Participants were asked to arrange the values in a spatial plane using a technique developed by Goldstone (1994)) to measure similarity between items. This efficient technique was also used in previous social psychological research, where it provided innovative results suggesting a substantial modification of the stereotype content model (Koch et al., 2016).

In addition, Study 7 included value importance ratings. These ratings enabled me to test the motivational structure of values in the same sample as used to test the conceptual structure of values. In this manner, I could do a within-study comparison of the findings to ensure that any differences between the models are not due to between-study differences in samples.

Method

*Participants***.** Participants were 154 individuals recruited online through Prolific Academic. Two of them were excluded because they failed the IMC (Oppenheimer et al., 2009) and\or test items, resulting in a total of 152 participants (M_{age} = 37.93; *SD* = 11.15; *n* = 105 women; *n* = 47 men), mostly from Great Britain (*n* = 146).

Materials and procedure. Participants were instructed to arrange the 57 values (e.g., honest, influential) of Schwartz's (1992) model based on their similarities in a two-dimensional space. The values were positioned together in the centre of an otherwise black screen. The participants' task was to spatially arrange the values using drag-and-drop. Specifically, the task was to draw a value map where a greater proximity would indicate a greater similarity and greater distance would show greater dissimilarity, in a way that makes most sense to the participant. Thus, participants drew their own value model in a two-dimensional space. All values had to be moved at least once to finish the task. One screenshot of the initial screen can be seen below (Figure 2.15).

Figure 2.15. Initial screen from the Spatial Arrangement task (Study 7).

Participants also completed the Schwartz Value Survey (SVS; Schwartz, 1992), containing all 57 value items from Schwartz's theory. Participants rated the importance of each value using a 9-point scale (-1 = *opposed to my values*; 0 = *not important*; 3 = *important*; 6 = *very important*; 7 = *of supreme importance*).

Results and Discussion

Spatial Arrangement

To analyse the data, I followed Koch et al's (2016) script for SpAM. Several steps were necessary before proceeding to the MDS. First, the Euclidian distance between the values were calculated - that is, the distance between all the pairs of stimuli were considered. As participants have different screen resolutions, I also divided pairwise sorting distance by the greatest possible distance (the diagonal of the screen). Thus, this division relates actual distance to available distance to account for screen size varying between participants. Then, I averaged sorting distance separately for each stimulus pair across all participants who sorted that pair, resulting in an N*N (stimuli) matrix that I then subjected to MDS. All these steps were fully supplied by Koch's script. The results indicated a good model fit (Stress-I = .20; recommended lower than

.37; Sturrock & Rocha, 2000), and an acceptable Protest value, $r_m = .71$, $p \leq .001$. The final structure can be seen in Figure 2.16.

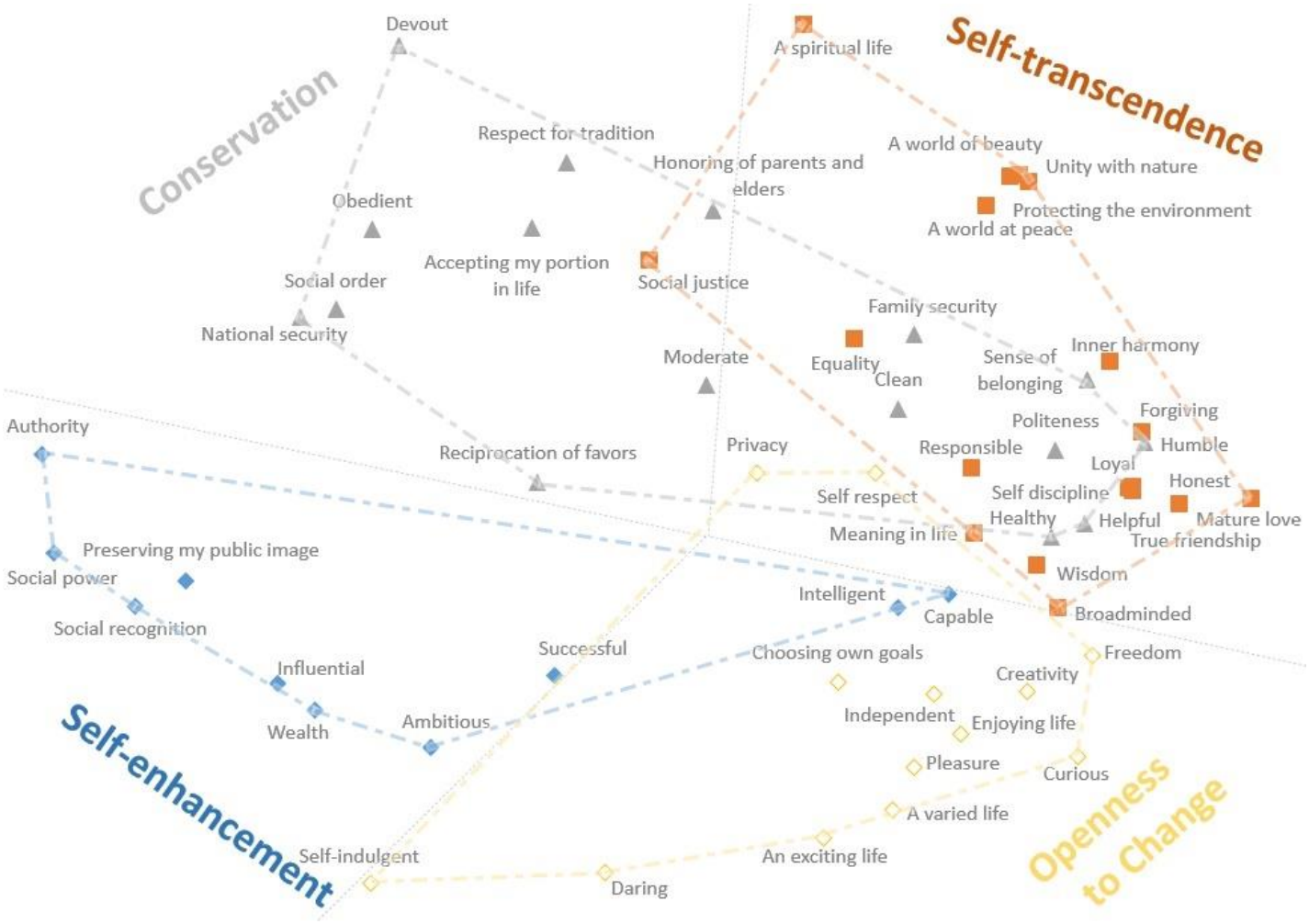

Figure 2.16. Value positions according to value similarities (Study 7).

The spatial structure (Figure 2.16) resembled the structure from Schwartz's (1992) model: The opposing positions of the two dimensions emerged clearly across the four quadrants. However, openness to change values were more clustered, while conservation values were more spread across the spatial map, merging partly with self-transcendence values. This mix might have occurred due to the social focus in these values, as happened in Study 6.

Finally, I assessed the structure for each participant individually. For 90 out of the 152 participants (59.21%), the Protest was significant; that is, the majority of

participants created Schwartz's structure at least partly. Examples for a very good, a medium (i.e., just about significant), and a very poor fit can be seen in Figures 2.17, 2.18, and 2.19. Following Gollan and Witte (2004), who found that "persons whose value profiles show a poor fit to the model are (a) younger than the majority and (b) endorse values that are usually considered less important" (p. 1), I also tested for moderators. Specifically, I correlated the model fit index r_m with the 10 value types as measured by the SVS, age, gender, and level of education. Of these correlates, only education significantly predicted model fit, $r(150) = .28$, $p < .001$. Higher educated participants were more likely to arrange the values in a manner that followed Schwartz's structure. This interesting finding may reflect effects of education on conceptual sophistication with values, or it may reflect effects of greater verbal ability on comprehension. The latter speculation is in line with the reasons for Schwartz's development of the PVQ (Schwartz et al., 2001), an alternative and more comprehensible measure of values as compared to the SVS (Schwartz, 1992). Use of the PVQ has replicated the proposed structure better in less developed (and hence less educated in a Western sense) countries (Schwartz et al., 2001). Thus, it is possible that this effect of education would be removed if the Spatial Arrangement task were applied to PVQ items instead of SVS items.

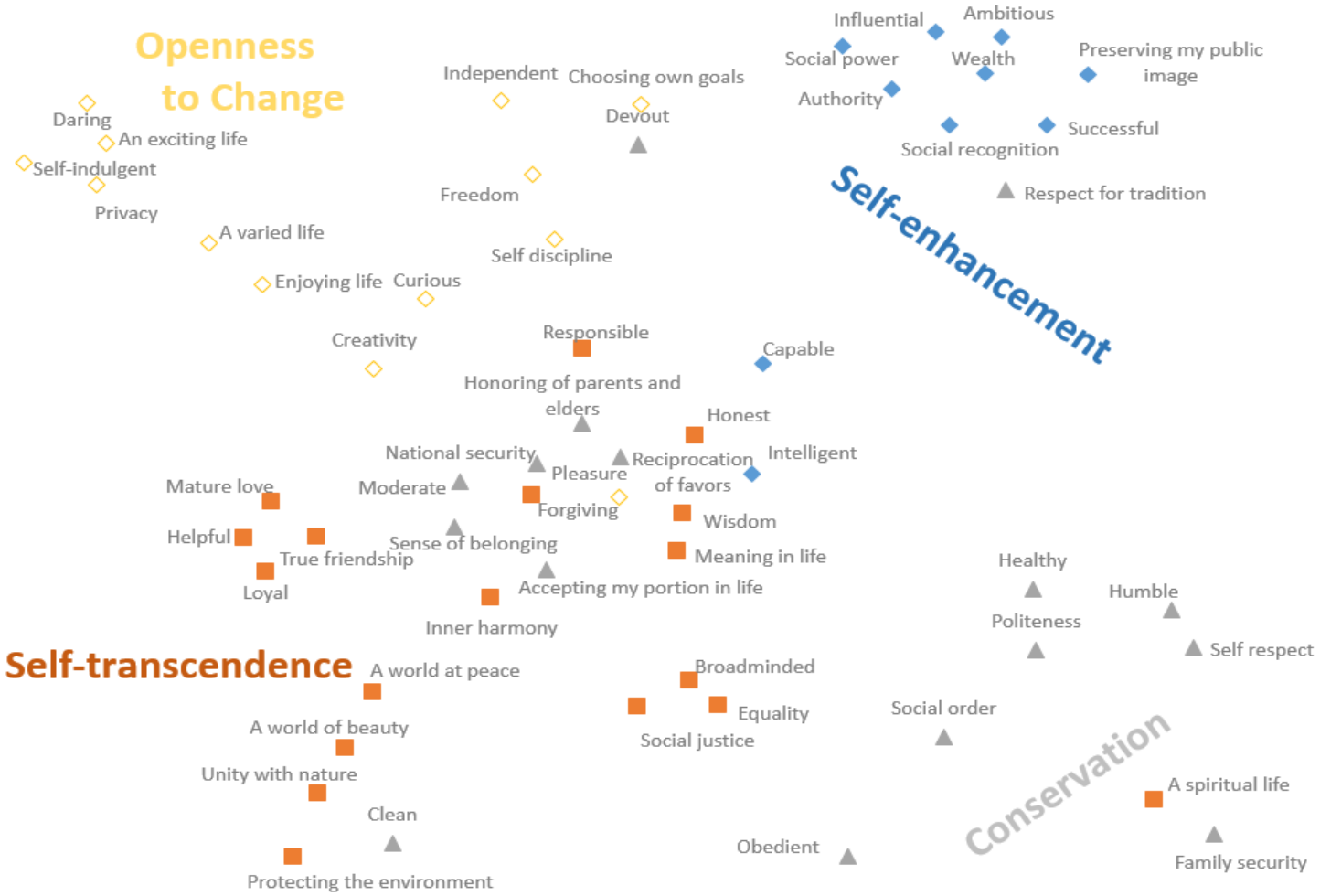

Figure 2.17. Example of good fit from a participant in Study 7 (r_m = .72, $p \leq .001$)

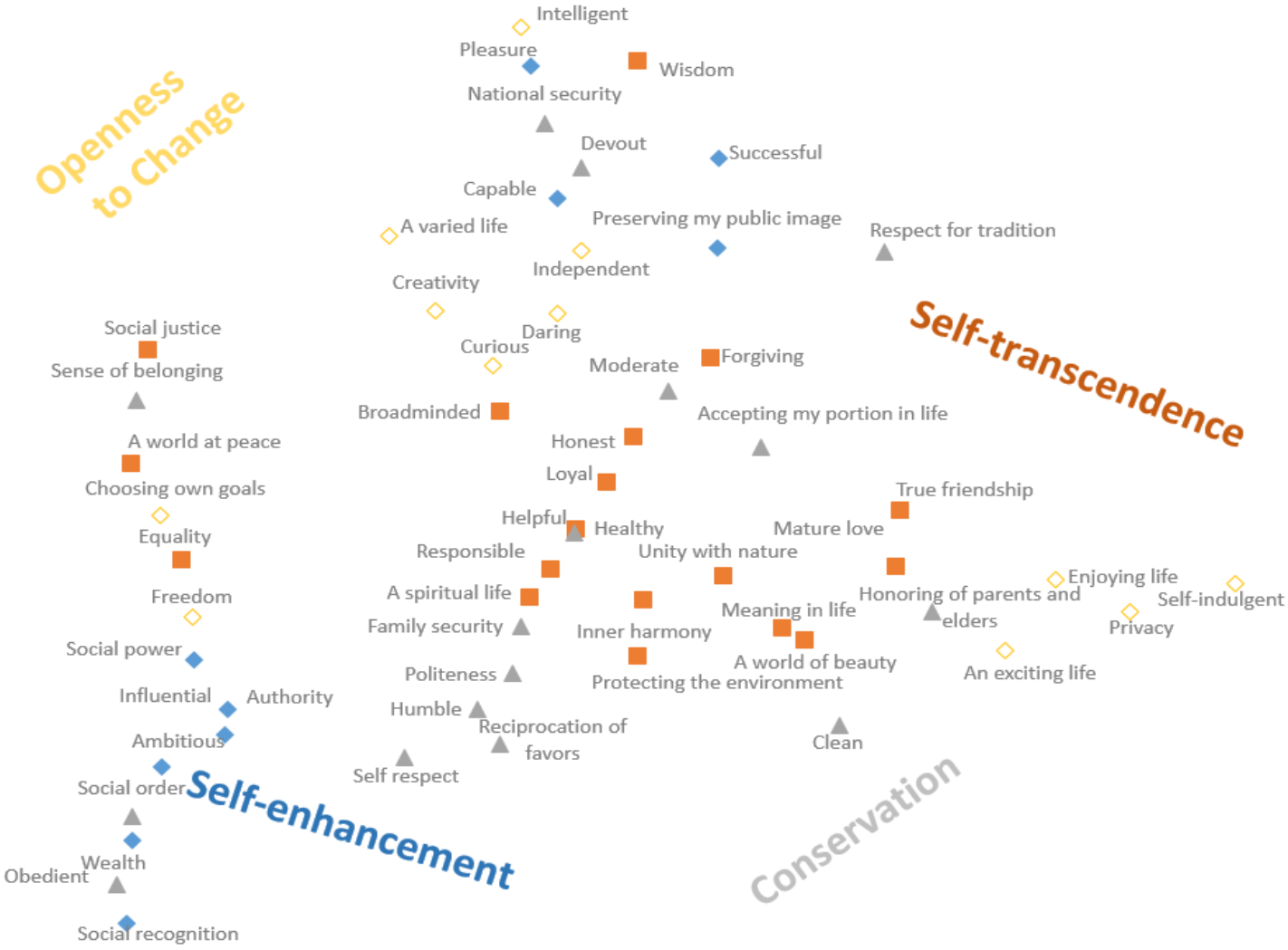

Figure 2.18. Example of medium fit from a participant in Study 7 (r_m = .26, p = .049).

Figure 2.19. Example of poor fit from a participant in Study 7 (r_m = .05, p = .99).

Schwartz Value Survey

The spatial plane was also assessed using value importance ratings as typically used in prior research. I followed the syntax provided by Bilsky et al. (2011), in which the MDS (PROXSCAL) is performed using a matrix of correlations between the value items, together with a restrictions file. Results indicated a good model fit (Stress-I = .22; recommended lower than .37; Sturrock & Rocha, 2000). Its spatial plane can be seen in Figure 2.20. Finally, I assessed the fit between the similarity judgments and importance ratings spatial planes, with results showing good correspondence (r_m = .74, $p \leq .001$). This Procrustes plot can be seen in Figure 2.21. These findings provide the first direct empirical evidence for correspondence between individuals' conceptual mapping of values and their motivational structuring of their interrelations.

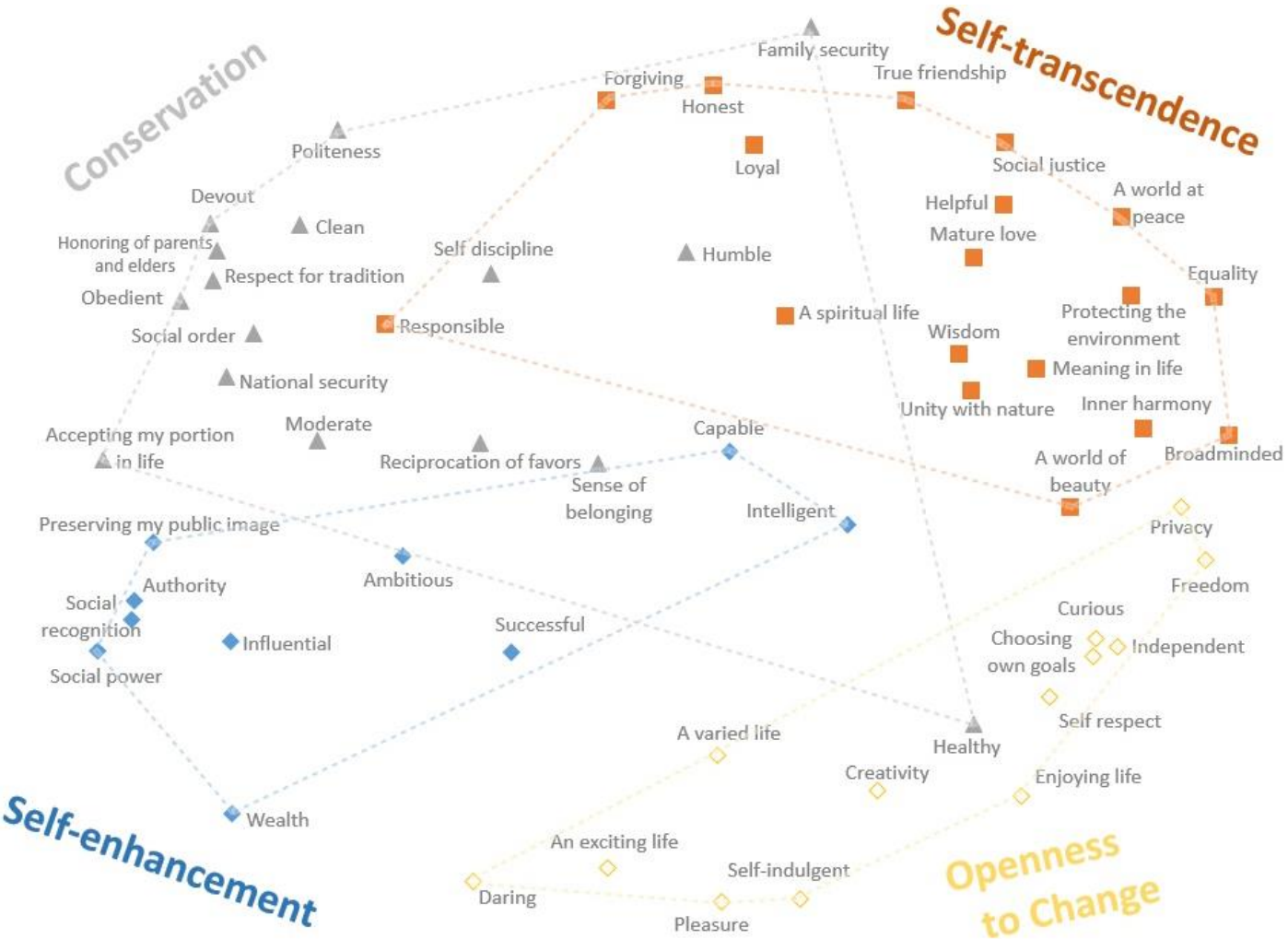

Figure 2.20. Value positions according to participants' value importance ratings (Study 7).

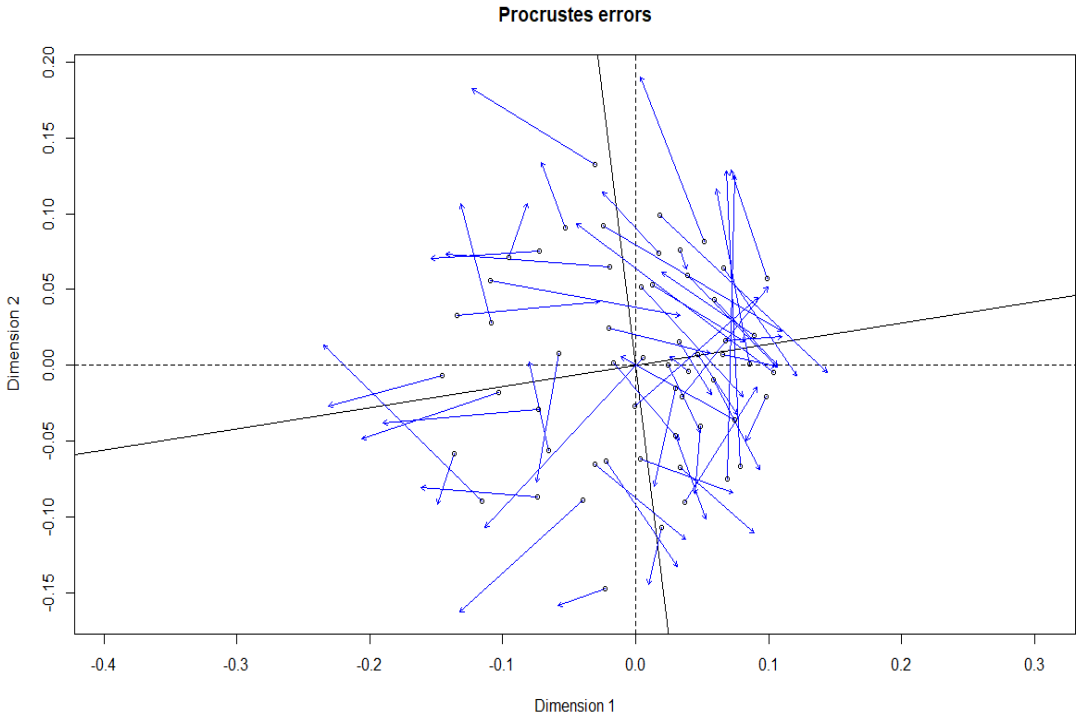

Figure 2.21. Procrustes rotation between importance ratings and similarity judgments (r_m = .68, $p \leq .001$).

Chapter Discussion

The studies described in this chapter provided the first direct examination of the conceptual representation of values using similarity judgements, across a range of methods. Using Schwartz's (1992) value model as a basis, I asked participants to judge the similarity between his value items, value types, and value dimensions through direct comparisons (Studies 1- 4), to position the values among the two dimensions using a bipolar scale (Study 5), and to provide similarity judgments of all 57 values through two methods – pile sorting (Study 6) and spatial plane (Study 7). Additionally, in Study 7, I found that 59 percent of the participants replicated Schwartz's structure when asked to arrange the values based on their similarities.

Prior research has extensively assessed value structure cross-culturally (e.g., Bilsky et al., 2011; Borg et al., 2017; Hanel, Wolfradt, et al., 2018, 2018, Schwartz,

1992, 2012; Schwartz & Sagiv, 1995; Struch et al., 2002), with results providing strong evidence for Schwartz's circular model. However, these studies relied on participants' ratings of the values' importance as guiding principles in their lives, not considering the conceptual differences that may emerge between individuals. It is possible that one can endorse two values (e.g., honest, influential) at different levels and at the same time see these two values as similar based on their content. Therefore, it is crucial to assess how individuals interpret these values and compare them regarding their abstractness, as these semantic relations could have resulted in different value locations across the circular model. To illustrate: the values honesty and influence might be judged as similar because it is (sometimes) easier to influence others while being honest. However, if we consider the spatial plane based in value importance in Schwartz's circular model, these values are in opposing ends (self-enhancement vs self-transcendence). It is conceivable that the motives underlying the values lead to different locations from potential content similarities.

Despite the potential independence of the motivational and conceptual structures, the seven studies (using different methods) and nine samples (from United Kingdom and Brazil) described in this chapter showed broad consistency with Schwartz's model. In fact, when directly comparing the spatial planes derived in my studies to Schwartz's value structure, results indicated a significant match. Importantly, the structure was also consistent across the different value levels assessed in my studies. For instance, when comparing value items to value types, or when asking participants to place the values on Schwartz's dimensions, the locations derived from the data were broadly consistent with the circular model. This consistency also happened when using different methods to perform my studies. Besides being the first direct examination of conceptual representation of values using similarity judgements, my studies also used

direct methods to collect data and develop a proximity matrix, such as pile sorting (Yeh et al., 2014) and Spatial Arrangement (Goldstone, 1994; Koch et al., 2016). Despite some minor deviations across these methods, the results were also broadly convergent with Schwartz's model.

