

Human values and value instantiations: Similarities and differences between countries and their implications

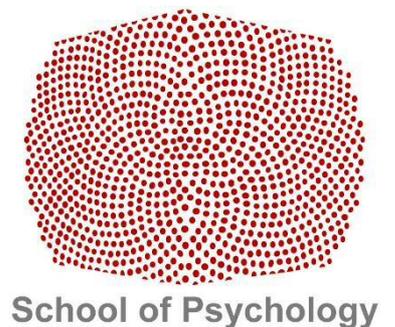
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A thesis submitted in partial fulfilment of
the requirements for the degree of Doctor of Philosophy

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October 2016



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Summary

This thesis has three aims. First, I propose that researchers should focus more on similarities between groups of people, because they are arguably at least as interesting and important as differences. I demonstrate that even effects that are usually labelled as large often still display more similarities than differences between groups. In Study 1, I modified and extended prior procedures for describing similarities and demonstrate the importance of this exercise by examining similarities between groups on 22 social variables (e.g., types of human values, trust, moral attitudes) within six commonly used social categories: gender, age, education, income, nation of residence, and religious denomination ($N = 86,272$). On average, the amount of similarity between two groups (e.g., high vs. low educated) was greater than 90%. Study 2 ($N = 54,082$) replicated these findings. Study 3 demonstrated the importance of presenting information about similarity, by showing that a research report led to more accurate perceptions when similarities were presented alongside differences.

Secondly, I explored whether differences might emerge in relatively concrete variables. In particular, human values (e.g., freedom, creativity) measured in Studies 1 and 2 were very abstract, and people instantiate (that is to say, exemplify) human values differently. I directly examined these instantiations in Brazil, India, and the UK (Study 4). Although some meaningful differences in value instantiation emerged, within-country variability outweighed between-country differences. Studies 5-7 provided further support for this conclusion.

Finally, I tested the implications of one provocative difference in value instantiation, namely a tendency to associate the value of creativity with art and not with science, particularly in the UK and not in Brazil (Study 8). Results indicated that the detection of this difference may depend on the ways in which art and science are

presented to participants, and this finding has implications for attempts to engage more interest in science.

To conclude, the final chapter of the thesis summarises the findings and discusses some limitations across the chapters. It then outlines a range of broad implications, including the benefits of a stronger focus on similarities, such as increased transparency in the reporting of scientific results.

Acknowledgements

The list of people I want to thank is long. Many people have contributed in a direct or indirect way to this thesis, starting from my supervisors, friends and colleagues, family, to those who have provided me with financial and technical resources. I am grateful to all people who allowed me to pursue my research interests and apologies that I mention only a few of them.

First, I want to thank my supervisors Greg and Tony for their great supervision. I especially appreciate all the freedom you have given me and all of our interesting discussions. Your guidance and patients along with your support for many of my ideas and side projects have helped me to structure and express myself better and also shaped the present thesis.

Als nächstes möchte ich meiner großen und großartigen Familie für ihre Unterstützung über all die Jahre hinweg danken. Mein Dank gilt insbesondere meinen Eltern Gunhild und Johannes sowie meinen Geschwistern Simon, Fridolin, Moïra und Antonia. Danke, dass ihr mir immer ein stabiles und sehr schönes Zuhause zum Leben und Lernen bereitet habt sowie für euer fortwährendes Interesse an meiner Arbeit. Vielen Dank auch an meine Freunde aus Deutschland Jenni, Elvira, Steffi, Sarah, Jojo und Flo für die Ablenkungen von und Diskussionen über Forschung. Zuletzt möchte ich auch den vielen meiner Dozenten der MLU danken, die viel Zeit in ansprechende und kritische Veranstaltungen gesteckt haben. Danke besonders an Uwe Wolfradt und Dieter Heyer für all die interessanten und kritischen Diskussionen sowie das Einbinden in Lehr- und Forschungstätigkeiten.

I also want to thank my friends from Cardiff, especially Lukas, Lins, George, Geoffrey, Katia, Sara, Robert, Atanaska, Natalia, Kenisha, and Luke for making my

PhD experience very enjoyable, both with very interesting discussions about enjoyment (here: research) and distraction from it.

Next, I want to thank all members of the three labgroups I took part in. I have learnt a lot from the discussions about mine and your interesting research. I also want to thank Valdiney Gouveia and Shanmukh Kamble for hosting me in João Pessoa (Brazil) and Dharwad (India) along with Ana Karla, Appasaheb, Lins, Katia, all the BNCS members, and many others for making my stays very enjoyable and productive.

Finally, I want to thank the School of Psychology and the Economic and Social Research Council for funding me.

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Chapter 1: General Introduction¹

Scientific research is supposed to reveal ‘the truth’ in an unbiased and reliable way. However, there are different ways to describe ‘the truth.’ For instance, if we compare two groups of people with respect to moral attitudes, we can describe either the differences or the similarities between the groups (or indeed both). We might say that there are highly significant differences between Britons and Eastern Europeans. Alternatively, we could say that there is 84% similarity between the two groups. Both summaries report the same findings, but they highlight different aspects of the results.

Historically, the focus of social sciences and psychology in particular has been on the description of differences between groups. Over 90 percent of the published research findings in psychology describe significant differences (Fanelli, 2010; Open Science Collaboration, 2015), and most of the inferential statistics and effect sizes used are only appropriate for describing and measuring differences. This lack of attention to similarities is important because differences between groups with so-called “large” effect sizes can occur even when the two groups are more similar than different, as will be described in Chapter 2. Moreover, this possibility is applicable whenever people are clustered into groups based on a specific variable, including many common demographic variables in psychology (e.g., gender, age, culture, religious denomination). In this thesis, I will illustrate this point by demonstrating the importance of appreciating similarities in addition to differences, beginning with cross-cultural comparisons across a range of countries (Chapter 2).

¹ The introduction is partly based on Hanel (2015b), Hanel, Zacharopoulos, Megardon, and Maio (2016), Hanel, Easterbrook, and Maio (2016), and Hanel, Vione, Hahn, and Maio (in press). Chapter 2 is currently under review (Hanel, Maio, & Manstead, 2016), the study reported in Appendix B (Hanel & Vione, 2016) has been accepted.

My analyses will focus on human values. Values are abstract ideals that people consider to be important in their lives (Maio, 2010; Rokeach, 1973; Schwartz, 1992). Examples include freedom, helpfulness, equality, and wealth. Similarities and differences in values are important for a number of reasons, which are outlined in this chapter. One of the key reasons is that cultures around the world show a lot of similarities in the values that they consider high in importance, even though everyday practices in some cultures imply much larger differences in values than the data reveal. Psychologically, there is an interesting jump from the values people rate as important to the concrete behaviours relevant to these values. For this reason, this thesis describes research and theories relevant to understanding how values are mentally represented as concrete actions, while testing whether differences across countries occur more at the concrete level, rather than the abstract level.

In this chapter, I first describe cross-cultural research that has claimed to have found either large differences or similarities between two or more cultures. Next, I provide an overview of the human value concept and related empirical findings. I then introduce and discuss the concept of value instantiations. Finally, I give an overview of the empirical chapters.

Cross-Cultural Research

What is Culture?

Given that the present thesis could be classified as belonging to the field of “cross-cultural” research, the term culture needs to be defined before any empirical evidence is presented. One of the earliest definitions of culture can be found in Tylor (1871, p. 1), who defines “culture, or civilization” descriptively as “that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.” A later, often cited definition of

culture is even more general: it is "the man-made part of the human environment" (Herskovits, 1948, p. 17). By 1952, varied attempts had been made to define culture, with foci that were relatively descriptive, historical, normative, psychological, structural, or genetic (Kroeber & Kluckhohn, 1952). A more recent and often cited definition of culture was suggested by Hofstede (2001, p. 9), who defined culture as the "collective programming of the mind that distinguishes the members of one group or category of people from another".

Unfortunately, all the definitions remain vague, lack any quantifiable criteria to differentiate between two cultures, and do not address the possibility that people can simultaneously belong to numerous (sub-)cultures (cf. Morris, Chiu, & Liu, 2015 for the latter). Moreover, as a cursory examination of any volume of the *Journal of Cross-Cultural Psychology* reveals, most researchers equate culture with country or nation without providing empirical support for this treatment². Instead, researchers seem to assume that, because people from two or more countries differ in a statistically significant way from each other with regard to certain variables, they belong to different cultures. In the General Discussion of this thesis (Chapter 5), I suggest that the findings of this thesis support an alternative empirical view of culture.

Two important theoretical positions in cross-cultural research are relativism and universalism. Until recently, these positions were regarded as dichotomous. The extreme versions of relativism ignore similarities, whereas universalism considers any classification of people into groups (e.g., culture) as redundant. More recently however, researchers started to treat them as falling on a dimension with extreme relativism and extreme universalism or absolutism being the endpoints (Berry et al., 2011). Berry et al.

² Other researchers (e.g., Schwartz, 2014b) also use society as a synonym for culture. For the convenience of the reader of this thesis, I will follow this practice and use the terms country, culture, and society interchangeably, unless clearly stated otherwise.

(2011), for example, distinguish between four positions: extreme relativism, moderate relativism, moderate universalism, and extreme universalism. Moderate relativism assumes that we are born as a blank slate and adapt to function well in one specific culture (cf. A. Fiske, Kitayama, Markus, & Nisbett, 1998). A prominent example for moderate relativism is the distinction between societies that promote independent versus interdependent self-construal (Markus & Kitayama, 1991). In contrast, moderate universalism acknowledges cultural differences such as different interpretations of behaviour or values, but assumes that similarities are large. Contemporary cross-cultural research has rejected both extreme relativism and universalism and tends to endorse moderate universalism (Berry et al., 2011). Below I discuss several studies that claim to have found either similarities between cultures or important differences.

Cognition

One variable on which group differences have been argued to exist is intellectual ability. Early ethnologists such as Lévy-Bruhl (1910) considered “primitive” people to be less reasonable than Westerners (“civilized” people). However, whereas Lévy-Bruhl attributed those apparent differences in intellectual functioning to environmental factors, many psychologists attributed them to biological factors. This happened, for example, during the Nazi period in Germany (Wolfradt, Billmann-Mahecha, & Stock, 2015), but can still be found in our time, albeit in a more attenuated form (Rushton, 1995). However, even contemporaries of Lévy-Bruhl argued for the existence of approximately equivalent cognitive processes across humankind, with differences occurring due to environmental differences (e.g., Wundt, 1912).

Other researchers have claimed that East Asian populations rely on holistic thinking, whereas Westerners rely on analytic ways of thinking, because “there are indeed dramatic differences in the nature of Asian and European thought processes”

(Nisbett, 2004, p. xviii). This relativistic claim was supported by a range of empirical studies and historical observations. For example, Nisbett (2004) argued that Asians needed historically to rely more on each other because they were (rice) farmers compared to Europeans, who were more likely to be hunters and fishers, and, as such, not necessarily living in stable communities. Empirical evidence also indicated that “when 2 apparently contradictory propositions were presented, American participants polarized their views, and Chinese participants were moderately accepting of both propositions” (Peng & Nisbett, 1999, p. 741). This finding appears to provide further support for the view that there are cultural differences in human reasoning, because Chinese people were seen as preferring a “middle way,” whereas Americans preferred to polarize.

The findings from Nisbett and colleagues can be criticized on at least two levels. At an empirical level, Lee and Johnson-Laird (2006) argued, based on Nisbett’s findings, that East Asians should be more tolerant of contradictions. However, in their own research, Lee and Johnson-Laird failed to find a statistically significant difference between East Asians and Americans with respect to this tolerance. The second level of critique relates to the generalizability of the findings of Nisbett and colleagues (see Berry et al., 2011). They generalize to regions (e.g., East vs. West), despite the fact that their conclusions were based on comparisons of only two countries in several of their studies (and in some cases fewer than two countries, given that the Chinese participants in several of their studies were living in the USA; e.g., Peng & Nisbett, 1999). To address this critique, Uskul, Kitayama, and Nisbett (2008) compared farmers, fishers, and herders in the Turkey’s eastern Black Sea region. The authors postulated and found that members of the first two communities exhibited greater holistic tendencies and less individual decision making than herders, presumably because those two groups

emphasize harmonious social interdependence. However, it is worth noting that the responses of all three groups were relatively similar (cf. also Henrich, Heine, & Norenzayan, 2010).

Collectivism and Individualism

Researchers frequently compare countries on a collectivistic-individualistic continuum (Hofstede, 1980; Oyserman, Coon, & Kimmelmeier, 2002). Western countries (Western Europe, North America, Australia, and New Zealand) are frequently labelled as individualistic, whereas East-Asian countries are cited as examples for collectivistic societies. Many studies have been conducted on the basis of this individualistic-collectivistic distinction, but the findings are not always consistent with predictions. For example, it has been postulated that individualism leads to isolation. However, a 30-nation study found that emotional closeness is relatively similar across the world (Georgas, Berry, Vijver, Kagitçibasi, & Poortinga, 2006). Related to this finding, participants in five countries (Hong Kong, Turkey, Greece, The Netherlands, and the United States) reported both expecting and giving a very similar amount of support to various people (e.g., family member, stranger; Fjñeman et al., 1996).

A meta-analysis (Oyserman et al., 2002) and some critical comments (A. P. Fiske, 2002) have further questioned the usefulness of the individualism-collectivism constructs. Fiske summarizes some

“limitations of research on individualism and collectivism: It treats nations as cultures and culture as a continuous quantitative variable; conflates all kinds of social relations and distinct types of autonomy; ignores contextual specificity in norms and values; measures culture as the personal preferences and behaviour reports of individuals; rarely establishes the external validity of the measures used; assumes cultural invariance in the meaning of self-reports and anchoring

and interpretation of scales; and reduces culture to explicit, abstract verbal knowledge” (p. 78).

Fiske’s hefty critique demonstrates that there are reasons to reject the individualism-collectivism as a single cultural dimension. Yet, this dimension is a major part of the distinctions that are often used in cross-cultural research to study differences between countries. In Studies 1 and 2 of this thesis, I will use a quantitative approach to test whether people across countries indeed differ in individualism and collectivism.

Personality

Cross-cultural research on personality has mainly focused on the Big Five dimensions of personality traits: openness for new experiences, conscientiousness, neuroticism, extraversion, and agreeableness (e.g., McCrae & Costa, 2008). Several large-scale studies have found considerable similarities across countries. Overall, the within-country variability in personality traits was found to be nine times larger than the between-country variability (Allik, 2005; Berry et al., 2011). It was also found that sex-differences in Big Five personality traits across 55 countries are similar and rather small (Schmitt, Realo, Voracek, & Allik, 2008). The same authors also found across 53 countries and almost 17,000 participants that (1) all nations scored on average above the scale-midpoint of Rosenberg’s self-esteem scale (RSES), (2) the factor structure of the RSES was largely invariant, and (3) the correlates (e.g., extraversion, neuroticism) of self-esteem were similar in most nations (Schmitt & Allik, 2005). Findings from human values research are similar (e.g., Fischer & Schwartz, 2011) and will be discussed in more detail later in this chapter, because of their direct relevance to the present thesis.

Some researchers from non-Western countries have claimed to have identified constructs that are especially characteristic for one region and are deeply rooted there. One example is *ubuntu*, which is supposed to be deeply rooted in (South) African

history (Mbigi, 1997). *Ubuntu* literally translated means “a person is a person through other persons” (Berry et al., 2011, p. 125) and consists of embeddedness values (cf. Schwartz, 2006), such as compassion and solidarity. Although it is described by African authors as being distinct from collectivism, this claim is challenged by others who fail to see the difference (see Berry et al., 2011). Another example is the concept *amae*, which was described as uniquely Japanese (Doi, 1973). *Amae* refers to the need to be loved and to depend on others, mainly in the context of the infant-mother relationship. Although it was demonstrated that *amae* can be distinguished from dependence and insecure attachment, *amae*-related behaviours were also found among Taiwanese and US-American participants (Yamaguchi & Ariizumi, 2006). Finally, in a behavioural study, including 15 small-scale societies such as Savannah foragers or Tundra-taiga fishers and hunters, it was found that at least some members of all societies administered costly punishment for unfair behaviour (Henrich et al., 2006). For all of these examples, it could be argued that the findings are actually similar to what could be observed in other countries. Nonetheless, the search for unique identifiers of particular cultures remains an interesting pursuit in cross-cultural research.

Emotion

Emotion research is another field in which claims about the universalism of research findings have been made. Some studies report similarities between various countries, while others have found differences. An example of the former is a study that compared 12 body sensations experienced with 7 emotions in individuals from Indonesia and Mexico with low exposure to the Western world with three student samples from Belgium, Indonesia, and Mexico (Breugelmans et al., 2005). Strong similarities across all five samples were found, although they were smaller between the groups with low exposure to the West. With a view to researchers who claim to have

found cross-cultural differences in the perception and expression of emotions, it was argued that these differences could be due to differences in the definition and/or operationalization of a construct (Berry et al., 2011).

A related disagreement concerns the criteria for how to decide whether an emotion is universal. For example, Berry et al. argue that “psychological processes (emotions) are similar across cultures but that their behavioural manifestations (emotion-based behaviour) can vary substantially from one culture to another” (p. 158). This argument raises the question of how data can be interpreted to demonstrate whether a universalistic or relativistic perspective is supported. An illustrative example is the debate between Ekman (1994) and Russell (1994) concerning the degree to which above chance recognition of six basic emotions (happy, surprise, sadness, fear, disgust, and anger) across many countries can be understood as support for universality. Russell reported meta-analytic evidence of how well the six basic emotions were recognized across Western and non-Western countries. The medians of correct recognition (in percentages) ranged from 77.5% to 82.6% for Western participants, and from 63.0% to 76.0% in non-Western countries. In societies which are ‘preliterate’ and visually isolated from Western influence, the percentage was even lower, although in most cases significantly (16.67%) above chance. These differences were used by Russell, along with questions he raised about the ecological, convergent, and internal validities of previous studies, to contest Ekman’s previous claim that emotions are universally recognized. In reply, Ekman (1994) accused Russell of having misrepresented and misanalysed previous studies. Ekman’s universalistic claim was further supported by a meta-analysis of 190 studies (Van Hemert, Poortinga, & Vijver, 2007). The meta-analysis found that culture-level factors explained 28% of variance in emotion variables and method-related factors additionally explained 14%, indicating that differences are at

least partly due to methodological factors. A related study has found that cultural variations across 37 countries explained less than 5% of the variance in the self-reported personal experience of seven emotions (Scherer & Wallbott, 1994). Overall, based on an extensive review of the literature, Berry et al. (2011, p. 174) concluded “that there is substantial overall similarity in emotion component profiles and that differences are found for specific components or specific emotions.”

The discussion between Ekman (1994) Russell (1994) makes it apparent that there is little agreement about when results should be regarded as providing evidence of similarities (i.e., universalistic claim) or differences (relativistic claim). In Chapter 2 of this thesis, I suggest how this gap can be closed by (1) proposing new measures of similarities, and (2) providing a taxonomy of when two groups of people can be judged as similar to or different from each other. I also demonstrate that classical approaches (e.g., frequentist and Bayesian statistics) and effect sizes (e.g., Cohen’s *d*) are limited for addressing this question.

Human Values

The concept of human values has a long history in psychology, but also in economics, philosophy, political sciences, and sociology (Hitlin & Piliavin, 2004). It is therefore unsurprising that definitions of human values vary across time and academic discipline, as does the use of the term “human values” as opposed to other similar terminology (e.g., “social values”, “personal values”).³ In the following subsections, I first give an overview of the history of human values, before describing the predominant

³ Until the 1960s, researchers seem to have used only the term “value.” More recently, value researchers have started to add ‘prefixes’ such as human, personal, or social, presumably to differentiate human values from numerical value or the verb “to value.” All three terms are often used in the literature: “Human values” results in 438,000 hits in Google Scholar, “social values” yields 632,000 hits, and “personal values” results in 185,000 hits (June 22, 2016), further emphasizing the importance of values in the scientific literature. Nevertheless, none of the three prefixes is unproblematic, because values can be both personal and social, and it is unclear whether or not animals have values. To the best of my knowledge, however, there is no argument yet that animals also have values, which is why I prefer to use the term “human values” or simply “values.”

value theory and selected empirical findings.

A short history of human values

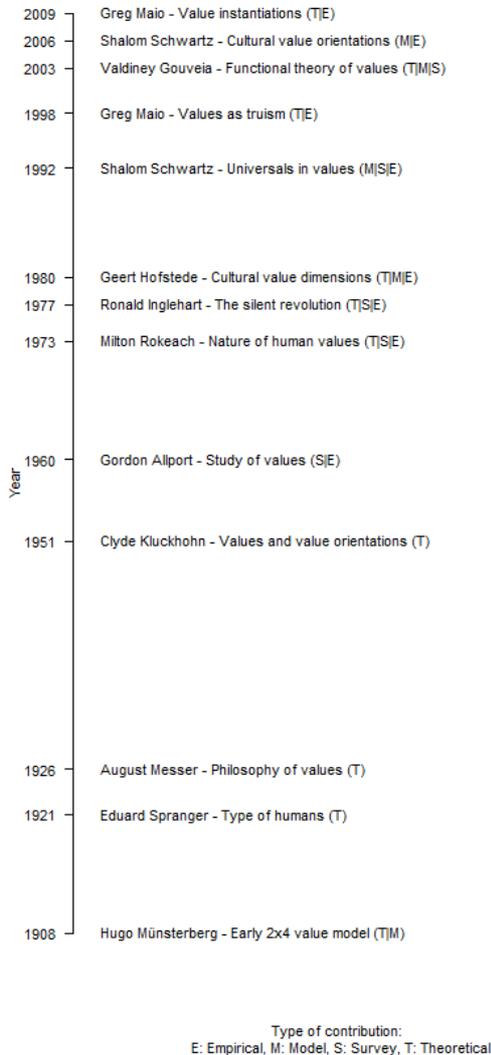
The structure of the history of human values is probably similar to the history of any topical area in psychology: (1) The origin of human value research can be traced back into philosophy; (2) the methods and statistics used have become more and more elaborated and complicated; and (3) several important contributions made more than fifty years ago have either been neglected or reinvented (cf. Hanel, 2013; Witte, 2004). Hence, I focus on value researchers not only from psychology but from other social sciences and philosophy, whose contributions I feel have been neglected but are nevertheless relevant for my thesis. This is not to criticize anyone – it cannot be expected that any one individual (including myself) is familiar with the vast literature in value research – but rather to link some past reflections and theorizing with modern findings.

A time bar of selected value researchers can be found in Figure 1.1. This figure is incomplete and misses important value researchers (for more extensive reviews, see Gouveia, 2013; Hitlin & Piliavin, 2004; Maio, 2016; Rohan, 2000; Rokeach, 1973; Spates, 1983). Nonetheless, early discussions of values can be traced back to ancient Greek philosophers (Maio, 2010) and can be found in the ‘neighbouring’ areas of morality and virtue in the history of philosophy (Schroeder, 2012). To the best of my knowledge, the first systematic discussion of values that included not only psychological elements but also a concrete value model, was made by Hugo Münsterberg (1908). The title of Münsterberg’s model is “The pure values.” His model maps values onto a four-by-two framework and contrasts life values with culture values on one dimension and

Figure 1.1. Historical overview of selected important contributions to human value research

logical, aesthetic, ethical, and metaphysical values, on the other. In

each of the eight cells, there is one ‘value type’ and three values, which are further differentiated according to whether they relate to the external, social, and internal world.



The value types are existence, unity, developmental, and god values (life value types), and coherence, beauty, achievement, and basic values (cultural value types). Münsterberg’s model appears to be similar to Gouveia’s functional theory, which I describe below (Gouveia, 2013; Gouveia, Milfont, & Guerra, 2014), although the names of the value types and values differ.

Another important theoretical contribution was made by Eduard Spranger (cf. Hanel, 2015a). In his book, *Types of Men*, Spranger (1921) differentiated between the theoretical,

economic, aesthetic, social, political, and religious man. Spranger proposed that one of the six types of men is predominant in each person. The theoretical person, for example, strives for knowledge and truth, whereas the economic person strives for usefulness. Spranger influenced Allport and colleagues, who created a survey to measure the six types of men as values (Allport, Vernon, & Lindzey, 1960; see below). In this survey, participants would first indicate their preference on a number of controversial statements before ranking other statements related to the six types of men.

An important theoretical contribution was made by the anthropologist Clyde Kluckhohn (1951). Kluckhohn defined value 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). From this perspective, values can be divided into several categories, such as situation specific or generalizable, or isolated values (i.e., values which neither conflict nor support other values), and integrated values, which are interlinked. Kluckhohn further emphasised conceptions of the “desirable”, which includes moral, aesthetic, and cognitive elements of appraisal. He considered the aesthetic dimension as dominant in value judgment. He also indicated that a value functions as a “preference which is felt and/or considered to be justified – “morally” or by reasoning or by aesthetic judgments, usually by two or all three of these” (p. 396). Kluckhohn further suggested that both personal and cultural values as implicit, which is in line with a social intuition approach (e.g., Haidt, 2001) and in contrast to modern value research where values are usually considered to be constructs that people can self-report through high deliberation (cf. Maio, 2010). Consistent with this implicit approach, recently it was demonstrated that measuring values as spontaneous associations is possible (Souchon, Maio, Hanel, & Bardin, 2016; see also below).

Prior statements that values are closely linked to emotions can be found in writings by Scheler (1913) and Messer (1926). Messer argues, based on Scheler, that to study “the world of values” we need to feel them. Introspection and observations are not appropriate. The more we are satisfied when we feel a specific value, the higher the value stands in the value hierarchy. Although this claim was echoed by important value researchers (Rokeach, 1973; Schwartz, 2006) it has only partly been addressed in the literature to date. There is evidence that we feel more positive towards the values that

we rate as more important, and cognitive explanations for values do not track value importance as strongly (Maio & Olson, 1998). Research has also linked specific values with specific emotions: For example, people who endorse self-transcendence values want to feel more empathy (Tamir et al., in press). Nevertheless, research has not yet discovered what comes first – the importance of the value or the feeling about it – and this remains an interesting issue for future study.

Kluckhohn (1951) discussed the function of values. He suggested that values help to resolve ambivalence because people think about them mainly when they are in doubt. Consequently, values are necessary for social life and the social system, helping to make social life more orderly and predictable (cf. Parsons, 1937). This view was challenged by Smelser (1959), who postulated that societies evolve faster when they loosen their value constraints. An alternative explanation for the different predictions is that Smelser's use of the term values in the societal context is closer to the concept of norms. Nevertheless, both Smelser's and Kluckhohn and Parsons' views are intriguing possibilities but lack empirical support.

Sociologists have also taken a lot of interest in the study of values. Between 1975 and 1982 over 400 studies of values were published in sociology (Spates, 1983). As in any field, there are various definitions of values. But perhaps a very typical sociological definition of values is to understand values as the phenomena which “define, maintain, and regulate the visible social structure [and] give it cohesion and stability so that it crosses the narrow boundaries of place and time” (Mukerjee, 1946, p. 101). An early and often-cited sociological approach to describing and defining values was put forward by Talcott Parsons (1937), who defined values as moral beliefs which provide the ultimate rationales for behaviour and control social life.

Franz Adler (1956), who considered himself as a natural sociologist, outlined an important behaviouristic criticism of the value concept as it was understood by Kluckhohn (1951), Parsons (1937), and others. He proposed that all value definitions can be placed in one of the following four categories:

(A) Values are considered as absolutes, existing in the mind of God as eternal ideas, as independent validities, etc. (B) Values are considered as being in the object, material or non-material. (C) Values are seen as located in man, originating in his biological needs or in his mind. Man by himself or man in the aggregate, variously referred to as group, society, culture, state, class, is seen as 'holding' values. (D) Values are equated with actions. (p. 272)

Adler rejects the first two definitions as trivial, as they imply that "a value is what is valued" (p. 273). Many value definitions fall into the third category, including the definition provided by Kluckhohn (1951; see above). These definitions of values were also rejected by Adler, because they imply that values cannot be directly observed, fail to differentiate between values, meanings, and norms, and must be observed through actions. This makes the type C definitions, redundant, as values must be equated with actions. Hence, Adler suggested that only definitions that equate values with actions are acceptable: "The observer of the action who knows the probabilities of the preceding and following actions knows the meaning as well as the value which the act performs without attempting to enter the actor's mind" (p. 277). Consistent with this view, Lundberg (1950) proposed that researchers should examine how people habitually spend or spent their energy, money, and time. This is an intriguing alternative method of estimating values on a group level that goes beyond the focus on individual behaviour, and it implies that values can be inferred from historic records.

However, this behaviouristic view has faced competition from perspectives that place greater emphasis on subjective standpoints regarding values. For instance, the sociologist William Catton (1959) formulated four falsifiable hypotheses relevant to people's internal manifestation of values. The first three are relevant in the context of this thesis. Hypothesis 1a states that values correlate with personal desires at any one time. Furthermore, the strength of the correlation increases within an isolated social system (Hypothesis 1b). Hypothesis 2 states that "when values are held constant, desiring (or 'motivation') varies inversely with the 'distance' (in an n-dimensional psychological space, or value-space) between the valuer and the desideratum" (p. 314). Although this dissertation does not examine these hypotheses directly, they all refer to a link between values and emotion, which is also identified in the psychological perspectives on values that I will employ.

Differentiations between human values and other concepts

Researchers have given a lot of consideration not only to the question of "What are values?", but also to the question of "What aren't values?" Differentiation between values and other constructs may help us to gain a deeper understanding of values. For example, according to Kluckhohn (1951), values are longer-term and more broadly oriented than short-term, narrow response impulses, but more arbitrary than decisions based on rational calculus. This position is largely consistent with the way in which research has treated values and neighbouring concepts in psychology, such as social norms, attitudes, personality traits, and needs. Because these concepts may easily be confused with values, below I briefly describe how each can be differentiated from values.

Social norms refer to modes of behaviour, but not to end-state of existence and are more externally directed than values (Rokeach, 1973). For example, loyalty can be

both a social norm and a value. Loyalty is a social norm as long as it is imposed by others and a value when it is judged to be (un-)important. People can value loyalty even if it is based on the predominant social norm in a society or disregarded. Further, attitudes are directed towards a specific object, whereas values are general beliefs (Rokeach, 1973). For example, people can have attitudes towards recycling garbage. That is, people might regard recycling as something good or bad. In contrast, values are more general (e.g., protecting the environment) and are evaluated along perceived importance. Thus, attitudes can be both positive and negative, whereas values are inherently positive constructs (Hitlin & Piliavin, 2004).

Differentiating values from traits and needs is somewhat more difficult. Traits are stable descriptions of people that describe how people tend to act across situations, whereas values are stable life goals that guide the behavioural dispositions and may be shaped by them (Parks-Leduc, Feldman, & Bardi, 2014; Rokeach, 1973). For example, helpful is a trait when it is meant as a description of how people tend in general to act and a value when it is about life goals. More generally spoken, traits refer to the past and present, values to the present and future. Similarly, values can guide needs and vice versa (Kluckhohn, 1951). For example, attaching high importance to obedience may lead to a higher need for dependence on an authority, and the need for dependence can be cognitively transformed into the value obedience. Despite these links, values may be seen as being under more volitional control than traits and needs, which can be driven by internal, habitual, and environmental factors. Rokeach (1973) considers needs to be more basic than values, because needs can also be found in animals.

Contemporary psychological models

Contemporary psychological research on human values has been influenced to a great degree by Milton Rokeach, who combined approaches of researchers from

different fields and aimed to measure and change values systematically. Rokeach (1973) argued that the value concept should play a central role in social sciences because all problems within the social sciences “implicate human values” (p. ix), as values influence “virtually all phenomena that social scientists might consider worth investigating and understanding” (p. 3). Rokeach defined value 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” (p. 5). He suggested that each person possesses only a limited number of values and that these are shared by all people, although the *relative* importance to each value may differ. Values can be organized into a value system, originate from culture, personality, and society and guide behaviour. Rokeach assumed that values are learnt and taught in an “all-or-none manner”. For example, as children, we were taught that we should be honest, not just a bit honest. As we become older, we learn to integrate different values and, therefore, come to recognize that values can vary in relevance and relative importance across specific situations. Rokeach further claimed that the difficulty of studying values lies in the interaction with specific situations: It is possible that more than one value becomes activated, so a conflict arises between different values.

This latter claim became easier to test after Shalom Schwartz (1992; Schwartz & Bilsky, 1987, 1990) developed a model and theory of human values. This model was based partly on Rokeach’s work and is the most widely used perspective to study values in recent decades. According to Schwartz, “values (1) are concepts or beliefs, (2) pertain to desirable end states or behaviours, (3) transcend specific situations, (4) guide selection or evaluation of behaviour and events, and (5) are ordered by relative importance” (1992, p. 4). Later, Schwartz (e.g., 2006, p. 143) added a sixth feature of

values: “the *relative* importance of values guides action.” However, it remains unclear to what extent this last feature of values is empirically justified (Borg & Bardi, 2016). Additionally, “values represent, in the form of conscious goals, three universal requirements of human existence: needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups” (p. 4; cf. Schwartz & Bilsky, 1987, 1990). As some of the work reported in this thesis builds directly on Schwartz’s work, I describe Schwartz’s theory in detail later in this chapter.

The most recent value theory is the functional theory of Valdíney Gouveia (Gouveia, 2013; Gouveia et al., 2014), which has been developed and tested during the last 15 years. It builds on Maslow’s (1943) theory and is based on two functions of values: whether values express needs (survival vs. thriving needs) or guide actions (personal vs. central vs. social goals), which Gouveia has mapped in a two-by-three framework. The functional theory was challenged by Schwartz (2014a) as not being distinct from his own value theory (Schwartz, 1992). Indeed, several findings that are based on the functional theory (e.g., Fischer, Milfont, & Gouveia, 2011; Gouveia, Vione, Milfont, & Fischer, 2015) could also have been obtained using Schwartz’s theory. Therefore, although ongoing research may yield important empirical differences between the models, the extensive evidence supporting Schwartz’s theory made it useful for the research presented here.

Schwartz’s circumplex model of human values

The predominant model in value research was proposed by Shalom Schwartz in 1992. It is based on two earlier papers by Schwartz and Bilsky (1987, 1990), who found that Rokeach’s 36 values could be ordered into 7 or 8 value types based on their motivational dynamics and that these value types, in turn, can be organized into a two-

dimensional circumplex. Building on these findings and a new theoretical perspective, Schwartz (1992) postulated the existence of 11 value types and developed a measure that is often used to measure values, the Schwartz Value Survey (SVS). The 11 value types are self-direction, stimulation, hedonism, achievement, power, security, tradition, conformity, spirituality, benevolence, and universalism. Based on analyses conducted by Sonia Roccas and Lilach Sagiv, Schwartz found across 20 countries and 40 samples (mostly students and teachers) that 10 value types could be reliably differentiated in most samples (cf. Figure 1.2). Each value type consists of 2 to 9 values and can be ordered along two dimensions: openness versus conservation and self-transcendence versus self-enhancement. Spirituality did not emerge as an independent value type.

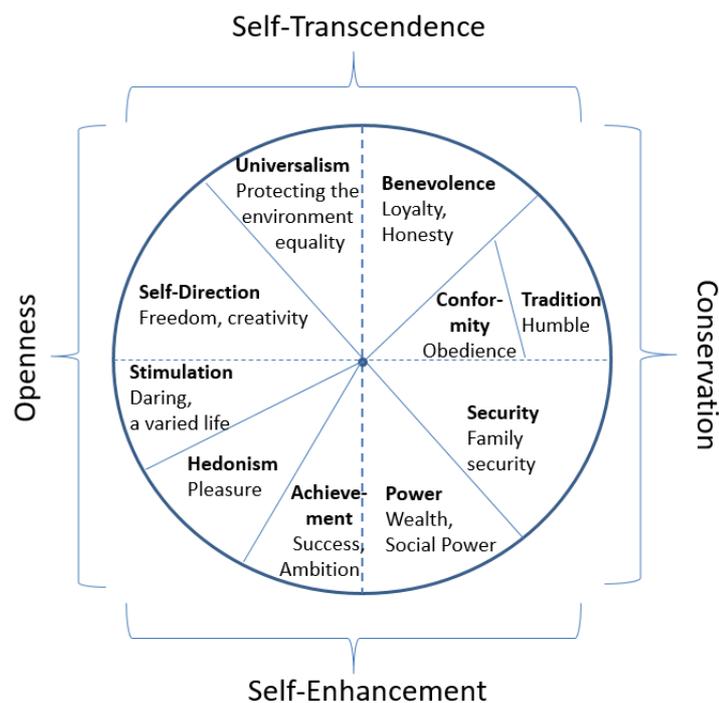


Figure 1.2. Schwartz' (1992) circumplex model of human values displaying four higher value types, ten value types (bold font) and examples of values in each type (normal font).

Over the course of the last 25 years, in samples from more than 80 countries, Schwartz has found support for his proposed structure of human values (Bilsky, Janik, &

Schwartz, 2011; Schwartz et al., 2001, 2012). Not only was the structure of values found to be universal; the hierarchy was also universal (Schwartz & Bardi, 2001): Benevolence, self-direction, and universalism values were considered most important and stimulation, tradition, and power least important in samples from 56 countries. In another study, Fischer and Schwartz (2011) found that country explained on average 2 to 12 percent of the between-subject variance in three large data sets. This finding refutes the widespread claim that culture shapes values and is in line with findings in personality research discussed above, which have also found high cross-cultural consistency of personality. The findings are particularly relevant for the present thesis because they further support the universalistic claim in some cross-cultural research (Berry et al., 2011).

In 2012, Schwartz published a revised version of his theory (Schwartz et al., 2012), postulating 19 rather than 10 value types. Most of the 10 value types were divided into two. For example, the value type self-direction was divided into self-direction-thoughts and self-direction-actions. In his refined theory, Schwartz explicitly contrasts values with a personal focus (openness and self-enhancement) from those with a social focus (conservation and self-transcendence). Interestingly, this contrast was proposed 60 years earlier (Parsons, Shils, & Olds, 1951). It is worth noting that this apparently arbitrary sub-division of the motivational value types (Gouveia et al., 2014) can be justified by arguing that the values form a motivational continuum. Just as the colour spectrum can be divided into very few or very many categories, so too can the array of values (Schwartz, 2014a).

One reason for the popularity of Schwartz's value models (Schwartz, 1992, 2006; Schwartz et al., 2012) is that the circular model captures motivational synergies and conflicts. It predicts that importance ratings of adjacent values will be positively

correlated with each other, whereas orthogonal values will be non-related, and opposing values will be negatively correlated. Schwartz's (1992) original model was the first to propose an integrative perspective that facilitates inferences about the relations between values and external variables. External variables can be defined as any variables that are outside the model. If one external variable exhibits a strong positive correlation with one of the value types, then the circumplex model predicts that correlations should become progressively less positive (and then perhaps more negative) as we move around the circular model from adjacent value types through the orthogonal value types to the opposing value types. This pattern follows a sine wave if the 10 value types are plotted on the x-axis of a Cartesian coordinate system, with the strength of the correlation on the y-axis (Figure 1.3).

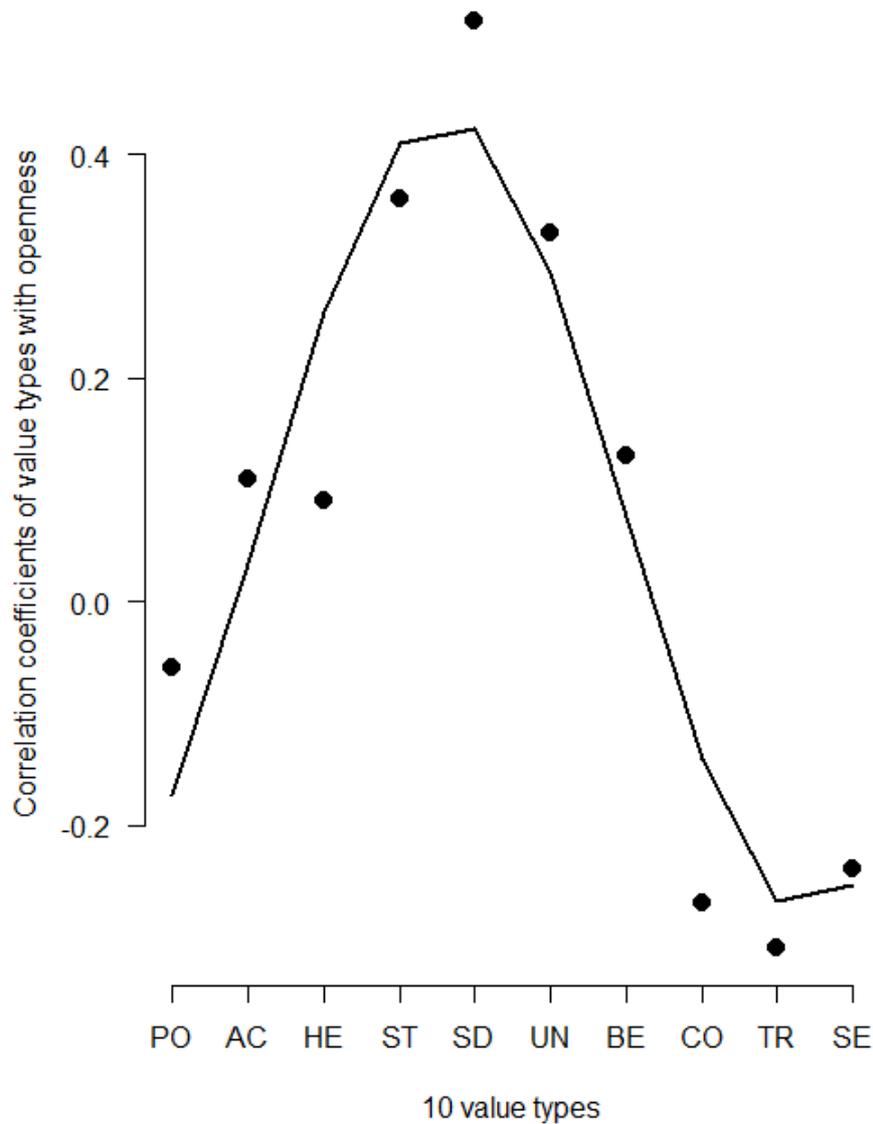


Figure 1.3. Correlations of the 10 value types with openness to new experience, fitted to an optimised restricted sine wave (data taken from Parks-Leduc et al., 2014).

SE: Security, TR: Tradition, CO: Conformity, BE: Benevolence, UN: Universalism, SD: Self-direction, ST: Stimulation, HE: Hedonism, AC: Achievement, PO: Power.

The use of the circumplex model of values to predict this sinusoidal pattern is one reason why the model has had a large impact (Boer & Fischer, 2013; Maio, 2010; Parks-Leduc et al., 2014). Whereas prior research relied on post hoc inferences to

explain patterns of association with values, the circumplex model enables researchers to *predict* patterns of relations between values and other variables. Diverse studies have sought evidence for sinusoidal patterns within research on values (Kasser, Koestner, & Lekes, 2002; Schwartz, 1992; Sortheix & Lönnqvist, 2014). For example, in a recent meta-analysis, it was postulated and found that the personality trait of openness to new experiences correlates positively with stimulation, self-direction, and universalism values, while correlating negatively with conformity, tradition, and security values (Figure 1.3; Parks-Leduc et al., 2014). This pattern of correlations was qualitatively judged by Parks-Leduc et al. to resemble a sine function.

Of course, it is not the case that all external variables should follow the sinusoidal pattern. In order for there to be a sinusoidal fit, the external variable must be relevant to the psychological functioning of values and, if this relevance exists, the external variable must *not* be particularly relevant to *orthogonal* values in the model. For example, in the aforementioned meta-analysis (Parks-Leduc et al., 2014), the researchers expected that the positive peak correlations between conscientiousness and values would arise for *orthogonal* values in the model (conformity and achievement); indeed, correlations between values and conscientiousness were judged not to follow the sinusoidal pattern. Several methods have been suggested to measure whether the observed pattern resembles a sine wave (Boer & Fischer, 2013; Brunso, Scholderer, & Grunert, 2004; Fischer & Hanke, 2009; Roccas, Sagiv, Schwartz, & Knafo, 2002; Schwartz & Butenko, 2014). To overcome several limitations of these approaches, my colleagues and I have proposed an alternative measure (Hanel, Easterbrook, & Maio, 2016; Hanel, Zacharopoulos, Mégardon, & Maio, 2016).

Although this newly developed sinusoidal test will not be discussed in this thesis, it merits mention here because it helps to illustrate the view that I repeat

throughout this thesis. Namely, I suggest that values can be modelled successfully at the level of both their abstract meaning and at the level of their concrete instantiations. The sinusoidal test is helpful for discerning patterns at the abstract level, but this thesis shows that abstract level values are limited in their ability to account for differences between people and cultures. For this reason, the thesis explores a methodology for tackling *concrete* differences and similarities (after first documenting the similarities at an abstract level of value representation).

Empirical findings

Research on values has examined associations between ratings of the importance of diverse human values (e.g., equality, freedom) and numerous kinds of judgments, affective states, and behaviour. In the following paragraphs, I give a short overview of some key findings. Research on values has employed designs that are mainly cross-sectional and has generated mainly theoretically consistent findings. For example, it has been consistently found that individuals' ratings of value importance are associated with religiosity (Saroglou, Delpierre, & Dernelle, 2004), the Big Five traits (Fischer & Boer, 2014; Parks-Leduc et al., 2014), behaviour that was derived from the values themselves (Bardi & Schwartz, 2003; Schwartz & Butenko, 2014), and social attitudes (Boer & Fischer, 2013). Other research has found that values help to predict organizational citizenship (Arthaud-Day, Rode, & Turnley, 2012), environmental behaviour (Hurst, Dittmar, Bond, & Kasser, 2013; Schultz & Zelezny, 1998), and protest action (Mayton & Furnham, 1994). Values are associated with biological markers, including genes (Schermer, Vernon, Maio, & Jang, 2011; Zacharopoulos, Lancaster, Maio, & Linden, 2016), and neuroanatomy (Zacharopoulos, Hanel, et al., 2016; Zacharopoulos, Lancaster, Bracht, et al., 2016). Furthermore, several of the correlational studies just

listed have found support for the proposed sinusoidal pattern of correlation coefficients between values and the other variables (e.g., neuroanatomy).