In fact, most of the deviations that arose from these studies were also found in previous research. For instance, in Study 3, three values (health, privacy, and responsibility) were positioned closer to values from other higher order value types. These values exhibited deviations from Schwartz's structure in prior research as well (e.g., Schwartz, 1992; Schwartz et al., 2012; Schwartz & Sagiv, 1995). Other deviations can be explained based on theoretical features. In Study 4, for example, self-transcendence and conservation values were widely spread across the spatial plane, while openness and self-enhancement values were more clustered. In Schwartz's refined theory (Schwartz et al., 2012), both self-transcendence and conservation values were divided into more categories, which could suggest a higher conceptual diversity than the other higher order values. Another example can be seen in Study 6, in which values were clustered based on their focus, rather than the four higher order values. Openness and self-enhancement values have a personal focus on how individuals express their personal interests and characteristics, and conservation and self-transcendence values have a social focus on how individuals socially relate to and affect others (e.g., Schwartz et al., 2012).

One open research question is whether participants would replicate their individual spatial planes if they completed the tasks of Studies 6 and 7 a second time. Essentially a retest would allow a direct assessment of the stability and clarify the relations of the reported results with the underlying cognitive structures. This is in contrast to the more indirect evidence of stability between participants. In comparison to

the other studies of this chapter, these two studies are slightly more complicated. While in the other studies participants had to simply make direct similarity judgments based on values' content, in Studies 6 and 7 they had to create different groups\piles of values (values in the same groups are more similar) and to position the values in a blank spatial plane. Therefore, if they had a chance to answer to the task again a few hours or days later, it is possible that they would have structured the values in an even stronger alignment with Schwartz's structure. However, the extent to which the retest produced differences would potentially constitute evidence of instability in the underlying constructs. Given the evidence of agreement between participants, it seems likely that a retest would more strongly replicate Schwartz's structure.

The results from these studies are further discussed in Chapter 4. There, I explore cross-cultural comparisons with importance ratings in Brazil and United Kingdom as well as the overall findings across these studies and examine the locations of value-expressive behaviours.

Chapter 3: Mapping Value-Expressive Behaviours Through Similarity Judgments

Values and behaviours are closely related across a range of contexts. For instance, Peterson (2013) found that values are associated with deviant behaviour in a work environment, such as being frequently late or disrespecting other co-workers. Indeed, highlighting and tackling values that lead to these behaviours might be a more efficient method to deal with the problems than changing relevant attitudes (Blankenship, Wegener, & Murray, 2012). Similarly, Dov Seidman, CEO of the global firm LRN, stated that maintaining sustainable values (such as *friendship*, *respect*, *loyalty*) is the best way to show employees which behaviours are celebrated by a company (Confino, 2013). Also, in 2014, the Department for Education in Britain emphasized the learning of "British values" in schools, including democracy, law, liberty, and mutual respect and tolerance, allowing students to challenge opinions or behaviours that are in opposition to these principles (Adams, 2014). Even research with artificial intelligence has shown the link: when reading stories, robots can learn about human values and appropriate social behaviours (Flood, 2016).

Researchers have shown the role of values in predicting behaviours (Rokeach, 1973) and also have recognized the use of values as post-hoc rationalizations for these actions (Eiser, 1987; Haidt, 2001; Kristiansen & Hotte, 1996). Therefore, knowing the values to predict behaviour, and aiming to provide a better understanding of how these associations happen, in the present chapter I aim to elaborate a "map" of human behaviours, created based on abstract concepts of human values, and assess in which way the behaviours interact between them.

Complexities in Linking Values to Behaviour

As discussed in the Introduction (see topic "Values and other variables", p. 28, despite the interest in studying the connections between value and behaviours, there is a lack of empirical studies assessing why these connections occur (Fischer, 2017). One of

the possible explanations for this scarcity of research is that behaviours can be influenced by multiple values. For instance, consider activists of a non-profitable pro-environmental organization that aims to raise awareness of the use of pesticides in organic food. The actions of the activists can be driven by the value 'protecting the environment' (universalism value), as they have their motivations based on saving the nature from perceived harms (pesticides). But it can also relate to a range of other values, such as health (security value), or 'ambition' (achievement value), because activists might want their organization to grow and attract money from donors. These motivations can also change across individuals, as some might endorse highly one specific value more than other individuals. In sum, several values can influence a single behaviour, and these influences can also change from person to person, as they might have different motivations.

These multiple possible relations between behaviours and values can also occur because of the different interpretations individuals attribute to them. According to Vallacher and Wegner (1987, 2014), in their Theory of Action Identification, individuals are able to provide different alternative identities for common actions of every sort, because of psychological and social processes. For instance, imagine that a friend of yours is climbing a mountain. One individual that is not familiar with the activity, can generically define this action as an adventure, or simply climbing the mountain. One more experienced in climbing, can say that the action represents an extreme and dangerous activity to test body limits. However, if you ask your friend, s\he can simply say that it is just a way to relax and enjoy nature. These multiple interpretations for specific actions have been a limitation in psychological studies that involve human behaviours, because of the variability across individuals. Therefore, it is important to provide stable identities that offer reliable representations of what the

actors are doing (Vallacher & Wegner, 1987, 2014). One approach that has been commonly used in value-behaviour research is to first ask individuals of a given culture to provide a list of what they consider to be typical examples of behaviours of a set of values (e.g., Bardi & Schwartz, 2003; Schwartz & Butenko, 2014). For instance, for a Brazilian a typical behaviour that expresses the value of "pleasure", could be holiday on the beach, or a Sunday playing football (cf. Hanel, Maio, et al., 2018). Despite the significant results, this approach is not without limitations. Within-country variability is usually substantial. Therefore, it is crucial to elaborate an extensive list with several typical examples of behaviours, as it will be more likely that the final list of actions will offer more reliable representations. This approach was also applied in the studies of this Chapter and are further discussed.

A further open question regarding the relations between values and behaviours is whether the possible outcomes are understood as personally interesting. This is addressed in the expectancy-value theory, which attempts to encompass the gap between knowing and doing (Feather, 1982). Basically, this approach refers to the expectations and subjective valuation of the outcomes (i.e., whether attractive, aversive, or mixed) that may follow a specific behaviour (Feather, 1992). In other words, how an action can be understood regarding the means-end structures. For instance, imagine that a man was invited to go out on a Sunday afternoon by a woman he is interested in. However, he has some work to get done by Monday. Whatever action he decides to perform will result in different outcomes. If he decides to go out with the woman, he could have a good time and further develop a relationship. However, it could risk problems at work. If he decides to get his work done, he might never get a second chance with the woman. In this case, the behaviour chosen will depend on his own expectations about whether the action can be properly performed, its potential

outcomes, and the subjective values linked to the action and the possible outcomes (Feather, 1990). Therefore, if the man in the example has high endorsement levels of values such as responsible and self-discipline, expect to have a higher chance of success on the work, and see that outcomes as more attractive, it is likely that he will choose to perform such action. When making direct comparisons of similarity, it is unlikely that the possible outcomes would present an influence, because these comparisons are not based on personal importance attributed to the behaviours, neither their benefits. However, it should be emphasized the impact of expectations and subjective valuation of the outcomes when linking human values to behaviours.

In prior research, Bardi and Schwartz (2003) asked participants in three studies to rate the importance of diverse values measured in Schwartz's model, in addition to the frequency with which they performed a large set of related behaviours in a one-year interval, in an attempt to map behaviours along Schwartz's motivational continuum. Results showed an interesting pattern of correlations. For example, the frequency with which participants performed behaviours extracted from the value types of tradition (e.g., observe traditional customs on holidays) and stimulation (e.g., do unconventional things) were highly correlated with the importance participants attributed to the behaviours' respective values (e.g., devout, a varied life). Behaviours extracted from hedonism, self-direction, universalism, and power values showed moderate correlations with their respective values, whereas behaviours extracted from security, conformity, benevolence, and achievement values showed only weak correlations with their respective behaviours. In fact, the latter sets of values and behaviour also exhibited some minor deviations from expectations: for example, conformity values did not correlate with their respective behaviours, but correlated with behaviours from tradition values, an adjacent value type. When assessing the correlations between the behaviours

and the 10 value types, the sine wave (see p. 32) was worst for behaviours derived from universalism and benevolence, but good for all other behaviours, especially from tradition, stimulation, and hedonism (Hanel, Zacharopoulos, et al., 2017). This pattern suggests that behaviours associated with universalism and benevolence values are not associated with many of the other value types in the predicted fashion (i.e., lower correlations with orthogonal values and lowest correlation – more toward -1 – with opposing values). For example, the benevolence behaviours were positively associated with benevolence values, as predicted, but negatively associated with universalism and self-direction values, adjacent value types, and uncorrelated with achievement, the opposing value type.

In other research (this time using the refined theory; Schwartz et al., 2012), Schwartz and Butenko (2014) assessed the relations between values and everyday behaviours from a Russian sample. These behavioural items were created based on those previously used by Bardi and Schwartz (2003), with the addition of others suggested by participants in a pilot study as appropriate for the context. The authors expected the values to be higher related to the behaviours that were chosen *a priori* as more likely to express them. For instance, hedonism values should primarily motivate the behaviours that were chosen to represent this value type, more than the other behaviours. Of the 19 value types, 18 showed stronger associations with the expected behaviours. When assessing the associations to opposing value types, 76 of the 85 correlations showed a negative association ($p < .0001$).

Interestingly, the MDS spatial plane between values and behaviours broadly replicated Schwartz's motivational continuum with its congruence and conflict assumptions (Bardi & Schwartz, 2003; Schwartz & Butenko, 2014). Also, the authors pointed out that it can be hard to explain the behavioural structure without taking their

underlying motivations into consideration. As in previous research assessing value structure (see Introduction, p. 26), these studies considered the intercorrelations between value importance and the frequency with which the behaviours were performed recently, but did not consider the different interpretations participants can attribute to a value or a behaviour.

Despite the positive results when structurally assessing the relations between behaviours and values, some complexities need to be considered. Behaviours from adjacent values do not necessarily occur together, and behaviours from opposing values do not necessarily exhibit the same motivational conflict as their underlying values (Bardi & Schwartz, 2003). Another interesting complexity occurs because of the different levels of abstraction of the values (Hanel, 2016). For instance, consider the values forgiving and meaning in life, both benevolence values. While the first is limited to a range of concrete actions, the second has a more abstract meaning. And with a greater abstraction, it might be difficult to obtain good concrete exemplars of behaviours for these values result in greater variation in how individuals interpret them. Also, as noted earlier, behaviours can express more than one value (Bardi & Schwartz, 2003; Schwartz, 2013) and can also express other determinants (e.g., social and practical constraints). Finally, as pointed out by Feather (1995), values not only influence the valence of actions and goals, but also help to identify whether the goals have attractive or aversive outcomes for the individual over a long-time frame. These complexities can complicate value-behaviour prediction, making it vital to investigate how abstract mental representations of values are instantiated in people's minds (Maio, 2010).

Value Instantiations

Maio (2010, 2016) suggests that values are mental representations of ideals that can be examined at three levels: (1) a system level, which is about the relations of the values with each other, as in Schwartz's (1992) model; (2) an abstract level, tapping how values are construed in relation to feelings and cognitions across situations, and refers to the importance that individuals give to value abstract concepts (e.g., pleasure, social order); and (3) an instantiation level, where a value is conceptualized in terms of concrete judgments and actions specific to situations. For instance, the value of freedom can be examined according to its relations with other values (system level), the experience of individuals regarding the value's own semantic meaning (abstract level) and, finally, the specific behaviours that people regard as promoting and threatening freedom (instantiation level).

Because any value can circumscribe numerous behaviours (cf. Kruglanski et al., 2013), *a priori* predictions about whether a value can predict a behaviour require a systematic investigation of which behaviours are the strongest instantiations of a particular values (Hanel, 2016; Hanel, Vione, Hahn, & Maio, 2017). The importance of this is shown in past research (Maio et al., 2009) that exposed participants to stories about typical (e.g., discrimination against women) or atypical instances (e.g., discrimination against left-handed people) of behaviour violating the value of equality. Participants who thought about typical instances exhibited less discrimination in a subsequent experimental task than participants who thought about equality in the context of atypical instances, which did not differ from the control condition. The results supported the hypothesis that the impact of value instantiations on subsequent behaviour depends on the extent to which the instantiations are typical exemplars of the value (Maio et al, 2009). Therefore, it is important not only to assess how the

connections between values and behaviours occur, but also to assess how concrete these relations are, in terms of typicality. In other words, how good a behaviour is as an instance of a value. Not using a behaviour that is a typical example of a specific value can result in weak predictions (Maio et al., 2009).

Of importance, the context can influence the instantiations that people include in their mental representations of values. Hanel, Maio, et al. (2018) found that individuals from different countries (United Kingdom, Brazil, and India) presented meaningful between-country differences in the behaviours used to concretely instantiate the human values, alongside high within-country variability. The authors also found that the individuals were able to match the instantiations presented to their respective human value, even if those were produced by individuals from different countries or created by the researchers. Therefore, although the participants had similar ideas regarding the abstract meaning of the values, as they were able to match them with the behaviours, they differed in which instantiations were most typical of the values. Thus, contextual or cultural variability is an important factor influencing value instantiations.

The Present Research

The aim of the present research is to generate spatial planes based on direct comparisons between the abstract level of values and behavioural examples. These behaviours were generated from values. These spatial planes enable a graphical overview of how the behaviours are related in the two-dimensional space embodied to Schwartz (1992) model. In prior research, Bardi and Schwartz (2003) indirectly indicated that there may even be systematic exceptions to the pattern predicted by Schwartz's model, because of the stronger value-behaviour relations exhibited by some types of values (e.g., tradition, stimulation) than for other value types (e.g., benevolence, security).

I employed different research methods across a pilot study (to generate the behavioural exemplars) and four empirical studies. Prior research that investigated the relations between values and behaviours relied on correlations between value importance ratings and (usually self-reported) frequencies of specific behaviours (Fischer, 2017). In contrast, I decided to examine the relations of value-expressive behaviours and (a) behaviours, (b) Schwartz's 10 value types, and (c) Schwartz's four higher order values. As in Chapter 2, I explored the abstract nature of values, using judgments of similarity. These judgments are commonly used in cognitive psychology, especially in categorization tasks (Medin & Schaffer, 1978; Murphy, 2004; Oden, 1987; for more information, see Introduction). The use of similarities provides an alternative, and arguably more fundamental assessment of the mental representations of values and behaviours.

In a pilot study, participants were asked to create hypothetical situations/behaviours for each of the ten value types from Schwartz's model, following a methodology developed previously (Hanel, Maio, et al., 2018, Study 1). I asked participants from the general public to provide situations in which they find each of Schwartz's (1992) ten value types relevant. The situations were composed of different people (participants), actions (behaviours), and places (locality). Based on the most frequent answers, I created a list of value-expressive behaviours to be used in the studies performed in this Chapter. The final list of behaviours can be seen in Table 3.1 (Study 8). The full Pilot Study, with the most frequent words mentioned for each one of the value types can be seen in the Supplementary Studies (p. 150).

Moreover, in Study 8 participants indicated to what extent the value-expressive behaviours related to their respective value types, providing an overview of how good the behaviours are as examples of the values. In Study 9, participants were asked to rate

the similarities between all the examples of value-expressive behaviours and the ten value types from Schwartz's model. In Study 10, they were asked to position the value-expressive behaviours among Schwartz's two value dimensions, using bipolar scales. In Study 11, they were asked to make direct judgments of similarities between all value-expressive behaviours. If the behaviours are unrelated to the underlying motives and values, the spatial planes should be unrelated to Schwartz's value model.

Also, I replicated Studies 8-11 using a different set of behaviours, generated based on Hanel's (2016) findings. These were applied to student samples and are available in the Supplementary Studies (p. 159).

Study 8

In this study, I asked participants to rate the extent to which the behaviours derived from the values match with their respective value types, using the methodology in Hanel, Maio et al., (2018). In total, I used a list of four behaviours per value type in each sample, resulting in 40 behaviours. In addition, I assessed the correlations between participants' ratings of values importance and how important they considered performing the behaviours.

Method

Participants. Participants were 114 British citizens. However, nine of them were excluded from analyses because they failed the IMC twice (Oppenheimer et al., 2009) and\or test items spread across the main task. The mean age of the remaining 105 participants was 35.87 (*SD* = 11.85), with 54 men (51.4%) and 51 women (48.6%). 39% of the participants had an undergraduate degree as their highest education level. The study was run online at Prolific.

Material and Procedure. Participants were asked to rate the extent to which 40 behavioural examples relate to the values from which they were generated, using a

slider scale ranging from 0% (*Not at all*) to 100% (*Extremely*). They had to click on the slider and move it towards the answer that best represented how well the behaviour related to the main value. An example can be seen in Figure 3.1. In addition to the behaviours used, nine situations were assigned to random value types (e.g., "feeling depressed" to the value type hedonism), to avoid eliciting high automatic agreement with items.

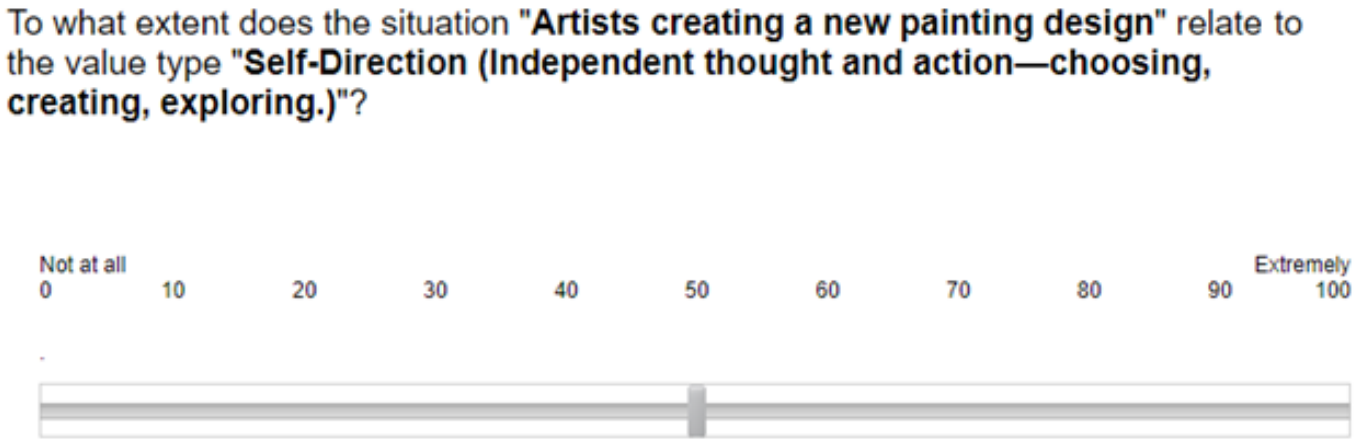

Figure 3.1. Example of task performed in Study 8.

Next, participants completed the Short Schwartz Value Survey (Lindeman & Verkasalo, 2005), which measures the importance of Schwartz's (1992) ten value types. The measure includes one item per value type (e.g., "Power (*social power, authority, wealth*)," and participants rated the importance of each value as a life-guiding principle for them, using a 9-point scale ranging from 0 (*opposed to my principles*) to 8 (*of supreme importance*). Also, participants were shown the list of behaviours and asked to rate the importance of each one (e.g., "couples getting married at church"), using a scale from 1 (*Not at all important*) to 6 (*Extremely Important*).

Results and Discussion

The main objective of this study was to evaluate the fit of the behaviours to their respective values. As can be seen in Table 3.1, most of the instantiations were described as more than 50% related to their respective value types. In fact, the only

exception was "*Children eating healthy food at home*", which was described as 35% similar to the value type Conformity. Also, as expected, most of the value-expressive behaviours assigned to random value types were rated as less than 50% related.

Table 3.1.

How good the situations\behaviours are as examples of the value types

Situations	CODE	Mean	SD
Benevolence			
Nurses taking care of patients in hospital	BE1	80.60	15.30
Mothers looking after their children at home	BE2	80.60	20.68
Volunteers providing food for homeless people in the community	BE3	77.68	20.95
Workers helping each other at workplace	BE4	74.01	17.79
Universalism			
Environmentalists planting new trees in the forest	UN1	80.82	18.51
Social workers helping people in their local communities	UN2	75.38	18.20
Zookeepers taking care of animals	UN3	71.55	20.73
Teachers helping students at school	UN4	60.66	25.25
Self-Direction			
Artists creating a new painting design	SD1	83.42	13.77
Authors writing a new book	SD2	81.15	15.19
Children drawing a picture at home	SD3	76.70	17.40
Students learning at school	SD4	57.21	24.96
Stimulation			
Skydivers jumping from a plane	ST1	91.24	11.14
Adventurers climbing a mountain	ST2	86.21	14.79
Children playing at the park	ST3	72.26	21.02
Athletes running on a track	ST4	67.22	21.30
Hedonism			
People going to a club or beach	HE1	73.78	22.95
Gamers playing at home	HE2	72.28	23.43
Teenagers having a drink in a pub	HE3	68.50	26.38
People eating at a restaurant	HE4	64.71	22.64
Achievement			
Athletes winning the Olympics	AC1	90.01	13.33
Students graduating from university	AC2	87.56	12.69
Employees getting a promotion at work	AC3	84.28	13.95
Teachers accomplishing their duties at school	AC4	71.61	18.19
Power			
Prime-ministers or presidents making decisions at parliament	PO1	84.55	15.87
Politicians giving speeches in town halls	PO2	72.30	18.82
Managers chairing a meeting at the workplace	PO3	69.04	20.35
Teachers disciplining students at school	PO4	67.26	23.17
Security			

Police officers arresting criminals in the streets	SE1	85.47	13.11
Police officers patrolling the streets	SE2	84.94	13.43
Parents taking care of their children at home	SE3	78.68	19.10
Security guards locking doors in a bank	SE4	75.28	20.92
Tradition			
Couples getting married at church	TR1	82.97	17.22
Religious people praying at home	TR2	81.42	17.03
Priests giving sermons at church	TR3	79.99	19.41
Individuals visiting family at home	TR4	67.64	21.93
Conformity			
Students following a dress-code at school	CO1	73.88	22.67
Prisoners following prison rules	CO2	72.89	25.64
Workers respecting colleagues	CO3	65.49	24.68
Children eating healthy food at home	CO4	34.93	28.53
Test Items			
Cheat in a board game (Power)	TEST1	46.94	26.41
Gossiping about friends (Conformity)	TEST2	36.99	31.85
Disrespecting others' opinion[s] (Hedonism)	TEST3	34.95	27.23
Complaining about different points of view (Trad.)	TEST4	27.21	26.40
Constantly talk about your own life (Conformity)	TEST5	25.77	22.51
Criticizing another's religion (Benevolence)	TEST6	15.66	18.78
Feeling depressed (Hedonism)	TEST7	13.29	22.84
Finish coursework late (Tradition)	TEST8	11.83	15.65
Sleeping late (Universalism)	TEST9	11.12	16.01

Next, the correlations between the value types from the Short Schwartz Value Survey (centered) and the importance that participants attributed to each group of value-expressive behaviours were assessed. As shown in Table 3.2, most of the value types presented significant and positive correlations with their respective group of behaviours. Indeed, a Welch's *t* test ($t[10.57] = 11.408$, $p < .001$] indicated that the correlations in the main diagonal of Table 3.2 were on average higher ($M = .34$, $SD = .14$) than those off the diagonal ($M = .18$, $SD = .12$). However, the self-direction behaviours did not significantly correlate with their respective value type. But, as can be seen once again in Table 3.1, these behaviours were still considered representative of self-direction (> 57%).

Table 3.2.

Correlations between group of behaviours and value types

Val*Beh*	*BEN*	*UNI*	*SD*	*STI*	*HED*	*ACH*	*POW*	*SEC*	*TRA*	*CON*
BEN	**.46**	**.31**	**.33**	**.27**	.05	**.25**	.14	**.34**	**.20**	**.38**
UNI	**.30**	**.44**	**.31**	**.21**	.15	**.24**	.01	.03	-.02	**.26**
SD	.17	**.30**	.09	.19	.11	**.20**	.07	.12	.02	.12
STI	**.20**	**.21**	.16	**.26**	**.26**	.17	.01	.02	.07	.07
HED	.15	.13	.12	.14	**.21**	.07	.19	.00	.00	.15
ACH	-.03	.03	.15	**.31**	**.24**	**.24**	**.27**	.00	**.22**	.06
POW	-.10	-.06	.05	**.22**	**.29**	.18	**.29**	.00	**.25**	.13
SEC	**.33**	**.30**	**.39**	**.28**	.12	**.27**	**.30**	**.39**	**.37**	**.39**
TRA	**.21**	.03	**.23**	**.21**	.04	**.22**	.09	**.24**	**.53**	**.37**
CON	**.22**	.16	**.24**	**.27**	.13	**.38**	**.36**	**.28**	**.50**	**.48**

Note. Numbers in bold: $p < .05$; Orange = Self-transcendence; Yellow = Openness to Change; Blue = Self-enhancement; Grey = Conservation.

It is important to point out that some behaviours were more highly associated with different value types, even though these behaviours were created and judged as good exemplars of their original values. For instance, stimulation behaviours. Despite a significant association to their respective value type, they were higher associated to achievement, an adjacent value type. At the same time, the correlations with adjacent values tended to be similar in magnitude. For instance, conformity behaviours were strongest associated with their value type, $r = .48$, $p < .001$, but also correlated with adjacent value types (benevolence, tradition, security). This finding demonstrates the importance of recognizing the role of multiple values in behaviour, even when the behaviour is chosen as an exemplar of another, different value.