In contrast, research on the relations of values with well-being has produced less consistent findings. For example, some studies have found positive relations between openness values and well-being, while others found negative relations, and again others did not find any significant correlations (Hanel & Wolfardt, 2016; Haslam, Whelan, & Bastian, 2009; Jarden, 2010; Jia, Rowlinson, Kvan, Lingard, & Yip, 2009; Sagiv & Schwartz, 2000). These inconsistent findings, along with their small effect sizes indicate that values, pose an important challenge for understanding the causal role of values in daily well-being.

A set of experimental studies by Maio and colleagues focused on the proposed motivational oppositions of Schwartz's (1992) model (Bernard, Maio, & Olson, 2003; Evans et al., 2013; Maio et al., 2014; Maio, Pakizeh, Cheung, & Rees, 2009; Souchon et al., 2016). For example, Maio et al. (2009) hypothesized that if "values are related through the motives that they serve, then changing a value should cause changes throughout the whole system. Values that serve the same motives as a promoted value should increase in importance, whereas values that serve conflicting motives should decrease in importance" (p. 701), while orthogonal values should remain unaffected. Thus, in contrast to other priming studies, Maio et al. made specific assumptions about values and behaviour on a theoretical basis. For example, in their Experiment 1, participants first had to rank 16 values in terms of their perceived importance (four of each higher order value type). Next, they were allocated to one out of five conditions: one control and four value change conditions. In the value change conditions, each participant was given fictional results of the value ranking of another student of the same university, in which one of the four dimensions was ranked as much more

important than the other three. The task of the participants was, among other things, to compare their own results with the results of the other student. Next, participants ranked another set of 16 values according their personal importance (p. 703f). Results demonstrated that targeting one value domain increased the importance of values within that domain, decreased the importance of opposed values, and left orthogonal values unaffected. This pattern is congruent with the motivational relations predicted by Schwartz's model and is consistent with other data tracking changes in values over time (Bardi et al., 2009).

Issues common to the psychological models of values

Notwithstanding the evidence in support of Schwartz's (1992) model and its revised version (Schwartz et al., 2012), there are couple of issues common to all psychological models of values that are useful to consider because they show some of the background rationale that underlies this thesis. The first issue, the role of values as truisms, relates to how they are mentally represented. The second issue, the modelling of values across nations, relates to cross-cultural similarities vs differences. In combination, both issues illustrate the need to model values at both abstract and concrete levels of mental representation.

Values as truisms. An alternative way of thinking about values was proposed by Maio and Olson (1998). They predicted and found that values are truisms, or "beliefs that are widely shared and rarely questioned" (p. 294). As one of several pieces of evidence for this claim, they observed that participants came up with more than twice as many reasons for (dis-)liking beverages than for why specific values (e.g., equality) are important to them. This lack of reasons for values occurred even though the values were considered highly important; they seemed to have been merely taken for granted. In fact, (1) participants' ratings of the valence of the reasons for their values were much

less strongly related to the importance of the values than were their ratings of the feelings they attached to the values, (2) thinking about reasons for values caused bidirectional value change (except when there was a prior opportunity to develop arguments supporting the values), and (3) value endorsement dropped in the face of persuasive attack (except when there was a prior opportunity to develop arguments supporting the values).

Interestingly, an early insightful discussion of the “values as truism” hypothesis can be found much earlier in writings by Mill (1859), although Mill used neither the term value nor the term truism. He argued that, because freedom of speech is not fully granted or practised – e.g., opinions that are clearly wrong, such as racist ones, are suppressed and even punished in our societies – people do not contemplate their values and are therefore unable to defend them. He argued that, in the end, the meaning of the truth will decrease because the truth is not defended appropriately. Maio and Olson’s (1998) aforementioned evidence directly demonstrated this impact of a lack of prior defence of values, albeit using a different approach and different terminology.

The values-as-truism hypothesis is relevant for this thesis because the hypothesis suggests that people have a large gap to bridge between their abstract representations of values and more concrete frameworks for thinking about and applying the values. If people often fail to contemplate and question their values, their relevance to concrete attitudes, feelings, and actions may become nebulous, and the foundation for the values may be less clear. I will discuss this line of thought in more detail in a subsection below.

Values on the country level. The value theories described so far have focused on values at the individual level. However, as Kluckhohn (1951) noted, values can also be described on a cultural level. Three prominent approaches of this type were proposed

by Ronald Inglehart (1977), Geert Hofstede (1980, 2001), and Shalom Schwartz (2006). Inglehart focused on whether and how values shift across time in relation to cultural change. For example, he found that economic growth is accompanied by a shift in values from materialism to post-materialism (Inglehart & Baker, 2000). In other words, societies become more tolerant, rational, and focus less on absolute norms when they economically develop.

Hofstede links values and culture in his work. His understanding of values is based on the definitions of Kluckhohn (1951) and Rokeach (1973). His definition of culture, “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, 2001, p. 9), points directly to the aim of his empirical work: to find elements which reliably differentiate cultures. Based on work he conducted for the computing corporation IBM, Hofstede (1980) identified four cultural dimensions, which he later extended to six dimensions: Power–distance, individualism vs. collectivism, uncertainty avoidance, masculinity vs. femininity, long-term orientation, and indulgence vs. restraints (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010).

Hofstede’s perspective has been highly influential in cross-cultural psychology, but Schwartz’s (2006) theory of cultural value orientations (CVO) has recently emerged as an important alternate view. Schwartz’s CVO model is derived from his prior theory of individual human values (Schwartz, 1992), which was described in detail above. Schwartz (2006) posits seven *a priori* CVOs, which are thought to “express shared conceptions of what is good and desirable in the culture, the cultural ideals” (Schwartz, 2006, p. 139). In his approach, cultural values are usually measured by aggregating value scores from individual responses to measures of values in a culture. The seven CVOs are intellectual autonomy (being independent), affective autonomy (pursuing

positive affective experiences), mastery (encouraging self-assertion), hierarchy (unequal distribution of power), embeddedness (being part of a collective), harmony (being at ease with the world), and egalitarianism (being concerned for others). The seven CVOs can be ordered along three dimensions in a circular model (see Figure 1.4):

embeddedness vs. autonomy (affective and intellectual), hierarchy vs. egalitarianism, and mastery vs. harmony.

The cultural values proposed by Inglehart, Hofstede, and Schwartz can be used to explain differences among countries. For example, dimensions named by all three researchers, post-materialism, individualism, and autonomy have been found to be positively related to indices of peacefulness and societal development (Basabe & Valencia, 2007). Especially worth mentioning is the strength of the correlations between cultural dimensions and national indices such as economic development, peacefulness, and corruption, because they usually far exceed correlations at the individual level (Basabe & Valencia, 2007; Fischer & Hanke, 2009; Hanel, Easterbrook, et al., 2016; Hofstede, 2001; Inglehart & Baker, 2000; Schwartz, 2006). This is especially remarkable in view of the fact that the two sets of data are drawn from independent sources (participant responses vs official statistics).

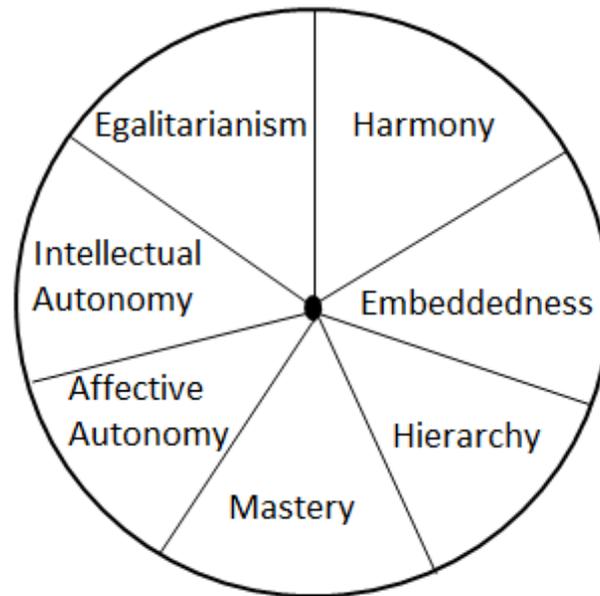


Figure 3.4. Schwartz's (2006) cultural value orientation model.

Value Instantiations

If values are guiding principles in our lives and hardly differ across countries (Fischer & Schwartz, 2011), how does it come about that people from different countries still appear to be different? The wide variation in personal, familial, and societal behaviour suggests the role of values is not so straightforward. One possible explanation is that values have different (implicit) meanings (Maio, 2010). In other words, people may use the same words (e.g., values) but attach different meanings to them. As Wittgenstein (1922) argued, many (philosophical) problems can be explained through linguistic misunderstandings. The same may be true for many cross-cultural misunderstandings, for example about values. For example, it was argued that “human dignity” is understood differently across jurisdictions and (over time) within jurisdictions (McCrudden, 2008). Of importance, however, these differences in meaning to which I refer are visible in the concrete actions that people link to values; these differences are not as evident if “meaning” is understood only as abstract conceptualizations of the values (which tend to be affective and vague in nature). In the terminology used in this thesis, these concrete actions that people link to values are value instantiations. Below, I provide a rationale for why value instantiation is an important construct, before I give a short overview of the construct and how it can be used to explain past evidence.

The psychological process

When people arrive in a situation and have to decide how to act, how do they decide which values should guide their actions? Here I propose a model to explain this process. The model introduces a critical role for value instantiations. That is, previous experiences and the context influence which behaviours are considered to be prominent instantiations (examples) of a value, thereby determining which values guide action in

the context. For example, the security of one's own family is considered to be important across the world (Schwartz & Bardi, 2001). Most of us are eager to protect close relatives and to provide them with a good life. But what does protecting close relatives mean, which relatives are close, how are they close (emotionally, physically), and how exactly are close relatives to be supported and protected? The specific ways in which we imagine family security may vary. In countries like Brazil, family security pertaining to children may have a large safety component because thousands of people are shot dead every year. In countries like the United Kingdom, family security pertaining to children may have a large socioeconomic component, because of large differences in the cost and quality of schools. Although empirical evidence indicates that *family security* is considered to be an important value across countries (Schwartz & Bardi, 2001), different actions may be seen as promoting family security in each location.

This example helps to illustrate how our mental representations of values matter. Even if the same level of importance is attributed to a value, different people may produce different concrete instantiations for a specific value. This process is depicted in Figure 1.5. Personal experiences and social-context influence the extent to which a behaviour is seen as an instantiation of a value or set of values, which in turn determines the values that are activated in the context. Their relative importance then influences behaviour. (This pathway occurs alongside other independent influences not shown here, such as influences of social norms and control of the behaviour.)

This model may be true for diverse values, including all of those described in Schwartz's (1992) model of values (e.g., equality, protecting the environment, family security). Thus, in this section, I first discuss general theory and evidence regarding the role of instantiation in conceptual categories, including evidence from cognitive and

social psychology. While research in cognitive and social psychology has shown some awareness of the importance of instantiations, their role has been underappreciated in the context of understanding values and value-guided behaviour. The section will therefore turn to describing how and why consideration of value instantiations helps us to understand past evidence and the role that value instantiations can play in bridging the gap between values and behaviour.

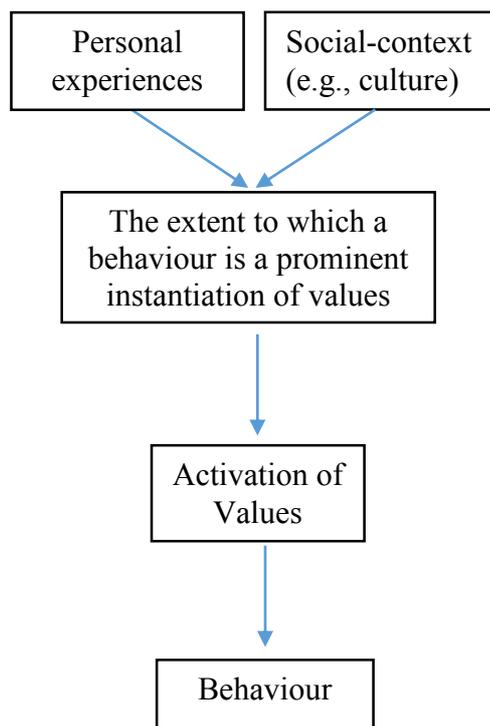


Figure 1.5. Role of value instantiations in the process linking values and behaviour.

The Cognitive Psychology of Instantiations

Before explaining further why instantiations of human values are important, it is necessary to define instantiations and understand their role in general categorization.

Instantiating a rule or concept entails applying it to a concrete exemplar. ‘Instantiation’ thus refers to a particular realization or instance of an abstraction or to the process of producing such an instance. Instantiation is therefore based on the relationship between general and specific, as in different levels of a conceptual hierarchy. For instance, *basketball* is an instantiation of the category *sport*, *yellow* is an instantiation of *colour*,

and *bikini* is an instantiation of the *things to wear on the beach*. It is a fundamental insight within cognitive psychology that levels in conceptual hierarchies such as ‘animal’–‘dog’–‘Doberman’ are not psychologically equivalent (see e.g., Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). Specifically, the intermediate level (‘dog’) seems privileged in many cognitive contexts (such as concept acquisition or the likelihood or speed of naming), and empirical research has sought to determine exactly why this is the case (e.g., Rogers & Patterson, 2007). At the same time, members of a category within a level are generally not equivalent. Instead they vary in typicality, that is, the extent to which they are a good example (e.g., Rosch, 1973; Rosch, Simpson, & Scott, 1976). For instance, a robin might be considered to be a good (typical) example for the category bird, but a penguin may not. All instances of a category can be placed on a continuum of category representativeness named graded structure (Barsalou, 1985). It starts with the most representative or most typical member and progresses to less typical members, and category boundaries (the boundary between members and non-members) are typically ‘fuzzy’ (e.g., McCloskey & Glucksberg, 1978). Fuzzy boundaries are prevalent in natural language categories (‘cup’, ‘democracy’, etc.) and cognitive concepts such as human values. In general, the more fuzzy the boundary, the more instantiations are possible.

The most important determinants of graded structure are central tendency, ideals, and familiarity (Barsalou, 1985, 1987). Central tendency refers to any kind of information based on the average, median, or modal values of category instances. In contrast, ideals simply reflect characteristics that exemplars should have and therefore do not depend on actual exemplars (for example, the ‘ideal democracy’ might not actually exist). Finally, familiarity depends on how often a specific instance can be

found across contexts; thus familiarity is related to the frequency with which the exemplars are experienced or observed and the intensity of the experience.

This “graded structure” of natural language categories appears to be a critical and universal property of categories and the process of categorization. In fact, graded structure can actually predict performance on acquisition, exemplar production, and category verification (Barsalou, 1985). That is, the location of the exemplar on the graded structure continuum can predict the ease with which it is learnt, produced, or verified as a member of the category. The most typical members tend to facilitate these processes (e.g., Rosch, 1973).

Categorization in Social Attitudes and Behaviour

There is important evidence of the role of graded structure in social attitudes and behaviour. For instance, a study by Lord, Lepper, and Mackie (1984) observed that participants with favourable attitudes toward a university’s social group were willing to interact with a prototypical target person to a greater extent than with a target person possessing only half of the attributes considered typical for members of that group. Participants in this research completed measures of their attitudes toward members of two eating clubs (of which the participants were not members themselves), evaluated which attributes they considered typical for the members, and how much they liked them or were willing to interact with them. Approximately 3 months later, without mentioning the first part of the study, participants were asked to choose one student to work with on a project. They received descriptions of two students; each was identified as a member of one of the two eating clubs, with one member described using traits that were 100% typical according to the participant’s own prior descriptions, and the other 50% typical. The authors observed greater consistency between attitudes and behaviour when participants were confronted with a target person whose attributes were previously

judged to be typical for members of that eating club. That is, participants who reported more positive attitudes toward members of the eating club were more likely to choose to work with the typical member than participants with less positive attitudes, but this relation was weaker when the member was described with only half of the typical attributes. Lord and colleagues also replicated their findings in a study of attitudes toward a different target group, gay men. Thus, across two real social groups, attitudes were better predictors of behaviour toward typical members of the groups than of behaviour toward atypical members of the groups.

A different set of studies points in a similar direction, but instead of using known social groups, the researchers investigated the role of experience that participants had with the target. Lord, Desforges, Ramsey, Trezza, and Lepper (1991) found that the correlation between attitudes and behaviour was more dependent on typicality when participants were less experienced and less skilled regarding the social category. For instance, in one experiment, the researchers assessed attitudes to people with mental illness and examined willingness to interact with a target presenting signs of mental illness, either through typical or atypical characteristics. Students who knew or had prior contact with people with mental illness displayed higher attitude-willingness consistency regardless of the typicality of the character, whereas students with relatively little prior knowledge or contact exhibited attitude-willingness behaviour consistency when the target individual was prototypical of people with mental illness than when the individual was atypical. Thus, the perceived typicality of a target affected the relationship between attitudes and behaviour for participants who had fewer skills or less experience with the category.

Subsequent research found that individuals apply social policy attitudes more consistently toward typical than atypical persons affected by the policy (Lord,

Desforges, Fein, Pugh, & Lepper, 1994). For example, participants in favour of the death penalty tended to apply their opinions of the acceptability of the death penalty for a fictitious criminal only when the character was described in terms of typical characteristics of murderers (e.g., impulsive), but not when he was described in terms that are atypical characteristics of murderers (e.g., fearful). However, participants who were against the death penalty made judgments that were consistent with their attitudes, regardless of the presented character. Drawing on these findings and similar results in another study, Lord et al. suggested that social policy attitudes may invoke principles and contexts that lead to asymmetries and boundaries in the extent to which typicality moderates the connection between social policy and attitudes and other judgments.

Together, the evidence just reviewed illustrates the importance of knowing the instantiations contained within people's mental representations of concepts. Some (typical) instantiations may be processed more easily, used as reference points, and contain more features belonging to a concept. In social contexts, this can lead to stronger effects of attitudes toward a category on relevant judgments and behaviour when people are considering typical instances of the category than when considering atypical instances. At the same time, however, the research on social category attitudes shows that the role of instantiations may be complex. In this context, the role of instantiations is influenced by attitude strength (i.e., high experience, knowledge) and attitude topic (e.g., death penalty, welfare).

Based on these and some other findings, Lord and Lepper (1999) proposed a model called attitude representation theory (ART). ART consists of two basic postulates: the representation postulate and the matching postulate. The representation postulate states that "a person's response to any attitude-relevant stimulus will depend (...) on the subjective representation of that stimulus by the person" (p. 269). The

matching postulate states that “the more two situations activate assumptions and perceptions that match (...), the more response consistency or generality our model will predict” (p. 270). The ART is relevant for this thesis, as I will modify it so it can be applied to value-behaviour relations (Chapter 3).

Instantiations of Human Values

Maio (2010) elaborated the relevance of the prior research on cognitive instantiation to understanding values. He suggested that values can be modelled as mental representations that include at least three levels. The first level is the system level, on which values are connected to each other, as in Schwartz’s (1992) model. The second level is the level of specific abstract values (e.g., equality, wealth), which comprise the importance that people attach to the abstract concepts. Finally, the third level is the instantiation level, which includes specific issues, situations, and behaviours relevant to the values.

Unlike most research on values, this thesis considers the instantiation level in addition to the abstract and system levels of values. The graded-structure that is evident in concepts studied within cognitive psychology is especially important to goal-directed categories such as values. Ideals are the characteristics that exemplars should have to serve a certain goal; they tend to be an extreme representation and may never be reached (e.g., what does a perfectly equal or free world look like?). Two other elements of graded-structure, central tendency and familiarity, are also relevant to values, although it may be harder to think spontaneously about value instantiations in terms of them. Remember that central tendency refers to highly probable properties of a given category, so the central tendency depends directly on the exemplars of that category, especially those that the person has experienced. Familiarity refers to how often the person has experienced a certain entity across situations.

These dimensions reflect a lot of potential variability between instantiations. This variability matters because it may influence the extent to which a value is perceived as being applicable to specific situations. As Maio (2010) pointed out, this may be an overlooked explanation for the findings of Darley and Batson's (1973) classical experiment. Darley and Batson found that theology students were less likely to help a person lying by the side of the path when under time pressure than when being on time. Maio (2010) noted that the underlying process of this finding could have been that students running late simply perceived helpfulness in this situation as less relevant, but politeness and punctuality as more relevant. He suggested that one potential reason (of several) for this lack of application of the value may be that the range of concrete instantiations relevant to the value was not sufficiently developed to permit easy detection of the value's relevance to the situation.

This line of thought was supported by a series of experiments in which it was found that participants who were encouraged to think more concretely about the value of equality (by generating concrete arguments for or against the value) subsequently behaved more equally compared to participants who were merely primed with equality (Maio, Olson, Allen, & Bernard, 2001). In another series of experiments, it was shown that only contemplation of typical, concrete examples of a value increased the value-related behaviour more than did contemplation about atypical examples (Maio, Hahn, Frost, & Cheung, 2009). This illustrates the importance of finding typical instantiations over a range of values (perhaps due to their greater familiarity or fit with the ideal or central tendency), which is the focus of Chapter 3 in this thesis.

Maio (2010) indicated that value instantiations could operate in different ways. More specifically, concrete value instantiations "could (1) affect a strength-related property of the abstract value itself (e.g., value certainty), (2) act as metaphors that we

apply to subsequent situations through analogical reasoning, or (3) affect our perceptual readiness to detect the value in subsequent situations” (Maio, 2010, p. 27). Maio et al. (2009) sought but found no evidence to indicate that contemplation of concrete and typical instantiations made values stronger or more subjectively relevant. In contrast, they did find that people become more perceptually ready to detect a value after contemplating concrete, typical instantiations. That is, the act of thinking about a typical, concrete example of a value left people more likely to spontaneously detect its fit to a subsequent situation and to apply the value.

Another interesting issue is that values may differ in levels of abstraction. For instance, in Schwartz’s (1992) model, protecting the environment might be perceived as a more concrete value than world of beauty, because protection of the environment implicitly covers a restricted range of actions. It is conceivable that typical instantiations are more difficult to obtain for the values that are higher in abstractness. However, this does not mean that abstract values have no instantiations, because this would be tantamount to saying that a specific value has no applicability to real world situations and plays no role in practice. Abstraction is a reason for some variation in the number of available and accessible instantiations per value to the extent that, all other things being equal, greater abstraction means greater scope, that is, more things to which a value could apply. The question, however, is the extent to which the ‘all other things being equal’ really applies in the values domain: It seems entirely possible that there are very abstract values that are used infrequently, and that there are more specific values, covering fewer distinct types of instances, that occur extremely often. In other words, abstraction may be a factor that gives rise to differences in typicality, but, in all likelihood, the relationship between abstraction and typicality is not a simple, direct one.

I am not aware of any available method to assess level of abstraction precisely, making this an interesting question for future research.

It is worth mentioning that Kluckhohn's theory of values (1951) presaged the importance of value instantiations. He distinguished between values and manifestations of values because "in its analytic meaning, the locus of value is neither in the organism nor in the immediately observable world; its locus is rather that of all scientific abstraction" (p. 396). As mentioned earlier in this chapter, Kluckhohn (1951) stated that values are manifested in behavioural regularities, ideas, aesthetic and moral norms, and symbols. But what are, for example, behavioural regularities, and are they the same across contexts such as countries? Kluckhohn hinted at this possibility by distinguishing between values and manifestations of values. For example, "people ought to help each other" (p. 396) is a manifestation of a value. Hence, Kluckhohn uses the term manifestation in a similar way to the way in which the term instantiation is used here (Maio, 2010; Maio, Hahn, et al., 2009).