One possible limitation of these correlational results should be highlighted. Unlike previous research, I did not assess how frequently the participants performed these behaviours. In my study, participants were presented situations including

characters and places that might not be common to them, and participants rated how important these situations were to them. For instance, let's consider the behaviour "*Couples getting married at church*" (a tradition example). One can value tradition, but at the same time not consider this behaviour important, because it is not relevant to the person individually (e.g., if not religious) and therefore unlikely to occur in their lifetime. The main goal of this study was to see how strongly the behaviours related to their respective values, with results indicating them as being more than 50% related. Given this support, I considered them for further studies. In the next study, I assessed their spatial plane through direct comparisons to the ten value types from Schwartz's model.

Study 9

In the previous study I established how well a set of value-expressive behaviours related to the respective value from which they were derived. This was an important foundation for beginning to look at the principal aim of this chapter, which was to see how the behaviours are spatially arranged based on their relations to value concepts. Therefore, this study assessed the relations between these 40 value-expressive behaviours and Schwartz's ten value types.

Method

Participants. One hundred twenty five participants completed an online questionnaire on Prolific, with two failing the IMC twice (Oppenheimer et al., 2009) and\or test items. Therefore, 123 participants were included in the analysis, including 54 men (43.9%) and 69 women (56.1%), with mean age of 38.93 (*SD* = 11.32). 42.3% of the participants reported having an undergraduate degree as highest education level.

Material and Procedure. Participants were asked to rate the similarity between 40 instantiations (e.g., *Working hard to get something*; *Solving logical problems*) and

Schwartz's (1992) 10 value types (e.g., *universalism, hedonism)*. They rated the similarity of each pair using a slider scale from 0% (*Not at all*) to 100% (*Extremely*). To avoid boredom and fatigue, participants only rated the similarities of each one of the behaviours to five of the ten value types, randomly selected, yielding a total of 200 comparisons. An example of the task can be seen in Figure 3.2.

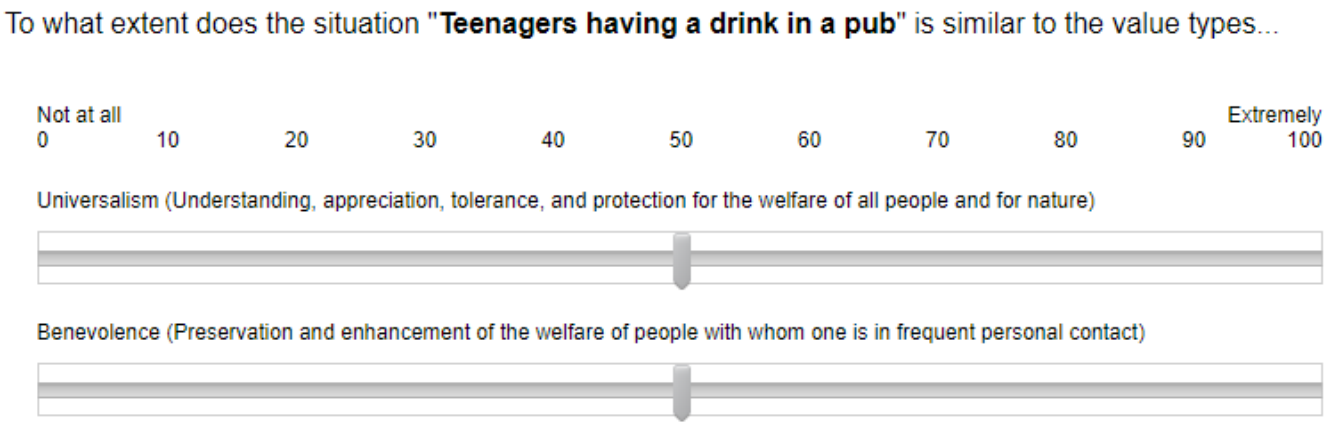

Figure 3.2. Example of task performed in Study 9.

Results and discussion

To perform the Multidimensional Scaling (MDS), the mean similarity ratings of all 200 comparisons were calculated. An ordinal MDS was performed using the PROXSCAL algorithm. This algorithm creates a geometric representation of the data, respecting the proximity of the items (Hout et al., 2013). The Torgerson configuration was selected as the initial configuration, also known as classical MDS. It creates a two-dimensional representation of high-dimensional data (Brandes & Pich, 2007). To assess the model fit, Stress-I was used (Jaworska & Chupetlovska-Anastasova, 2009), following Sturrock and Rocha's (2000) suggested cut-offs. For this study, with 40 behaviours spread across a two-dimensional plane, a cut-off lower than .35 is recommended. Results indicate a good model fit (Stress-I =.13). Also, I assessed how this spatial plan matches a hypothetical spatial plane of Schwartz's model, using

Procrustes rotation (for more information about the method, see Study 1, Chapter 2). Results indicated a good match between the spatial planes ($r_m = .79$, $p \leq .001$).

As in the studies from Chapter 2, I used the convex hull (dashed lines connecting the behaviours) to facilitate data interpretation by providing the smallest convex set of behaviours for each higher order value from Schwartz's model. As can be seen in Figure 3.3, most value-expressive behaviours from the same higher order value were clustered together. In addition, the putatively opposing behaviours (based on the values from which they were derived) were in opposite positions on their respective dimensions, easily seen in the conservation vs openness to change dimensions. However, some deviations must be highlighted. The spread of the behaviours derived from self-enhancement values is large, with some of them visually opposing each other in the spatial set (AC1 - PO4), rather than being adjacent in line with Schwartz's (1992) model. Also, some behaviours derived from self-transcendence values were mixed with conservation behaviours, including "*Teachers helping students at school*" (UN4) and "*Mothers looking after their children at home*" (BE2).

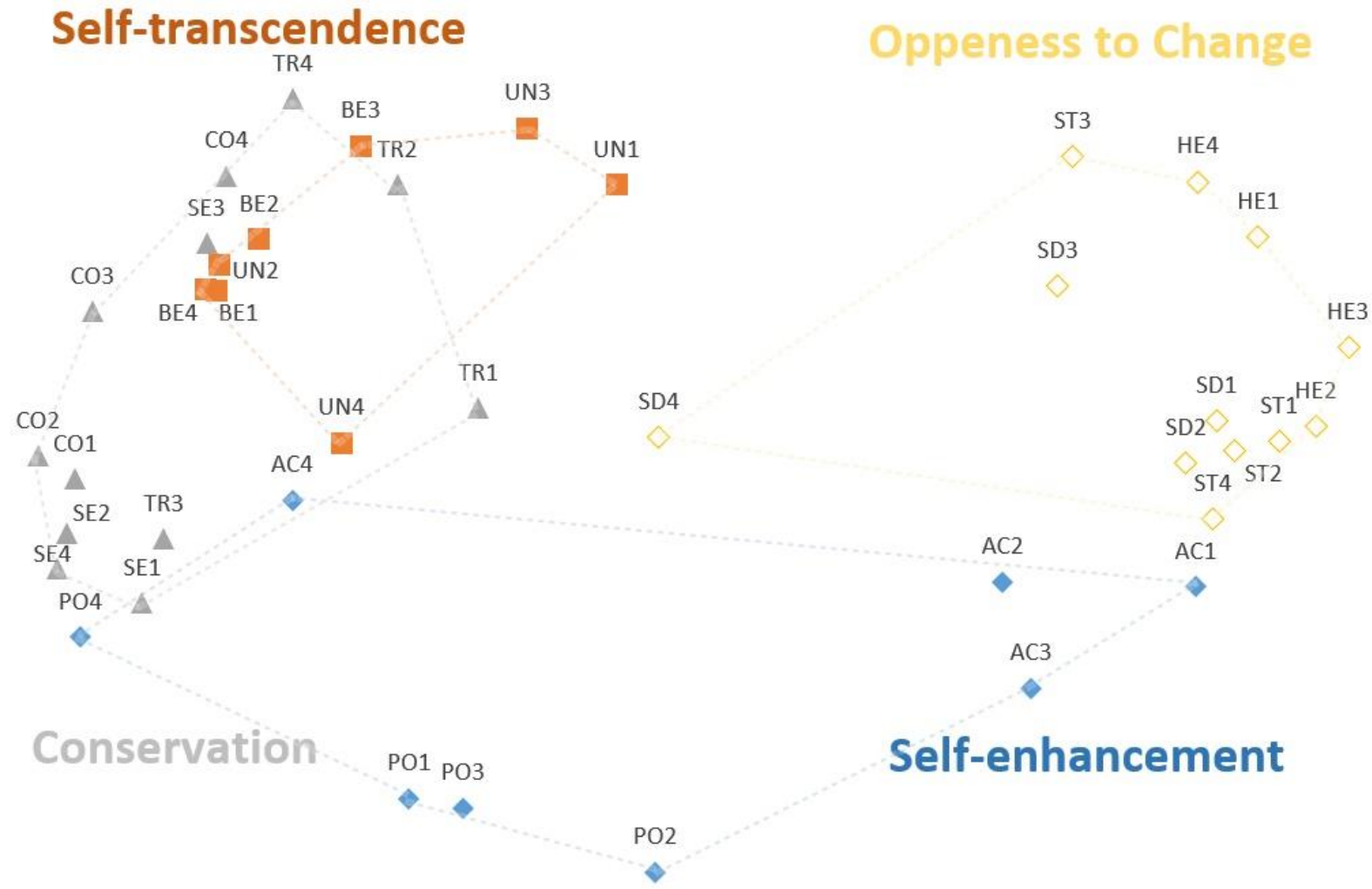

Figure 3.3. MDS structure for similarities ratings between behaviours and value types (Study 9). Convex hull: dashed lines connecting behaviour groups.[2]

[2] Athletes winning the Olympics, AC1; Students graduating from university, AC2; Employees getting a promotion at work, AC3; Teachers accomplishing their duties at school, AC4; Nurses taking care of patients in hospital, BE1; Mothers looking after their children at home, BE2; Volunteers providing food for homeless people in the community, BE3; Workers helping each other at workplace, BE4; Students following a dress-code at school, CO1; Prisoners following prison rules, CO2; Workers respecting colleagues, CO3; Children eating healthy food at home, CO4; People going to a club or beach, HE1; Gamers playing at home, HE2; Teenagers having a drink in a pub, HE3; People eating at a restaurant, HE4; Prime-ministers or presidents making decisions at parliament, PO1; Politicians giving speeches in town halls, PO2; Managers chairing a meeting at the workplace, PO3; Teachers disciplining students at school, PO4; Artists creating a new painting design, SD1; Authors writing a new book, SD2; Children drawing a picture at home, SD3; Students learning at school, SD4; Police officers arresting criminals in the streets, SE1; Police officers patrolling the streets, SE2; Parents taking care of their children at home, SE3; Security guards locking doors in a bank, SE4; Skydivers jumping from a plane, ST1; Adventurers climbing a mountain, ST2; Children playing at the park, ST3; Athletes running on a track, ST4; Couples getting married at church, TR1; Religious people praying at home, TR2; Priests giving sermons at church, TR3; Individuals visiting family at home, TR4; Environmentalists planting new trees in the forest, UN1; Social workers helping people in their local communities, UN2; Zookeepers taking care of animals, UN3; Teachers helping students at school, UN4.

In sum, most of the value-expressive behaviours were clustered with behaviours from the same value type, indicating that behaviours derived from values mirror the structure of the values when directly compared to them. However, the abstractness of values and the potential for behaviours to express different values at once (Bardi & Schwartz, 2003; Schwartz, 2013) also led us to expect some deviations. The deviations I observed illustrate these issues. For example, "*Teachers helping students at school*" was generated in response to a self-transcendence value type (Universalism; UNI04), but the content of the value can also imply, for instance, conservation motives, because it involves doing his\her job. This might help to explain why this specific behaviour mixed with conservation across the MDS solution. All such instances of intermixing between the behaviours and other values show that even the behaviours generated to represent particular values can be to other value concepts.

Study 10

In Study 10, I asked participants to place the behaviours along Schwartz's two dimensions, self-enhancement vs self-transcendence and openness vs conservation. A value-expressive behaviour placed closer to one end of the dimension indicated that it is more characteristic of this end. The method is useful because the two dimensions are important core features of the model, reflecting the contrasting motives. In addition, the method is a more direct assessment of the value space in Schwartz's mode insofar as it plots participants' responses on the two dimensions directly rather indirectly inferring them via MDS.

Method

Participants. Participants were 113 British citizens, including 65 women (57.5%) and 48 men (42.5%), with a mean age of 37.48 (*SD* = 12.21), 40.7% of the participants had an undergraduate degree as their highest level of education. No

participants failed the IMC (Oppenheimer et al., 2009) and\or test items. The study was run online at Prolific.

Material and procedure. Before engaging in the task, participants were presented to a one-paragraph summary of Schwartz's (1992) theory, explaining how the two dimensions are specified. Next, they were asked to position the behaviours between the opposing ends on each of his two dimensions. As shown in Figure 3.4, participants used a 9-point bipolar scale, with the opposing higher-order value domains identified at each end. Behaviours that participants place closer to one end should be more representative of that end of the dimension.

Figure 3.4. Example of task performed in Study 10.

Results and discussion

The spatial plane (Figure 5) was plotted from the means of the values for both dimensions, with *self-enhancement versus self-transcendence* on the x-axis and *openness to change versus conservation* on the y-axis. This method allows the coordinates of values in the model to be directly checked without needing any optimization of fit. Value-expressive behaviours originating from self-enhancement values should be on the left of the x-axis, while those originated from self-transcendence values should be on the right. Similarly, the openness to change behaviours should appear in at the top the y-axis, with conservation behaviours at the bottom.

Most of the behaviours aligned with the dimensions from Schwartz's theory, as can be seen in Figure 3.5. That is, (1) most of the behaviours promoting self-enhancement values were more likely to occur on the self-enhancement end of the self-enhancement-to-self-transcendence value dimension than on the other end, which comprised most of the behaviours promoting self-transcendence values, and (2) most of the behaviours promoting conservation values were more likely to occur on the conservation end of the conservation-to-openness dimension than on the other end, which comprised most of the behaviours promoting openness values. However, the positions of the behaviours only slightly resembled Schwartz's model, despite of the significant match with Schwartz's hypothetical configuration ($r_m = .71$, $p \leq .001$).

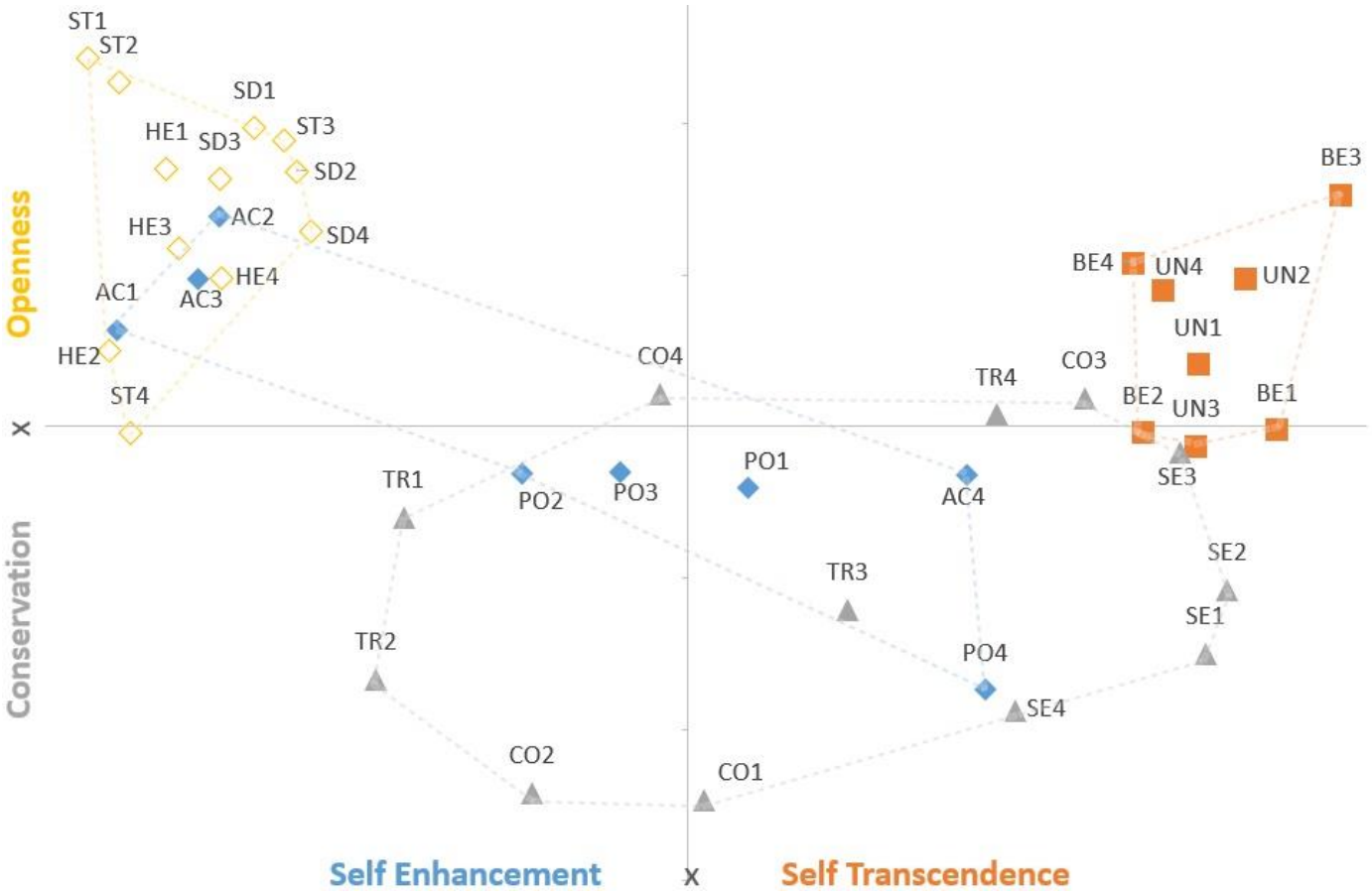

Figure 3.5. Behaviours placed among Schwartz's dimensions (Study 10).[3]

Regarding the deviations of the value-expressive behaviours from the model, six behaviours were positioned at the opposite end of the dimension from the values they were derived from. Three from self-enhancement end positioned slightly towards self-transcendence, and three conservation behaviours positioned towards openness to change. Thus, individuals might think of the behaviours through different motivations. For example, "*Teachers disciplining students at school*" (PO4) is supposed to be an example from self-enhancement. However, one can interpret this behaviour as with a self-transcendence motivation, seeing this disciplining as something that aims to help the students, instead of seeing it as a demonstration of power or authority from the teacher. Another example is "*Children eating healthy food at home*" (CO4), which was previously seen as not well related to its respective value type (see Study 8). Despite this behaviour example derived from conservation value types, one can think of that as an opportunity to try new and alternative types of food, pursuing innovative ways. The other behaviours were "*Prime-ministers or presidents making decisions at parliament*" (PO1), "*Teachers accomplishing their duties at school*" (AC4), "*Workers respecting colleagues*" (CO3), and "*Individuals visiting family at home*" (TR4).

[3] Athletes winning the Olympics, AC1; Students graduating from university, AC2; Employees getting a promotion at work, AC3; Teachers accomplishing their duties at school, AC4; Nurses taking care of patients in hospital, BE1; Mothers looking after their children at home, BE2; Volunteers providing food for homeless people in the community, BE3; Workers helping each other at workplace, BE4; Students following a dress-code at school, CO1; Prisoners following prison rules, CO2; Workers respecting colleagues, CO3; Children eating healthy food at home, CO4; People going to a club or beach, HE1; Gamers playing at home, HE2; Teenagers having a drink in a pub, HE3; People eating at a restaurant, HE4; Prime-ministers or presidents making decisions at parliament, PO1; Politicians giving speeches in town halls, PO2; Managers chairing a meeting at the workplace, PO3; Teachers disciplining students at school, PO4; Artists creating a new painting design, SD1; Authors writing a new book, SD2; Children drawing a picture at home, SD3; Students learning at school, SD4; Police officers arresting criminals in the streets, SE1; Police officers patrolling the streets, SE2; Parents taking care of their children at home, SE3; Security guards locking doors in a bank, SE4; Skydivers jumping from a plane, ST1; Adventurers climbing a mountain, ST2; Children playing at the park, ST3; Athletes running on a track, ST4; Couples getting married at church, TR1; Religious people praying at home, TR2; Priests giving sermons at church, TR3; Individuals visiting family at home, TR4; Environmentalists planting new trees in the forest, UN1; Social workers helping people in their local communities, UN2; Zookeepers taking care of animals, UN3; Teachers helping students at school, UN4

Study 11

The aim of Study 11 was to examine the relations among behaviours by having participants compare 40 behaviours pairwise. Comparing behaviours with behaviours, allows a direct assessment of whether they result in the same motivational space as values, even without participants' explicit considerations of the values.

Method

Participants. Participants were 135 British citizens. Four failed the IMC twice (Oppenheimer et al., 2009) and\or test items, leaving 131 participants with a mean age of 39.48 (*SD* = 11.43), including 71 women (54.2%) and 60 men (45.8%). 44.3% of the participants had an undergraduate degree as highest education level. The study was run online at Prolific.

Material and Procedure. Participants were asked to rate to the extent to which all forty behaviours are similar, one to another, using a slider scale ranging from 0% (*Not at all*) to 100% (*Extremely*). One example can be seen in the Figure 3.6. Because the total number of comparisons was high (780), participants were only presented with a randomly selected one-third of them (260).

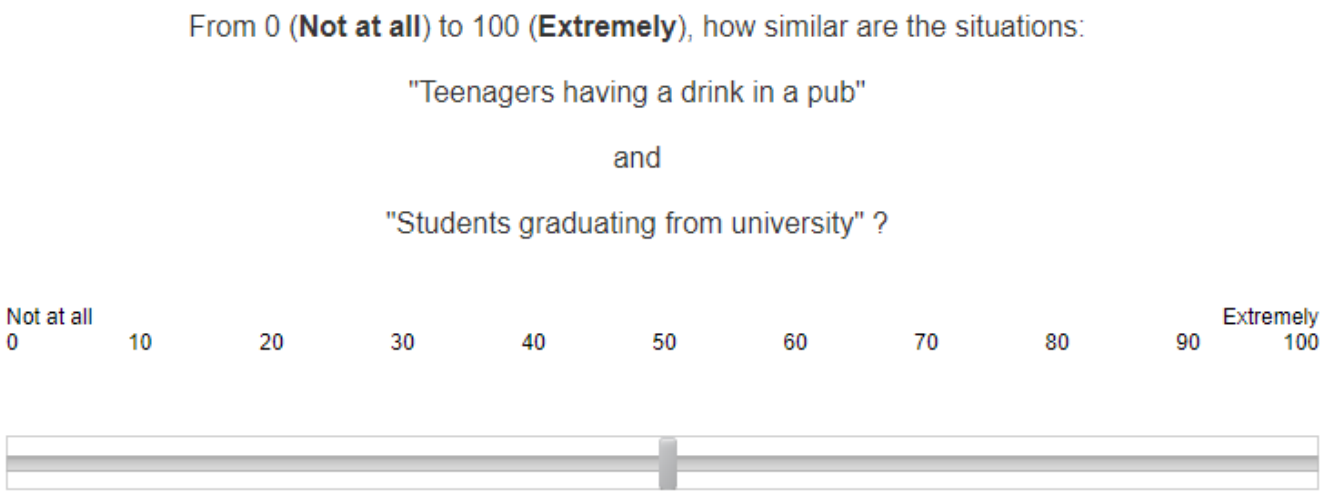

Figure 3.6. Example of task performed in Study 11.

Results and discussion

An ordinal MDS was performed using the PROXSCAL algorithm, and Torgerson configuration. Once again, the results indicated a good model fit (Stress-I = .23; which is lower than the recommended level of .35; Sturrock & Rocha, 2000). The structure of the behaviours (Figure 3.7) was in line with Schwartz's model (r_m = .59, $p \leq$ .001).