Indeed, Kluckhohn (1951) argued that it is possible that group values are shaped by sanctions and reinforcement through instantiations. For example, recycling is promoted as a mean to protect the environment in many Western countries. By reinforcing recycling while simultaneously sanctioning failure to recycle, both recycling behaviour and the importance of protecting the environment increases (for a caveat of this method, see Evans et al., 2013). In fact, it is hard to imagine how values can be promoted if not by means of instantiations.

How Instantiations Help to Explain Past Evidence

There is a need for more evidence to help explain the role of value instantiations in behaviour. It is not yet clear why typical, concrete instantiations make people more people more perceptually ready to detect and apply a value to a subsequent situation

(e.g., does it affect interpretation of attributes of the subsequent situation?). From my perspective, there are also broader methodological and theoretical issues to address.

Consider first the methodological issues. Following the example given at the beginning of this section, imagine a researcher who wants to investigate the relationship between the value of family security and behaviour. Which behaviours should the researcher examine? In an unstable and unsafe country, it may make sense to measure the number of CCTVs in one's property, the 'quality' of the perimeter fence (e.g., electric or barb wire), and whether there is access to a safe car for taking children to school. In a safe and stable country, it may make more sense to assess the amount of financial support within a family, family stability, and harmony in family relationships. Consequently, a researcher who measures the use of home security devices in a relatively safe and stable country might discover little connection with the extent to which individuals value family security, because people mentally represent the value in a very different way. Without knowing the concrete instantiations that are most relevant to people's values, it is likely that the strength of the relations between values and behaviour will be underestimated.

To avoid this mistake, it is necessary to ensure that research examines behaviour that is typical of any targeted values within a specific country. An example of this approach occurred in research by Bardi and Schwartz (2003). They asked participants to generate behaviours that express each of the ten value types. Bardi and Schwartz found correlations between values and behaviour that were higher than in studies where the behaviour was chosen on the basis of theoretical considerations, including studies of organizational citizenship behaviour (OCB, Arthaud-Day et al., 2012) and intentions to support social action (Feather, Woodyatt, & McKee, 2012). Furthermore, studies have found lower correlations when they have employed a behaviour measure developed in a

different country. For example, Pozzebon and Ashton (2009) used Bardi and Schwartz's (2003) measure, which was developed in Israel, in Canada. Pozzebon and Ashton found somewhat lower correlation coefficients than those that had been obtained by Bardi and Schwartz. Although this trend could be attributable to diverse factors (e.g., sample characteristics, respondent conscientiousness), one possibility is that the behaviours assessed by Bardi and Schwartz were less typical of the values in the Canadian population than in the Israeli population.

If a behaviour is not considered typical of a value, it is not surprising when values predict it only weakly (see Maio, Hahn, et al., 2009). This is precisely what should happen given the evidence for the typicality effect in social attitudes and behaviour (Lord et al., 1994). For example, although it was postulated and found that specific value types like benevolence or achievement correlate with OCB (Arthaud-Day et al., 2012), there are other behaviours that are considered to be more typical of these values (see Bardi & Schwartz, 2003, for examples). In other words, many participants would likely agree that OCB is related to benevolence, but would probably not come up with this example by themselves. The lack of a spontaneous association between the value and OCB should weaken the ability of the value to predict this kind of behaviour, because the value may not be automatically activated when the opportunity to perform this behaviour exists (see Maio, 2010). In other words, the strength of the correlation between a value and a relevant behaviour is likely to be moderated by the typicality of the behaviour for the respective value: Value-behaviour relations should be larger if the behaviour that is measured is considered more typical for the specific value. This may help us to understand the role of value instantiations in bridging the gap between values and behaviour, especially in the context of cross-cultural research. I further elaborate this in more detail in Study 7.

The way in which instantiations help to bridge the gap between values and behaviour is further illustrated in a research project that examined the effect of value salience on pro-environmental behaviour (Evans et al., 2013). In two studies, the investigators manipulated the salience of different reasons for a pro-environmental behaviour (car-sharing), emphasizing either a self-enhancing value orientation (i.e., saving money) or a self-transcending value orientation (i.e., saving the environment). Results indicated that only the salience of the self-transcending value orientation, but not the self-enhancing value orientation, led to a spill-over effect in other pro-environmental behaviour. Crucially, the main dependent variable was recycling behaviour. As described in Study 4 of the present thesis, recycling is a typical example of pro-environmental behaviour in the UK, where the Evans et al. (2013) study took place. For two other relatively atypical behaviours that were measured, namely choosing scrap over new paper and choosing an energy-saving mode when using a computer, no significant effect of value salience was found. In the analyses of British participants' instantiations of protecting the environment described in Study 4 of the present thesis, choosing an energy-saving mode on a computer and using scrap paper were not mentioned. These behaviours are not as strongly associated in memory with the value of protecting the environment. These results are in line with findings from the social categorization research described above (Lord et al., 1991).

This latter example illustrates the theoretical importance of considering value instantiation. It is an inherent quality of basic values that they are abstract. This means that any application of such values needs to 'bridge the gap' between the abstract level of the value and the specific situation or instance to which it is to be applied. This is fundamental to how values 'work'. It enables widespread agreement about values themselves, while allowing for strong disagreement in actual practice. For example, the

term “human dignity” is often used in international agreements like the Universal Declaration of Human Rights, because everyone can agree that this concept is important. Indeed, at an abstract level, human values barely differ between countries, as discussed above. Differences between nations explain on average only 2 to 12 percent of the variance between individuals (Fischer & Schwartz, 2011). That is, the variance in values is much larger within countries than between them.

The differences between countries may be much less about how important values are rated in the abstract than about how the values are exemplified in different cultures. This hypothesis fits the definition of culture as “shared cognitive representations in the minds of individuals” (Romney, Boyd, Moore, Batchelder, & Brazill, 1996, p. 4699). For instance, it has been argued that different parties “can conceive human dignity as representing their particular set of values and worldview” (Shultziner, 2003, p. 5), which is one reason why there are many differences across the world in how humans are treated by their governments. This observation is, for example, relevant to the value of equality. In many countries, women are still considered to be unequal to men, and they are granted fewer rights and opportunities. People in these countries (especially men) may have a strong sense of justice and equality with regard to treatment of men in relation to each other and with regard to the treatment of women with regard to each other, but either do not apply egalitarian notions to relations between men and women, or instantiate equality between men and women in a different way (e.g., according to perceived differences in needs, abilities, duties). If two cultures do not instantiate equality relating to men and women in the same way, then the value may be endorsed highly despite notable differences in how it is conceptualized.

To illustrate this effect, it is worthwhile to briefly describe an analysis of data from the fourth round of the European Social Survey (www.europeansocialsurvey.org).

This survey includes over 56,700 people from 31 countries. Participants responded to a variety of questions, including items from a short version of the Portrait Value Questionnaire (PVQ, Schwartz et al., 2001). One item assessed equality (“Important that people are treated equally and have equal opportunities”) and was answered on a 6-point scale (1 “very much” to 6 “not at all”). Participants from Turkey ($n = 2,416$), a country that has been found to discriminate against women on average more than other European countries (Tansel, Dalgic, & Guven, 2014), agreed with this item virtually to the same extent as participants in the other European countries ($M = 2.06$, $SD = .93$ for Turkey, $M = 2.10$, $SD = 1.06$ for the 30 remaining countries, Cohen’s $d = .05$).

However, a comparison of the means of two items that explicitly asked about gender discrimination revealed more unequal attitudes within the Turkish sample. Specifically, using a 5-point Likert scale from 1 (agree strongly) to 5 (disagree strongly), participants rated their agreement with the statements, “A woman should be prepared to cut down on her paid work for the sake of her family” and “When jobs are scarce, men should have more right to a job than women”. Turkish participants agreed with the first ($M = 2.14$, $SD = .92$) and second ($M = 2.20$, $SD = 1.13$) statements much more than did participants in the 30 other countries ($M = 2.86$, $SD = 1.18$, $d = .77$, and $M = 3.61$, $SD = 1.23$, $d = 1.24$, respectively).

Interestingly, responses to the equality item were weakly but *positively* correlated with the two items about gender discrimination in Turkey ($r[2225] = .11$ and $r[2251] = .13$, $ps < .001$). That is, greater endorsement of the importance of equality predicted *more* acceptance of discrimination against women. In the rest of Europe, responses to the equality item were weakly but *negatively* correlated with the two items about gender discrimination ($r[52007] = -.01$, $p = .047$ and $r[51659] = -.06$, $p < .001$). That is, as expected, greater endorsement of the importance of equality predicted *less*

acceptance of discrimination against women. Although these latter associations were very small⁴, this brief analysis demonstrates that the instantiation of equality may differ between the nations, with implications for value-behaviour relations.

Finally, and possibly most importantly, the various examples of instantiation discussed above make it clear that one cannot understand how values guide behaviour without understanding how the *process* of instantiation takes place. This complex process entails recognizing how a specific situation falls under a general value (or, more likely, values) and working out the implications this has for action. Without understanding how people manage this task, we will neither fully understand the role of values in human behaviour, nor be able to change behaviours effectively where this is desired.

For example, it makes little sense to try to tackle issues of gender equality by emphasizing equality per se in a context whether there is little or no connection between gender equality and equality as a value. Similarly, it would not make sense to aim for less CO₂ emissions as a result of poor house insulation by emphasizing the importance of environment protection in a context in which no connection is made between insulation and these emissions. Such attempts become feasible only when the value instantiations are brought into people's conceptualization of the value itself, through cultural change, information campaigns, education, or other means. However, for such attempts to be successful, a more detailed understanding of the process of instantiation is required. Given that this process has largely been overlooked in past research, there is a considerable need for studies that manipulate value instantiations, examine the factors that make it easy or hard for instances to be recognized as instances of a value, and

⁴ Value-behavior relations are often small when one specific behavior is examined, because values explicitly relate to large aggregates of behavior, and are much better at predicting large aggregates (Maio, 2010).

examine the effects of changes in value instantiation on value-behaviour relations over time.

The aims of this section were to introduce the concept of value instantiation and to highlight why it is important to study them. Thus far, the literature on value instantiation is very limited. In Study 4 of the present thesis, I propose a method of measuring value instantiations and provide the first systematic overview of how 23 different values are instantiated. In Studies 5 to 10 of the thesis, I explore diverse basic consequences of value instantiations.

Overview of the thesis

The main aim of this thesis is to explore the extent to which people differ in values across countries. First, in Chapter 2, I test whether various groups of people are indeed more similar than different (moderate universalistic claim) on values (in addition to a set of additional variables). Prior evidence supports this claim (e.g., Fischer & Schwartz, 2011), but Study 1 and 2 analyse two large international datasets and with two newly developed statistics for measuring similarities. These statistics utilise the distribution of the data and the scale endpoints instead of the distribution of the means, as it is done within classical statistical framework (e.g., frequentist and Bayesian). Moreover, I explain why the direct examination of similarities is beneficial for various reasons, such as a more accurate interpretation of scientific findings. Study 3 explores three possibilities to improve the accuracy of the interpretation of scientific findings.

As Chapter 2 mainly focuses on values measured at the abstract level, Chapter 3 begins to focus on whether differences are larger when we move from an abstract to a concrete level (i.e., value instantiations). Hence, in Studies 4 to 10, I test whether people in three countries instantiate values differently and potential implications of these differences. The three countries I compare are Brazil, India, and the UK. All countries

differ along various dimensions. In terms of years of schooling, GNP, and life expectancy (United Nations Developmental Programme, 2014), India is the least developed out of the three countries, and the UK is the most developed. Brazil and India are perceived as much more corrupt than the UK (Transparency International, 2014), and the homicide rate in Brazil is 25 times higher than in the UK and almost 8 times higher than in India (United Nations Office on Drugs and Crime, 2014). These differences provide an interesting context to study differences in value similarities: If values are instantiated similarly across these three (at least somewhat) dissimilar countries, this evidence would provide new support for the universalistic claim. Conversely, if values are instantiated differently, this evidence would support the claim that culture consists of shared mental representations at a concrete level (Romney et al., 1996).

Because most the participants in Studies 4 to 10 were students, I conducted a further study reported in Appendix B, in which I tested whether students are representative of the general population and more homogeneous, addressing a potential limitation of the empirical studies. Table 1.1 provides an overview of all studies.

As already mentioned, one of the main aims of this thesis is to depart from the common ‘difference focus’ found in the social sciences and to focus instead on similarities. However, across 18 million papers in all fields science, it was found that balancing conventional with atypical knowledge results in a higher impact than does solely focusing on the atypical (Uzzi, Mukherjee, Stringer, & Jones, 2013). Hence, I aim to balance my focus on similarities with a focus on differences. In Studies 1 and 2, I focus mainly on similarities and discuss differences only briefly. Given the high similarities documented in Studies 1 and 2, I then turn to a search for differences by focusing on value instantiations. The search across the last eight studies in this thesis

show in diverse ways that strong similarities remain, even while looking for (and finding some) nichés that expose difference.

Table 1.1

Overview of empirical studies

	Description	Countries included	Sample size	Data type
Study 1	Demonstrating that similarities between groups are larger than differences	60 from five continents	~86,000	Secondary
Study 2	Replication of Study 1	29 European countries	~54,000	Secondary
Study 3	Influence of presentation type on lay readings of reports	UK	291	Primary
Study 4	Instantiations of human values (qualitative-exploratory design)	Brazil, India, UK	630	Primary
Study 5	Do people recognize that instantiations are related to the originating values?	Brazil, UK	627	Primary
Study 6	Estimating the relevance of instantiations	Brazil, UK	250	Primary
Study 7	Influence of typicality on values – attitudes – social norms – perceived behaviour control – intention relations (Theory of Planned Behaviour)	Brazil, India, UK	749	Primary
Study 8	Art bias in lay-perception of creativity (same data as Study 4)	Brazil, UK	67	Primary
Study 9	Conceptual replication of Study 8: Amount of creativity needed for professions	Brazil, UK	253	Primary

	Description	Countries included	Sample size	Data type
Study 10	Conceptual replication of Study 8: Amount of creativity needed for various objects (pictures, engineering products)	Brazil, UK	171	Primary
Appendix B Study	Are students an accurate estimate of the general public? (same data as Study 1)	59 from five continents	~84,000	Secondary

Chapter 2: A Case for Documenting Similarities Between Groups of People

In the weeks after a narrow majority of British voters voted to leave the European Union in June 2016, the level of openly racist incidents appeared to increase sharply (Versi, 2016). This is in line with an upsurge of support for right-wing parties across Europe in recent years (Wodak, KhosraviNik, & Mral, 2013). A similar pattern has been seen in the USA, where it has been argued that racism has become more acceptable as a result of speeches made by presidential candidate Donald Trump (Vasquez, 2015). A key characteristic of racism is its focus on the fact that out-groups are different from and inferior to the in-group. Here I suggest that quantitative social science has inadvertently been playing a role in fostering these beliefs by focusing on differences between groups and neglecting to highlight stronger and important similarities.

This issue is of fundamental importance because scientific research is supposed to reveal intersubjective reality (the ‘truth’) in an unbiased and reliable way. However, there are different ways to describe intersubjective reality. For instance, if we were comparing two groups of people with respect to moral attitudes, we could describe either the differences or the similarities between the groups, or indeed both. Historically, the focus of social sciences and psychology in particular has been on the description of differences between groups. Over 90 percent of the published research findings in psychology describe statistically significant differences (Fanelli, 2010; Open Science Collaboration, 2015). Studies that are instead consigned to the metaphorical file-drawer contain results that are often described as “failures” to detect significant differences, and most of the inferential statistics and effect sizes used are only appropriate for measuring differences.

The lack of recognition that similarities matter is important because differences between groups with so-called “large” effect sizes can occur even when two groups are much more similar than different, as described below. Moreover, this possibility is applicable whenever people are clustered into groups based on a specific variable, including many common demographic variables studied in psychology (e.g., gender, age, culture). Further, the inclusion of information on similarities, instead of a narrow focus on differences, can lead to more accurate perceptions of findings. In this chapter, I illustrate these points, beginning with a rationale of why I assume that similarities between groups of people are larger than differences, followed by a discussion of common ways of reporting scientific findings and measures of similarities.

Cultural Comparisons as an Example of Research that has Reported Similarities

Cross-cultural psychology provides one example of a domain wherein the importance of examining similarities has been highlighted (Berry et al., 2011; Brouwers, Hemert, Breugelmans, & Vijver, 2004), despite most research focusing on differences. Furthermore, several definitions of cross-cultural psychology emphasize differences (Brislin, Lonner, & Thorndike, 1973; Eckensberger, 1972), while ignoring similarities and uniformity (see Berry, Poortinga, Breugelmans, Chasiotis, & Sam, 2011). A review of 200 random selected publications of the *Journal of Cross-Cultural Psychology* concluded that similarities are underrated (Brouwers et al., 2004).

Many studies that have used large-scale cross-cultural surveys, like the European Social Survey (ESS) or the World Value Survey (WVS), have focused almost entirely on differences. For example, some studies have reported between-country differences in happiness or well-being (e.g., Mencarini & Sironi, 2012; Swift et al., 2014), whereas others have focused on attitudes towards immigrants (as a perceived ethnic threat), trust in other people, or trust in institutions such as the national parliament, police, or the

United Nations (e.g., Davidov & Meuleman, 2012; Grönlund & Setälä, 2012; Marozzi, 2014; Visser, Scholte, & Scheepers, 2013). Using data from the WVS, studies have reported differences in social trust and self-reported health (Jen, Sund, Johnston, & Jones, 2010) or satisfaction with life (Oishi, Diener, Lucas, & Suh, 1999).

Yet many international agreements are consistent with the view that there are high levels of similarity between nations. For example, more than 190 countries joined the international crime police organization (INTERPOL), which indicates that they share at least some common policies regarding the response to criminal behaviour. Another example is the Universal Declaration of Human Rights (1948), which has been signed by almost every nation and demonstrates that humans share a common system of values (Bobbio, 1996). Indeed, the primary reason I became interested in similarities is the evidence for cross-nation similarity in values. Specifically, as discussed in Chapter 1, there is evidence that (a) human values are structured in the same way across 80 countries (Bilsky et al., 2011; Schwartz, 1992; Schwartz et al., 2001, 2012), (b) the hierarchy of human values is the same across numerous countries (Schwartz & Bardi, 2001), and (c) differences between countries with regard to value priorities are very small compared to the differences within a country (Fischer & Schwartz, 2011). Furthermore, a recent study that investigated 18 psychological variables (e.g., social axioms, personality, nationalism) in 27 countries found that the variance between countries only accounted for between 7 and 34 percent of individual differences (Saucier et al., 2015), suggesting that countries are more similar than different, although the paper itself only focused on differences.

However, both of the above studies focused only on comparisons between countries. Furthermore, Fischer and Schwartz (2011) quantified similarities, but only examined values, while Saucier et al. (2015) investigated a range of variables, but did

not quantify similarities. Research needs to go beyond country differences to explore differences/similarities in other important group categories, such as gender, age, income, education, and religious denominations. Indeed, in a second-order meta-analysis, Hyde (2005) found that the majority “of effect sizes for gender differences were in the small or close-to-zero range” (p. 586). It may be the case that effects of other traditional grouping variables (e.g., age, income, education) also occur against a backdrop of strong similarity. Such evidence would provide an important counterpoint to the dominant emphasis on differences.

A General Test of Similarities and Methodology

The typical way of presenting research findings contributes to our ignorance of similarities. Presentation usually focuses on means, line graphs, bar graphs, p levels, or Bayes factors. These modes of presentation usually focus on differences. Another reason for a lack of attention to similarity may be an incorrect assumption made by researchers. Specifically, we tend to assume that a null difference indicates high similarity, whereas a statistically significant result reflects low similarity.

While the null difference potentially affirms (or at least fails to refute) high similarity, a significant and/or large difference is *not* diagnostic of low similarity. Consider national differences in an important contemporary topic: trust in science. Figure 1 displays Brazilians’ ($n = 1473$) and Germans’ ($n = 2043$) trust in science, as reported in the World Value Survey (see below and Appendix A for more details). Larger scale values (i.e., towards 10) reflect greater trust in science. As shown in Figure 2.1A, superimposing one density distribution on the other reveals a large overlap between the two nations. The majority of Brazilians chose response options that were also frequently chosen by German respondents. Other ways of depicting the data also reveal large overlap. Figure 2.1B displays two Kernel distributions, which have been

smoothed to the data. Figure 2.1C displays two histograms with five bars, and Figure 2.1D displays two histograms with 18 bars each. Moreover, this overlap occurs even though a Welch's *t*-test of statistical difference reveals that Germans have significantly greater trust in science, $t(2507.10) = 13.27, p < .0001$, with a moderate effect size, Cohen's $d = .48$. The Bayes factor is $> 10^{35}$, using Rouder's default JZS of $r = 0.71$, indicating overwhelming evidence for the alternative hypothesis (cf. Rouder, Speckman, Sun, Morey, & Iverson, 2009). Crucially, however, the overlapping density distributions show that these robust difference tests neglect another perspective on the two groups' trust in science: Notwithstanding the moderate effect size, the vanishingly small *p*-value and the enormous Bayes factor, 81% of the responses are shared between the groups. The similarities are visibly far larger than the differences. Such similarities are often ignored in the reporting of results, even though they have a fundamental relevance to the "take-home" message for readers: Brazilians and Germans both trust science to a great extent – they do not have opposing or dissimilar views.

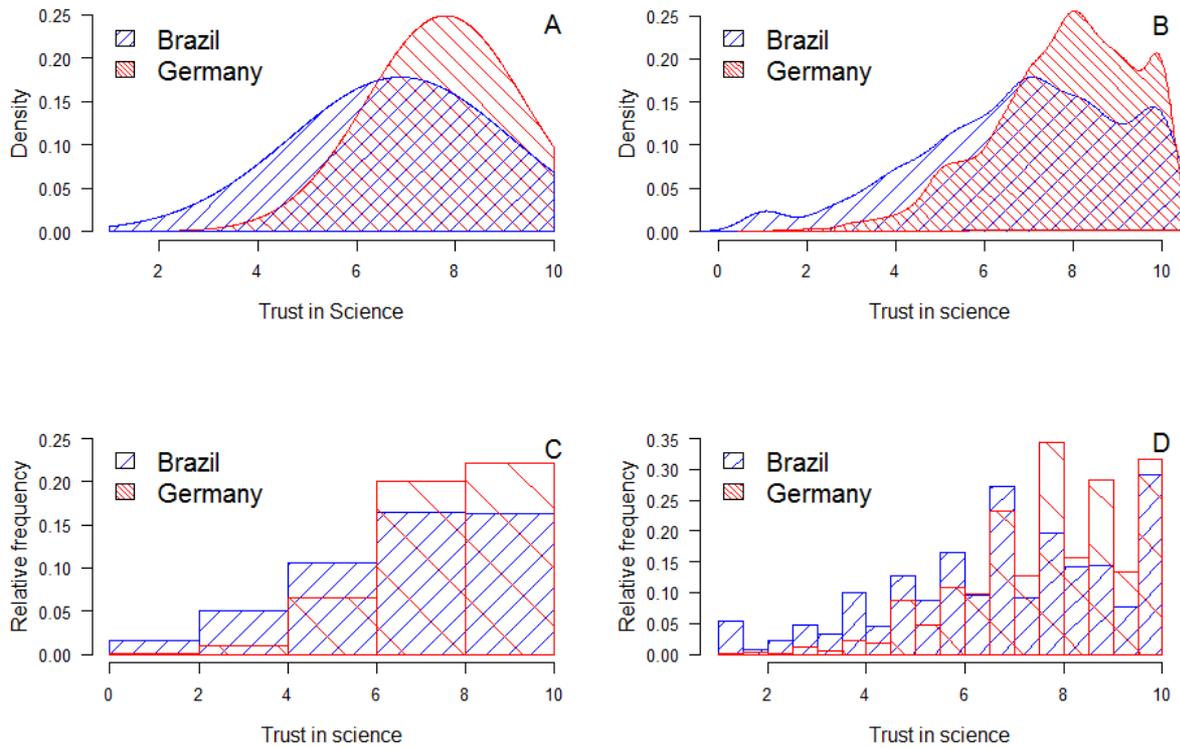


Figure 2.4. Different ways to present Trust in Science in Brazil and Germany, with $d = .48$ and $PCR = 81$.

To make similarities more apparent in research reports, it is important to apply a general and easy-to-use method for quantifying similarity across diverse research domains. Although researchers have called for greater examination and discussion of similarities, especially in cross-cultural research (Berry et al., 2011; Brouwers et al., 2004), a coherent approach to describing similarity has been absent. My proposal is to avoid the problems associated with overreliance on both null hypothesis significance testing (NHST) and Bayesian statistics by supplementing them with information about similarities.

To support this aim, I have reexamined a generally neglected measure of similarity and developed two new methods for assessing similarities. As background to understanding my approach, it is important to consider current approaches to testing

differences and to effect sizes representing differences. For example, a two-sample t-test, one of the most commonly used tests in psychology, tests only the probability that two means are from the same population, while relying on the hypothesized distribution of the means and neglecting the actual distribution of the data. In other words, a t-test can only help to ascertain whether the two means are likely to come from the same distribution; it does not allow any inferences about the actual distributions. Similarly, one of the most popular indices of effect size, Cohen's d , measures the differences between two means in units of variability (Cohen, 1988).

A possible and often neglected application of d is that it can be transformed to yield an overlap coefficient (OVL), which allows one to draw conclusions about the distribution of the whole data, not just the means, by estimating the percentage of overlap between two normal distributions (Inman & Bradley, 1989). In other words, the OVL helps to assess similarity. For example, even a large effect size of Cohen's $d = .80$ (Cohen, 1992) represents an overlap of 69 percent; a medium effect size of $d = .50$ represents an overlap of 80 percent; and a small effect size of $d = .20$ represents an overlap of 92 percent (Figure 2.2). Below, I describe an empirical comparison of the OVL with four additional measures of similarities: The intraclass correlation (ICC[1]), the probability of superiority, non-parametric versions of the OVL, and a new measure we developed to explicitly calculate the percentage of common scores (PCS). I demonstrate that the OVL is essentially the same variable as the PCS and very strongly related to the other similarity indices. Because the OVL and PCS are almost perfectly correlated, I argue that it is easiest and most useful to simply multiply the OVL by 100 and label this new index as the percentage of common responses (PCR), which is a more

concrete and easy-to-comprehend statement of similarity than the abstract notion of overlap.

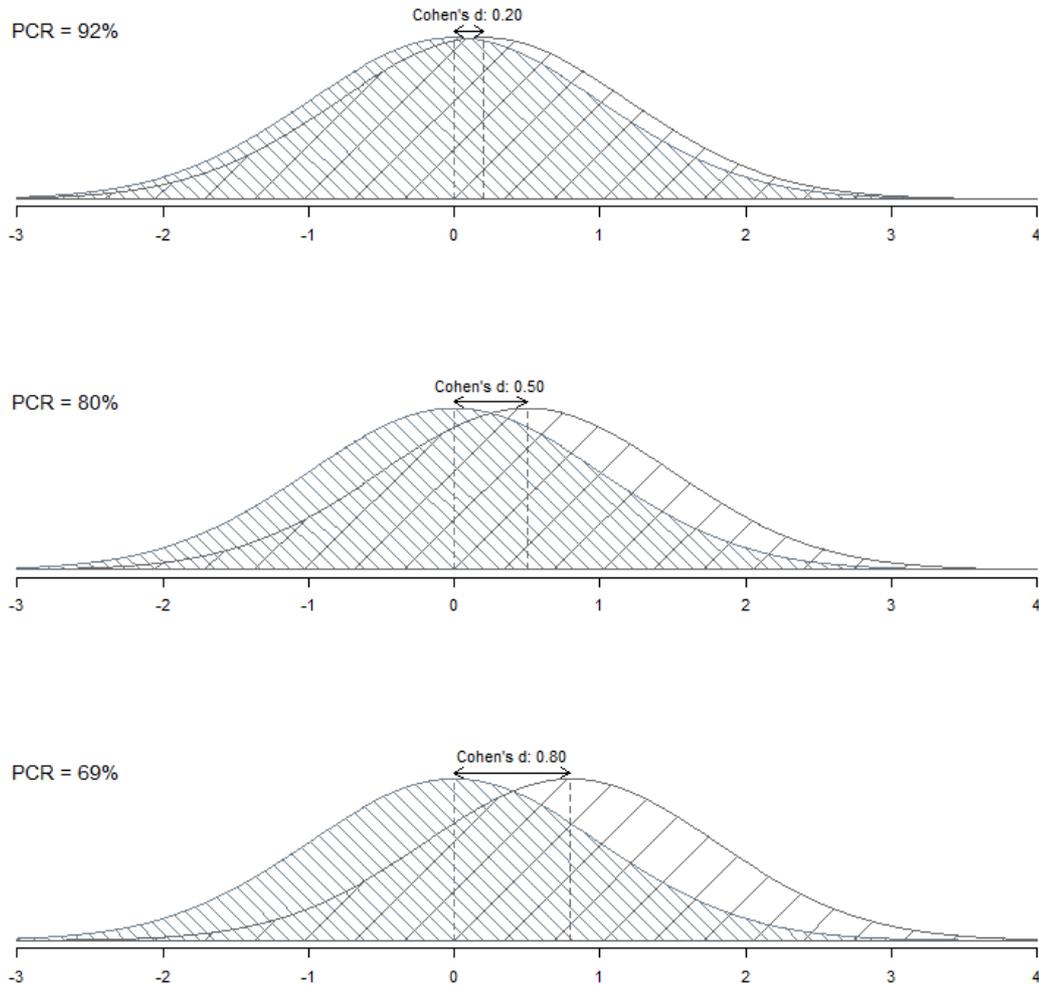


Figure 2.2. Illustration of the percentage of common responses (PCR; or overlapping coefficient) for different Cohen's d s. The design of the figure was inspired by Kristoffer Magnusson's interactive visualization on <http://rpsychologist.com/d3/cohend/>.

The PCS estimates similarity simply by calculating the percentage of common scores across two distributions. It can be used for both normal and non-normal distributions, and it is easy to interpret. The PCS can be interpreted as the percentage of

one group that has the same scale responses as the other group. For example, a percentage of 90 indicates that only 10 percent of each group has chosen a response on the measurement scale that is not mirrored in the other group.

PCS is computed using an easy-to-use function I developed in R. In developing the method for calculating the PCS, two issues had to be addressed. First, the PCS for an item with a 5-point response scale is likely to be larger than for an item that has a 10-point response scale. To address this issue, I calculate the PCS by normalizing the data separately for each group, counting the number of values in the following five groups: 0 to 0.2, 0.2 to 0.4, 0.4 to 0.6, 0.6 to 0.8, and 0.8 to 1. Each score in the first group would be replaced by 0.1, each score in the second group by 0.3, and so on. (The scores 0.1, 0.3, etc., are arbitrary numbers; alternatives such as 1 to 5 would have fulfilled the same purpose). Through this transformation, I ensured that each variable consists of different frequencies of the same five scores. That is, I standardized the number of scale points for all variables to 5. I applied this transformation to all measures, because many recent and reliable scales use at least a 5-point scale. A second issue is differences in sample size: If one sample is twice as large as the other, how can the PCS be calculated? To address this, I used bootstrapping methods. That is, from the larger group we draw a sample of the same size as the smaller group and calculate the number of responses in common with the smaller group. After normalizing and clustering the values into one of the five groups as described above, the percentage of common responses between the two vectors is computed. This is done 100 times for each variable. The median of the 100 common responses is then used as an estimate of the percentage of common responses.

The interpretation of the PCS is approximately the same as the PCR when the two distributions are normal, especially if the sample sizes are equal. The primary

difference is that the PCS refers directly to common scale responses across two groups. That is, a research report could indicate that one group was X units higher than the other, but gave the same responses Y% of the time (rather than report a difference of X and overlap of Y). Furthermore, the PCS returns, on average, a more conservative estimate of similarity (cf. results below).

Given that PCR and PCS are conceptually similar, I expected large correlations between these measures. Indeed, all correlations were as expected, both on a single pairwise comparison level and on an aggregated level. For example, within the category of country, PCR and PCS of moral attitudes towards personal-sexual behaviors correlated very strongly, $r[1768] = .98$. On an aggregated level (correlating the medians of each variable across all categories), the medians of PCR and PCS correlated highly, $r(130) = .96$, but, PCS was slightly smaller ($M = 91.23$, $SD = 6.46$), than PCR ($M = 93.30$, $SD = 5.37$).

There are other effect sizes that could be used to estimate similarities instead of the PCR and PCS. I consider all three as interesting alternatives. One alternative option is the intra-class correlation (ICC[1]; Bliese, 2000). The ICC(1) uses the between-group and within-group variance directly. It can be interpreted as the average proportion of total variance explained by group membership within categories, such as countries or age groups. An ICC(1) of .2 indicates, for example, that 20 percent of a variable can be explained by group membership, or, alternatively, that 80 percent of the variation cannot be explained by group membership. If similarities are large, between group variance is low and the ICC(1) is therefore close to zero. However, the concept of amount of explained variance is not very intuitive. Further, because the ICC(1) is calculated from an ANOVA model, the ICC(1) is a parametric measure.

A second option is the probability of superiority (PS), which is a non-parametric generalization of the common language effect size (McGraw & Wong, 1992). The PS returns the probability that a randomly selected person from the higher-scoring group has a higher value than a randomly selected person from the other group (Ruscio, 2008; Ruscio & Mullen, 2012). A PS of .50, for example, would indicate maximum similarity, whereas values close to 0 or 1 large differences. I think PS is an underused measure to present differences. However, a “probability of superiority” is not a label that could be applied to directly convey similarities.

A third alternative is to smooth a kernel density estimate over the data and compute the overlap of the two functions. Figure 2.1B displays such a possibility. This approach can be understood as a non-parametric version of the OVL coefficient (Schmid & Schmidt, 2006, p. 200). However, an evident problem is that both the distribution of the data and the response options vary. Hence, smoothing a kernel density estimation above all data in the same way becomes practically impossible. For example, assume the data in both groups are normal distributed. When the kernel density estimates are smoothed in a loose way above the data, we obtain two normal distributions. If the density would be smoothed exactly above the data, the result would be the same as for the PCS measure, without standardizing it to five response options.

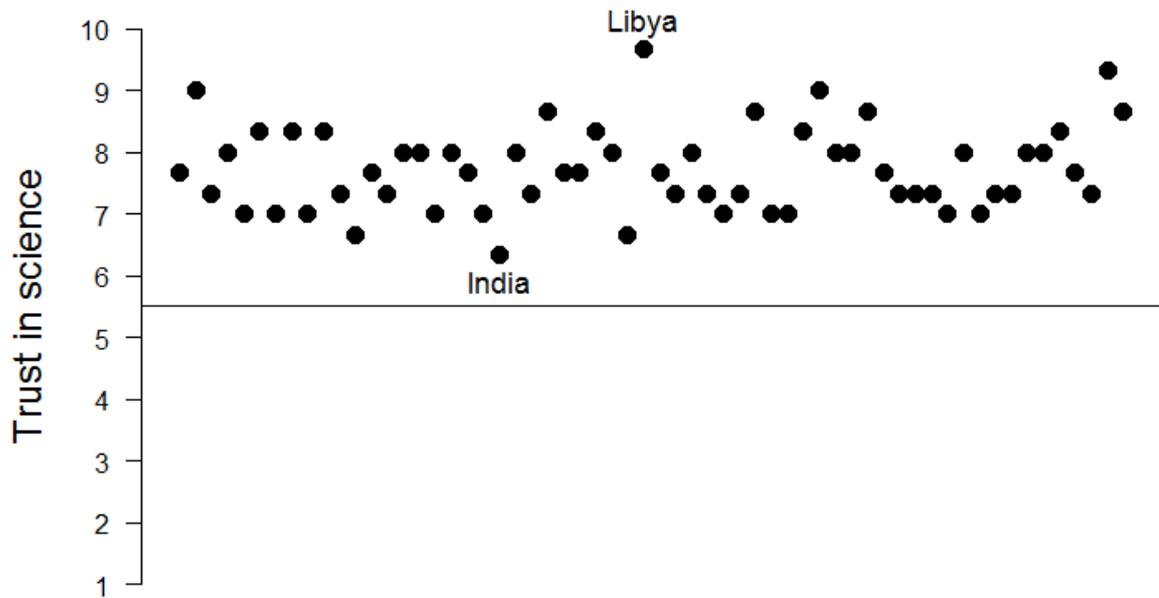
For all of these approaches, the interpretation is less direct and intuitive than an approach that simply ranges from 0 to 100 percent, which can be obtained easily through the PCR (i.e., a non-linear transformation of d).

However, the PCR, like the conceptually related measures such as the percentage of common scores, the ICC[1], and the probability of superiority measure, neglects one other vital consideration for quantifying similarity: the *absolute* difference between the two means or medians, given a specific scale. For example, small variances result in

larger d s: If the standard deviation is reduced by x , d will be increased by x . In other words, even small mean differences can result in large effect sizes and low estimates of similarity in distributions. For this reason, interpretation of the PCR needs to be supplemented with a measure of the absolute difference between two populations. To illustrate, consider once again the example of trust in science. To anticipate analyses reported below, I compared all 60 countries from the WVS with each other pairwise, resulting in 1770 comparisons. On the basis of the ‘classical’ approach that focuses on differences, one might conclude that countries differ considerably in their trust in science. The average d is .31, and the largest d is 1.60 (between India and Libya, $M = 6.05$, $SD = 2.10$, $median = 6.33$, vs. $M = 8.92$, $SD = 1.53$, $median = 9.67$). Many of the differences between any two given countries are statistically significant, which is not surprising given an average sample size of 1438 per country. A few of the differences also seem appreciable when considered alongside the percentage of common responses for some countries. For example, the PCR between India and Libya is only 42. However, the picture looks different when the median scores are considered. Participants in these two countries (and indeed in each of the 60 countries) scored significantly higher on average than the mid-point of the 10-point Likert scale (Figure 2.3). In short, people in all the nations had a high trust in science.

This similarity in central tendency can be captured by calculating the absolute effect (AE), which I define as the median difference expressed as the proportion of the largest possible difference: $(\text{median group A} - \text{median group B}) / (\text{scale maximum} - \text{scale minimum})$. If the median difference is .5, measured on a scale ranging from 1 to 6, the AE would be $.5 / (6 - 1) = .1$. An advantage of the AE is its independence from the distribution and the variance. In the current example, calculating the AE reveals that the

proportion of the median difference is rather small (median AE = .07; the maximum AE of .37 is between India and Libya).



All Countries from the World Values Survey

Figure 2.3. Median score of trust in science per country. The horizontal line represents the scale midpoint.

Despite their conceptual independence, PCR and AE tend to be negatively related in the data we have examined (see below). Therefore, based on these measures, I propose the following approach to describing similarities between two groups. This approach uses three thresholds to provide a scale for interpreting similarity that is parallel to the common practice of dividing measures of effect size into small, medium, and large (cf. Cohen, 1992). A *small* amount of similarity exists when the PCR is above 50% and the AE is below .50; a *medium* amount of similarity exists when the PCR is above 66.67% and the AE is lower than .33; and finally, a *large* amount of similarity exists when the PCR is above 83.33% and the AE is below .17. Conversely, a *small*

amount of difference exists when PCR is below 50% *and* the AE is above .50; a *medium* amount of difference exists when the PCR is below 33.33% *and* the AE is above than .67; and finally, *large* differences exists when the PCR is below 16.67% *and* the AE is above .83. Because 50% and .50 are the natural mid-point of PCR and AE, respectively, the thresholds follow from these points.

The Present Research

To provide a broad demonstration of the utility and importance of my proposed similarity indices, I performed two studies using large international datasets. In Study 1, I tested for similarities across six categories: gender, age, education, income, countries, and religious denomination. In Study 2, I used the same categories except religious denominations because the data was restricted to European countries, providing less variance in this variable. Furthermore, I tested for similarities on a range of dependent variables, including human values, moral attitudes, trust, and well-being. These choices were made with an eye to examining variables that have often been reported as showing important differences between people. If there is evidence of high similarity in these tests, the data would provide an important caveat regarding prior conclusions about differences.

The present research addresses this issue using newly developed tests in large, representative international samples across 22 dependent variables in Study 1 and 24 dependent variables in Study 2. I computed the described statistics, PCR, AE, and for the purpose of comparison, the percentage of common scores (PCS, see below and Appendix A), which is a non-parametric test for similarities, and Cohen's *d*. Within a given category (e.g., countries), I compared each group with each other (e.g., Brazil with Germany) to compute all the statistics. For example, I compared in Study 1 60 countries pairwise, resulting in 1770 comparisons for each statistic and variable. For the

remaining five categories, I conducted 155 pairwise comparisons: 28 for religious denominations, 1 for gender (male vs. female), 36 for education, 45 for income, and 45 for age. In total, I conducted in Study 1 167,284 pairwise comparisons for all of four statistics (d , PCR, PCS, AE).

I expected to find large correlations between the PCR, AE and the other measure of similarity, PCS. I then explored potential differences in levels of similarity involved across all comparisons. For example, I tested whether people were less similar to each other when clustered in different income groups than when clustered in countries, as Greenfield (2014) proposed. Furthermore, I explored which variables show more similarities and which variables show fewer similarities across all six (five) categories.

Study 3 focuses on one of the key reasons why it is important to examine similarity in the first place. Specifically, it may make a large difference whether people see results in a way that depicts the traditional focus on difference versus the same findings in a way that represents the similarities. Study 3 tests whether reporting similarities compared to differences leads to more *accurate* perceptions of effects in lay reading of reports. If this finding emerges, it provides important evidence that reporting similarity enhances the correct understanding of scientific data communication.

Study 1: Similarities Across 60 Countries

Method

Participants. I used the most recent version of the WVS at the time of conducting our data analyses (6th round; April 2015), which includes 86,272 participants (51.20% female) from 60 countries with a mean age of 41.68 years ($SD = 16.58$). Data were retrieved from <http://www.worldvaluessurvey.org>.

Material. My independent variables were gender, age, education, income, nation of residence, and religious denomination. Gender was measured dichotomously as

male/female. The continuous variable year of birth was divided into 10 equal sized groups, ranging from “born in 1946 or before” to “born in 1991 or later.” Education was measured on a 9-point scale ranging from “no formal education” ($n = 4604$) to “university-level education with degree” ($n = 14,260$). To estimate income, participants were asked to indicate their household net income, relative to the country-specific income distribution, on a 10-point scale from 1 (lowest group) to 10 (highest group). For country, I used all 60 countries in the WVS. More than 1000 participants indicated that they belong to one of the following eight religious denominations: Buddhism ($n = 3861$), Evangelical ($n = 1411$), Hindu ($n = 1742$), Muslim ($n = 18,004$), Orthodox ($n = 8505$), Protestant ($n = 5562$), Roman Catholic ($n = 14,921$), and Sunni ($n = 3172$).

Twenty-two dependent variables were included. The ten value types postulated by Schwartz (1992) were measured in the WVS with a short version of the Portrait Value Questionnaire (Schwartz et al., 2001), containing one item per value type. Participants were asked to rate the extent to which they are similar to each description (portrait) of another person. Example descriptions include “It is important to this person to think up new ideas and be creative; to do things one’s own way” (self-direction) and “It is important to this person to be rich; to have a lot of money and expensive things” (power). Responses were given on a 6-point Likert scale ranging from 1 (very much like me) to 6 (not like me at all). I chose the other 12 variables by considering the scales within the WVS, the findings of previous studies, and the results of principal component analyses (PCAs). For instance, although trust in other people had been measured in previous studies with a single scale (Jen et al., 2010), I created two factors from the six items, based on the results of a PCA (varimax rotation). All six items were answered on a 4-point scale from 1 (trust completely) to 4 (do not trust at all). The first factor represents trust in strangers, and is based on trust in people met for the first time, trust in

people of a different religion, and trust in people from a different country ($\alpha = .79$). The second factor represents trust in people with whom one is close (family, neighbours, people known personally; $\alpha = .58$). The correlation between the two factors was of medium size, $r(83962) = .35$. Other variables were understanding of democracy (6 items, $\alpha = .74$), trust in political institutions (6 items, $\alpha = .87$), perceived respect for the elderly in own society (3 items, $\alpha = .71$), ageism (4 items, $\alpha = .60$), trust in science (3 items, $\alpha = .73$), scepticism towards science (3 items, $\alpha = .56$). Trust in science was uncorrelated with scepticism towards science, $r(83686) = -.07$. Further, the items of the Morally Debatable Scale (Harding & Phillips, 1986) were divided into three subscales after a PCA (cf. Vauclair & Fischer, 2011): attitudes towards personal-sexual behaviours (e.g., justifiability of homosexuality, 7 items, $\alpha = .89$), dishonest-illegal behaviour (e.g., stealing, 5 items, $\alpha = .83$), and domestic violence (e.g., a man beating his wife, 3 items, $\alpha = .78$). Higher scores on these attitude scales signify more agreement. Finally, political attitude was measured with a single item, on which participants could indicate their position on a left-right political dimension from 1 (left; $n = 3459$) to 10 (right; $n = 5354$), with most participants identifying themselves as in the middle (5 items, $n = 19,005$).

Results

First, I report validations of the measures. Next, important findings for each category are reported, then comparisons between all categories, and finally comparisons between the 22 dependent variables. Detailed results can be found in Appendix A.

Validation of the measures.

One possible objection to the use of the PCR is that it may be biased when the assumptions of normality and variance homogeneity are violated. I therefore validated the PCR with the PCS. This new measure computes the percentage of common scores

while taking sample size and the length of the response scale into account. Given that the measures are highly correlated ($r = .95-.98$) and the average difference is 2 percent, I consider the PCR to be a valid measure of similarities.⁵

The large correlation between PCR and PCS indicates that the PCR, despite being a parametric measure, is robust against violations of normality assumptions. A large correlation was also found between PCR and AE ($r = -.65$). Given this evidence for convergent validity, we focus below on the two measures that we propose: PCR and AE.

Findings within each category. As expected, the median values for the four statistics revealed high levels of similarity. For all variables, the median PCR between two groups is 95 ($M = 93$), and the AE is .02 ($M = .05$), indicating large similarities. Only 274 out of 41,821 pairwise comparisons (0.66%) for both effect sizes combined revealed a PCR of less than 50 percent and an AE of more than .50. All 274 cases were found in the *country* category (see Table A1).