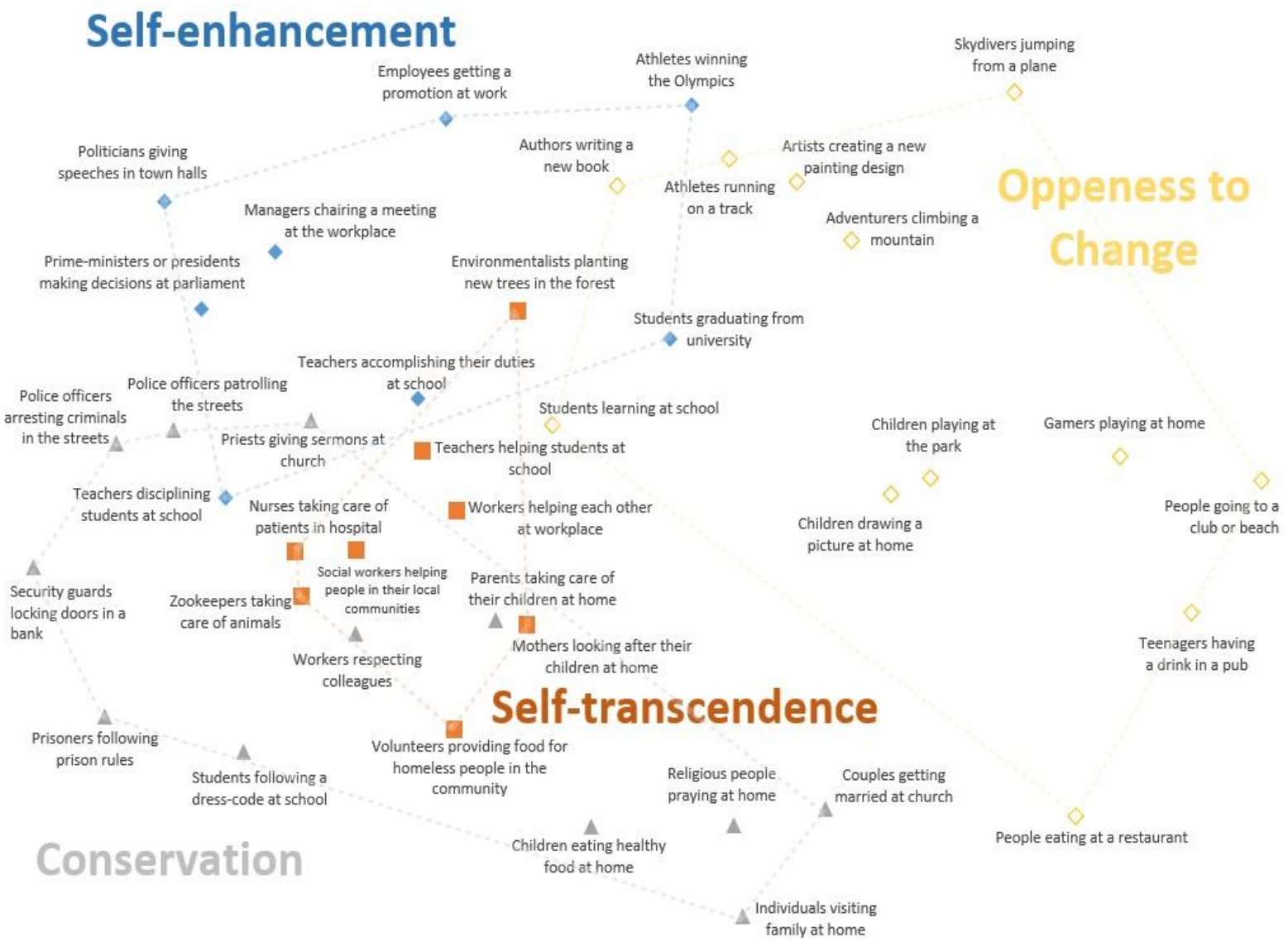

Figure 3.7. MDS spatial plane based on behaviours similarities (Study 11).

Although these behaviours originated from values in Schwartz's model and the significant congruence to a hypothetical Schwartz's spatial plane, the behaviours were not always consistent with the model. As can be seen, openness to change and conservation (i.e., the grey and yellow dots in a triangle and diamond shape), were opposing each other. However, self-transcendence behaviours were mixed with both conservation and self-enhancement, in a position near the middle of the plane. Some self-transcendence and conservation values were already mixed in Chapter 2 (Studies 3, 4, 6, 7, and 9). This may have occurred because these two higher order values have a social focus, representing how individuals socially relate to and affect others (e.g., Schwartz et al., 2012). Of importance, despite this deviation, the self-transcendence behaviours were more clustered, in comparison to the other three higher order value-expressive behaviours, indicating a greater similarity between its behaviours.

Interestingly, when assessing the content of these value-expressive behaviours without the influence of their value groups, one rational explanation for the structure can be based on the focus of these behaviours. For instance, most of the behaviours that are positioned at the left of the spatial plane showed a higher social focus (e.g., "police officers arresting criminals", "zookeepers taking care of animals"). The behaviours more to the right of the space tend to correspond to personal gains (e.g., "People eating at a restaurant", "Teenagers having a drink in a pub"). Another possible interpretation of the spatial plane can be based on how familiar the participants were with these behaviours. Despite their notable importance, the behaviours from the left might not be common to daily life ("Security guards locking doors in a bank", "prime-ministers making decisions"), while the ones from the right are more likely to be performed frequently ("Gamers playing at home", "People going to a club or beach").

In sum, when removing any explicit influence of values, and making direct comparisons between behaviours, the alignment of the data with Schwartz's model wasn't as strong as for prior studies. Openness to change and conservation behaviours were in opposing ends of the plane, however self-transcendence behaviours were placed in the center of the plane, mixed with conservation and self-enhancement behaviours. Post-hoc interpretations suggested that the behaviours are ordered along their focus (social or personal) or their familiarity.

Chapter Discussion

The set of studies performed in this chapter provided the first direct examination of the relations between human values and a set of behaviours generated based on these values. The studies also provided the first spatial plane based on similarities between behaviours, removing explicit influence that values might have in the final configuration of behaviours. I performed four studies using British participants from the general public. In Study 8, I asked participants to rate how related they think a set of behaviours were to their expected value types. Then, in Studies 9 and 10, I directly examined the similarities between the behaviours and the ten value types of Schwartz's (1992) model, and how would they be positioned among the dimensions from his theory. In Study 11, the spatial plane was used to assess similarities between behaviours, without the influence of human values.

Previous research has replicated Schwartz's circumplex structure when plotting values and behavioural importance together (Bardi & Schwartz, 2003; Schwartz & Butenko, 2014), but these relied on intercorrelations of items and also restricted an initial configuration to both. Some complexities should be taken into account when evaluating these relations, such as the fact that the assumptions of congruence and conflict do not necessarily apply to behaviours (Bardi & Schwartz, 2003) and the fact

that multiple values can be relevant to the same behaviours (Bardi & Schwartz, 2003; Schwartz, 2013). Therefore, assessing behaviours purely based on their similarities to abstract concepts of values is useful to provide a spatial plane of behaviours that considers how people interpret and understand the behaviours. Also, asking people to judge the similarities between values and behaviours might help to reduce social desirability, as individuals are just giving their opinion about how they interpret two items, instead of making judgments of importance to their lives and how frequently they perform the behaviours. All these things considered, it was an empirical question if these associations would replicate Schwartz's model or would result in a different spatial plane for behaviours than for values.

The value-expressive behaviours used in my studies were originated from examples given by participants in a Pilot Study (p. 136). I used words (characters, places, actions) that were more frequently mentioned by the participants to generate a set of 40 value-expressive behaviours that were further considered as good examples of their respective value types (Study 8). Using examples created by the participants is a crucial step to assess value-behaviour relations, because the behaviours were directly generated from mental representations of values (Maio, 2010).

I used these value-expressive behaviours in direct judgments of similarities in three studies (9-11). Consistently, the spatial planes showed congruence to a hypothetical distribution of Schwartz's circular model. However, deviations were seen in the position of some behaviours. For instance, the behaviour "*Teachers accomplishing their duties at school"* (AC4) was originated from mental representations of the value type achievement and was rated as a good exemplar to this value type; however, when participants were asked to position it among Schwartz's dimensions, it was placed closer to the self-transcendence end, instead of self-

enhancement. This finding may indicate that, when interpreting the behaviours, participants could be attributing different motivates to their performance. In this case, some might think of teachers accomplishing their duties as a way to achieve personal success at school, demonstrating competence and hard work – characteristics typical of achievement. However, others might think of it as a way to help students to develop their abilities and strengths, showing teachers' concern for the students.

It is also relevant to consider whether the value spaces generated in my studies are the result of the specific behaviours used. First, it is important to highlight that the value-expressive behaviours used in my studies were generated based on participants' interpretation about what would be good examples of the values. In prior research, using typical behaviours similarly generated resulted in spatial planes congruent to Schwartz's model (Bardi & Schwartz, 2003; Schwartz & Butenko, 2014). Therefore, if new studies were conducted with a different set of behaviours - and these behaviours were reliably generated as good examples of values within the same type of sample, it would be likely that their spatial planes would consistently reproduce the main features of Schwartz's model (e.g., opposing higher order values). Alternatively, the use of less representative behaviours seems likely to produce a space that correspond less well. Even though my studies used a different methodology, the behaviours also showed congruence with Schwartz's model, with some small deviations, because of participants' different interpretations. Support for this prediction can be found in my supplementary studies (p. 159), in which I replicated the method used in this chapter with students as participants. Even using a different set of behaviours, the results (further discussed in the General Discussion, Chapter 4, and Supplementary studies) were congruent with Schwartz's model, and even exhibited a similar pattern of deviations to those reported in this chapter (e.g., behaviours mixing with others from adjacent higher order values, or

being widely spread across the value space). Therefore, it seems likely that using different methods and sets of behaviours will reproduce the main features of Schwartz's model to the extent that the behaviours are representative of the values.

The results from these studies are further discussed in Chapter 4. There, I link the findings of Chapters 2 and 3 chapter and then I further explore the direct comparisons between behaviours and values, the importance of motivations to value-behaviour research, limitations of this research, and future research possibilities.

Chapter 4: General Discussion

What does it mean when people say that abstract ideals, such as freedom, creativity, equality, and power are important guiding principles in their lives? In psychological research, among other disciplines (e.g., political science), values are treated as essential guidelines to attitudes and behaviour, which require thought and contemplation. In psychology, values are modelled as desirable, *trans-situational* goals that vary in importance (Schwartz, 1992). Crucially, however, this trans-situational focus brings a level of complexity to the concept of values.

For this reason, it is important that researchers have paid relatively little attention to how individuals interpret and understand values. Models of values have attempted to map their conceptual space by plotting correlations between ratings of value importance. It was an empirical question in this thesis whether the new tasks performed in my studies would generate the same value space as previously derived from correlations between value importance given the difference in theoretical basis between the two. The tasks asked for judgments of value concepts (Chapter 2) and behaviours (Chapter 3), which should be less influenced by social desirability than personal value importance ratings. I was therefore interested in discovering whether these tasks would reveal maps of values and value-expressive behaviours that closely aligned with our current understanding of values or differed from the dominant zeitgeist. The results predominantly supported prevalent thinking about the motivations that interconnect values, while revealing important caveats.

Prior to discussing the results, it is important to consider Pakizeh et al. (2007) who assessed semantic relatedness of human values, and whether they are empirically different to similarities in value importance judgments. In their study, participants were presented with pairs of values, and asked which of the values were more important to them. In another task, participants were asked to what extent pairs of values shared a

similar meaning. In addition, Pakizeh et al. assessed whether the discrepancy in importance attributed to each pair of values is related to their perceived semantic relatedness and found a significant association ($r = -.26$, $p < .001$). Despite the modest correlation, Pakizeh et al.'s research provided the first association between importance ratings and conceptual similarity.

Mapping of Value Concepts

My Chapter 2 focused on mapping value concepts. My concept-focused tasks generally produced results similar to those from motivation-focused tasks (e.g., Bilsky et al., 2011; Schwartz, 1992). When assessing how my value spaces match the configuration in Schwartz's model using Procrustes rotation, results showed significant congruence across all studies. Also, across two cultures (United Kingdom and Brazil), I obtained a two–dimensional spatial plane that resembled Schwartz's model, and which accentuates the assumptions of motivational synergies and conflict between the values. These consistent findings indicate that the conceptual representations of the values within Schwartz's (1992) model align with the past evidence of their motivational interconnections, suggesting deep underlying relations between the two.

It is important to highlight that my research utilized a range of methods to directly map the meaning of values. When making similarity judgements, people are required to think beyond the motivational importance of each value and to explicitly compare their understanding of the meaning of the values. I asked participants to make explicit comparisons at different levels (values, value types, and value dimensions), to group values according to their understanding, or to freely position the values across a spatial plane. Thus, I was able to introduce different judgmental reference points, which is important for diverse social constructs. For instance, many decades ago, Asch (1946) observed how social traits like "cold" could take on new meaning depending on the

traits presented alongside them. Also, when presenting different and new stimuli to individuals, concepts are triggered in memory, allowing people to draw conclusions about similarity between the items (Medin & Schaffer, 1978; Minda & Smith, 2001; Murphy, 2004). This concept mapping exercise explicitly builds these shifting perspectives into the derivation of the conceptual model.

Cross-cultural comparisons: Importance ratings x similarities.

Although I replicated Schwartz's structure across a range of methods, there are some differences between my findings and previous research that investigated value structure in the United Kingdom and in Brazil. In the United Kingdom, using importance ratings, the circular structure was consistently replicated across three samples (Bilsky et al., 2011). For Brazil, previous research showed only minor deviations (value types merging or swapping positions; Sambiase et al., 2010; Tamayo & Porto, 2009; Tamayo & Schwartz, 1993). The structure was similar in most of my studies, with the two opposing bipolar dimensions clearly arising. However, some structural differences occurred. For instance, in Study 2, the self-transcendence value types emerged closer to each other than the value types of the other higher order values. This finding is in line with previous findings based on importance ratings, which also found that universalism and benevolence tended to occupy the same region (e.g., Sambiase et al., 2010; Tamayo & Porto, 2009). Also, in Study 4, self-enhancement and openness values were more tightly clustered than the other two higher order values. This finding might indicate that self-enhancement and openness values are composed by less diverse concepts. Indeed, Study 6 found that self-enhancement and openness values were mixed together, opposing the self-transcendence and conservation values, which were also intermixed. In this case, the structure indicated an organization based on the personal and social focus of the values. Together, these comparisons show that

the conceptual clustering of values can differ from their motivational clustering, despite broad alignments between the conceptual and motivational structure of values.

Deviations.

Notwithstanding the support for Schwartz's value structure across the seven studies, I also observed small deviations that warrant consideration. For example, some values swapped positions with adjacent values (Studies 1, 2, and 3), some values clustered more than others (Study 4), some were grouped based on their focus (personal and social; Study 6), and some values were categorised differently in different nations (Study 5). These swapping and fluctuations in values positions have also been shown in previous research that assessed the circular structure (e.g., Bilsky et al., 2011; Fontaine et al., 2008; Schwartz et al., 2012; Schwartz & Sagiv, 1995). For example, in the UK sample of Study 5, six of the eight values positioned in the unexpected end of the dimension are known for their inconsistency across cultures (Schwartz & Sagiv, 1995). Nonetheless, it is worth emphasising that my designs are better suited to drawing conclusions about the broad patterns of relations between values than about specific deviations, because I would need larger samples to provide more systematic conclusions about the reliability of specific deviations. In this respect, the consistency of support for the circular model across all seven studies is more noteworthy.

It may nevertheless be useful to consider whether there are patterns in the deviations that reflect inherent properties of the values. Consider the findings in Study 5. In the British sample, six self-transcendence values were positioned closer to the opposite end of the dimension. Specifically, *inner harmony*, *meaning in life*, *mature love*, *wisdom*, *true friendship*, and *a spiritual life* appeared in the self-enhancement side, even though the last value was next to the centre of the scale. In the Brazilian sample, there were similar deviations for two self-transcendence values, and five conservation

values (*healthy*, *humble*, *reciprocation of favors*, *politeness*, *sense of belonging*) were found at the wrong end of the conservation-to-openness dimension. These exceptions might have been more evident in Study 5 because of the way the task was structured. Whereas Studies 1 to 4 asked participants to rate similarities between the items, Study 5 asked participants to place the values inside the two-dimensional space proposed by Schwartz. By asking participants to make a choice inside the two-dimensions, they might have been more likely to notice instances where the values can serve varied motives. In this respect, it is interesting that the six self-transcendence values may be relatively broad, inward facing, and focused on balance (e.g., *inner harmony*, *true friendship*, *meaning in life*, *mature love*, *wisdom*, *a spiritual life*) compared to other self-transcendence values, such as *equality*, *honesty*, *forgiving*, and *loyalty*. The relative focus on inward insight and balance may help to explain their flexibility in motivational construals. For example, *wisdom* can be useful for one's own career. Similarly, the conservation values that deviated in the Brazilian sample may be relatively broad, indicating personal characteristics that are considered important to individuals, especially when compared to more concrete values from this higher order value (e.g., *family security*, *national security*, *social order*, *respect for tradition*). Despite being exceptions and not the rule, these values indicate interesting ways in which particular values may readily encompass behaviours that simultaneously map onto opposing values.

Overall, the multiple structure assessment methods used across my studies in Chapter 2 indicate that the conceptual interrelations between values and the motivational interrelations currently embodied in Schwartz's model are closely aligned. It is relevant to recognize the importance of motivational relations between values and their role in understanding relations between values and other variables. This

importance can be seen when assessing the sine wave (see p. 23) that emerges when relating the values to other psychological variables (e.g., political attitudes, personality traits; Caprara et al., 2006; Parks-Leduc et al., 2015). For instance, why would universalism and benevolence both positively predict altruism when they are only conceptually similar (Hanel et al., 2018)? We expect that they both predict altruism because of similar underlying motivation. Also, as can be seen in Study 7, results indicate a correlation (after Procrustes rotation) between the spatial planes provided through similarity judgments and importance ratings. Thus, my findings do not undermine the importance of the motivational interrelations. Instead, they show for the first time that the conceptual and motivational aspects of value interrelations are distinct and convergent.

In prior research, Maio and Olson (1998) assessed the hypothesis that values are cultural truisms. That is, beliefs that are widely shared but rarely questioned. This hypothesis was supported and raises questions on what basis people rate some values as important and others as less important. Maio and Olsen suggested that importance ratings are mainly influenced by affective information, because of the strong feelings the participants attached to the more important values. Further, by behavioural information (recollections of value-affirming behaviour), because participants often listed past behaviours (e.g., "I go to church each Sunday") as reasons to endorse their values. However, one finding is particularly important to my research. When the values were provided with cognitive support (which people usually lack of), participants' values were strengthened against value change. As a result, this cognitive support for a value not only makes the value endorsement stronger, but also might be relevant to guide attitudes and behaviours. Of course, in this research participants were asked to make personal judgments of importance, while in my thesis, they were asked to

make similarity judgments. The point is, even though they were presented with pairwise comparisons, and asked to make judgments based on their understanding about values and behaviours, the cognitive support provided is likely to strengthen their judgments. That is, when asked to think about the content of values and behaviours, and make judgements based on their cognitive understanding, it is likely that they would provide more reliable judgments.

Mapping of Value-Expressive Behaviours

The variability in conceptual locations of values across methods and cultures provides clues about their potential for variation in application to attitudes and behaviours. Knowing how similar values are to each other might help to delineate future studies that focus on understanding their predictive power. This has been a difficult task so far, because any particular attitude or behaviour can express different values at time (Bardi & Schwartz, 2003; Schwartz, 2013). For instance, one might think of influential, a self-enhancement value, as relevant to some self-transcendence values (e.g., protecting the environment, equality), because the values may be interconnected in real-world contexts (e.g., *using one's influence to promote recycling*, *making public speeches to end the gender pay gap*). Therefore, the investigation of these mental representations can facilitate better understanding of the value relations based on their content, but also their associations to attitudes and behaviours in the real world.

In fact, assessing the mental representations of values and behaviours can also lead to theory development. For example, in a prior research, using importance ratings, Aavik and Dobewall (2017) assessed whether the value health, simply defined in Schwartz's model as the avoidance of disease, could be broadly represented across his structure if further divided into subcomponents of health (e.g., mental health, physical health, social health). Using a large sample (N = 1818), they found that the health

subcomponents were spread across a third dimension, operating together with other value types and not limited to the location of the original value in the conservation area of the space– which doesn't seem consistent with the assumptions of conflict and compatibility from Schwartz's model. Their results can benefit any further research that might attempt to assess the relations of health to different variables, such as attitudes, intentions, and behaviours. Following this idea, when introducing the mental representations of value-expressive behaviours, we are exploring concrete examples of these values, not limiting the interpretation to their abstract definitions. The use of these examples can lead to a structure different from the one proposed by Schwartz, once the behaviours can interact with other value types from his structure rather than being limited to the position of the original value. Making a parallel to Aavik and Dobewall (2017) research, these examples would work as the subcomponents of health (e.g., mental health, physical health, social health).

One important thing to be considered is that to avoid general interpretations of the behaviours, it is vital to assess which of them are more typical to a specific culture. According to Vallacher and Wegner (2014), the identification of an action goes through multiple psychological and social processes, creating connections between the behaviour and mind. Therefore, it is important to provide stable examples of what the actors are doing. If a behaviour is not reliably typical of a culture, it is more likely that participants would provide more diverse judgments about them. To avoid these general interpretations, instances of behaviours were generated based on individuals' opinion of good situations that could represent the ten value types from Schwartz's model (See Pilot study, appendix). Specifically, participants were asked to present different characters, actions, and places, creating a full scenario. The most frequent words helped to select common behaviours. For all the studies in Chapter 3, I ensured that all

participants were British citizens and living in United Kingdom, to avoid any cross-cultural influence over the behaviours (Hanel, Maio, et al., 2018). Study 8 showed how these behaviours related to their respective value types. Participants' answers showed that 39 of the 40 generated behaviours were rated as more than 50% related to the values types from which they were originated, except for one conformity example. Also, in this study, participants were asked to rate how important they judged the ten value types to be in their lives, and how important they considered each one of the behaviours. The results of analyses of these importance ratings were not fully in line with my expectations. For instance, self-direction behaviours did not significantly relate to their respective value type. Likewise, some behaviours were more highly related to adjacent value types, instead of their own. However, these unexpected results might have occurred because the participants were not necessarily used to engaging in the behaviours they were presented, despite the behaviours being considered typical of their context. To illustrate, consider the behaviour "*Athletes winning the Olympics*" (AC1). This behaviour was considered to be typical for achievement. Even for participants with a high score on achievement, this behaviour might be low in importance because they see it as an unrealistic behaviour in their daily life. However, when simply assessing how these are directly related, based on their content and removing any judgment of importance, different results could emerge: winning an Olympic medal is one of the highest honours a professional athlete can achieve in his\her career, and therefore the behaviour and value are highly related based on their content. With this in mind, I considered the findings that these behaviours are good exemplars for the values and used them in subsequent studies.

When assessing the relations between values and behaviours, we need to consider the influence of expectations and subjective valuation of the outcomes that

individuals' might develop regarding a specific action (Feather, 1992, 1995). When I opted to learn statistics during my undergraduate degree, I had the expectation that it would be useful for a further career as a researcher, helping me to get a MSc. and a Ph.D. When using similarity judgments instead of importance ratings, it is uncertain the role of expectations and subjective valuation of the outcomes. For instance, consider the behaviour "*People going to a club or beach*" (HE1). If we consider importance ratings, one might think of hedonism as highly important, but could judge the example as not at all important, as it might have several aversive outcomes (e.g., not enjoy loud music, do not like to dance, afraid of sunburns). That is, the outcomes would influence the importance attributed to the behaviour. However, when asked about the similarities between hedonism and such an action, it is unlikely that the outcomes would influence participants' answer, as I am not considering how important they might judge this for their personal life, but only their general interpretations. Of course, s\he can still think of the outcomes of a specific situation when making these interpretations, but once the task simply requires direct comparisons to different values, these outcomes influence are expected to be minimized.

Direct comparisons: behaviours and values.

Direct comparisons between values and behaviours were made in Studies 9 and 10, using different methods and value levels. In Study 9, participants rated the similarities between behaviours and all ten value types. The resulting spatial map showed significant congruence with Schwartz's model, with most of the behaviours clustered together with behaviours from the same higher order value. Also, the map visually reproduced the assumptions of congruence and conflict, with conservation opposing openness to change behaviours, and self-enhancement opposing self-transcendence. Nevertheless, it is important to highlight that self-enhancement

behaviours were widely spread across the two-dimensional plane, which might indicate more variation in the way individuals interpret these behaviours, associating them with other value types. Another interesting finding is how behaviours derived from self-transcendence values mixed with behaviours derived from conservation values. Some studies reported in Chapter 2 also found that self-transcendence and conservation values were mixed (Studies 3, 4 and 7), especially in Study 6, in which they merged into a single higher order value. This mix might have occurred because of the social focus of these two higher order values (e.g., Schwartz et al., 2012). This social focus can be clearly seen in some of the behaviours from self-transcendence and conservation (e.g., "*Nurses taking care of patients in hospital*", BE1; "*Parents taking care of their children at home*", SE3).

The spatial plane from Study 10 also showed significant fit to Schwartz's model. One interesting finding is that both openness to change and self-transcendence behaviours were highly clustered, indicating high congruence between their value-expressive behaviours. In contrast, conservation and self-enhancement behaviours were spread across the plane, and even appeared at the opposing end. One possible explanation relies on the motivations people attribute to these behaviours. Consider the behaviour "*Prime-ministers making decisions at parliament*" (PO1), which was rated in Study 8 as a good example of power. This behaviour can also be considered to express concerns for the welfare of others - and therefore, a good example of self-transcendence behaviour. The multiple motivations potentially underlying the behaviours raised the question how the structure would look like if behaviours were only compared among themselves.

Moreover, In Study 11, I removed the explicit influence of values, and performed direct comparisons of similarity to all 40 behaviours created. It was an open

question whether it would generate a new spatial plane or replicate Schwartz's structure. The results showed some congruence and some differences. Conservation and openness to change behaviours were in opposing sides of the spatial plane, but self-transcendence behaviours were positioned close to the centre of the spatial plane, mixing with self-enhancement and conservation behaviours.