Findings within each category

Countries. Countries were less similar to each other than were the groups in the other categories. The average PCR across all 22 variables was 84 ($range = 71 - 90$) and the average AE was .14 ($range = 0 - .20$). The two variables with the smallest PCRs and largest AEs were moral attitudes towards personal-sexual issues and moral attitudes towards (domestic) violence (PCRs = 6 and 9, AEs = .67 and .41): Participants from Pakistan considered liberal personal-sexual behaviours (e.g., abortion, homosexuality) least justifiable ($M = 1.60$, median = 1.14), whereas those from the Netherlands ($M = 6.69$, median = 7.14) and Sweden (median = 7.14) found them most justifiable.

⁵ I also consider our newly developed measure, the percentage of common scores (PCS), to be as valid as the PCR, which is why I have also reported the results of the PCS in Appendix A. I use the PCR because it is easier to compute, for example with this short command in R: $2 * pnorm((-abs(0.43))/2) * 100$ (for $d = 0.43$) and because people judge it more accurately (Study 2).

Participants in 28 countries reported that (domestic) violence is not justifiable ($M_s < 2$, medians = 1), whereas participants from Rwanda found it relatively more justifiable ($M = 4.50$, median = 4.67). However, the average Rwandan reported that (domestic) violence is less justifiable than justifiable, as did the average respondent from the other 59 countries (Table A1); the largest AE for these 1700 pairwise comparisons was .41, indicating only a small amount of similarity, following the taxonomy introduced above.

Religious denomination. Pairwise comparisons were made for eight religious denominations. The amount of similarities across 22 dependent variables was large (PCR = 90, range = 85 – 96) and the average AE was .06 (range = 0 – .20). The smallest PCR was with respect to moral attitudes towards liberal personal-sexual behaviours (PCR = 49, AE = .29), with Sunnis reporting them as least justifiable ($M = 1.82$, median = 1.29) and Evangelicals reporting them as relatively more justifiable ($M = 4.06$, median = 3.86).

Income. The amount of similarities was again large with an average PCR of 96 (range = 92 – 98) and an average AE of .04 (range = 0 – .20). The smallest similarity was with respect to political attitudes (PCR = 78, AE = .22), with participants in the lowest 5 income groups having a stronger pro-left attitude ($M_s < 5.88$, median = 5) than those in the highest income group ($M = 6.77$, median = 7).

Education. Similarities between educational groups were large: The average PCR was 96 (range = 91 – 98) and the average AE was .02 (range = 0 – .10). The smallest similarity was in moral attitudes towards liberal personal-sexual behaviours (PCR = 74, AE = .19), with participants having the lowest educational level reporting them to be least justifiable ($M = 2.50$, median = 2.00), and those with the highest educational level reporting them to be relatively more justifiable ($M = 3.94$, median = 3.67).

Gender. The amount of similarity was again large with an average PCR of 97 (*range* = 90 – 100) and an average AE of .03 (*range* = 0 – .20). The smallest similarity was for the value type *stimulation* (PCR = 90, AE = .20), with women reporting it to be less important ($M = 3.87$, median = 4) than men did ($M = 3.49$, median = 3), with lower values indicating greater importance.

Age. The amount of similarity was again large with an average PCR of 96 (*range* = 88 – 99) and an average AE of .04 (*range* = 0 – .20). The smallest similarity was for the value type *stimulation* (PCR = 65, AE = .40), with those born in 1955 or earlier valuing stimulation less than those born after 1978 ($M_s \geq 4.10$ vs ≤ 3.50 , medians = 5 vs 3, respectively, with lower values indicating greater importance). Although it cannot be distinguished between age and cohort effects in these comparisons, the issue is tangential to the current focus.

Comparisons between all categories.

To identify the categories for which similarities were the largest, I compared the PCRs and AEs between the six categories across the 22 variables. That is, I treated the variables as cases, and subjected the PCRs and AEs to 6-level (category type) repeated-measures ANOVAs. Because of violations of the sphericity assumption, the Greenhouse-Geisser (1959) correction was applied. Both the PCRs ($F[2.46, 51.72] = 85.57, p < .001, \eta^2 = .80$) and the AEs ($F[3.80, 79.81] = 15.63, p < .001, \eta^2 = .43$) differed significantly between categories. For both statistics, pairwise comparisons revealed that countries were less similar to each other than were the groups in each of the other categories (all $p_s \leq .001$). Countries were less similar to each other ($M_{PCR} = 84, M_{AE} = .14$) than were religious denominations ($M_{PCR} = 90, M_{AE} = .06$), income groups ($M_{PCR} = 96, M_{AE} = .04$), educational groups ($M_{PCR} = 96, M_{AE} = .02$), women and men ($M_{PCR} = 97, M_{AE} = .03$), and age cohorts ($M_{PCR} = 96, M_{AE} = .04$).

A second category where the degree of similarity was somewhat lower compared to the remaining four categories was religious denomination ($ps < .001$), but this applied only for the PCR measure; the differences for AE were less consistent (see Tables A1 to A6 in Appendix A). The difference in PCR between religious denominations and the remaining four categories ranged between 5.41 and 6.86, indicating smaller levels of similarities between religious denominations, relative to those for income, education, gender, and age.

Discussion

The objective of Study 1 was to present a case for reporting similarities. The utility of doing so was demonstrated in the analysis of similarities across six important psychological categories and 22 topical variables. Across all variables we examined, the average PCR was 93 when we compared people from different genders, ages, educational attainments, incomes, countries, and religious denominations⁶. This high level of similarity was corroborated by the absolute effect (AE). With an average of .05 across all categories and variables, this shows that the median difference between any two groups was only one-twentieth of the possible difference on the scale in question.

Countries were on average less similar to each other than were the groups in other categories. This challenges the claim that countries are more similar to each other than are people with different socio-economic status (Greenfield, 2014). The lowest degree of similarity I found across all comparisons was for moral attitudes towards personal and sexual issues. This result is broadly consistent with Graham et al.'s (2011) evidence that the largest differences between various groups of people – mainly liberals

⁶ The average amount of similarity is slightly higher here than in the published social psychological literature. The average estimated effect size in social psychology was estimated to be $d = 0.43$ (Richard, Bond Jr., & Stokes-Zoota, 2003), which translates into a PCR of 83. However, it was found that because of publication bias and p-hacking, among other things, the effect sizes in the published literature are inflated by a factor of approximately two (Open Science Collaboration, 2015), which means that the average PCR in social psychology is around 91.

and conservatives – is on the moral dimension *purity*, which is closely related to moral attitudes towards personal and sexual issues.

Notwithstanding the evidence for smaller similarities between countries than between groups in the other categories, the high average degree of similarity between countries supports the moderate universalism claim in cross-cultural research, which holds that values, attitudes, and beliefs are weakly influenced by cultural factors (Berry et al., 2011). At the same time, however, we can now be more confident that country has a relatively strong influence on variables like human values, independently of religious denomination, education and income level, or age distribution. If country differences were mainly due to differences in religious denomination, education level, or age distribution, I would have found groups in these categories to be less similar to each other than countries. By contrast, I found that countries were less similar to each other than were groups in these other categories.

It is important to keep in mind that I could have presented all of the comparisons without PCR and AE data and focused only on effect sizes quantifying differences (e.g., d scores). The differences between categories and variables would have been replicated, but phrased in the reverse manner. For example, it would have been concluded that differences between countries are larger ($M_d = .39$) than differences between groups in the other categories and that differences between gender and age cohorts are small, albeit highly significant (for the Cohen's d s see Appendix A). Such a focus would tell a different story, focusing on large d s, and ignoring the large number of small effects. Not only would this approach result in most results attracting little attention due to small effect sizes (i.e., ending up in a virtual file-drawer), but the interpretation of the large effect sizes would have obscured the fact that the similarities are in many cases very large. Adding PCR and AE to the analyses helps to put the interpretation of d -scores, p -

values and/or Bayes factors into perspective and increases the interpretability of the findings, as Study 3 demonstrates. However, before describing Study 3, I replicated first the findings of Study 1 using another large data set from 29 European countries.

Study 2: Similarities Across 29 Countries

Study 2 used the data provided by the European Social Survey (ESS; www.europeansocialsurvey.org), 6th round, collected in 2012 and 2013. The ESS has been conducted every other year since 2002 in 20 to 31 European and adjacent (Turkey, Israel) countries. The survey contains a variety of items that the survey designers selected *a priori* based on the items' perceived relevance for understanding differences between countries. For the sake of conceptual parsimony in my analyses, I categorized these items into several factors, as described below.

Method

Participants. The sample was representative and contained 54,673 participants from 29 different countries. Prior to the analyses, 591 participants were excluded from all of the analyses because they did not respond to four or more items on the Portrait Value Questionnaire (PVQ-21; Schwartz et al., 2001), leaving 54,082 participants. The mean age of the sample was 48.23 years ($SD = 18.56$, $range = 15-103$), including 29,395 women (54.35%).

Material and procedure. The five categories examined were country, gender, income, education, and age. For country, I used all 29 countries in the ESS. Gender was measured in the usual dichotomous way, male/female. Income was measured in a country-specific way, by coding the total household's net income into the respective decile of the income distribution for the household's nation. To measure education, the International Standard Classification of Education (ISCED) was used, splitting the participants into seven groups, ranging from less than lower secondary ($n = 5753$) to

higher tertiary education ($n = 6674$). The continuous variable ‘year of birth’ was split into 10 equal sized groups, ranging from born in 1939 or before to born in 1991 or later.

In total, 24 dependent variables were chosen. I used all 21 items of the Portrait Value Questionnaire (PVQ), which measures the 10 value types according to Schwartz’s (1992) model of human values (Schwartz et al., 2001): security, tradition, conformity, benevolence, universalism, self-direction, stimulation, hedonism, achievement, and power (Schwartz, 1992). Using a scale from 1 (very much like me) to 6 (not like me at all), participants indicated how similar they were to a fictitious person who shows a positive attitude towards a prototypical behaviour for one of the ten value types. Examples for items include “Thinking up new ideas and being creative is important to her/him. She/he likes to do things in her/his own original way” (self-direction) and “It is important to her/him to be rich. She/he wants to have a lot of money and expensive things” (power).

The remaining 151 items in the ESS that were measured on a quasi-interval level were factor analysed with a principal component analysis (PCA). After varimax rotation, I obtained 13 factors, consisting of 67 items. Many of these items have been used in international comparisons and in studies examining the ESS in particular (e.g., Davidov & Meuleman, 2012; Grönlund & Setälä, 2012; Marozzi, 2014; Visser et al., 2013). I labelled these factors as engagement in different political activities (6 items, $\alpha = .64$), attitudes towards immigrants (6, $\alpha = .89$), pessimistic world view (4, $\alpha = .61$), religiosity (4, $\alpha = .85$), feeling depressed (7, $\alpha = .84$), subjective happiness (4, $\alpha = .79$), trust in other people (3, $\alpha = .78$), trust in political institutions (7, $\alpha = .91$), feeling optimistic and fulfilled (6, $\alpha = .76$), relationship to neighbours (3, $\alpha = .66$), relationship to other people you are close to (3, $\alpha = .72$), trust in democratic rights (7, $\alpha = .85$), and trust in democratic processes (6, $\alpha = .83$). Items had to load at least .50 on one

component and less than .40 on any other component (with a loading difference between the two highest loading components of at least .25) to be included in a component.

Details of the dependent variables can be found in Appendix A.

Results

This section first reports validations of the four statistics measuring similarity. Next, important findings for each of the five categories are reported. I then examine which categories reveal larger similarities and which of the dependent variables show larger similarities across all categories.

Validation of the measures used.

First, I validated the measures across all categories and variables, again by correlating them with each other to estimate their convergent and divergent validity. Given that PCS and PCR are conceptually more similar to each other than to the other two measures, I again expected larger correlations between those measures than with the AE. Indeed, the medians of PCS and PCR across all categories variables correlated highly ($r[118] = .95$), but, as expected, PCR was significantly larger ($M = 93.01$, $SD = 4.75$) than PCS ($M = 92.08$, $SD = 5.00$) on average, $t(119) = 6.47$, $p < .001$, replicating the findings of Study 1.

Findings within each category.

As expected, the median values for the five statistics revealed high levels of similarity. Only 17 out of the 29,464 pairwise comparisons revealed a PCR of below 50 percent and an AE of above .50. For all variables, the smallest average PCR between two groups is well above 50 percent, and the absolute effect below .30. Thus, even between extreme groups (e.g., highly- vs. lower educated), large similarities were found. With a few exceptions (see examples below), people across the different groups within

each category revealed on average the same amount of similarity for the 10 value types as for the 14 other variables.

Countries. The median for all 24 dependent variables indicates large similarities between countries. The average PCR was 87. That is, on average, 87 percent of the participants in two countries chose an answer that was mirrored in the other country. The average absolute effect was .08, indicating that median differences between two countries were less than one tenth of the response scale. For example, the median PCR was 84 for the security value type. The median absolute effect for this value was .1, and the largest absolute effect between two countries was .4 (see Table A7).

There was some variation in the amount of similarity between the variables. For religiosity, for example, the amount of similarities was of moderate size (median PCR = 79, median AE = .19). Also, for 17 pairwise comparisons the differences were larger than the similarities. For example, the largest differences were found between Czech Republic as the least religious country ($M = 1.67$, median = 0.42), on the one hand, and Poland and Cyprus, on the other ($M_s = 6.74$ and 7.17 , both medians = 7.58), resulting in PCRs of around 22 and AEs of .72.

Gender. The amount of similarity was large with an average PCR of 95 (*range* = 87 – 100) and an average AE of .02 (*range* = .00 to .12). The smallest percentage of common scores was found for religion (PCR = 87), with women scoring higher than men ($M_s = 4.80$ vs. 4.36, medians = 5.17 vs. 3.92).

Income. The amount of similarity was again large with an average PCR of 95 (*range* = 86 – 99) and an average AE of .03 (*range* = 0 – .1). The smallest PCR was found for having a pessimistic world-view (PCR = 60), with people from the lowest two income deciles reporting being more pessimistic about their future compared to the

people from the highest two deciles ($M_s = 2.51$ and 2.61 vs. 3.12 and 3.26 , medians = 2.50 vs. 3.25).

Education. The amount of similarity was again large with an average PCR of 94 ($range = 86 - 99$) and an average AE of .05 ($range = 0 - .10$). The smallest PCR was between attitudes towards immigrants and having a pessimistic world-view (69 and 66 percent), with the lowest educated having a more pessimistic world-view than the second highest educated (lower tertiary educated; $M_s = 2.56$ vs. 3.16 , medians = 2.50 vs. 3.25), and the lowest educated having less favourable attitudes towards immigrants than the highest educated ($M_s = 4.23$ vs. 6.01 , medians = 4.17 vs. 6.17).

Age. The amount of similarity was again large with an average PCR of 94 ($range = 84 - 99$) and an average AE of .05 ($range = 0 - .10$). The smallest PCR was for the value type stimulation (PCR = 52), with the two groups of elderly participants (those born in 1947 or before) valuing stimulation less than the youngest participants (those born in 1991 or later; $M_s = 4.06$ and 3.85 vs. 2.59 , medians = 4.0 vs. 2.5 , where lower numerical values indicate higher importance).

Comparisons between all categories.

To identify the categories for which the similarities are the largest, repeated-measurement ANOVAs were conducted for PCR and AE separately, with the five categories as the repeated-measure factor across all the 24 variables. Because of violations of the sphericity assumption, the Greenhouse-Geisser correction was applied. The ANOVAs revealed significant differences between categories in the PCRs ($F[2.61, 60.12] = 27.02, p < .001, \eta^2 = .54$), and the AEs ($F[3.51, 80.69] = 12.52, p < .001, \eta^2 = .35$). Pairwise comparisons revealed that country differed consistently from the four other categories (all $p_s \leq .001$), indicating that countries are somewhat less similar to each other than are the other categories. For PCR, countries were between 6.88 and 8.21

lower than for the other categories. For AE, countries were between .03 and .05 higher than the other categories. Differences between the remaining six categories were mostly non-significant.

Discussion

Study 2 replicated findings of Study 1. Similarities were even slightly larger, which is likely due to more homogeneity of countries in terms of economic, political, and geographical terms.

The findings of Study 1 and 2 are intriguing and have a range of implications. For example, emphasizing similarities is promising for developing intervention programs to reduce prejudices or to increase the accuracy in which scientific findings are interpreted by the general public. The former example is discussed in more detail at the end of this chapter, whereas the latter example is empirically tested in Study 3, as one out of many intriguing implications of the finding that similarities between groups are usually far larger than differences.

Study 3: Mode of Data Presentation on the Interpretation of Results

Study 3 investigated the influence of mode of data presentation on the interpretation of results, using partly a one factorial between-subjects design with mode of presentation as the only factor. Specifically, I was interested in exploring which of three ways of displaying the same results (Figure 2.4) yields in a more accurate estimation of similarities and is perceived as clearer and more informative.

Method

Participants. Two hundred and ninety-one participants ($M_{\text{age}} = 33.75$, $SD_{\text{age}} = 11.17$, 46% women) remained in the analysis after excluding twenty-four participants because they failed the instructional manipulation check twice (Oppenheimer, Meyvis,

& Davidenko, 2009), and one participant was excluded because he or she responded to all items with 0. Participants were recruited via a paid online platform.

Materials and Procedure. Three types of graphs were created, displaying simulated data with 1500 participants in each group (i.e., the average sample size per country of the World Values Survey data). Data were simulated from a normal distribution, with a standard deviation of 0.80 and an overall mean of 3. The three types of graphs are depicted in Figure 2.4: a graphical representation of the overlapping distributions assessed by the PCR measure, a default barplot with confidence intervals, and superimposed histograms that represent the PCS measure. For each type of graph, nine versions were created with varying effect sizes: $d = 0, 0.20, 0.40, 0.50, 0.60, 0.80, 1, 1.5, \text{ and } 2$. Participants were randomly allocated to rate one type of graphs, which were presented randomly. The instructions for the participants were “In your opinion, to what extent do the data as depicted in this plot indicate that the two groups A and B are different or similar? Each group consists of around 1500 people.” To make the variable more concrete, I labelled it sociability. Participants responded on a slider measure, ranging from 0 (“very different”) to 100 (“very similar”). Also, for each graph, participants rated how comprehensible they found the figure on a 5-point scale ranging from 1 (“extremely incomprehensible”) to 5 (“extremely comprehensible”).

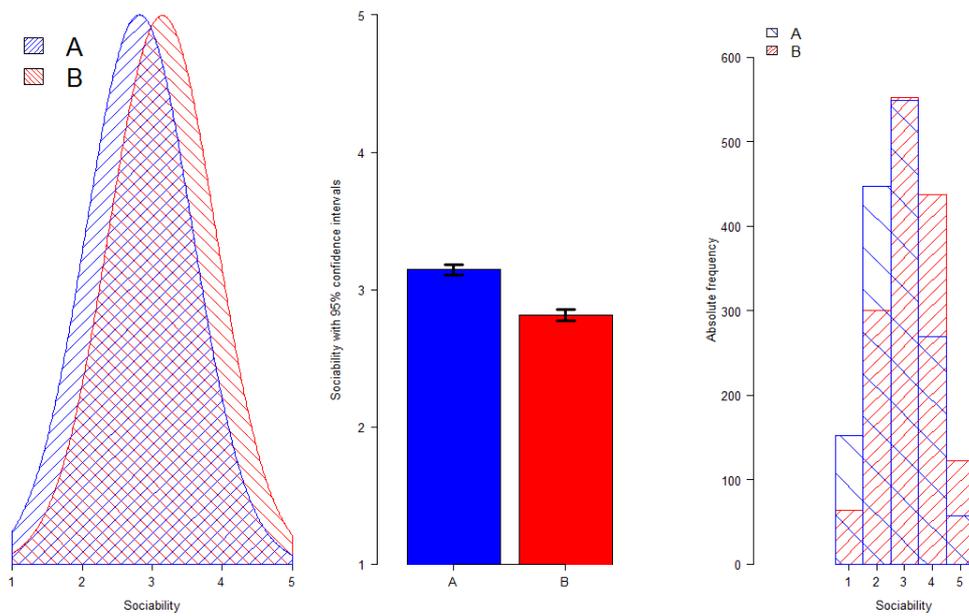


Figure 2.4. Three modes of depicting the same data. See text for more details.

Next, participants ranked which out of three possibilities (Cohen’s d , PCR, and PCS) is the clearest and most informative way to describe scientific findings. The first option was “The difference between men and women was Cohen’s $d = .43$ with Cohen’s d being the difference in the two groups’ means divided by the average of their standard deviations”, the second option was “The overlap of the responses given by men and women was 83 percent”, and the last option was “83 percent of the responses given by men were mirrored by women” (options were presented randomly). Finally, participants responded to some demographic items, including their education level and their statistical training, before being debriefed and thanked.

Results and Discussion

First I compared participants with a university degree and some or a lot of statistical training with the other participants. The response pattern was highly similar across all items; therefore the results are presented across educational levels and statistical training.

Next, I tested the influence of the mode of presentation on the perceived similarity. All but one between-subjects one-way ANOVAs reached statistical significance at $F_s > 5.2$ and $p_s < .006$, indicating that mode of presentation had an impact on the perceived similarity of two groups. For 6 out of the 9 graphical comparisons, a very similar linear pattern was observed, with the superimposed normal distribution plots being more accurate, followed by the barplots, and the superimposed histograms least accurate (Figure 2.5). In other words, people were more accurate estimating similarities with the measure that represented the PCR than with any other measure. For example, for graphs displaying medium effect size (i.e., $d = 0.50$), the mean estimated amount of similarity was 78% for the superimposed normal distributions, 65% for the barplots displaying the means and confidence intervals, and 57% for the superimposed histograms. The correct amount of overlap is, using the PCR, 80 percent. Thus, as expected, people underestimate similarities when shown results in the standard presentation format (means and confidence intervals); they even do so with the superimposed histograms, but presenting overlapping distributions attenuates this error. Participants in the superimposed normal distribution condition also rated the graph as more comprehensible ($M = 3.92$, $SD = 0.93$) than did participants in the barplot ($M = 3.59$, $SD = 1.12$, $p = .03$) and histogram conditions ($M = 3.50$, $SD = 1.13$, p

= .006).

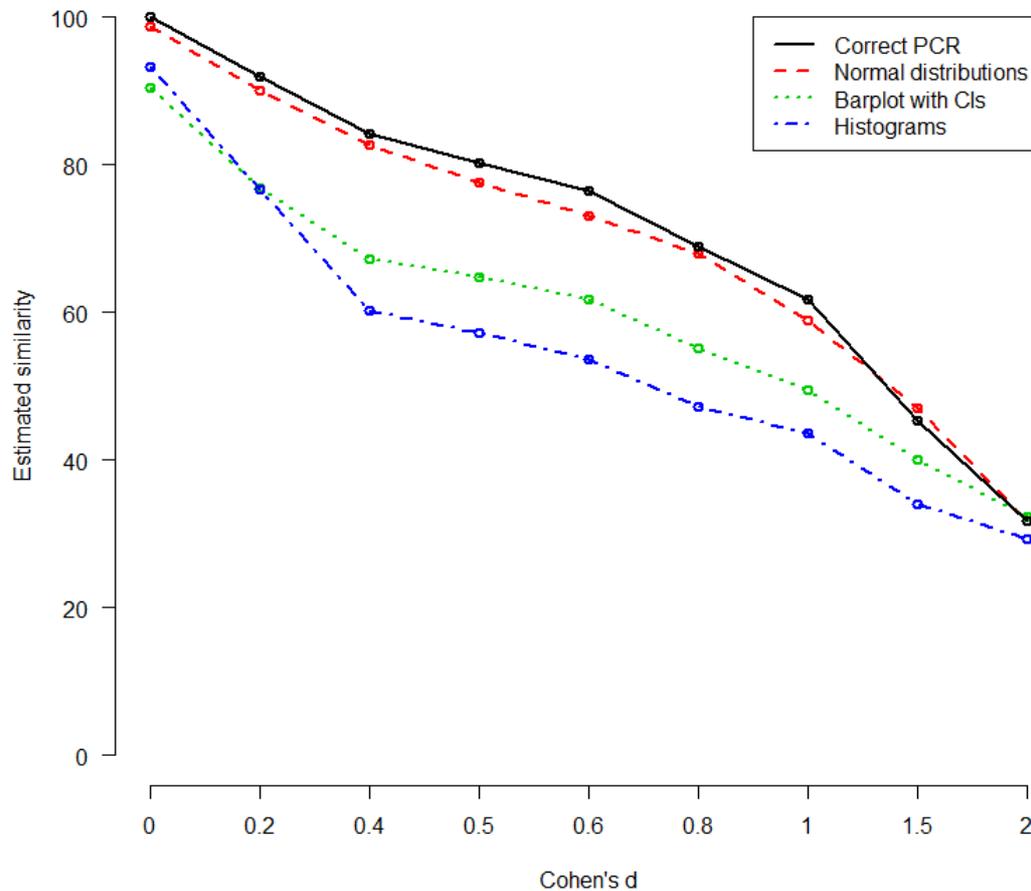


Figure 2.5. Estimated similarities for plots displaying data for various Cohen's ds.

Finally, all participants were asked to rank which out of three possibilities was the clearest and most informative way to present scientific findings. A within-subject ANOVA was significant, $F(2, 254) = 342.54, p < .001, \eta^2 = .73$, with the option describing the PCS measure rated as the clearest and most informative way to present the findings ($M = 1.47, SD = 0.59$), followed by the overlapping coefficient ($M = 1.69, SD = 0.55$), and Cohen's d ($M = 2.84, SD = 0.52$). Pairwise comparisons revealed that all three groups differed significantly from each other at $p < .001$.

General Discussion

In all three studies, there was evidence for the view that similarities between categories should be reported, alongside differences: (1) similarities are typically stronger than differences; and (2) reporting similarities as well as differences results in more accurate interpretations of research findings. As described below, the implications of these results are wide-ranging.

Implications. My focal argument is not that differences should not be reported; rather, my point is that simultaneously reporting similarities helps readers to interpret differences more appropriately. Consider an example taken directly from the mean result of the between-country comparisons: A researcher comparing two countries could report the mean difference between them had an effect size of $d = .39$, but with 84% common responses and only an 11% difference in the scale use. Reporting the results in this way avoids the tendency to over-simplify by focusing on differences. This latter focus is one way in which psychology may inadvertently steer people into regarding differences between groups as entrenched. By reporting observed differences between groups in the context of the fact that the groups in question are more similar to each other than they are different provides one way of counteracting racism and xenophobia. Emphasizing similarities may also offer a way to bridge the gap between people with different levels of education (Spruyt & Kuppens, 2014), by making it more evident that members of the outgroup are more similar to the ingroup than they are sometimes thought to be.

Furthermore, the presentation of similarity information is useful even when differences are reliable but small. Although people may more easily infer from small differences that similarity is potentially high, this inference is misleading if it is not framed concretely. Discrimination on grounds of ethnicity or gender is a case in point.

For example, if people belonging to a specific group (e.g., ethnic minorities or women) earn less than those in other groups, such differences matter a great deal, even if the similarities are large. The measures of similarities discussed here would enable researchers to frame such differences more concretely. For example, stating that the (small) gender wage difference in a specific company is $d = .24$ is less easy to apprehend than stating that the 90% of men and women employees share the same salary, but that men have higher salaries in the remaining cases. Furthermore, this conceptualization fosters greater realization that the key problem is to understand when these salaries differ and why, rather than encouraging absolutist, reductionist statements.

It should be noted that my proposal is descriptive. Null hypothesis significance testing and Bayesian statistics are complementary with my approach, and could be used to answer questions such as, “Is the degree of similarity between experimental group 1 and the control group larger than that between experimental group 2 and the control group?” When comparing two groups, larger p -values and smaller Bayes factors – *ceteris paribus* – imply greater similarity, but neither index directly *expresses* similarity. In addition to reporting differences, researchers should report measures of similarity to fully reflect the nature of the effects in question, rather than encouraging absolutist, reductionist statements about the problem. Thus, I am not arguing that small effects are meaningless (Prentice & Miller, 1992), but rather that researchers should always report such differences in the context of the much larger similarities between the categories, thereby helping others to interpret the data more accurately (Study 3).

A stronger focus on similarities in published research should help to reduce the “file-drawer” problem (Rosenthal, 1979) because both statistically large and statistically small differences between groups are potentially more interesting against the backdrop of similarity information. Reporting similarities helps to complement specific tests of

differences with a broader descriptive analysis. This practice would make the documentation of similarities between some groups and variables an interesting exercise in its own right, which may also increase the number of variables that are used to compare groups. At the moment, variables are often chosen on the basis of their perceived likelihood of revealing differences, potentially biasing the literature before any data are collected (Fiedler, 2011).

Conclusion. This chapter has presented alternative ways to describe quantitative data comparisons between groups. In the course of making more than 225,000 pairwise comparisons, I found that similarities between two groups generally far outweigh the differences between them. At the same time, some interesting exceptions to this pattern occur (e.g., for personal sexual-moral behaviours). Routinely reporting the extent of similarities in the presentation of results offers a more balanced way to describe research findings.

Chapter 3: Instantiations of Human Values and Their Implications

Studies 1 and 2 demonstrated that similarities are larger than differences between various groups of people, using diverse variables, including the type of variable that is the main focus of this thesis: human values. However, as indicated in Chapter 1, differences between countries seem to be larger than the findings of Studies 1 and 2 indicate. People may also relate intuitively to the perception of differences because of their beliefs are influenced by relatively concrete instantiations of the abstract variables being measured. By thinking about groups in terms of concrete instances, differences may be starker than similarities. In this chapter, I test this reasoning using instantiations of human values as examples.

Study 4 probed for diversity in instantiations of values across countries. For this purpose, I collected data from three regions: north-east Brazil, south-west India, and south Wales. As described in Chapter 1, the three countries differ in terms of various dimensions such as societal development, security, and perceived corruption. This variety of differences enables the detection of potential differences in value instantiation between the nations. For example, water conservation may be more spontaneously associated with protecting the environment in places where water is scarce than where it is abundant. Similarly, waste recycling will be more spontaneously associated with protecting the environment in places where recycling is possible and promoted than where it is not possible and not promoted. This difference could emerge even if the absolute or relative importance of the value protecting the environment – a key value relevant to these behaviours – is the same in both types of location. Furthermore, this difference may emerge even if people in both regions recognize the behaviours as potential ways to promote the environment (Study 5). That is, people in both types of

location may recognize that water conservation and recycling protect the environment, but they may simply differ in how strongly they *spontaneously* associate these behaviours with the value in day-to-day life.

If this prediction is correct, it would be important to explore ramifications of any observed differences in value instantiation. One potential implication arises for the emotions attached to behaviour. That is, do people attach stronger emotions to actions that are typical ways to promote or threaten a value than to actions that are unusual ways to promote or threaten a value? This difference in emotional implications may occur because of the link between importance and emotions (Nussbaum, 2004). If behaviours or instantiations that are more often mentioned (i.e., more typical) are seen as being more important, then they may elicit a stronger emotional response. This possibility is explored in Study 6.

Another potential implication is that behaviours may be predicted differently by values if they differ in the extent to which they are typical instantiations of the values. For example, protection of the environment may be more closely linked to recycling behaviour in places where recycling is mentally represented as a typical instantiation of protecting the environment. Of importance, this prediction applies particularly to spontaneous actions and not necessarily to behaviours that people have time to ponder and explicitly consider in connection to their values. Recall from Chapter 1 that typical instantiations are those that are more likely to spontaneously occur to people. In the same way, actions that are typical exemplars of a value may be spontaneously linked to a value more strongly than atypical actions, but even atypical actions might cause people to consider the relevant value if they are motivated and able to do so. I discuss this issue in Study 7, which examined value-behaviour connections using the Theory of Planned Behaviour (Ajzen, 1991) as a theoretical framework.

As stated in the discussion of Chapter 2, it is possible to focus both on similarities and differences, when interpreting results. However, because there are no similarity measures for some of the statistics used in the present chapter yet (e.g., interactions in an ANOVA design) and because this and the following chapter were designed to search for differences in the face of the prevailing evidence of value similarities, the focus will be more on differences. Nonetheless, I still will report and discuss similarities to address the overall question of this thesis: Are groups of people more similar than different?

I expected that people in different regions would differ in their concrete instantiations of values, because I assumed that personal experiences and the socio-cultural environment have a strong influence on the concrete level (Hanel, Vione, Hahn, & Maio, in press; Morris, 2014). To test this hypothesis, I focused on the comparison of Brazil and the UK because of the greater availability of data in both of these countries, but also considered India in Studies 4 and 7.

The Present Studies

The aims of Studies 4 to 7 were (1) to explore the extent to which similarities can be found on a concrete level of values while simultaneously finding instantiations which are only typical in one but not the other countries; and (2) whether typicality predicts the values–attitude/intention relations in the TPB framework. Studies 4, 5, and 6 addressed the first aim, and Study 7 addressed the second aim.

Study 4 used a qualitative-explorative design to measure and compare instantiations in a systematic way across three countries and 23 values from Schwartz's (1992) value model. That is, participants were asked to report situations in which they considered a value as relevant, including the people in this situation and their actions.

This study is the first systematic approach to measure value instantiations (but see Maio, Hahn, et al., 2009, for an earlier approach to measure instantiations).

In Study 5, the instantiations were matched to values. That is, the degree to which instantiations are recognized as belonging to the values they originate from was examined. For example, would participants recognize recycling as an example of protecting the environment and keeping secrets as an example of loyalty to an equal extent across countries? This step was important because it shows the conceptual relevance of the instantiations to the values. In other words, people should be able to recognize the value that a behavioural instantiation promotes, even if the instantiation is atypical for the participant's region. This matching would show how the instantiations vary in their spontaneous natural activation by values, but not in their actual conceptual relevance to values upon reflection.

Study 6 focused on the emotions elicited by the value instantiations. That is, participants rated how they would feel (e.g., happy or surprised), if someone close to them would or would not engage in a specific action (e.g., recycling or keeping secrets). The actions were mainly taken from the responses made by participants in Study 4. This method allowed a test of whether typical instantiations give rise to different self-reported emotional responses, than atypical instantiations. This method can also be used as an indirect way to measure the importance groups of people attribute to specific actions (see below).

Finally, Study 7 considered value instantiations in the context of the Theory of Planned Behaviour (TPB, see below; Ajzen, 1991). As outlined below, this was done to test whether the relations between values, attitudes, social norms, perceived behaviour control, and especially intention is stronger when a typical instantiation is used as the target behaviour. That is, participants completed a value measure and measures of the

four named TPB elements several times, with only the target behaviour (e.g., recycling or keeping secrets) changing.

Study 4: Exploring Value Instantiations

This study aimed to find typical value instantiations in Brazil, India, and the UK and estimate the amount of similarities between them. This enabled me to discern which instantiations are typical in one or two of the cultures under investigation but atypical in the other(s). These aims were achieved using a paradigm that has been used to examine exemplars of natural categories (e.g., Collins & Quillian, 1969), as well as in later research on typicality effects (Fehr & Russell, 1984; Lord et al., 1994; Maio, Hahn, et al., 2009) and on the strength of associations between categories and their members (Fazio, Williams, & Powell, 2000). For example, Maio et al. (2009) asked “participants ... to list situations in which they considered equality to be important” (p. 601). A different approach was chosen by Lord et al. (1994), who asked their participants to complete attitude concept maps on capital punishment and social welfare in order to identify how participants reference people who are affected by each of those social policy. Specifically, participants were asked to answer the questions what, where, when, who, why, and how to construct a concept map by adding nodes to the central node which either states “capital punishment” or “social welfare”.

Following the examples of Maio et al. and Lord et al., in Study 4 I asked participants to list situations in which they considered a value to be important and to include people and their actions. These responses were then used to create a conceptual map representing values and value instantiations for each country. These maps would be similar to those created by Lord et al. (1994, p. 661), except that my method maps values rather than natural concepts (see Fig. 1 for such a values map; 22 more value maps can be found in Appendix A, one for each of the 23 value investigated in this

study). Because of the magnitude of the concept maps, I only report a summary of the most common themes. To identify prospective typical instantiations, I noted which behaviours were mentioned ten times or more by at least five participants in one country. This threshold was selected so that in each country around 5 to 10 typical instantiations emerged. This is not to claim that each instantiation in this way is definitively typical, but to identify a range of potential typical instantiations. These were then compared between the nations and considered for future study.

Method

Participants in Brazil. Participants were 189 mostly postgraduate students from João Pessoa, a coastal city from north-east in Brazil. Because it is presumably against the law in Brazil to pay participants, even indirectly through a raffle, they volunteered without receiving any material incentive. The average socioeconomic status (SES; Sharma, Gur, & Bhalla, 2012) of 18.50 indicates that the average participant was part of the Brazilian upper-middle class (see Table 3.1 for details).

Participants in India. Participants were 214 undergraduate and graduate students from Dharwad, south-west India. Participants were not compensated. The mean SES was 20.78, indicating that the average participant was part of the Indian upper-middle class (see Table 3.1 for details).

Participants in the UK. Of the 227 participants in the UK, 122 were psychology undergraduate students, and 105 were other members of Cardiff University (students or staff). The students received course credits in exchange for their participation, and the university members could add their name to a raffle of three cash prizes of 30, 20, and 10 British Pounds Sterling. The participants' SES was similar to the SES of participants in the two other countries (Table 3.1).

Table 3.1

Demographic details of the two samples

	Age	% Women	SES
Brazil	25 (7.98)	67.00	18.50 (4.86)
India	22.41 (5.15)	66.40	20.78 (5.15)
United Kingdom	22.17 (7.94)	79.90	18.60 (5.74)

Note. Standard deviations (SD) are in brackets, where applicable.

Design. The design was qualitative and exploratory with open questions.

Materials. I selected 23 out of the 56 values of Schwartz (1992) value model (Table 3.2) for study. The values were selected according to their perceived relevance for explaining cross-cultural differences. That is, I expected the instantiations for the chosen values to be more different than for some other, non-chosen values. For example, the value family security was chosen instead of national security, because I expected the latter to be instantiated quite homogeneously across countries (e.g., “protection against external enemies”). However, I expected family security to vary stronger, depending on various contextual factors such as the safety (see Chapter 1 for examples). From most value types, two values were selected. The exception was the value type universalism, for which seven values were selected with an eye to potential future studies. I chose values instead of value types (e.g., universalism), because values are more concrete and allow to differentiate in more detail compared to value types, which are a combination of several values. To measure socioeconomic status, the “Kuppuswamy’s Socioeconomic Scale” (Sharma et al., 2012) was used; it consists of three items, assessing education, occupation, and family income per month. Participants responded to each item on a scale from 1 to 7, and these responses were summed up to one score. In order to adjust the income classes, the most recent available official income distribution from all countries were used. The questionnaire was translated to

Portuguese from the original English version for the Brazilian sample but left in English for the Indian and British samples.

Procedure. Participants were asked to list typical situations in which they considered each value to be important. Furthermore, they were asked to include a “short description of the people in the situation and what they do”. The instructions provided two examples that pertained to two values not included in our measures and Schwartz’s value model: “For example, the value ‘enjoyment’ could be relevant during leisure time. Relevant people in the situation can be friends and the family. They could spend time together at the beach or playing games at home.”

Participants were asked to list at least two to three situations, people, and their actions for each value, up to seven in total. To reduce the risk of fatigue, each participant responded to four out of the 23 values (see Table 3.2 for the sample size of each value). Subsequently, they completed socio-demographic items. Brazilian and British participants completed the survey online, while Indians used a pen-and-paper version.

Data analysis.

The data for both samples were analysed with the open access program Iramuteq, which is built on R and Python and designed for content and frequency analyses (version 0.6 alpha 3; Ratinaud, 2009), separately for the responses for each value and country. For all analyses, the option lemmatization was chosen: Very similar words (e.g., people and person) as well as different verb forms (e.g., advice, advices, advised) were treated as equivalent. Additionally, I grouped together some words that seemed very similar (e.g., parents, dad/father, and mother/mum), but this grouping was generally avoided because participants may have used the words in different ways even if they seemed different to me. Furthermore, only nouns, verbs, and adjectives were analysed.

To analyse the data, I did a frequency analysis, because both the length (Table 3.2) and the comprehensibility of the responses differed across countries. I struggled to interpret some responses, especially those made by Indian respondents. Often my Indian collaborators also had difficulties in interpreting the answers. Therefore, a frequency analysis seemed to be appropriate, as the meaning of a single word is usually easier to understand than the meaning of a sentence. To identify potentially typical instantiations, words mentioned at least 10 times in one country by at least five participants were analysed. Because a substantial part of the responses consisted of keywords, especially within the British sample, a more detailed qualitative analysis was not deemed to be possible. Because almost no negations (e.g. “recycling is not relevant”) were used by Brazilian and British participants, the absolute frequencies of specific words and their connections are meaningful. Only Indian participants used more negated sentences compared to participants from the other two countries, which itself is an interesting finding, as they seem to have focused more on what a value does not mean. However, I do not consider this as an issue for the frequency analysis, because such occurrences were still minor and they were not judged to be actually meant the opposite, just a different way of expressing the same. For example, the possible instantiation for the value helpfulness, “not offering your seat in a bus to elderly people”, was judged to be equal to the positive version. Our Indian collaborators shared this interpretation.

The Brazilian and Indian data were analysed with the help of our local collaborators. The Brazilian instantiations were first identified by a native speaker and then translated by an experienced translator (Portuguese native speaker), who ensured that the meaning was correctly translated. Our Indian collaborators helped to identify

responses that were clearly non-meaningful, and these responses were removed before any analysis was conducted.

Because the three different response possibilities – “situation”, “people in the situation”, and “what are they doing” – are all part of the instantiations, they were analysed together. Furthermore, family, friends, and people or person were mentioned for most values at least ten times as the “relevant people in the situation”. The value itself was also very frequently mentioned. Therefore, these responses are not informative and not discussed further. This is because words which were often mentioned in all countries do not provide information for finding differences between countries. Nevertheless, the frequencies of these words are listed in Appendix A. Instead, the instantiations were noted when mentioned at least 10 times across 5 participants or more.

Results

Overview of Responses.

The responses of the Brazilian participants for each value were on average almost twice as long as the responses from Indian and British participants (Table 3.2). However, the number of words mentioned at least ten times barely differed between the Brazilian and the British sample, although they were fewer in the Indian sample, resulting in a smaller sample of potential typical instantiations.

Table 3.2

Length of average responses for each value and number of participants

Value	Brazil Ø	N (BR)	India Ø	N (IND)	UK Ø	N (UK)
Protecting the environment (UN)	644	34	238	33	316	35
Wisdom (UN)	511	32	211	25	317	37
Unity with nature (UN)	554	32	185	28	252	31
World of Beauty (UN)	607	31	264	28	295	35
Social Justice (UN)	571	30	234	31	250	27

Broad-mindedness (UN)	517	33	220	35	309	29
Equality (UN)	574	25	278	39	268	25
Freedom (SD)	474	32	240	38	245	37
Creativity (SD)	532	35	225	34	322	44
A varied life (ST)	551	28	216	27	232	37
Daring (ST)	566	26	217	37	301	23
Pleasure (HE)	599	36	189	34	265	37
Success (AC)	602	35	227	40	353	41
Ambition (AC)	511	34	195	35	323	34
Wealth (PO)	557	27	261	33	307	27
Social Power (PO)	680	25	318	31	332	29
Family Security (SE)	477	30	219	31	281	27
Respect for Tradition (TR)	522	33	204	37	275	39
Self-discipline (CO)	489	29	239	36	438	35
Obedience (CO)	501	33	329	37	370	33
Helpfulness (BE)	531	36	215	28	330	31
Loyalty (BE)	534	36	247	33	343	34
Honesty (BE)	574	30	273	36	320	36

Note. Ø: Average number of characters of responses including spaces, *N*: number of participants. The value types are in brackets. UN: Universalism, SD: Self-direction, ST: Stimulation, HE: Hedonism, AC: Achievement, PO: Power, SE: Security, TR: Tradition, CO: Conformity, BE: Benevolence.

Analyses of each value.

In the following paragraphs, the results of the above analysis are described for each value separately, comparing Brazil, India, and the UK. In parentheses next to each instantiation, I list the number of times in total it was mentioned, followed by the number of people who gave the responses. By presenting these findings in text, I enable the reader to reflect on the numbers in evaluating the comparisons that I make. This inclusion is important because the comparisons I make in the qualitative data (e.g., X instantiation was mentioned more in Y country than Z country) are necessarily speculative, and the numbers better support some comparisons than others.

(Quantitative chi-square tests are not appropriate because this analysis is exploratory and any *p* values would need to correct for an unknown number of comparisons, which reflects an *a priori* testing mode that is not the aim in this study.) By providing the actual numbers in text, I aim to provide a more thorough and integrated reflection on the

findings. Nonetheless, for readers interested in a tabular summary, the instantiations below are listed alongside their frequencies in Appendix A.

Protecting the environment. For British participants, typical instantiations were recycling (mentioned in total 18 times by 14 people), putting rubbish in the bin (15/8), switching off the lights (13/9), and reducing carbon emissions (11/8). These instantiations were also mentioned by Brazilian participants (19/5, 69/21, 2/2, 3/3) but rarely by Indian participants (0/0, 2/1, 0/0, and 0/0). For Brazilian participants, other typical instantiations were not wasting or polluting water (20/14), and that companies should not pollute the environment (18/9). These two instantiations were less often mentioned by British (5/5 and 5/4) and Indian participants (3/2 and 0/0). Indian participants frequently mentioned keeping the environment clean (12/6). Clean was mentioned less often by British (5/4) and Brazilian (0/0) participants. Overall, few of the typical instantiations in Brazil and the UK were mentioned by Indian participants, indicating that the instantiations are not typical in India.