It is also important to highlight that these studies directly comparing behaviours to values and between themselves were replicated using student samples, using a different set of behaviours. Consistently, behaviours were mainly clustered with other behaviours from the same higher order value. However, some deviations were also noted. For instance, behaviours mixing with others from adjacent higher order values (based on their focus: social or personal) or being widely spread across the value space. One interesting finding was noted in the replication of Study 11 (Supplementary Study 4). In both studies, despite of the significant alignment with Schwartz's model when considering the Protest analysis, the circular structure was not clearly present. However, a holistic interpretation of the findings suggests that behaviours more to the left of the spatial planes corresponded to a higher social focus and were less concrete examples of daily behaviours. The behaviours more to the right of the spatial plane had a more personal focus and are more common to daily life. These results indicate that, when removing the explicit influence of values in direct comparisons, Schwartz's model is not fully replicated, even though the structure of value-expressive behaviours presented some features of his model (a division based on personal and social focus).

Integrating Value Concepts and Value-Expressive Behaviours

The motivational aspects of human values are central to understanding their implications, but conceptual representations of values are equally fundamental. The present research addresses a longstanding deficit in our knowledge of the conceptual

representation of values. By examining how these values are organised as concepts, I have shown about how people categorize and interpret values. This novel analysis showed conceptual links between values that are broadly consistent with the motivational relations predicted by Schwartz's model, alongside small differences that warrant further investigation.

I also assessed how these value conceptual representations were related to behaviours that were found to be good exemplars of values. Using behaviours that were directly originated from people's mind is important to assess the value-behaviour relations, and to reduce any potential complexity that might influence them (Bardi & Schwartz, 2003; Hanel, 2016; Schwartz, 2013). It was uncertain whether the structure from Schwartz's value model would be replicated by the spatial plane composed of value-expressive behaviours. These associations provided a novel point of view of how values and behaviours are related based on how people interpret them, without using personal judgements of importance.

Together, the findings helped to reveal many of the subtle complexities that should be considered when tackling questions about the role of values in human social cognition and behaviour. In the cognitive literature, the classification in terms of concepts occur based on the features that compose these concepts, grouping new items to similar old ones (Hahn & Chater, 1997). This can happen in different ways, because these classifications are based on personal experiences and interpretations. For example, think of different animals, such as cats, tigers, dogs, and wolfs. Some might classify these examples as types of felines and canines, while others can classify them as pets and wild animals. These, of course, are more concrete examples. As abstract concepts, values are fluid in construals, despite being trans-situational in nature. Fortunately, it turns out that people can nonetheless map these abstract concepts in

systematic ways that reflect extant assumptions about their motivational relations. This suggests that, despite the tremendous range of behaviours that may relate to values, there are core characteristics that enable people to detect their conceptual similarities and dissimilarities.

Yet, values can predict behaviours, and my findings showed that behavioural connections to values are not as straightforward as the conceptual mapping of values suggests. In fact, some complexities underlying the relations between values and behaviours were clear in my research. Despite reproducing and being congruent to Schwartz's model, the spatial planes presented some deviations from the behaviours expected positions. For example, some value-expressive behaviours were judged as similar to values from both ends of Schwartz's dimensions. This model-inconsistency raised questions about the reasons for these associations. One possible explanation regards to the underlying motivations that lead people to perform such acts. In other words, individuals interpret these behaviours in different ways, seeing different values being more or less associated to the behaviours. For instance, one might interpret the daily actions of a medic as associated to self-transcendence motivations, because of the intentions to help other individuals. However, some can also interpret these actions as self-enhancement motivated, as a way to improve the medic's professional skills or to get more money from the patients. Prior research has also alluded to the role of motivations in behaviour, (Bardi & Schwartz, 2003; Schwartz & Butenko, 2014), but research has not tried to model this effect.

Therefore, while values are ordered along underlying motivations, the results of my research suggest that behaviours might also be ordered along value dimensions. Individuals generally consider the underlying motivations of the behaviours as well, rather than solely their consequences. If people would not take the underlying

motivations of behaviours into account, a behaviour spatial plane that aligns with Schwartz's value model would be difficult to be obtain. Of course, not everyone focuses on the motive of a behaviour to the same extent. Some people might focus more strongly on the consequences instead. These differences in judging behaviours are expressed in the deontological and utilitarianism inclinations of people. In the deontological inclination, the individual cares about the intention or motive of an action. Thus, morality depends on the intrinsic nature of the action (Conway & Gawronski, 2013). In the utilitarianism inclination, the individual cares about the consequences of the actions. The morality of an action is a result of its consequences (Conway & Gawronski, 2013). Therefore, the results of Studies 8-11 would presumably be more in line with Schwartz's model (i.e., have fewer deviations) for deontologists, as they place more importance to the motive and intention of behaviours. Individuals with a higher utilitarianism inclination would present more heterogeneous results.

In sum, my research may be useful for future research that attempts to assess the associations between values and behaviours. Despite the congruence to Schwartz's structure, some associations between the value-expressive behaviours with values from opposing higher order values were found, suggesting multiple interpretations regarding these associations. Most studies simply assume *a priori* that a behaviour has a connection to a value or set of values that is plainly evident, without empirically querying the motivations that individuals see as underpinning the behaviours. Thus, one way to test which behaviours present a higher variation in their association to human values is assessing their relations through direct judgments of similarity, reducing potential desirability, and focusing on mental representations of values and behaviours.

Limitations

First, one key consideration is whether there is an overlap between similarity judgements and importance ratings. To judge the importance of different objects or to make comparisons regarding their similarities, we are subject to a cognitive understanding of what these objects represent. Therefore, the similarity judgments performed would depend on individual knowledge, which can also help to attribute a higher or lower importance to something. Imagine, for instance, that an individual, disappointed with his\her religion, decided to abandon it. This change is likely to lower his\her endorsement of tradition values. However, when presented with similarity judgments between these values and behaviours such as "*Couples getting married at church*" (TR1) and "*Priests giving sermons at church*" (TR3), it is likely that s\he will attribute a higher similarity, because of the content of these values and behaviours, and this is likely to be independent of his\her endorsements. However, although it seems likely to happen this way, the exact nature of the relations between importance ratings and similarity judgments is still only partly clarified. In fact, prior research (Maio & Olson, 1998) has suggested that the cognitive underpinning of values is weak, which could raise questions about whether the structures found in my studies, using similarity judgments, are driven by importance after all. If a participant rates the value of equality as very important to him\her, it is possible that s\he might want to rate broad-mindedness or social justice as also very important, because they are similar, and s\he would like to appear consistent. This could suggest that importance ratings are driven by similarity judgments. Still, the importance attributed to some values can contribute to the way individuals interpret different situations, which can result in a partial overlap with similarities. In prior research, Pakizeh et al. (2007) attempted to assess how semantic relatedness and importance ratings of values were related, finding a significant

association. If the importance ratings had a major influence on similarities judgments, we would expect higher associations between them.

Another possible limitation that can be pointed out is regarding the inequity in participants' gender. For instance, some of my samples in Chapter 2 had disproportionally more women than men. However, Struch et al. (2002) provided evidence that the circular structure from Schwartz and its ideas of congruence and conflict are consistent across gender. The authors assessed data from eight cultural regions (e.g., Eastern Europe, Latin America, United States; N = 11,244), and results consistently showed no gender effects on value meaning through three levels of Schwartz's model (e.g., value items, value types, higher order values). Therefore, although the discrepancy in the distribution, it is unlikely that this limitation affected my results. Furthermore, three of my studies (4, 6, and 7) recruited from more general populations with more gender balance in the samples, and they showed no noteworthy differences from my other results.

A small limitation of Chapter 2 is the fact that not all studies were replicated cross-culturally – only Studies 2 and 5. Similarly, in Chapter 3, I used solely British participants, which limits the conclusions we can draw to this population only. It is known that there are cross-cultural differences in how people understand different values (Hanel, Maio, et al., 2018), and behaviours (Hanel, 2016), and future research can benefit of collecting data in different countries. Also, these replications are necessary to provide further support to the methodology novelty. However, given the extensive cross-cultural similarities in value importance ratings (Hanel, Maio, & Manstead, in press; Schwartz & Bardi, 2001), value structure (Schwartz, 1992; Schwartz & Sagiv, 1995, Schwartz et al., 2012), and some similarities in value

instantiations (Hanel, Maio, et al., 2018), I expect that my findings will be replicated in the future.

Finally, one important question that can be raised is regarding the number of participants in the studies of my thesis, ranging from 69 to 167. Although a higher number is always desired, because of limited resources, the samples had to be restricted to these numbers. However, the fact that prior results have been replicated indicates that the sample sizes were sufficient, and the participants were representative.

Future studies

Future studies could test whether my findings are moderated by individual differences. For instance, consider that in a hypothetical study, I divided the sample regarding individual levels of need for cognition (NFC), low and high. Need for cognition refers to the individuals' inclination towards activities that demand cognitive effort (e.g., playing chess, resolving math problems; Cacioppo & Petty, 1982). It is possible that, when mapping values or behaviours dividing the sample based on the NFC levels, the spatial planes could present slightly different distributions. Individuals higher in NFC could present a spatial plane with the values distributed in a more systematic way (i.e., according to Schwartz's model). These differences can also happen regarding how individuals relate to others, with some preferring to act individually rather than in a group (individualism and collectivism). More collectivist people could highly relate the value wealth to helpful and\or social justice, something not necessarily expected from individualistic individuals. Therefore, while I did not test for individual differences in this thesis – the sample sizes were too small –, it is important to highlight that the use of such variables could result in different spatial planes, and that this could benefit further studies. Research could investigate whether such individual differences would generate distinct patterns of value similarities, and

consequently, novel spatial planes. In importance ratings, however, these differences are unlikely to influence the final spatial distribution, only influencing the value endorsement levels.

Another important point that can be useful for future research is how some group of behaviours were more clustered than others across the studies. For instance, despite their spatial mixing with behaviours from other higher order values, self-transcendence behaviours (e.g., *Nurses taking care of patients in hospital*, BE1; *Social workers helping people in their local communities*, UN2) were consistently positioned together, more clustered, suggesting a higher congruence between the behaviours that constitute this higher order value. Therefore, the variability when assessing good examples of such value types is smaller when compared to others, suggesting they have more solid core features. Is this an influence of the behaviours in isolation, or are self-transcendence characteristics more well formed in comparison to the other higher order values? In my studies, individuals interpreted the behaviours derived from other higher order values more broadly, which could suggest more general characteristics to them. As a result, these behaviours were less clustered in their position. These differences in how clustered the behaviours are can raise some interesting points. For instance, whether the higher order value from the behaviours are more widely spread could be further divided into other value types. Is it possible that these less clustered behaviours present specific characteristics that differentiate them and that could be useful to distinguish a new value type? Such findings could contribute with Schwartz's refined theory (Schwartz et al., 2012). Future research can also benefit from this clustered consistency presented by self-transcendence exemplars of behaviours. It is likely that different behaviours would show higher congruence when assessing the predictive power of different values. For instance, imagine that we want to assess the predictive

power of wealth (self-enhancement) to two self-enhancement behaviours. Not necessarily will the predictive power be high for both, as the behaviours from this value type were widely spread across the spatial planes. Now imagine that we want to assess the predictive power of helpful (self-transcendence), and two behaviours corresponding to this higher order value. Differently from the previous example, it is more likely that the predictive power will be somewhat similar for both behaviours, once they were more clustered across the spatial planes – and therefore, are more alike in their core characteristics. These may be useful questions for future research.

Future research can also benefit by the fact that the use of direct judgments of similarities can aid theory development. This methodology can be applied not only using Schwartz's value model, but also other (circular) models, such as the circumplex model of goal content (Grouzet et al., 2005), the interpersonal circumplex (Wiggins & Pincus, 1989), the circumplex model of affect (Posner, Russell, & Peterson, 2005), or personality traits (McCrae & Costa, 2003). It might also lead to the identification of a new dimension, as previously done by Koch et al. (2016), who modified the stereotype content model also using SPaM.

In fact, similarity judgments can also be used to compare different constructs, like I did in Chapter 3. For instance, one can focus on the emotional aspect linked with attitudes, instead of behaviours linked with values. Imagine a task where participants would be presented with different emotions (e.g., love, happiness, fear), and asked to make comparisons to attitudes towards different types of animals. One that might have positive attitudes towards dogs or cats that could indicate a higher similarity of these attitudes to emotions such as happiness or love, because of a hypothetical personal attachment in the past, while others could have negative attitudes towards them, and associate them to fear, because of being bitten when a kid. Therefore, it is possible to

map different constructs based on cognitive interpretations of how similar they are. In this example, it would be expected there would separation between positive and negative attitudes and emotions, and within these there could also be further distinctions – but this would need further exploration.

Take the Big-5 personality traits as an example of how the methods proposed in Chapter 2 might advance our understanding of important psychological constructs. The five dimensions are usually confirmed through factor analysis based on ratings of how accurately people describe themselves on various attributes such as bold, creative, imaginative, or selfish (e.g., Goldberg, 1992; Saucier, 1994). However, the self-ratings of the Big-5 are influenced by social desirability (e.g., Bäckström, 2007); even rephrasing the items more neutrally did not fully eliminate social desirability (Bäckström, Björklund, & Larsson, 2009). Using similarity judgements would eliminate social desirability because participants are not asked to make statements about themselves, rather about how words are connected.

Finally, similarity judgements could also be used to further integrate different personality constructs such as values and traits (Fischer & Boer, 2015; Parks-Leduc et al., 2015) to avoid problems with social desirability and also to test to what extent participants distinguish between values and traits. If participants distinguish between values and traits on an abstract level (abstract ideals that ostensibly help to guide behaviour vs how a person regularly acts; Maio, 2016), values and traits will form two more distinct regions in a spatial plane. In contrast, if participants do not distinguish between them, values and traits will be more mixed.

Conclusion

My research provided the first direct assessment of value similarity based on their conceptual representation, and how these are associated to value-expressive

behaviours. That is, the similarities underlying values and behaviours based on how individuals interpret them. With an exploratory character, it was unclear whether these judgments would generate a spatial plan that resembled the structure from Schwartz's model of human values. Results provided direct and indirect support for it. Across a range of new methods, I found that Schwartz's model can be directly replicated across and within participants. When I assessed Schwartz's model indirectly by investigating the structure of value-expressive behaviours, I found that participants made similar distinctions between behaviours that were based on the two value dimensions as they did for the value themselves. Thus, not only values can be structured based on their underlying motivations but also value-expressive behaviours.

Appendix

Table of Contents

Overview

The **Scree Plot** was used to assess the number of dimensions across the studies performed in my thesis. For that, I considered the Stress-I values over four different configurations, of the spatial planes with one to four dimensions.

The **Stress-per-point** tables indicate the contribution of each value\behaviour individually to the normalized raw stress ($\sqrt{n.r.s}$ = Stress-I).

The **Shepard plots** (also known as Shepard diagrams) indicate how far the data points are from each other before versus after being transformed in space. Ideally, these points should be placed on a straight ascending line (x=y).

Scree plots (1D, 2D, 3D, 4D)

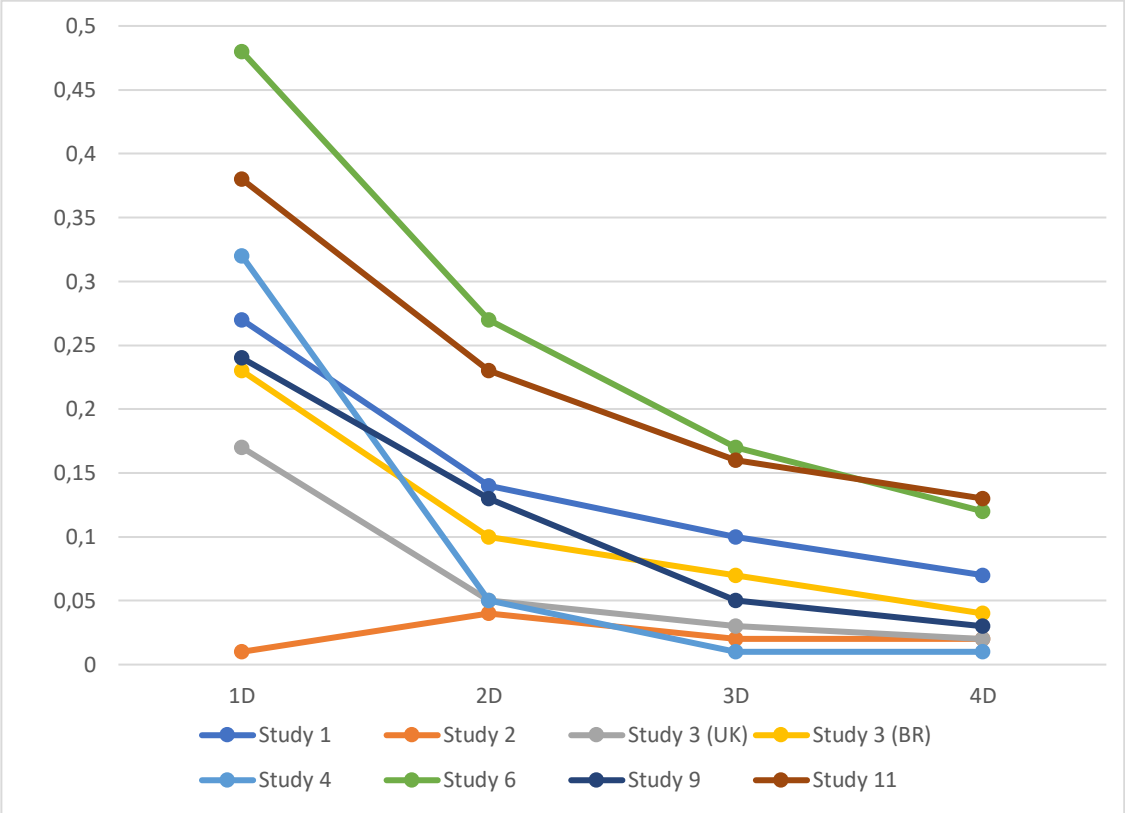

Figure a.1. Scree plots based on the Stress-I points over the studies multiple configurations (1D, 2D, 3D, 4D).

Chapter 2: Study 1

Table a.1.

Stress-per-point values.

		Source SRC_1	Mean
Object	Ambition	,0076	,0076
	Equality	,0108	,0108
	Exciting_Life	,0139	,0139
	Freedom	,0292	,0292
	Helpful	,0204	,0204
	Independent	,0159	,0159
	Intelligent	,0261	,0261
	National_Security	,0234	,0234
	Obedient	,0231	,0231

	Pleasure	,0188	,0188
	Preserving_Public_Image	,0184	,0184
	Respect_Tradition	,0180	,0180
	Self_Respect	,0430	,0430
	Social_Justice	,0070	,0070
	Social_Order	,0186	,0186
	Wealth	,0401	,0401
Mean		,0209	,0209

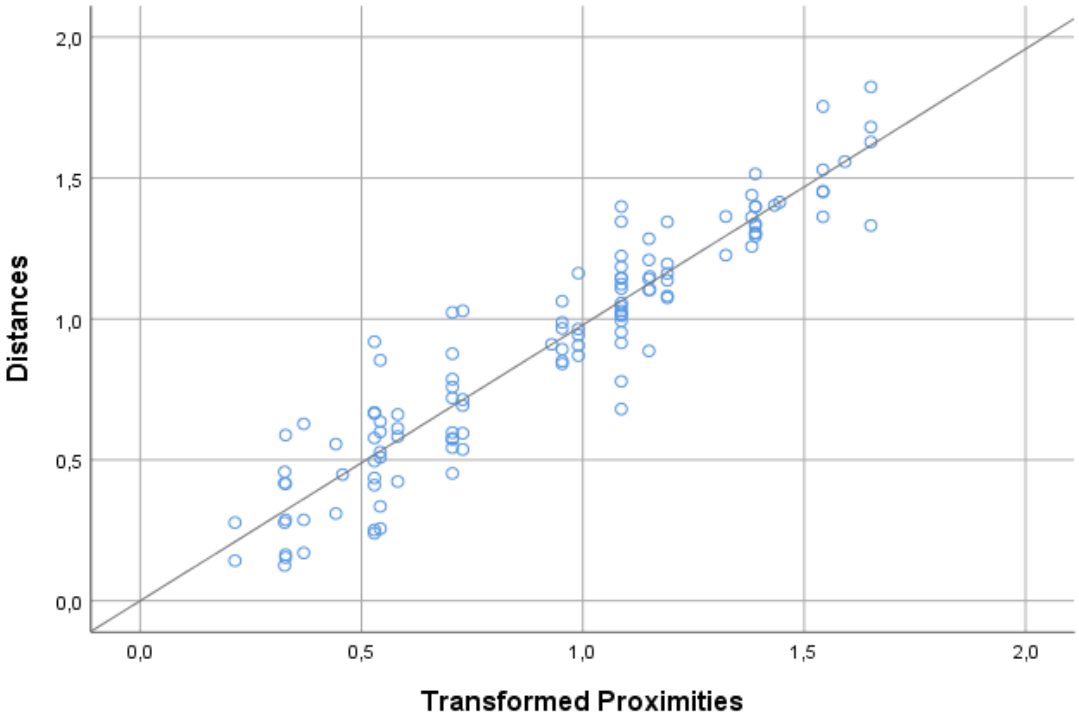

Figure a.2. Shepard plot, Study 1.

Chapter 2: Study 2

United Kingdom.

Table a.2.

Stress-per-point values.

		Source SRC_1	Mean
Object	Universalism	,0009	,0009
	Self_Direction	,0024	,0024

	Stimulation	,0019	,0019
	Hedonism	,0007	,0007
	Achievement	,0024	,0024
	Power	,0018	,0018
	Security	,0023	,0023
	Tradition	,0030	,0030
	Conformity	,0032	,0032
	Benevolence	,0009	,0009
Mean		,0020	,0020

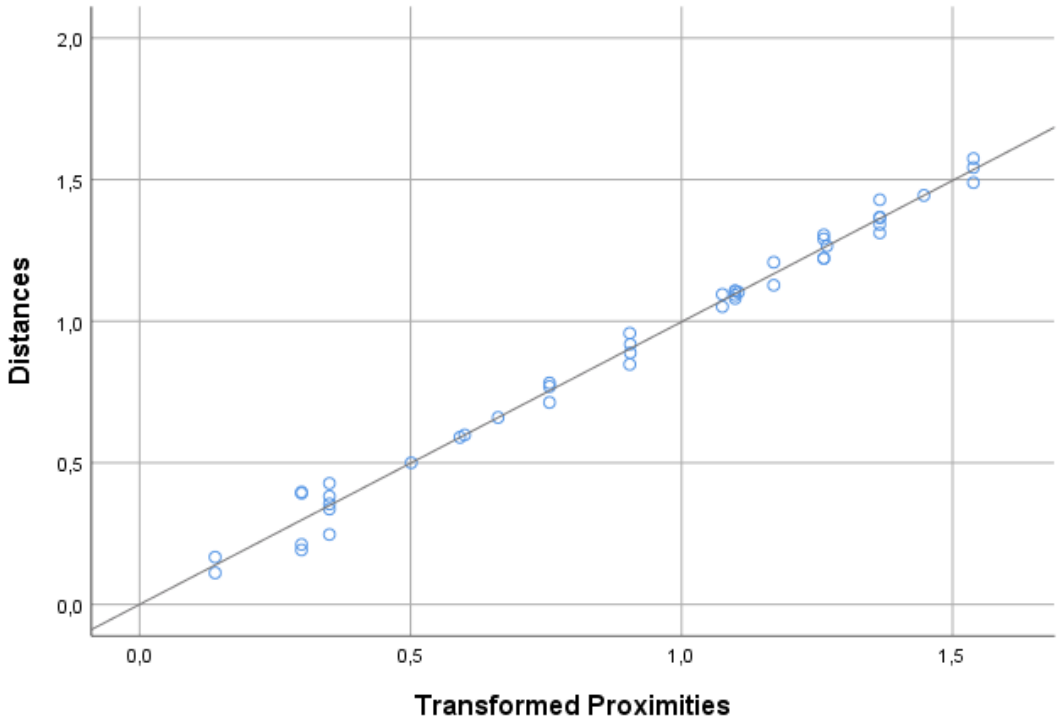

Figure a.2. Shepard plot, Study 2 (UK).

Brazil.

Table a.3.

Stress-per-point values.

		Source SRC_1	Mean
Object	Universalism	,0019	,0019
	Self_Direction	,0016	,0016
	Stimulation	,0021	,0021
	Hedonism	,0030	,0030

	Achievement	,0015	,0015
	Power	,0026	,0026
	Security	,0033	,0033
	Tradition	,0027	,0027
	Conformity	,0024	,0024
	Benevolence	,0020	,0020
Mean		,0023	,0023

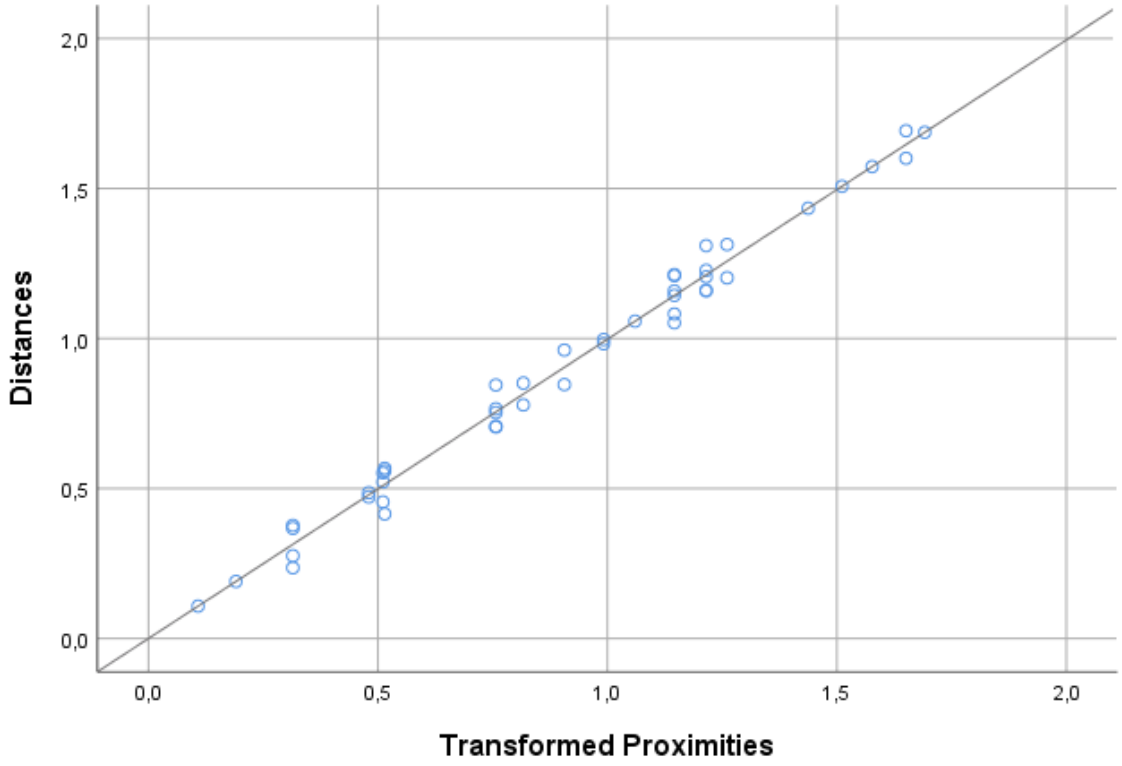

Figure a.3. Shepard plot, Study 2 (BR).

Chapter 2: Study 3

Table a.4.

Stress-per-point values.

		Source SRC_1	Mean
Object	A_spiritual_life	,0169	,0169
	A_varied_life	,0048	,0048
	A_world_at_peace	,0094	,0094
	A_world_of_beauty	,0170	,0170
	Accepting_my_portion_in_life	,0076	,0076

	Ambitious	,0030	,0030
	An_exciting_life	,0047	,0047
	Authority	,0090	,0090
	Broadminded	,0125	,0125
	Capable	,0042	,0042
	Choosing_own_goals	,0038	,0038
	Clean	,0312	,0312
	Creativity	,0054	,0054
	Curious	,0079	,0079
	Daring	,0070	,0070
	Devout	,0175	,0175
	Enjoying_life	,0050	,0050
	Equality	,0074	,0074
	Family_security	,0072	,0072
	Forgiving	,0048	,0048
	Freedom	,0046	,0046
	Healthy	,0150	,0150
	Helpful	,0078	,0078
	Honest	,0047	,0047
	Honoring_of_parents_and_elders	,0040	,0040
	Humble	,0078	,0078
	Independent	,0032	,0032
	Influential	,0193	,0193
	Inner_harmony	,0072	,0072
	Intelligent	,0072	,0072
	Loyal	,0060	,0060
	Mature_love	,0085	,0085
	Meaning_in_life	,0046	,0046
	Moderate	,0062	,0062
	National_security	,0177	,0177
	Obedient	,0055	,0055
	Pleasure	,0053	,0053
	Politeness	,0061	,0061
	Preserving_my_public_image	,0169	,0169
	Privacy	,0262	,0262
	Protecting_the_environment	,0059	,0059
	Reciprocation_of_favors	,0046	,0046

	Respect_for_tradition	,0138	,0138
	Responsible	,0154	,0154
	Self_discipline	,0156	,0156
	Self_respect_	,0053	,0053
	Self_indulgent	,0082	,0082
	Sense_of_belonging	,0227	,0227
	Social_justice	,0114	,0114
	Social_order	,0096	,0096
	Social_power	,0135	,0135
	Social_recognition	,0094	,0094
	Successful	,0029	,0029
	True_friendship	,0094	,0094
	Unity_with_nature	,0163	,0163
	Wealth	,0059	,0059
	Wisdom	,0203	,0203
Mean		,0098	,0098

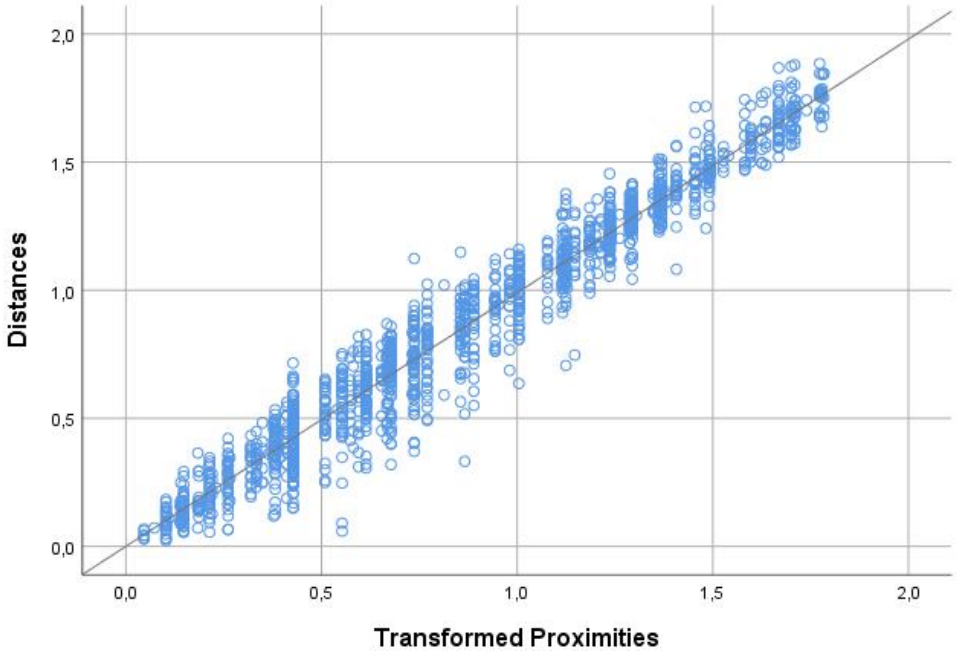

Figure a.4. Shepard plot, Study 3.

Chapter 2: Study 4

Table a.5.

Stress-per-point values.

		Source SRC_1	Mean
Object	Ambitious	,0012	,0012
	Capable	,0007	,0007
	Influential	,0023	,0023
	Intelligent	,0010	,0010
	Successful	,0018	,0018
	A_spiritual_life	,0015	,0015
	Forgiving	,0014	,0014
	Helpful	,0010	,0010
	Honest	,0014	,0014
	Loyal	,0030	,0030
	Mature_love	,0007	,0007
	Meaning_in_life	,0009	,0009
	Responsible	,0016	,0016
	True_friendship	,0013	,0013
	Honoring_of_parents_and_elders	,0021	,0021
	Obedient	,0047	,0047
	Politeness	,0019	,0019
	Self_discipline	,0071	,0071
	Enjoying_life	,0012	,0012
	Pleasure	,0009	,0009
	Self_indulgent	,0007	,0007
	Authority	,0008	,0008
	Preserving_my_public_image	,0026	,0026
	Social_power	,0023	,0023
	Social_recognition	,0072	,0072
	Wealth	,0021	,0021
	Choosing_own_goals	,0030	,0030
	Creativity	,0024	,0024
	Curious	,0016	,0016
	Freedom	,0012	,0012
	Independent	,0024	,0024
	Privacy	,0026	,0026

	Self_respect_	,0013	,0013
	Clean	,0024	,0024
	Family_security	,0026	,0026
	Healthy	,0042	,0042
	National_security	,0025	,0025
	Reciprocation_of_favors	,0106	,0106
	Sense_of_belonging	,0149	,0149
	Social_order	,0028	,0028
	A_varied_life	,0015	,0015
	An_exciting_life	,0019	,0019
	Daring	,0065	,0065
	Accepting_my_portion_in_life	,0171	,0171
	Devout	,0024	,0024
	Humble	,0028	,0028
	Moderate	,0053	,0053
	Respect_for_tradition	,0043	,0043
	A_world_at_peace	,0022	,0022
	A_world_of_beauty	,0009	,0009
	Broadminded	,0036	,0036
	Equality	,0020	,0020
	Inner_harmony	,0007	,0007
	Protecting_the_environment	,0031	,0031
	Social_justice	,0015	,0015
	Unity_with_nature	,0093	,0093
	Wisdom	,0011	,0011
Mean		,0031	,0031

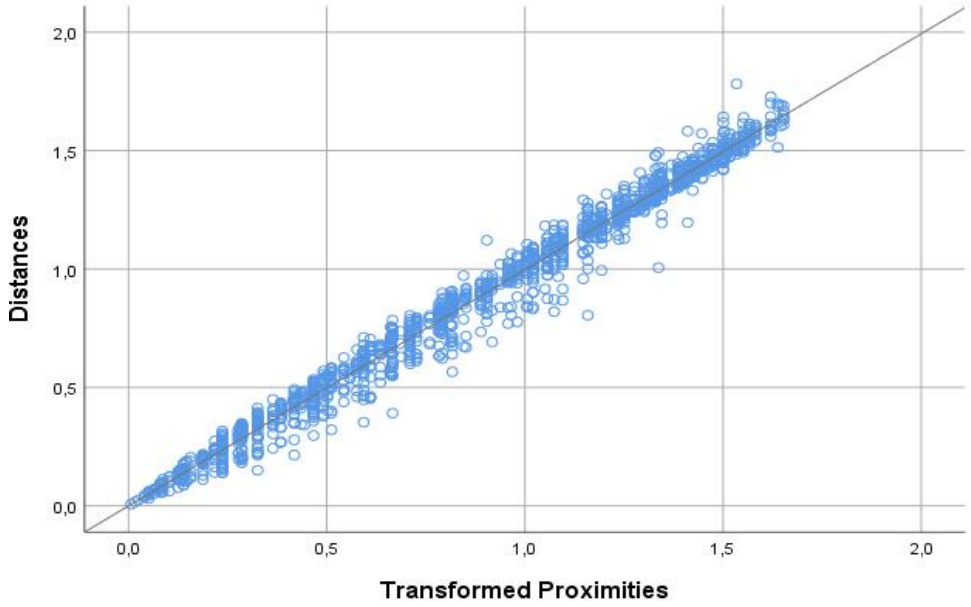

Figure a.5. Shepard plot, Study 4.

Chapter 2: Study 6

Table a.6.

Stress-per-point values.

		Source SRC_1	Mean
Object	A_spiritual_life	,1000	,1000
	A_varied_life	,0840	,0840
	A_world_at_peace	,0601	,0601
	A_world_of_beauty	,0741	,0741
	Accepting_my_portion_in_life	,1323	,1323
	Ambitious	,0494	,0494
	An_exciting_life	,0712	,0712
	Authority	,1115	,1115
	Broadminded	,0740	,0740
	Capable	,0414	,0414
	Choosing_own_goals	,0701	,0701
	Clean	,0661	,0661
	Creativity	,0873	,0873
	Curious	,0582	,0582
	Daring	,0540	,0540
	Devout	,1176	,1176
	Enjoying_life	,0787	,0787

	Equality	,0884	,0884
	Family_security	,1060	,1060
	Forgiving	,0354	,0354
	Freedom	,0963	,0963
	Healthy	,1083	,1083
	Helpful	,0569	,0569
	Honest	,0335	,0335
	Honoring_of_parents_and_elders	,0695	,0695
	Humble	,0273	,0273
	Independent	,0317	,0317
	Influential	,1113	,1113
	Inner_harmony	,0952	,0952
	Intelligent	,0375	,0375
	Loyal	,0417	,0417
	Mature_love	,1005	,1005
	Meaning_in_life	,1015	,1015
	Moderate	,1048	,1048
	National_security	,0853	,0853
	Obedient	,0698	,0698
	Pleasure	,0547	,0547
	Politeness	,0436	,0436
	Preserving_my_public_image	,0879	,0879
	Privacy	,1137	,1137
	Protecting_the_environment	,0650	,0650
	Reciprocation_of_favors	,1312	,1312
	Respect_for_tradition	,0971	,0971
	Responsible	,0396	,0396
	Self_discipline	,0830	,0830
	Self_respect	,0728	,0728
	Self_indulgent	,0446	,0446
	Sense_of_belonging	,0797	,0797
	Social_justice	,0716	,0716
	Social_order	,0962	,0962
	Social_power	,0770	,0770
	Social_recognition	,0891	,0891
	Successful	,0573	,0573
	True_friendship	,0778	,0778

	Unity_with_nature	,0758	,0758
	Wealth	,0694	,0694
	Wisdom	,0718	,0718
Mean		,0760	,0760

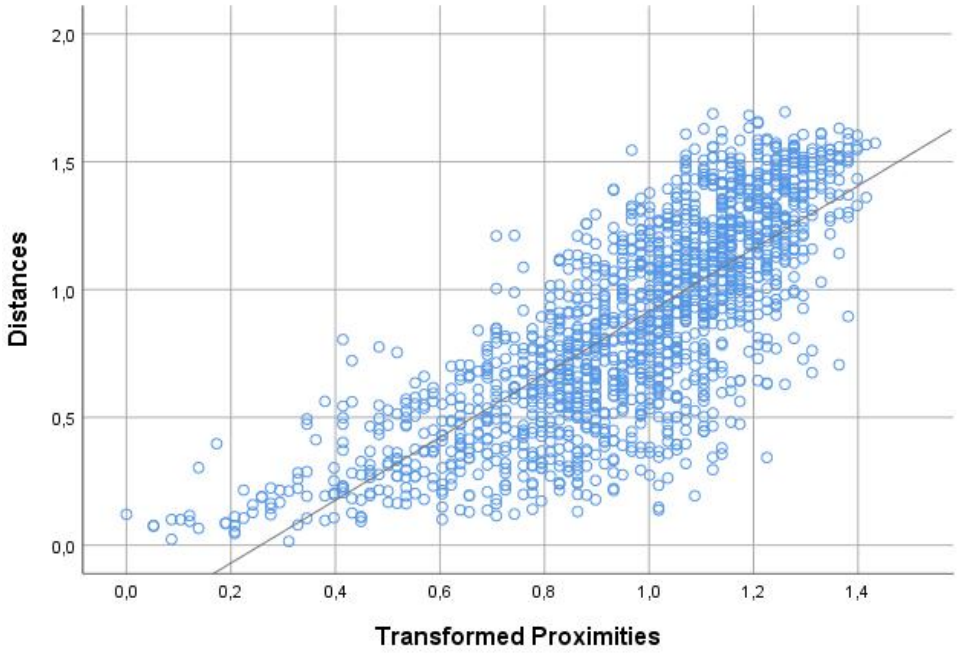

Figure a.6. Shepard plot, Study 6.

Chapter 3: Study 10.

Table a.7.

Stress-per-point values.

		Source SRC_1	Mean
Object	AC01	,0061	,0061
	AC02	,0042	,0042
	AC03	,0093	,0093
	AC04	,0155	,0155
	BE01	,0118	,0118
	BE02	,0058	,0058
	BE03	,0204	,0204
	BE04	,0110	,0110
	CO01	,0216	,0216
	CO02	,0143	,0143
	CO03	,0041	,0041
	CO04	,0082	,0082

	HED01	,0083	,0083
	HED02	,0050	,0050
	HED03	,0137	,0137
	HED04	,0195	,0195
	PO01	,0126	,0126
	PO02	,0163	,0163
	PO03	,0097	,0097
	PO04	,0109	,0109
	SD01	,0047	,0047
	SD02	,0070	,0070
	SD03	,0095	,0095
	SD04	,0156	,0156
	SE01	,0153	,0153
	SE02	,0134	,0134
	SE03	,0054	,0054
	SE04	,0113	,0113
	ST01	,0039	,0039
	ST02	,0065	,0065
	ST03	,0092	,0092
	ST04	,0053	,0053
	TR01	,0687	,0687
	TR02	,0666	,0666
	TR03	,0184	,0184
	TR04	,0254	,0254
	UN01	,0296	,0296
	UN02	,0255	,0255
	UN03	,0427	,0427
	UN04	,0273	,0273
Mean		,0160	,0160

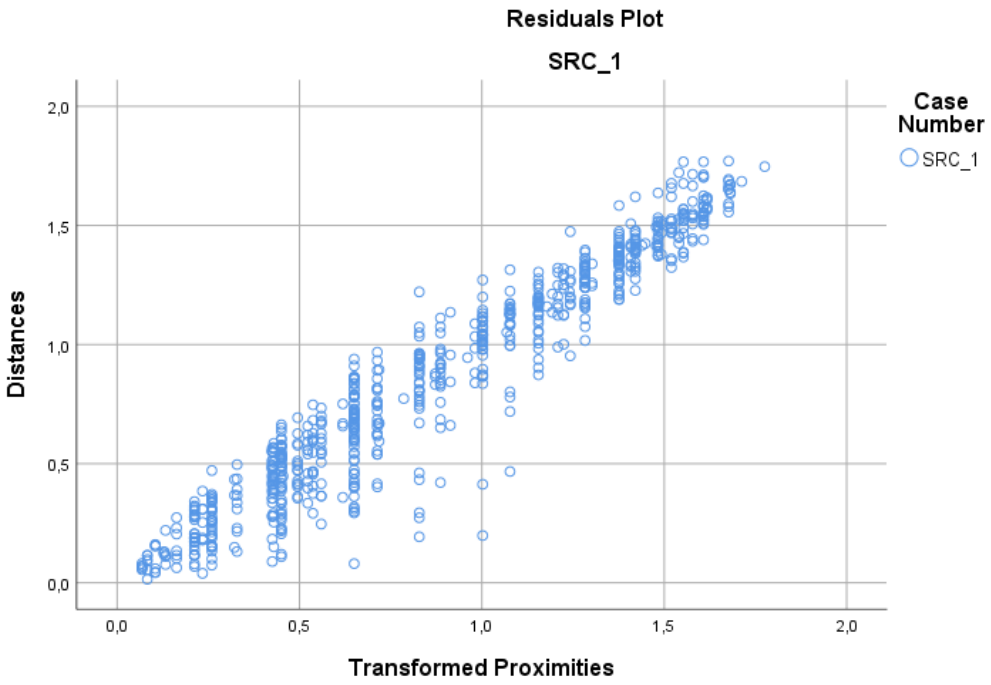

Figure a.7. Shepard plot, Study 10.

Chapter 3: Study 11.

Table a.8.

Stress-per-point values.

		Source SRC_1	Mean
Object	SD01	,0418	,0418
	SD03	,0727	,0727
	SD04	,0417	,0417
	SD02	,0428	,0428
	UN02	,0344	,0344
	UN04	,0238	,0238
	UN03	,0619	,0619
	UN01	,1011	,1011
	ST02	,0332	,0332
	ST03	,0347	,0347
	ST01	,0403	,0403
	ST04	,0514	,0514
	HED04	,0675	,0675
	HED03	,0723	,0723
	HED02	,0643	,0643
	HED01	,0321	,0321

	AC02	,0602	,0602
	AC01	,0520	,0520
	AC03	,0745	,0745
	AC04	,0204	,0204
	PO03	,0457	,0457
	PO01	,0376	,0376
	PO04	,0319	,0319
	PO02	,0668	,0668
	SE02	,0507	,0507
	SE03	,0412	,0412
	SE04	,0448	,0448
	SE01	,0507	,0507
	TR02	,1033	,1033
	TR03	,0805	,0805
	TR01	,1347	,1347
	TR04	,0501	,0501
	CO04	,0843	,0843
	CO01	,0690	,0690
	CO02	,0484	,0484
	CO03	,0544	,0544
	BE04	,0371	,0371
	BE01	,0385	,0385
	BE03	,0652	,0652
	BE02	,0344	,0344
Mean		,0548	,0548

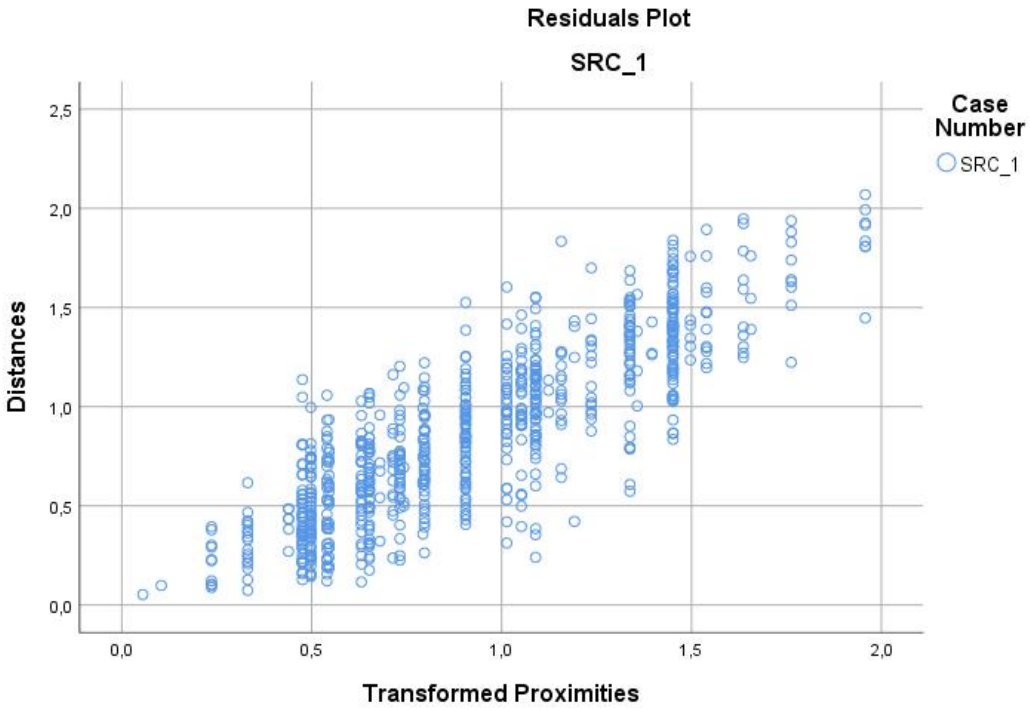

Figure a.8. Shepard plot, Study 11.

Supplementary Studies

Chapter 3: Pilot Study

To provide the behaviours used in the set of studies in Chapter 3, I performed this pilot study. Participants were asked to generate examples of hypothetical situations for each of the ten value types from Schwartz's (1992) model (e.g., *Achievement*, *Benevolence*), following the method previously used by Hanel, Maio, et al., 2018 (Study 1). Participants were asked to provide different actors to the situation (participants), actions (behaviours), and places (locality). Not all this information was used to develop the behaviours used in the studies, but they were used as a basis to specify the most typical situations. Knowing the typical behaviours for a culture is an important step to further assess their relations with human values.

Method.

Participants. One hundred four British citizens with mean age of 36.14 (*SD* = 12.63), with 65 women (62.5%) and 39 men (37.5%). More than half (56.7%) of the participants had finished at least an undergraduate university program. The study was run online on Prolific and participants were compensated with approximately the minimum wage. All participants successfully passed the Instruction Manipulation Check (IMC; Oppenheimer et al., 2009), which tests whether participants read instructions.

Material and Procedure. Participants were asked to give two examples of hypothetical situations in which they considered the value types from Schwartz theory (e.g., Benevolence, Universalism, Power) to be relevant. For each situation, participants listed examples of individuals (people), an action (behaviour), and a place (locality). They were randomly presented with five of the ten value types to avoid fatigue or boredom. One example can be seen in Figure 1.

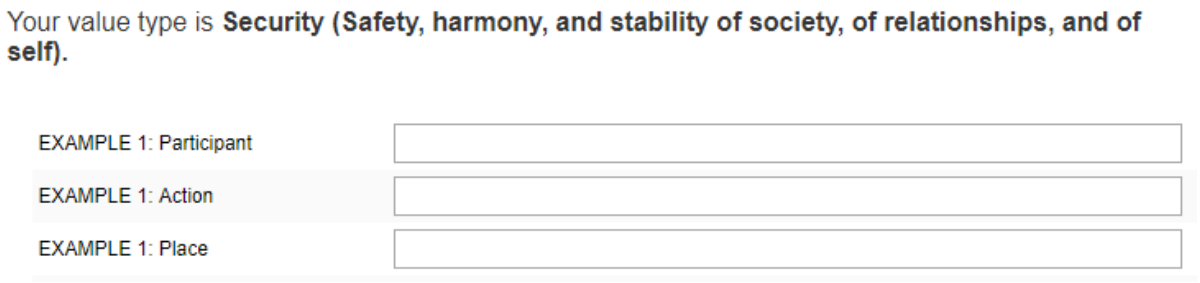

Figure 1. Example of task performed in the pilot study.

Results.

To summarize the frequency of different words used for each value type, a free online text analysis tool was used (http://textalyser.net/index.php?lang=en#analysis). I analysed words with two or more characters, not considering English stop words (e.g., are, am, be, some, and). I only discuss and list words that were mentioned at least three times. These frequency tests were performed for each value type, separately for all three sections (characters, action, and place).

Next, I generated examples that were used in the following studies. For this purpose, I considered the most frequently mentioned words, aiming for a total of four examples of each value type. When a word did not seem appropriate to me in the context of the value type, less frequently mentioned words were considered. Participants sometimes mentioned nouns or adjectives in the action section (e.g., child, new, mountains), but these words occasionally helped to clarify the context of the situations better and facilitated generating examples. Also, because I was primarily seeking actions, the generated examples did not always contain people or places. Finally, because the characters and places given by the participants were sometimes quite regular or general across the value types (e.g., school, hospital, teacher, child, doctor, person), I also considered less frequently mentioned situations and actions to avoid repetition in the final example set.

The study generated approximately 100 examples for each value type. Due the length of the tables and results, below I only report the most frequently mentioned words, and the four behaviours\instantiations generated, separately for each value type.

Self-direction (independent thought and action-choosing, creating, exploring)

The most frequently mentioned characters were *child* (9 times), *artist* (8 times), *student* (7 times), and *author* (4 times). *School* (8 times), *studio* (7 times), *home* (6 times), and *office* (6 times) were the most frequently mentioned places. The most frequently mentioned action word, *new* (11 times), is an adjective and was therefore not considered as central for the examples. *Choosing* (7 times), *creating* (7 times), *writing* (6 times), and *travelling* (5 times) were the most often mentioned actions. However, to develop a more comprehensive example with the participants and place, *drawing* (5 times) and *painting* (4 times) were considered, instead of *choosing* and *travelling*. The examples for future studies were (1) Artists creating a new painting design, (2) Children drawing a picture at home, (3) Students learning at school, and (4) Authors writing a new book.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
child	9	8.3%	1	new	11	4.6%	1	school	8	6.3%	1
artist	8	7.3%	2	choosing	7	2.9%	2	studio	7	5.6%	2
student	7	6.4%	3	creating	7	2.9%	2	home	6	4.8%	3
author	4	3.7%	4	writing	6	2.5%	3	office	6	4.8%	3
traveler	4	3.7%	4	travelling	5	2.1%	4	mountains	4	3.2%	4
musician	3	2.8%	5	drawing	5	2.1%	4	shop	3	2.4%	5
architect	3	2.8%	5	painting	4	1.7%	5	library	3	2.4%	5
person	3	2.8%	5	book	4	1.7%	5	university	3	2.4%	5
teacher	3	2.8%	5	making	4	1.7%	5				
				picture	3	1.3%	6				
				climbing	3	1.3%	6				
				play	3	1.3%	6				
				learning	3	1.3%	6				
				art	3	1.3%	6				
				mountain	3	1.3%	6				

Universalism (understanding, appreciation, tolerance, and protection for the welfare of all people and for nature)

For Universalism, *worker* and *teacher* (7 times each) were the most frequently mentioned characters, followed by *doctor* and *environmentalist* (5 times each). *School*

and *home* (7 times), *centre* (6 times), and *hospital*, *garden*, *university*, *local*, and *park* (4 times each) were the most frequently mentioned places. For the actions, *caring* (6 times), and *planting*, *protesting*, *giving*, and *helping* (5 times) were the most often cited. The examples generated were (1) social workers helping people in their local communities, (2) teachers helping students at school, (3) zookeepers taking care of animals, and (4) environmentalists planting new trees in the forest.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
worker	7	5.1%	1	caring	6	2.2%	1	school	7	4.7%	1
teacher	7	5.1%	1	planting	5	1.9%	2	home	7	4.7%	1
doctor	5	3.7%	2	protesting	5	1.9%	2	centre	6	4%	2
environmentalist	5	3.7%	2	helping	5	1.9%	2	hospital	4	2.7%	3
police	4	2.9%	3	animals	5	1.9%	2	garden	4	2.7%	3
conservationist	4	2.9%	3	giving	5	1.9%	2	university	4	2.7%	3
social	4	2.9%	3	trees	4	1.5%	3	local	4	2.7%	3
zookeeper	3	2.2%	4	people	4	1.5%	3	park	4	2.7%	3
carer	3	2.2%	4	meeting	4	1.5%	3	parliament	3	2%	4
nurse	3	2.2%	4	looking	4	1.5%	3	forest	3	2%	4
				community	3	1.1%	4	office	3	2%	4
				listening	3	1.1%	4	zoo	3	2%	4
				performing	3	1.1%	4	church	3	2%	4
				elderly	3	1.1%	4				

Stimulation (excitement, novelty, and challenge in life)

The most frequently mentioned characters were *climber* (9 times), *child* (8 times), *skydiver* (6 times), and *student* (5 times). *Mountain* (17 times), *park* (7 times), *home* (5 times), and *university* (4 times) were the most frequently mentioned places. For the actions, c*limbing* (10 times), *playing* (7 times), *jumping* (7 times), and *running* (6 times) were cited the most often. For a better diversity of examples, *driver* (3 times) was also considered as a character, and *plane* and *track* (3 times each) were considered as places. The examples generated were (1) Adventurers climbing a mountain, (2) Children playing at the park, (3) Skydivers jumping from a plane, and (4) Athletes running on a track.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
climber	9	6.3%	1	climbing	10	4.2%	1	mountain	17	10.3 %	1
child	8	5.6%	2	playing	7	2.9%	2	park	7	4.3%	2
skydiver	6	4.2%	3	jumping	7	2.9%	2	home	5	3%	3
student	5	3.5%	4	mountain	6	2.5%	3	university	4	2.4%	4
gamer	4	2.8%	5	running	6	2.5%	3	house	3	1.8%	5
woman	3	2.1%	6	new	6	2.5%	3	high	3	1.8%	5

driver	3	2.1%	6	skydiving	5	2.1%	4	plane	3	1.8%	5
thrillseeker	3	2.1%	6	going	4	1.7%	5	school	3	1.8%	5
rock	3	2.1%	6	plane	4	1.7%	5	track	3	1.8%	5
teenager	3	2.1%	6	rollercoaster	3	1.3%	6	office	3	1.8%	5
footballer	3	2.1%	6	learning	3	1.3%	6	new	3	1.8%	5
runner	3	2.1%	6	starting	3	1.3%	6				
athlete	3	2.1%	6	swimming	3	1.3%	6				
mountain	3	2.1%	6								

Hedonism (pleasure and sensuous gratification for oneself)

The most common characters were *myself* (7 times), *person* (5 times), *student* (5 times), and *woman* (4 times). The common places were *home* (12 times), *anywhere* (5 times), *restaurant* (4 times), and *studio* (4 times). For the actions, *eating* (9 times), *drinking* (8 times), and *having*, *winning*, and *playing* (4 times) were most often cited. *Gamer\teenager* (3 times each) were common characters, *going* (3 times) was also a frequent action and *club\beach\pub* (3 times each) were other common places. The examples generated were (1) people eating at a restaurant, (2) teenagers having a drink in a pub, (3) gamers playing at home, and (4) people going to a club or beach.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
myself	7	6%	1	eating	9	4.3%	1	home	12	9%	1
person	5	4.3%	2	drinking	8	3.8%	2	anywhere	5	3.7%	2
student	5	4.3%	2	having	4	1.9%	3	restaurant	4	3%	3
woman	4	3.4%	3	winning	4	1.9%	3	studio	4	3%	3
gamer	3	2.6%	4	playing	4	1.9%	3	club	3	2.2%	4
teenager	3	2.6%	4	going	3	1.4%	4	beach	3	2.2%	4
man	3	2.6%	4	life	3	1.4%	4	pub	3	2.2%	4
child	3	2.6%	4	chocolate	3	1.4%	4				
adult	3	2.6%	4	living	3	1.4%	4				
				taking	3	1.4%	4				
				shopping	3	1.4%	4				
				painting	3	1.4%	4				
				massage	3	1.4%	4				
				music	3	1.4%	4				

Achievement (personal success through demonstrating competence according to social standards)

The most frequently mentioned characters were *student* (23 times), *athlete* (9 times), *worker* (7 times), and *teacher* (6 times). For place, *university* (20 times), *school* (11 times), *workplace* (10 times), and *stadium* (6 times) were the most frequently mentioned. For the actions, *graduating* (11 times), *winning* (10 times), *promotion* (7

times), and *teaching* (6 times) were the most often cited. For better diversity, Olympics (4 times) was considered as place. Also, workplace was replaced by office, and teaching was adapted to avoid duplication. The examples generated were (1) students graduating from university, (2) athletes winning the Olympics, (3) employees getting a promotion at work, and (4) teachers accomplishing their duties at school.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
student	23	17.7%	1	graduating	11	4.8%	1	university	20	14.7 %	1
athlete	9	6.9%	2	winning	10	4.3%	2	school	11	8.1%	2
worker	7	5.4%	3	promotion	7	3%	3	workplace	10	7.4%	3
teacher	6	4.6%	4	teaching	6	2.6%	4	stadium	6	4.4%	4
employee	5	3.8%	5	exams	6	2.6%	4	hospital	6	4.4%	4
man	4	3.1%	6	passing	5	2.2%	5	Olympics	4	2.9%	5
driver	3	2.3%	7	getting	5	2.2%	5	office	4	2.9%	5
learner	3	2.3%	7	running	4	1.7%	6	track	3	2.2%	6
footballer	3	2.3%	7	competing	4	1.7%	6	sports	3	2.2%	6
				doing	4	1.7%	6	studio	3	2.2%	6
				studying	3	1.3%	7				
				results	3	1.3%	7				
				race	3	1.3%	7				
				work	3	1.3%	7				
				medal	3	1.3%	7				
				degree	3	1.3%	7				
				driving	3	1.3%	7				

Power (social status and prestige, control or dominance over people and resources)

The most frequently mentioned characters were *manager* (12 times), *Prime minister* (10 times), *teacher* (10 times), and *politician* (9 times). *Workplace* (15 times), *school* (10 times), *parliament* (8 times), and *house* (5 times) were the most frequently mentioned places. For the actions, *making* (12 times), *deciding\decisions* (7 times), *speaking\speech*, *meeting*, and *teaching* (5 times each) were the most often cited. *Disciplining* and *giving* (3 times), and *town hall (*4 and 3, respectively) were considered as actions and place. The examples generated were (1) managers chairing a meeting at the workplace, (2) prime-ministers or presidents making decisions at parliament, (3) teachers disciplining students at school, and (4) politicians giving speeches in town halls.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
manager	12	7.9%	1	making	12	4.7%	1	workplace	15	9.7%	1
prime	10	6.6%	2	deciding or decisions	7	2.8%	2	school	10	6.5%	2
minister	10	6.6%	2	speech	5	1.9%	3	parliament	8	5.2%	3

teacher	10	6.6%	2	meeting	5	1.9%	3	house	5	3.2%	4
politician	9	6%	3	teaching	5	1.9%	3	court	4	2.6%	5
officer	8	5.3%	4	do	3	1.2%	4	town	4	2.6%	5
police	7	4.6%	5	you	3	1.2%	4	hall	3	1.9%	6
head	6	4%	6	giving	3	1.2%	4	office	3	1.9%	6
judge	4	2.6%	7	voting	3	1.2%	4	company	3	1.9%	6
president	4	2.6%	7	disciplining	3	1.2%	4	country	3	1.9%	6
boss	3	2%	8	arresting	3	1.2%	4	centre	3	1.9%	6
lecturer	3	2%	8	country	3	1.2%	4	white	3	1.9%	6
ceo	3	2%	8	work	3	1.2%	4	hospital	3	1.9%	6
mp	3	2%	8					street	3	1.9%	6

Security (safety, harmony, and stability of society, of relationships, and of self)

The most frequently mentioned characters were *police officer* (21 times), *parent* and *guard* (6 times), and a general example, *myself* (5 times). *Home* (21 times) and *streets* (10 times) were the most frequently mentioned for places, followed by several other examples (e.g., church, car, bank, workplace, school), all mentioned 3 times. For the actions, *patrolling* (7 times), *locking* (6 times), *caring* (5 times), and *getting*, *arresting*, and *keeping* (4 times each) were the most frequently mentioned. *Security* (4 times) was considered as example of participant. The examples generated were (1) police officers patrolling the streets, (2) parents taking care of their children at home, (3) security guards locking doors in a bank, and (4) police officers arresting criminals in the streets.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
police	21	13.9%	1	patrolling	7	3%	1	home	21	14.7 %	1
officer	21	13.9%	1	locking	6	2.6%	2	streets	10	7%	2
parent	6	4%	2	caring	5	2.2%	3	church	3	2.1%	3
guard	6	4%	2	door	5	2.2%	3	car	3	2.1%	3
myself	5	3.3%	3	child	4	1.7%	4	bank	3	2.1%	3
teacher	4	2.6%	4	getting	4	1.7%	4	workplace	3	2.1%	3
security	4	2.6%	4	married	4	1.7%	4	local	3	2.1%	3
worker	4	2.6%	4	children	4	1.7%	4	place	3	2.1%	3
mother	3	2%	5	arresting	4	1.7%	4	school	3	2.1%	3
child	3	2%	5	keeping	4	1.7%	4	centre	3	2.1%	3
house	3	2%	5	taking	3	1.3%	5	parliament	3	2.1%	3
owner	3	2%	5	looking	3	1.3%	5				
minister	3	2%	5	policing	3	1.3%	5				
				beat	3	1.3%	5				
				teaching	3	1.3%	5				
				going	3	1.3%	5				
				front	3	1.3%	5				
				safety	3	1.3%	5				
				criminals	3	1.3%	5				
				watching	3	1.3%	5				

Tradition (respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide)

The most frequently mentioned characters were *religious* and *priest* (14 times each), *vicar* (10 times), and two general examples, *man* and *person* (6 times). *Church* (38 times), *home* (11 times), *school* (6 times), and *worship place* (4 times) were the most frequently mentioned places. For the actions, *giving* (11 times), getting *married* (11 times), *praying* (10 times each) and *taking* (4 times) were the frequently mentioned. *Family* (3 times), and *visiting* (3 times) were considered as additional characters and actions. The examples generated were (1) religious people praying at home, (2) priests giving sermons in church, (3) couples getting married at church, and (4) individuals visiting family at home.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
religious	14	11.2%	1	sermon	12	5.2%	1	church	38	27.7 %	1
priest	14	11.2%	1	giving	11	4.7%	2	home	11	8%	2
vicar	10	8%	2	marriage \ wedding	11	4.7%	2	school	6	4.4%	3
man	6	4.8%	3	praying	10	4.3%	3	place	4	2.9%	4
person	6	4.8%	3	service	6	2.6%	4	worship	4	2.9%	4
woman	3	2.4%	4	taking	4	1.7%	5	temple	3	2.2%	5
family	3	2.4%	4	visiting	3	1.3%	6				
children	3	2.4%	4	father	3	1.3%	6				
teacher	3	2.4%	4	going	3	1.3%	6				
				attending	3	1.3%	6				
				church	3	1.3%	6				
				leading	3	1.3%	6				

Conformity (restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms)

The most frequently mentioned characters were *child* (9 times), *student and police officer* (6 times each), and *worker and prisoner* (5 times each). *School* (13 times), *home* (9 times), *prison* (6 times), and *church* (5 times) were the most frequently mentioned places. For the actions, *wearing* (6 times), *following* and *eating* (5 times each), and *serving* (3 times) were the most often cited. *Disciplining* and *giving* (3 times), and *town hall (*4 and 3, respectively) were considered as well. The examples

generated were (1) children eating healthy food at home, (2) students following a dress-code at school, (3) prisoners following prison rules, and (4) workers respecting colleagues.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
child	9	6.7%	1	wearing	6	2.5%	1	school	13	9.6%	1
student	6	4.4%	2	following	5	2.1%	2	home	9	6.6%	2
officer	6	4.4%	2	eating	5	2.1%	2	prison	6	4.4%	3
police	6	4.4%	2	them	3	1.3%	3	church	5	3.7%	4
worker	5	3.7%	3	Doesn't	3	1.3%	3	public	3	2.2%	5
prisoner	5	3.7%	3	serve	3	1.3%	3	streets	3	2.2%	5
teenager	4	3%	4	public	3	1.3%	3	workplace	3	2.2%	5
person	3	2.2%					4	house	3	2.2%	5
guard	3	2.2%					4	party	3	2.2%	5
soldier	3	2.2%									
school	3	2.2%									

Benevolence (preservation and enhancement of the welfare of people with whom one is in frequent personal contact)

The most frequently mentioned characters were *worker* (13 times), *nurse* (12 times), *and* teacher and *mother* (7 times each). *Home* (28 times), *hospital* (15 times), *school* (6 times), and *workplace* and *church* (5 times) were the most frequently mentioned places. For the actions, *caring* (13 times), *helping* (10 times), *looking* (7 times) and *providing\giving* (6 times each) were the most often cited. *Volunteer* (6 times) and *community* (4 times) were considered as well. Other words mentioned as actions were considered to generate examples: *children* (7 times), *patients* and *homeless* (5 times each), and *food* (4 times). The examples generated were (1) workers helping each other at workplace, (2) nurses taking care of patients in hospital, (3) volunteers providing food for homeless people in the community, and (4) mothers looking after their children at home.

Participants	Entries	(%)	Pos.	Action	Entries	(%)	Pos.	Place	Entries	(%)	Pos.
worker	13	9.1%	1	caring	13	4.7%	1	home	28	19.3 %	1
nurse	12	8.4%	2	helping	10	3.7%	2	hospital	15	10.3 %	2
teacher	7	4.9%	3	looking	7	2.6%	3	school	6	4.1%	3
mother	7	4.9%	3	children	7	2.6%	3	workplace	5	3.4%	4
charity	6	4.2%	4	providing	6	2.2%	4	church	5	3.4%	4
social	6	4.2%	4	giving	6	2.2%	4	community	4	2.8%	5
volunteer	6	4.2%	4	people	5	1.8%	5	care	4	2.8%	5
doctor	4	2.8%	5	patients	5	1.8%	5	kitchen	3	2.1%	6

member	3	2.1%	6	homeless	5	1.8%	5	office	3	2.1%	6
carer	3	2.1%	6	charity	4	1.5%	6	anywhere	3	2.1%	6
parent	3	2.1%	6	food	4	1.5%	6	room	3	2.1%	6
				therapy	3	1.1%	7	street	3	2.1%	6
				working	3	1.1%	7				
				elderly	3	1.1%	7				
				talking	3	1.1%	7				
				supporting	3	1.1%	7				
				meal	3	1.1%	7				
				cooking	3	1.1%	7				

Replication set (Studies 8-11)

Studies 8 to 11, from Chapter 3, were replicated using a different set of behaviours and a different sample. To recall, Chapter 3 aimed to generate spatial planes based on direct comparisons between value expressive behaviours and the abstract level of human values. The behaviours used in this replication set was generated based on Hanel's (2016) findings – and therefore, previously collected. As in the Pilot Study previously presented, participants were asked to provide typical situations for different values from Schwartz's model. The most frequent examples (4 to each value type, in a total of 40) were selected to compose the final group of behaviours in these studies. Also, differently from the studies from Chapter 3, I used a student sample.

In these studies, I asked the participants to indicate to what extent the value-expressive behaviours related to their respective value types (Supplementary Study 1); to rate the similarities between all the examples of value-expressive behaviours and the ten value types from Schwartz's model (Supplementary Study 2); to position the value-expressive behaviours along Schwartz's two value dimensions, using bipolar scales (Supplementary Study 3); and to make direct judgments of similarities between all value-expressive behaviours (Supplementary Study 4). I then assessed their spatial arrangement through Multidimensional Scaling and the degree of convergence with Schwartz's space, using Procrustes analysis. If the behaviours are unrelated to the underlying motives and values, the spatial arrangements should be unrelated to Schwartz's value model.

Supplementary study 1 (Replication study 8).

In this study, participants rated to what extent the set of behaviours matched the respective value types from which they were originated. In total, four behaviours were selected per value type, resulting in 40 behaviours. I also assessed the correlations between participants' ratings of values importance and how important they considered performing the behaviours.

Method.

Participants, material, and procedure. Participants were 184 psychology students who took part in exchange for course credit. However, five participants were excluded because they failed the IMC (Oppenheimer et al., 2009) or\and test items twice. In this study, differently from Study 8, I also asked participants to answer the *Need for Cognition Scale* (Cacioppo & Petty, 1982), to test whether there is a relation between the construct and failing in the IMC. However, no significant result was found. Moreover, the mean age of the remaining 179 participants was 19.29 years (*SD* = 2.01), with 162 women (90.5%), and 17 men (9.5%). The material and procedure used in this Study is available on Study 8 (p. 91).

Results and Discussion.

As can be seen in Table 1, most of the behaviours were rated as being more than 50% related to their respective value types, as expected. The only exception was power, which had all behaviours between 44% and 49%. In Study 8, most of the behaviours were described as more than 50% related to their value types, with one exception ("Children eating healthy food at home", Conformity).

Table 1.

Relatedness between each behaviour and the value types

Situations	Code	Mean	SD
Benevolence			
Comfort others in times of need	BE1	79.43	15.51

Supporting colleagues at workplace	BE2	77.12	14.94
Giving food to poor people	BE3	67.63	24.77
Offering a lift	BE4	63.25	20.07
Universalism			
Respecting everyone regardless of gender religion or ethnicity	UN1	89.84	13.22
Promoting gay rights	UN2	85.08	17.22
Treat everyone the same	UN3	79.67	19.26
Treating co-workers fairly	UN4	78.79	14.29
Self-Direction			
Having the possibility to choose	SD1	82.11	15.88
Vote for whomever you want	SD0	77.42	15.60
Starting a university degree	SD3	74.10	16.92
Defending your own opinion	SD4	72.85	16.10
Stimulation			
Travel to new places	ST1	84.49	14.73
Exploring different cultures	ST2	75.90	17.08
Practicing extreme sports	ST3	74.68	19.14
Going to lots of parties	ST4	64.47	20.19
Hedonism			
Having a fulfilling sexual relationship	HE1	77.35	16.23
Having a drink with friends	HE2	67.03	19.79
Relax watching television	HE3	64.95	19.24
Being in the presence of nice people	HE4	62.03	23.37
Achievement			
Working hard to get something	AC1	86.27	12.38
Getting good grades on exams	AC2	84.37	14.97
Obtaining a job promotion	AC3	83.66	11.05
Not resting until achieve your goals	AC4	80.31	14.50
Power			
Providing financial support to your own family	PO1	49.86	24.58
Pay for family vacations	PO2	48.01	23.57
Buying expensive food	PO3	47.78	26.87
Act with respect during a meeting	PO4	44.07	23.17
Security			
Combating terrorist attacks	SE1	77.49	18.26
Trusting the justice system (Police, Court, etc.)	SE2	69.52	17.88
Voting in political matters	SE3	59.37	21.98
Fight for my country	SE4	57.09	23.05
Tradition			
Preserving your national culture	TR1	77.64	17.22
Celebrating religious ceremonies	TR2	76.57	19.44
Honouring your parents' requests	TR3	70.67	17.12
Spending time with family at holidays	TR4	63.90	21.95
Conformity			
Complying with the law	CO1	77.61	17.61
Respecting the rules	CO2	73.81	21.20

Obeying a superior at work	CO3	70.24	20.20
Children following parents instructions	CO4	68.46	18.68
Test Items			
Cheat in a board game (Power)	TEST1	34.82	26.36
Gossiping about friends (Conformity)	TEST2	30.51	26.09
Complaining about different points of view (Trad.)	TEST3	20.24	21.60
Constantly talk about your own life (Conformity)	TEST4	20.13	18.53
Disrespecting others' opinion[s] (Hedonism)	TEST5	16.45	18.88
Feeling depressed (Hedonism)	TEST6	14.50	20.69
Criticizing another's religion (Benevolence)	TEST7	10.71	17.32
Finish coursework late (Tradition)	TEST8	10.07	16.32
Sleeping late (Universalism)	TEST9	8.93	13.37

After, the importance attributed to the value types (centered) was correlated with the importance attributed to the behaviours. As can be seen in Table 2, all the value types correlated positively with their respective behaviours, usually to a greater extent than they correlated with other value types (e.g., moving across the rows in Table 2). Only the importance attributed to universalism-related behaviours correlated higher with another value type, benevolence (r = .36). The overall pattern of these results was also seen in Study 8, except for Self-direction behaviours, that were not significantly correlated to their respective value type. Welch's t test (t[10.57] = 11.370, p < .001] indicated that the correlations in the main diagonal of Table 2 were on average higher (M = .34, SD = .09) than those off the diagonal (M = .13, SD = .10).

Table 2 .

Correlations between groups of behaviours and value types

Val*Beh*	*BEN*	*UNI*	*SD*	*STI*	*HED*	*ACH*	*POW*	*SEC*	*TRA*	*CON*
BEN	**.39**	**.36**	**.15**	.14	**.15**	.11	.08	**.20**	**.21**	**.20**
UNI	**.24**	**.26**	.12	**.19**	.08	-.09	.06	.12	.09	.04
SD	.09	**.23**	**.26**	.10	.11	.12	**.15**	.09	.04	.06
STI	.12	**.21**	**.24**	**.35**	**.21**	.11	**.19**	**.17**	.04	.08
HED	-.01	.04	**.18**	**.18**	**.23**	**.21**	**.17**	.08	.09	.12
ACH	-.02	**.16**	**.22**	**.15**	**.21**	**.42**	**.21**	.03	.10	.10

POW	-.11	**-.15**	.04	.14	.13	**.15**	**.24**	.01	.13	.14
SEC	.14	**.18**	.12	.08	**.23**	**.20**	**.22**	**.34**	**.30**	**.30**
TRA	**.16**	-.01	.03	.12	.02	-.04	.14	**.27**	**.52**	**.30**
CON	.10	.03	-.06	.05	.09	.01	.14	**.24**	**.40**	**.35**

Note. **Numbers in bold**: $p < .05$; Orange = Self transcendence; Yellow = Openness to Change; Blue = Self-enhancement; Grey = Conservation.

Supplementary Study 2 (Replication Study 9)

In this study, I asked participants to rate to what extent the set of 40 value-expressive behaviours presented in Supplementary Study 1 were similar to the ten value types from Schwartz's model. That is, participants were asked to compare each of the behaviours (e.g., *Complying with the law*, CO1) to each one of the value types (e.g., Security, Stimulation), resulting in a total of 400 pairs of similarity judgments. However, as in Study 9, to avoid boredom and fatigue, they only rated half of the similarities, randomly selected, resulting in a total of 200 comparisons per participant.

Method.

Participants, material, and procedure. Participants were 180 psychology students who took part in exchange for course credits. Eleven of these participants were excluded after failing to successfully complete the IMC (Oppenheimer et al., 2009) and "test items" ("*please, rate all the following items as Not At All*"), which were added at random points in the procedure. The remaining sample contained 169 participants, mostly female (89.9%) and British (84%), with a mean age of 19.49 (*SD* = 2.63). The material and procedure used in this Study is available on Study 9 (p. 96).

Results and Discussion.

An ordinal MDS was performed using the PROXSCAL algorithm. Stress-I indicated a good model fit (.12; recommended lower than .35, Sturrock & Rocha, 2000), suggesting that the data fits well into a two-dimensional Cartesian plane. A match with

a hypothetical spatial plane from Schwartz's model showed significantly congruence between the spatial plane ($r_m = .67$, $p \leq .001$). As can be seen in Figure 1, most of the behaviours from the same higher order value were placed close together. It can also be seen the assumption of conflict between the higher order values, with self-transcendence opposing self-enhancement, for instance. Nonetheless, as expected, some deviations were found. For example, behaviours related to self-enhancement were presented as sharing positions with behaviours from openness to change, while some others were positioned further apart from their groups [e.g., "*Voting in political matters*" (SE3), "*Combating terrorist attacks*" (SE1), "*Providing financial support to your own family*" (PO1), and "A*ct with respect during a meeting*" (PO4)]. Of importance, values from self-enhancement and openness to change share a personal focus, which might help to explain their mixed positions in the spatial plane. Curiously, the results in Study 9 indicated some deviations from self-transcendence behaviours, mixing with conservation. These value types, however, share a social focus.

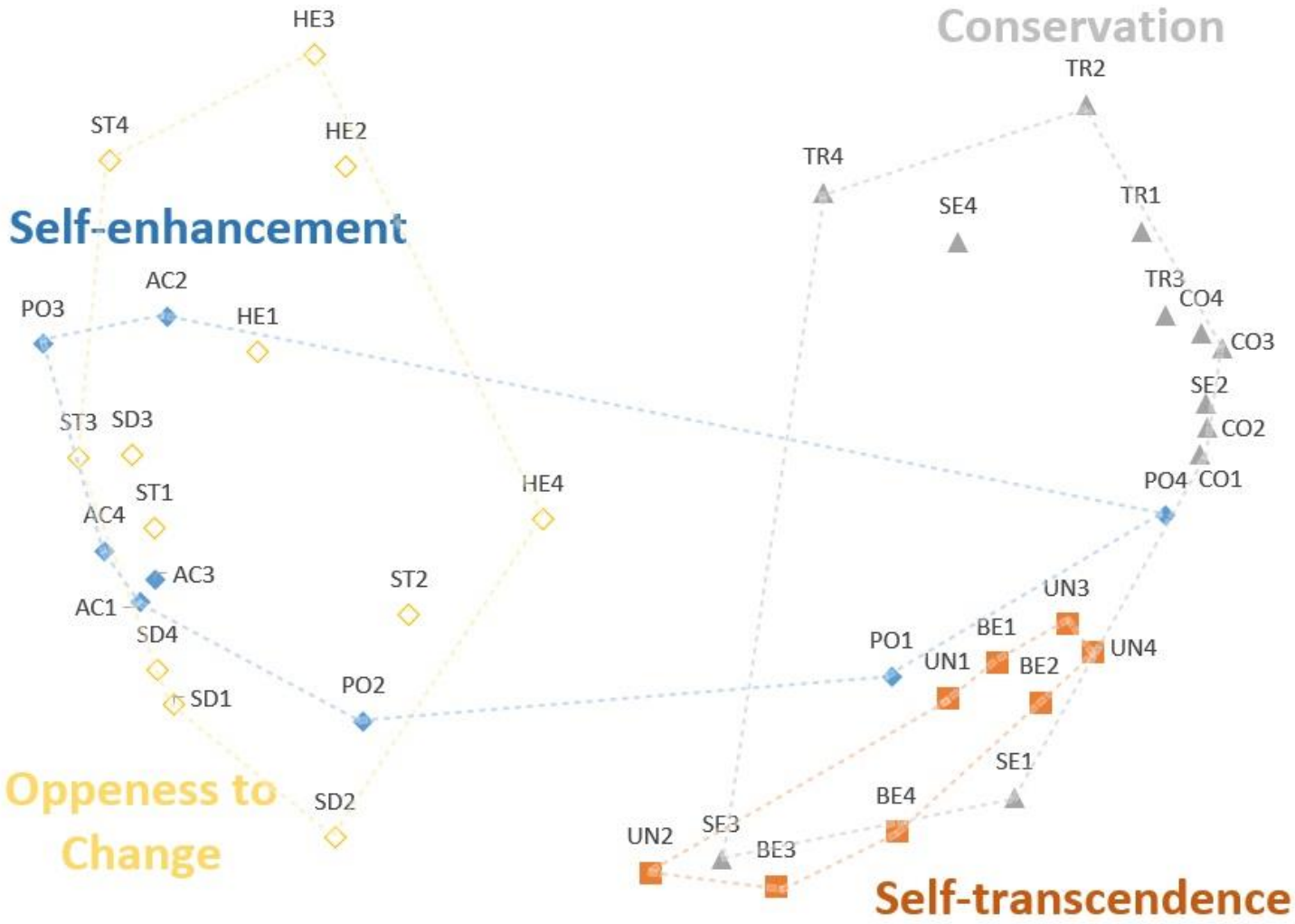

Figure 1. MDS structure for similarities ratings between behaviours and value types.[4]

Supplementary Study 3 (Replication Study 10)

In this study, participants were asked to position the behaviours along bipolar scales representing Schwartz's two dimensions, self-enhancement vs self-transcendence

[4] Working hard to get something, AC1; Getting good grades on exams, AC2; Obtaining a job promotion, AC3; Not resting until achieve your goals, AC4; Comfort others in times of need, BE1; Supporting colleagues at workplace, BE2; Giving food to poor people, BE3; Offering a lift, BE4; Complying with the law", CO1; Respecting the rules, CO2; Obeying a superior at work, CO3; Children following parents instructions, CO4; Having a fulfilling sexual relationship, HE1; Having a drink with friends, HE2; Relax watching television, HE3; Being in the presence of nice people, HE4; Providing financial support to your own family, PO1; Pay for family vacations, PO2; Buying expensive food, PO3; Act with respect during a meeting, PO4; Vote for whomever you want, SD0; Having the possibility to choose, SD1; Starting a university degree, SD3; Defending your own opinion, SD4; Combating terrorist attacks, SE1; Trusting the justice system (Police, Court, etc.), SE2; Voting in political matters, SE3; Fight for my country, SE4; Travel to new places, ST1; Exploring different cultures, ST2; Practicing extreme sports, ST3; Going to lots of parties, ST4; Preserving your national culture, TR1; Celebrating religious ceremonies, TR2; Honouring your parents' requests, TR3; Spending time with family at holidays, TR4; Respecting everyone regardless of gender religion or ethnicity, UN1; Promoting gay rights, UN2; Treat everyone the same, UN3; Treating co-workers fairly, UN4

and openness vs conservation. If a behaviour was placed closer to one end of these dimensions, it would indicate that the behaviour is more characteristic of this end. Unlike Study 10, in this replication I used two samples, inverting the direction of one of the bipolar scales for one of the samples.

Method.

Participants, material, and procedure. For this study, I collected two samples. In the first student sample, 19 out of 245 participants were excluded from analyses because they failed the IMC twice (Oppenheimer et al., 2009) and\or test items. The second student sample contained 226 participants; most were women (61.9%) and the mean age was 23.10 seconds (*SD* = 6.00). In the second sample, 13 out of 180 participants were excluded from analyses because they failed the IMC twice (Oppenheimer et al., 2009) and\or test items. The remaining sample contained 167 participants, with a mean age of 19.82 years (*SD* = 3.12). Most were women (89.8%). The material and procedure used in this Study is available on Study 10 (p. 100). The only difference in the tasks used in this replication is the direction of one of the dimensions, for the second sample. Instead of openness to change vs conservation, was presented to conservation vs openness to change.

Results and Discussion.

When assessing if the spatial plane matches with a hypothetical arrangement of values, results indicate a significant congruence (r_m = .76, $p \leq .001$). However, as in Study 10, the spatial plane (Figure 2) only slightly visually resembled Schwartz's structure, in despite of the significant match. Openness to change and conservation behaviours clearly were positioned opposing each other, however some self-enhancement behaviours were positioned next to self-transcendence. Five behaviours were more strongly linked with the opposite end of the value dimension, one from

openness to change, one from conservation, and three from self-enhancement. As in Study 10, the motivations that underlies these behaviours might help to explain these deviations. For example, "*Defending your own opinion*" (SD04), was derived from an openness to change value (self-direction), but appeared closer to conservation. Nonetheless, this behaviour has elements of conservation motivation, because, although the idea of expressing your own opinion indicates independent thought, insisting on this idea is protective of the status quo in one's own thinking. Also, "*Providing support to your own family*" (Power 1)", "*Pay for family vacations*" (Power 2), "*Act with respect during a meeting*" (Power 4), and "*Voting in political matters*" (Security 3) were positioned closer to the other end of the dimension. Interestingly, most of these behaviours were also positioned further away from their respective end of the dimension in the supplementary study 2. Also, it is important to highlight that the power values were described as less than 50% related to their value type, in the supplementary study 1. When comparing with the results from Study 10, should be noted that self-enhancement behaviours were the ones that most deviated from their original end of the dimension. Nevertheless, these exceptions provide a useful steer as to particular behaviours that may be weaker instantiations of the intended values.

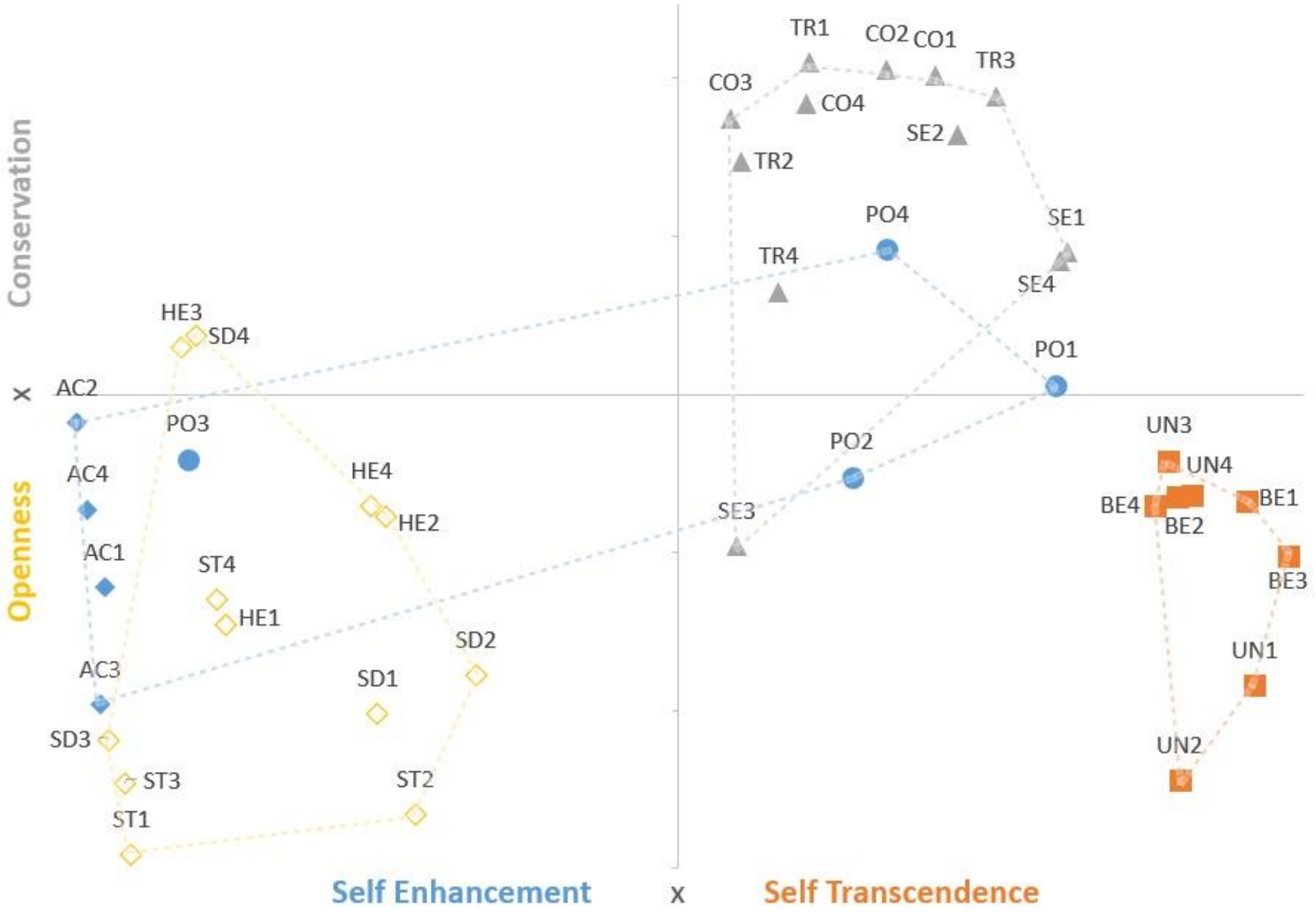

Figure 2. Behaviours placed among Schwartz's dimensions.[5]

Students sample 2. As can be seen in Figure 3, the results were consistent with the first sample. This spatial plane also matches Schwartz's significantly (r_m = .75, $p \leq$

[5] Working hard to get something, AC1; Getting good grades on exams, AC2; Obtaining a job promotion, AC3; Not resting until achieve your goals, AC4; Comfort others in times of need, BE1; Supporting colleagues at workplace, BE2; Giving food to poor people, BE3; Offering a lift, BE4; Complying with the law", CO1; Respecting the rules, CO2; Obeying a superior at work, CO3; Children following parents instructions, CO4; Having a fulfilling sexual relationship, HE1; Having a drink with friends, HE2; Relax watching television, HE3; Being in the presence of nice people, HE4; Providing financial support to your own family, PO1; Pay for family vacations, PO2; Buying expensive food, PO3; Act with respect during a meeting, PO4; Vote for whomever you want, SD0; Having the possibility to choose, SD1; Starting a university degree, SD3; Defending your own opinion, SD4; Combating terrorist attacks, SE1; Trusting the justice system (Police, Court, etc.), SE2; Voting in political matters, SE3; Fight for my country, SE4; Travel to new places, ST1; Exploring different cultures, ST2; Practicing extreme sports, ST3; Going to lots of parties, ST4; Preserving your national culture, TR1; Celebrating religious ceremonies, TR2; Honouring your parents' requests, TR3; Spending time with family at holidays, TR4; Respecting everyone regardless of gender religion or ethnicity, UN1; Promoting gay rights, UN2; Treat everyone the same, UN3; Treating co-workers fairly, UN4

.001). In addition to the deviations noted above, "*Spending time with family at holidays*" (TR04) was slightly positioned towards the other end of the dimension. Once again, the content of the behaviours can help to understand why these deviations happened. Despite having a tradition of spending time with family during holidays, it can also indicate an opportunity to do something new, as for example, travelling to a different country or enjoying an outdoor activity with the relatives. It all depends on how the situation is interpreted by the individual, showing the importance of the content when assessing these.

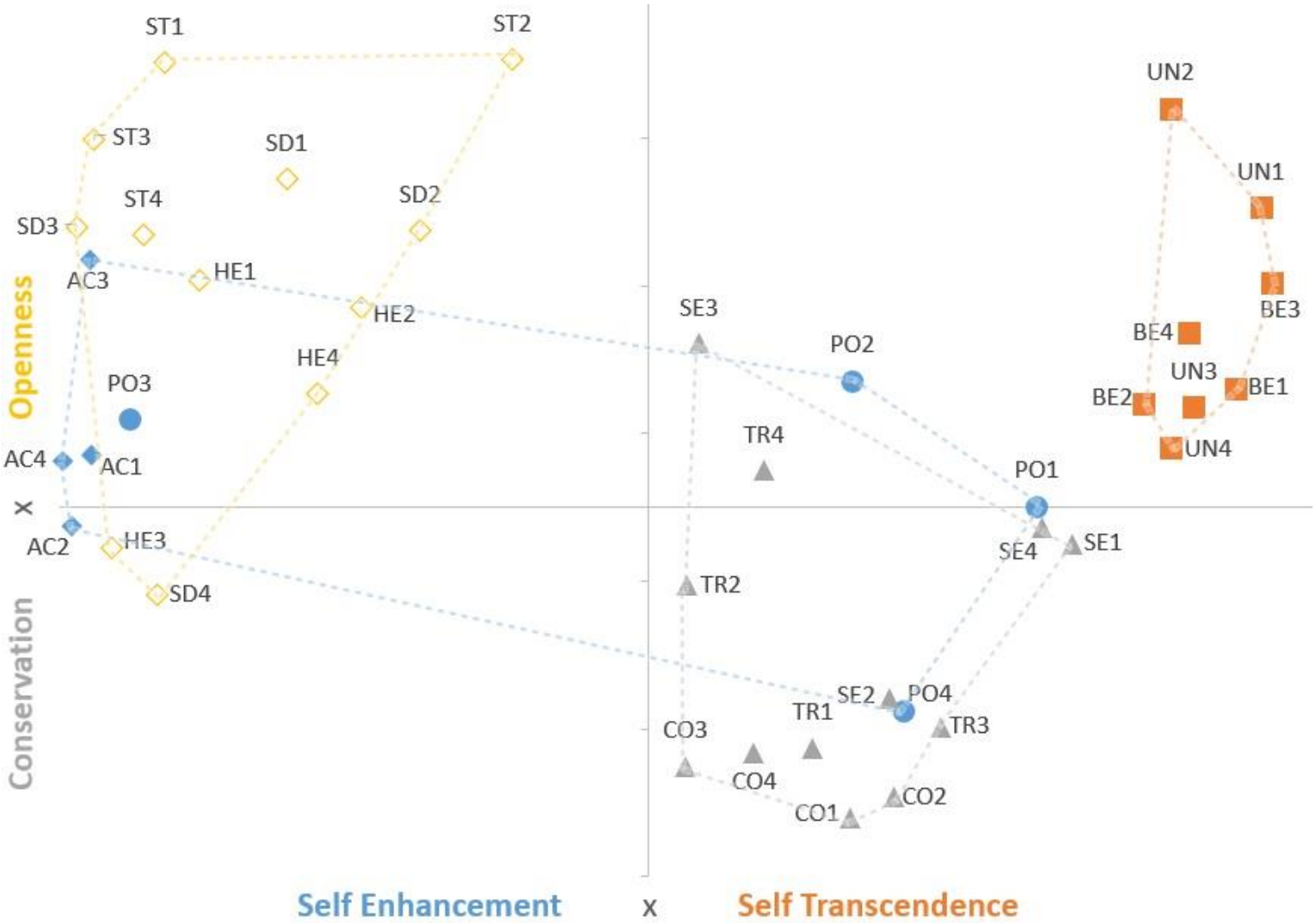

Figure 3. Replication of behaviours among Schwartz's dimensions.[6]

[6] See previous note.

Supplementary Study 4 (Replication Study 11)

In this study, I aimed to assess how the value expressive behaviours would be distributed when removing the explicit influence of human values in the similarity judgment comparisons. For that, I asked participants to compare the 40 behaviours pairwise, resulting in a total of 780 comparisons. However, as in Study 11, participants were randomly presented to one-third of them (260).

Method.

Participants, material, and procedure. Two-hundred forty-three students took part in exchange for course credit. Six of them failed the IMC twice (Oppenheimer et al., 2009) and\or test items. After excluding those who failed, we had 237 participants, with a mean age of 19.21 (*SD* = 2.16), who were mostly women (89%) and British (84.4%). The material and procedure used in this Study is available on Study 11 (p. 104).

Results and Discussion.

An ordinal MDS was performed using the PROXSCAL algorithm, and Torgerson configuration. Results indicated a good model fit (.25; recommended lower than .35, Sturrock & Rocha, 2000). Its match to a hypothetical spatial plane from Schwartz's model was also significant (r_m = .48, $p \leq .001$). The final structure can be seen in Figure 4.

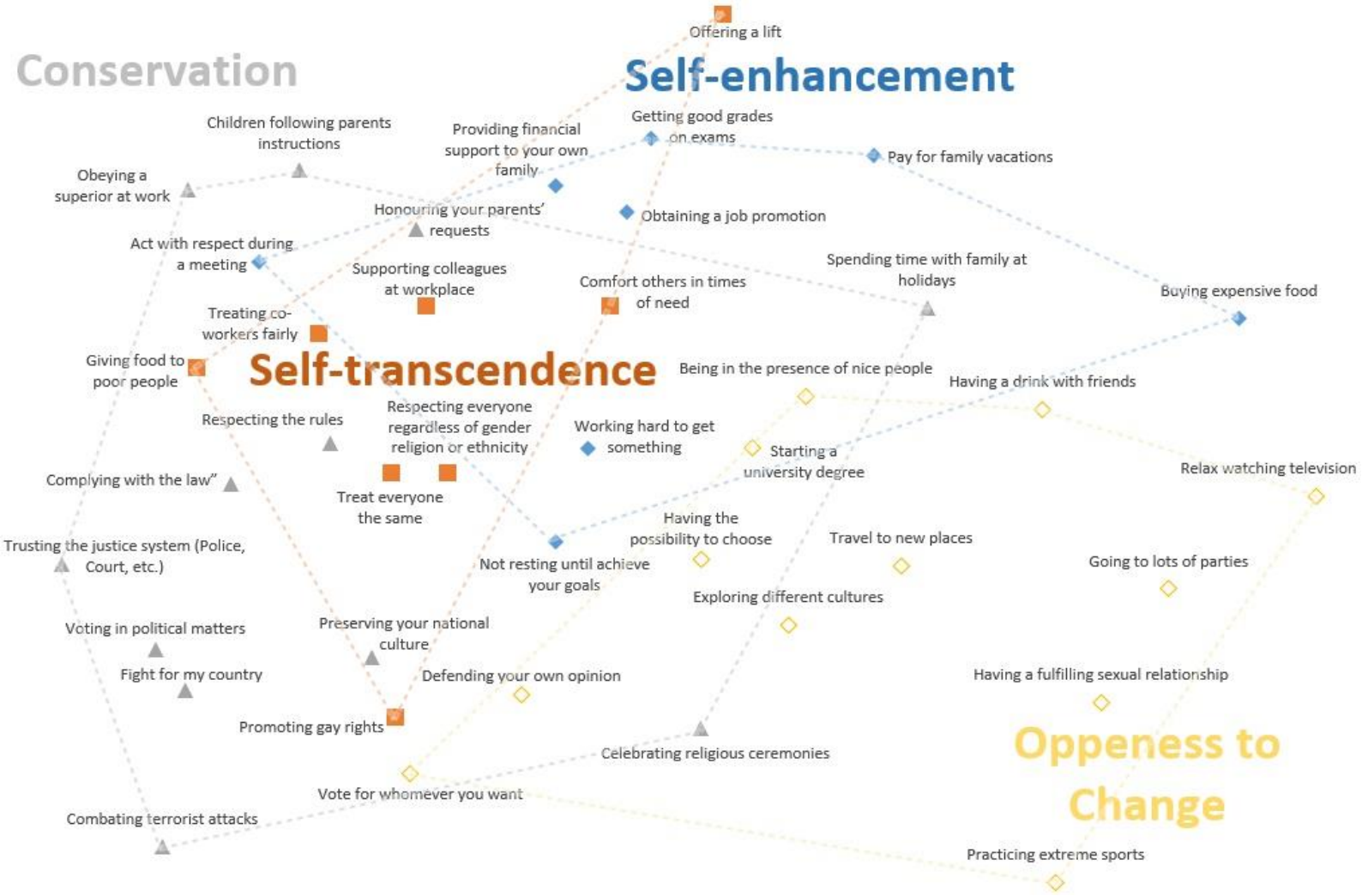

Figure 4. MDS structure of behaviours' comparisons.

Similarly to Study 11, most of the behaviours from conservation and openness to change values were placed in opposing positions across the spatial plane. However, while in Study 11 the behaviours form these higher order values did not mix, in this study one conservation behaviour ("*Celebrating religious ceremonies*", Tradition 02) "entered" the convex hull area of openness to change. Also, once again self-transcendence behaviours mixed with conservation and self-transcendence. While in Study 11 the self-transcendence behaviours were highly clustered, in despite of its deviations, in this study the area was more spread across the spatial plane.

It is important to notice that, as in Study 11, this structure can also suggest a dimensional interpretation based on the focus of the behaviours. The behaviours placed

to the left of the spatial plane have a higher social focus (e.g., "*giving food to poor people*", "*voting in political matters*", "*act with respect during a meeting*", "*promoting gay rights*"), while the behaviours more to the right represent more personal actions (e.g., "*going to lots of parties*", "*relax watching television*", "*practicing extreme sports*", "*having a drink with friends*").

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