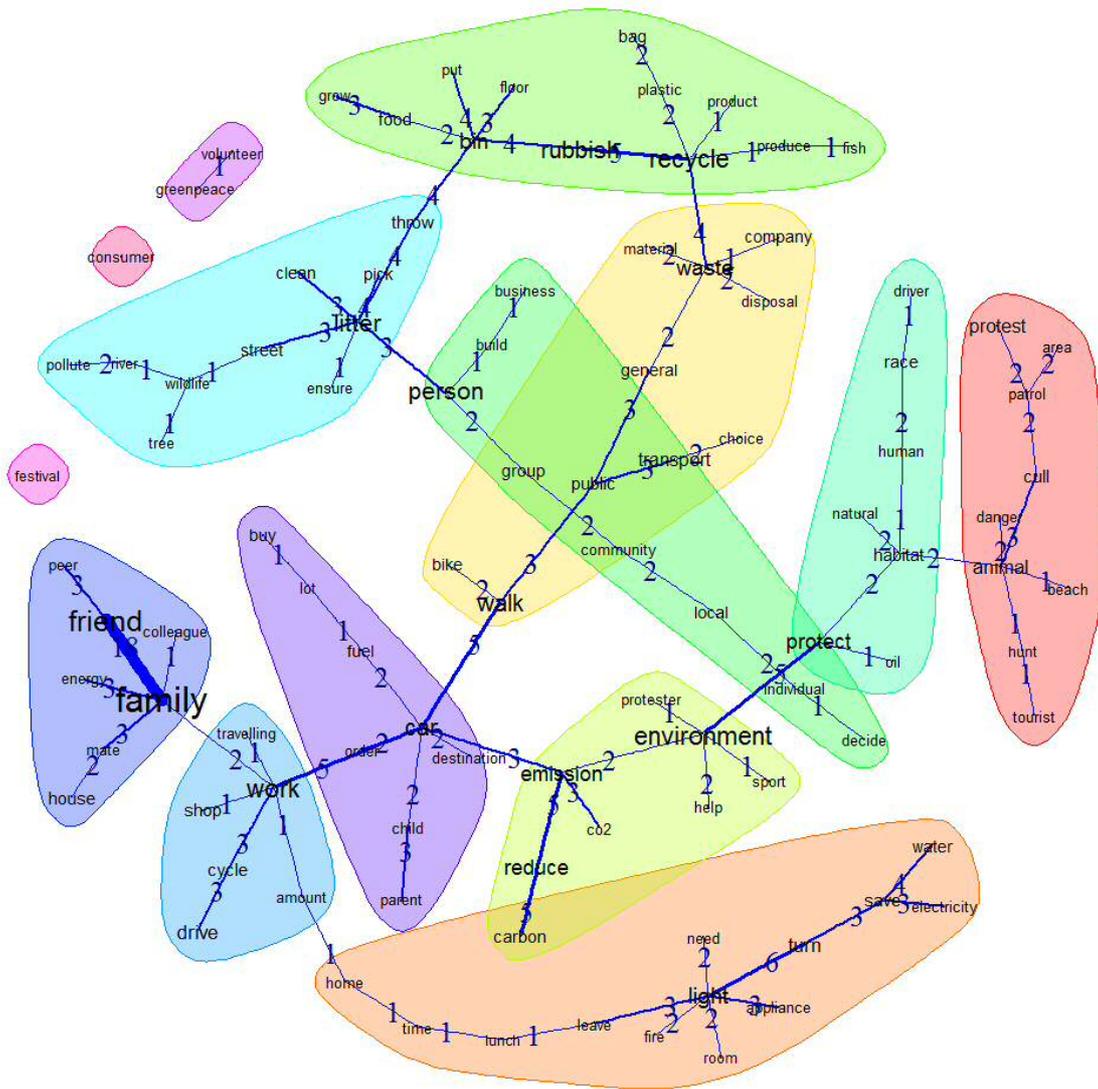


Figure 3.1. Result of the graphical similarity analysis for 'Protecting the environment' (UK only). Numbers indicate how often two words were mentioned together in single responses. Shared colours indicate that words were mentioned together.

The context and frequency of all the words for the UK sample can be seen in Figure 3.1. As for instantiations of most values, friends and family were mentioned often together. In the cluster at the bottom, for example, the words “lights”, “turn”, and “save”, in the cluster at the top the words “bin”, “rubbish”, and “recycle” were often mentioned together, supporting the aforementioned typical instantiations.

Wisdom. For British participants, typical instantiations were giving advice, for example to students or children (30/18) or making important decisions (17/10). In contrast, these two instantiations were not emphasized strongly in the Brazilian (7/4 and 4/4) or Indian (0/0 and 0/0) samples. Instead, Brazilian participants identified wisdom as being important for improving a difficult situation, as in conflict solving (16/7) more often than British and Indian participants did. In the Indian sample, no clear pattern was recognizable.

Unity with Nature. For British participants, typical instantiations were walking outside in nature (25/12), feeding or watching birds (12/6), or being in the garden (e.g., gardening, 12/8). These instantiations were mentioned less often by Brazilian (6/4, 5/3, and 3/2) and Indian (0/0, 3/1, and 2/1) participants. Brazilian participants emphasized protecting nature (11/8) more often than British (6/3) and Indian (2/2) participants. Brazilian participants mentioned the beach as a typical place more often (19/10) than British (5/5) and Indian (0/0) participants, probably because João Pessoa, the city where the questionnaire was completed, is on the coast of the Atlantic Ocean and has a tropical climate. Finally, Brazilian participants mentioned taking care of animals more often as an example of unity with nature (22/8) than British (7/5) or Indian (5/3) participants. In the Indian sample, no clear pattern was recognizable.

World of Beauty. For British participants, typical instantiations were walking outside (21/11), waking on the beach (10/8), or going on holiday (12/10). All three instantiations were mentioned less often by Brazilian (3/2, 6/5, and 0/0), and Indian (0/0, 0/0 and 0/0) participants. For both Brazilian and Indian participants, no common theme was observed.

Broad-mindedness. For British participants, the only typical instantiation was meeting new people (14/9). This instantiation was not mentioned by Brazilian or Indian

participants. Brazilian participants emphasized new ideas and opportunities (18/6), and that the society should be more open towards minorities such as homosexuals (15/6). These instantiations were mentioned less frequently by British (5/5 and 5/3) and Indian (0/0 and 1/1) participants. For Indian participants, a typical instantiation was to help others, especially poor people (10/7). This instantiation of broad-mindedness was rare within the British (2/2) and Brazilian (0/0) samples.

Social Justice. For British participants, typical instantiations were ensuring that justice is applied equally to all, including homosexuals and disabled people (23/6). As a typical situation or environment, jobs were mentioned (10/6). Both instantiations were mentioned less often by Brazilian (2/2 and 0/0) and Indian (0/0 and 0/0) participants. Brazilian participants considered political rights like those related to health, education, and security as typical instantiations (27/14), regarded the government as responsible for reinforcing them (15/10) and education as a way to obtain equality (13/9). Those instantiations were mentioned less often by the British (13/5, 6/3, and 11/4) and Indian participants (0/0, 2/2, and 1/1). Indian participants considered helping as more typical (10/7) than British (2/2) and Brazilian (0/0) participants.

Equality. For British participants, typical instantiations were treating all children (13/6) and students (15/9) equally. Equality was also considered relevant during job applications and at the work place (24/12). The latter finding is consistent with observations by Maio et al. (2009). These three instantiations were also mentioned by the Brazilian (10/4, 6/5, and 9/6) and Indian (3/3, 16/11, and 25/8) participants. Brazilian participants frequently mentioned equal opportunities for all (23/14), including black people (13/6) and women (11/6). These topics were less often mentioned by British (1/1, 0/0, and 9/4) and Indian (3/3, 0/0, and 12/8) participants. For Indian participants, typical instantiations were giving equal opportunities to various subgroups

(15/9) and doing this independent of caste affiliation (castism; 17/8). These two instantiations were less often mentioned by British (6/5 and 0/0) and Brazilian (6/3 and 0/0) participants.

Creativity. For British participants, typical instantiations were making or creating art (40/25), writing a book, poem, or essay (29/18), or making or composing music (22/16). All three instantiations were mentioned less often by Brazilian (5/4, 10/5, 3/2) and Indian (2/2, 3/2, and 0/0) participants. Brazilian participants focused on new (18/13) and different (11/5) things, such as ideas and products. Companies were mentioned as typical places (13/10). These three instantiations were less often mentioned by British (29/14, 7/2, and 2/2) and Indian (3/2, 6/5, and 3/2) participants. Finally, Indian participants frequently indicated that being creative is useful to become happy or to solve problems (20/8). Students were mentioned as typical people relevant to creativity (12/7). Both instantiations were mentioned less often by British (28/17 and 19/14) and Brazilian (19/9 and 11/7) participants. A more detailed comparison of the responses given by Brazilian and British participants can be found in Chapter 3, Study 8.

Freedom. For British participants, freedom rights were frequently mentioned. Of interest, they emphasized positive liberty rights (freedom *to*; 34/20) more than negative freedom rights (freedom *from*; 2/1). Job and work were mentioned as situations where freedom is relevant (17/10). All three instantiations were mentioned less often by Brazilian (13/10, 3/3, and 6/4) and Indian (15/8, 4/4, and 3/3) participants. In addition to mentioning liberty rights, Brazilian participants frequently mentioned travelling (11/8) as an exemplar of freedom and did so more often than British (7/6) and Indian (2/2) participants. A typical instantiation for Indian participants was that students need more freedom, especially from teachers (14/7). Students' need for more freedom in general was also mentioned by British (11/8) and Brazilian (6/5) participants.

A Varied Life. For British participants, typical instantiations were doing varied activities at work (37/20), doing different and new activities (12/9) and having new experiences (12/7). The latter two instantiations were mentioned less often by Brazilian (0/0, and 2/2) and Indian (0/0, and 1/1) participants, but doing varied activities at work was mentioned at least somewhat frequently in Brazil (17/7) and India (7/4). In addition, Brazilian participants considered trying new things and meeting new people (21/8) and travelling (12/9) as typical instantiations of a varied life. Those two instantiations were mentioned less often by British (19/8 and 5/4) and Indian (16/6 and 0/0) participants. For Indian participants, no pattern was recognizable.

Daring. In none of the three countries did a clear pattern emerge. The written responses suggested some confusion about the meaning of the value, especially for the Brazilian participants.

Pleasure. For British participants, typical instantiations of pleasure were enjoying various things (29/15), eating (24/14), and drinking (14/12). All three instantiations were mentioned less often by Brazilian (2/1, 14/10, and 7/5) and Indian (7/4, 1/1, and 2/1) participants, although eating was also mentioned frequently in the Brazilian sample. In addition, Brazilian participants considered spending time with friends (65/21), family (32/18), and the boy- or girlfriend (i.e., partner; 21/9) as typical people relevant to pleasure. These three instantiations were also mentioned by British participants (59/25, 38/20, and 27/14) and to a lesser degree by Indian participants (18/12, 7/5, and 3/3). For Indian participants, no pattern was recognizable.

Success. For British participants, working (33/16) was a typical activity relevant to success. The most frequently mentioned people were students (28/19), and the common activities were exams (22/14) and sport (17/11). To some extent, these instantiations were also mentioned by Brazilian (8/6, 4/3, 3/2, and 2/2) and Indian

(13/11, 9/7, 6/3, and 0/0) participants. For Brazilian participants, typical instantiations were companies (15/8), studying (14/11), and passing the entrance tests (12/9) for public positions, which everyone who wants to work in the popular public sector in Brazil has to pass. The first two of these instantiations were also mentioned by British (6/4, 7/6, and 0/0) and Indian (2/2, 7/6, and 0/0) participants. A typical instantiation for Indian participants was working hard (12/11). This instantiation was mentioned by British (14/7), but not by Brazilian (0/0) participants.

Ambition. For British participants, frequently mentioned typical instantiations were work (56/28), achieving your goals (15/10), and (sport) team (13/7). These instantiations were less often mentioned by Brazilian (20/11, 0/0, and 0/0) and Indian (32/16, 5/4, and 0/0) participants. For Brazilian participants, a typical ambition was having a good family life (14/7). This instantiation was mentioned less often by British (2/2) and Indian (0/0) participants. Typical instantiations for Indian participants were getting a good job (18/11), education (17/8), and working hard (11/8). These instantiations were less often mentioned by British (3/3, 3/3, and 13/9) and Brazilian (1/1, 0/0, and 0/0) participants.

Wealth. For British participants, typical instantiations of wealth were buying various, mainly expensive things (24/11) and shopping (12/8). Children were identified as typical people (e.g., “to provide children with what they need”, 13/6). These instantiations were also mentioned by Brazilian (4/3, 4/3 and 7/4) and Indian (5/4, 0/0, and 8/4) participants. For Brazilian participants, a typical instantiation was health (10/7). This instantiation was mentioned less often by British (1/1) and Indian (6/5) participants. A typical instantiation for Indian participants was to live a good life (11/8), which was mentioned less often by British (2/2) and Brazilian (9/8) participants.

Social Power. British participants identified the police (23/10) and teachers/professors/lecturers (18/10) as typical groups of people holding social power, and voting (12/8) as a typical situation or behaviour relevant to the value. These instantiations were mentioned less often by Brazilian (1/1, 8/4, and 4/2) and Indian (0/0, 0/0, and 3/3) participants. For Brazilian participants, typical instantiations were society in general as typical people (whereas a society has social responsibilities; 23/6), children as typical people (13/6); (liberty) rights (12/9) were also frequently mentioned. These instantiations were mentioned less often by British (1/1, 12/5, and 3/3) and Indian (5/2, 4/1, and 9/5) participants. Indian participants frequently mentioned work (10/5) as a typical situation relevant to social power, and this instantiation was also mentioned by British (14/11) and Brazilian (6/3) participants.

Family Security. For British participants, support was a typical behaviour (14/11), and the people mentioned were parents (including mother and father, 32/10) and children (including daughter and son, 26/9). Brazilian (10/5, 71/16, 37/11) and Indian (0/0, 11/5, 15/6) participants followed a similar pattern. Brazilian participants also considered securing the family home against intruders (through electronic fences, demanding more police on the street; 15/7) as typical, whereas this was not mentioned by British (0/0) or Indian (2/1) participants. No other instantiations arose frequently among the Indian participants.

Respect for Tradition. British participants frequently mentioned Christmas (24/16), church (19/15), and eating together (16/9). These instantiations were mentioned less often by Brazilian (6/4, 4/3, and 7/4) and Indian (all 0/0) participants. For Brazilian participants, parents (34/10) and children (29/12) and the city (10/5) were mentioned often. (Cities are the centre for a local festival.) Parents were mentioned by British (18/9) and, to a lesser extent, Indian (6/3) participants, but children and cities

were not mentioned as often among British (4/4, 0/0) and Indian (6/3, 0/0) participants. Typical instantiations for Indian participants were wearing traditional dress (16/10) and festivals (13/9). These instantiations were mentioned somewhat less often by British (6/4 and 5/4) and Brazilian (4/3 and 11/8) participants, although Brazilian participants also mentioned festivals frequently (and their locations in cities; see above).

Self-discipline. British participants identified the importance of self-discipline in work (34/18), exercising (19/12), and losing weight (17/13). Work was also identified frequently by Brazilian (25/12) and Indian (16/10) participants, whereas exercising and losing weight were mentioned less often by Brazilian (2/2 and 0/0) and Indian (0/0 and 0/0) participants. For Brazilian participants, lecturer/professor/teacher was a typical person (12/7), but such persons were mentioned less often by British (4/4) and Indian (8/5) participants. Indian participants frequently mentioned students (13/11). This instantiation was also mentioned often by British (19/14) and Brazilian (16/11) participants.

Obedience. British participants mentioned children (31/14), parents (27/14), and teachers (24/15) as typical people relevant to obedience, mostly in the sense that children should obey their parents and teachers. A similar pattern was shown by Brazilian (32/16, 63/21, and 22/11) and, to a lesser extent, Indian (5/4, 15/10, and 16/12) participants. Brazilian participants also frequently mentioned the verb to ask (20/10) and rules (20/10). These instantiations were mentioned less often by British (0/0 and 13/8) and Indian (2/2 and 0/0) participants, although British participants did mention rules frequently. Indian participants identified work (19/9) as a typical situation or activity and students (14/10) as typical people. These instantiations were also mentioned by British (13/9 and 21/10) and Brazilian (4/4 and 21/12) participants.

Helpfulness. British participants frequently connected helpfulness with work (13/10), students (12/7), and customers (11/5), as did Brazilian participants (40/18, 21/12, and 8/5), but not Indian participants (2/2, 3/3, and 0/0). For Brazilian participants, typical people were colleagues/classmates (24/9) and elderly (18/11), while the street (17/11) was a typical place. These instantiations were mentioned less often by British (6/5, 8/6, and 1/1) and Indian (1/1, 0/0, and 0/0) participants. No typical instantiations for Indian participants were found.

Loyalty. British participants often mentioned work (22/12), relationships (19/14), (providing) support (18/12), and (keeping) secrets (10/6). These instantiations were also mentioned by Brazilian (25/11, 3/3, 4/3, and 2/2) and Indian (5/4, 5/4, 1/1, and 2/2) participants. Brazilian participants also frequently mentioned (business) companies (17/8), colleagues (13/5), and husband-and-wife (15/7). These instantiations were less often mentioned by British (6/4, 15/7, and 4/1) and Indian (1/1, 0/0, and 10/4) participants, aside from British references to colleagues and Indian references to couples. In both countries, being loyal to friends was mentioned at least three times as often as being loyal to any other group of people. No typical instantiations for Indian participants were found.

Honesty. Typical instantiations of honesty for British participants were relationships (31/21), not cheating (13/9), and the courtroom (11/8). These instantiations were mentioned less often by Brazilian (7/5, 0/0, and 0/0) and Indian (3/3, 2/2, and 1/1) participants. For Brazilian participants, typical instantiations included money (21/10) and returning money (mostly money found on the street or after receiving too much change, 15/8). These instantiations were less often mentioned by British (2/2 and 0/0) and Indian (8/5 and 7/4) participants. Typical instantiations for

Indian participants were parents (15/10) and work (10/6), which were also mentioned by British (8/4 and 7/6) and Brazilian (14/5 and 12/8) participants.

Further analyses

In a next step, I computed the number of instantiations where differences were observed, based on the definition of differences suggested in Chapter 2. I adopted a conservative approach: an instantiation had to be mentioned by at least 50 percent more participants in one nation than in another country before I labelled it as a difference. However, because the majority of all instantiations in all countries were mentioned by less than 50 percent of the participants, only two instantiations revealed significant differences: 62 percent of the Brazilian participants considered throwing garbage into a bin as typical for protecting the environment, whereas only 3 percent of the Indian participants did so. Also, 57 percent of the British participants mentioned art as a typical instantiation of creativity, whereas only 6 percent of the Indian participants did so. All the other instantiations were less different between nations, although this does not mean that the differences were meaningless, as I discuss below.

Finally, I looked for similar instantiations in different values across all samples. In the descriptive analyses above, it is easy to discern a number of instances where the same instantiation was mentioned for different values, and sometimes participants in one nation used the same example for a different value than was used in another nation. To illustrate this diversity with only the relatively common examples, I list below only those words which were mentioned at least 10 times for different value types.

- *New* is relevant for ambition (self-enhancement), as well as for daring, varied life, creativity, broad-mindedness (openness and self-transcendence).

- *Eat* is relevant for pleasure (openness), respect for tradition (conservation), and self-discipline (conservation; e.g., not eating something as an example for self-discipline).
- *Support* is relevant for family-security (conservation) as well as loyalty (self-transcendence).
- *Work* in the sense of work place is relevant for success and ambition (self-enhancement) as well as creativity (openness).

Some other examples of overlap were found in the Brazilian sample. In particular, typical instantiations of wealth in this sample were quite idealistic and less materialistic, often focusing on a good family life. In addition, Brazilian participants understood social power more as social responsibility.

Discussion

Study 4 explored concrete examples (i.e., instantiations) associated with values across 23 values and 3 countries. This was done to test the hypothesis that values on a concrete level differ between countries. This hypothesis was not supported: Almost no differences, as defined in this thesis, were found. This was mainly due to large individual variability of the responses within countries. This can be explained with the value as truism hypothesis (Maio & Olson, 1998). People usually do not think often enough about their values and discuss them to develop a shared understanding of the meaning of values. If, for example, students would discuss whether freedom is important, they would presumably develop a more shared understanding of values.

The only exceptions where differences were found pertained to the value of protecting the environment and creativity. However, often the similarities were not perfect. This can easily be attributed to contextual differences. For example, a typical instantiation of success for Brazilian participants was passing the entrance test, which is

highly competitive, but promises a well-paid and prestigious job with a permanent contract. Indian participants mentioned castes or castism, a social system that does not exist in Brazil and the UK, although prejudice based on social class is similar. These examples show that the examples given depend on the social environment in which people live (cf. Figure 1.5 in Chapter 1).

Another aim of Study 4 was to find, based on the classical difference approach (e.g., chi-square tests), instantiations that are more frequent in one but not the other countries in order to select these for further, confirmatory studies. This aim is important because there are a number of findings that suggest the presence or absence of instantiations in participants' responses to the open-ended questions used in this research are not suitable as the *sole* criteria for selecting typical instantiations. Specifically, the presence of the same examples across values is a complicating factor. There were many instances of the same context being referenced for different values. In some instances, the same example was used for motivationally similar values, but countries varied with respect to which value generated the example (e.g., meeting new people used for broadmindedness in the UK, but used for a varied life in Brazil). This suggests that small shifts in understanding the meaning of the values may affect which examples are given.

Even more problematic, it is likely that participants' open-ended responses occasionally miss typical instantiations that they take for granted and, therefore, may neglect to mention. For instance, prior research has identified Blacks and women as two groups that are often used to instantiate the value of equality in the UK (Maio, Hahn, et al., 2009). Yet, these groups were mentioned in Brazil, but *not* in the UK. Conversational norms apply to the information that participants might chose to identify, and one important norm is not offering information already mutually understood (the so-

called Gricean norm; Grice, 1975). This might cause people to occasionally neglect to report common instantiations that are not salient. Another possibility is that participants' responses are somewhat ego-centric. That is, treating students and job applicants equally is something that affects the British participants directly, whereas equal treatment of Black people does not (assuming that most participants are Caucasian). Note that both of the normative and egocentric explanations are speculative and post hoc. Regardless of whether one or both is correct, they show that reliance on open-ended measures of concept mapping, as done here and in past research, is likely to be unreliable as the *sole* measure of the typicality of an exemplar.

Another issue is that some of the differences in instantiations are clearly relevant to the context, while others are more difficult to explain. Examples of the easily attributable instantiations included castism in the Indian sample and the association of electric fences with family security among Brazilian participants, because castism does not exist in Brazil and the UK, and both India and the UK are safer than Brazil (Office for National Statistics, 2014). A difference that is more difficult to explain is in the use of saving water for the environment. Although it seems obvious why saving water was mentioned often in the rather dry north-east of Brazil, but not in the rainy Wales, it is less clear why saving water was barely mentioned by the Indian participants. Water conservation is an aspect of daily life in the region where this research was conducted (Karnataka), making it highly relevant to the residents. However, they did not think of this behaviour with respect of the environment. This may be another situation wherein an instantiation is taken for granted, making it less salient to the respondents. Alternatively, it may be the case that water conservation is encoded more as a basic necessity than as an optional means to protect the environment. Indian participants may

have perceived water scarcity as their own personal problems and not as relevant for protecting the environment.

Most instantiations were mentioned by less than half of the participants in one country, indicating within-country variation. A relatively large proportion of instantiations mentioned by at least five participants in one country were mentioned by one or no participants in another country. Unfortunately, our sample was too small to analyse within-country moderators, such as gender or socio-economic status.

However, small sample sizes are known to provide fickle results (Halsey, Curran-Everett, Vowler, & Drummond, 2015); in addition to the complexities noted above, there are a number of other reasons why more studies should be conducted to follow up these results. First, it is possible that I overlooked relevant synonyms. I attempted to reduce this risk by reading all the instantiations before conducting the frequency analysis and by working closely with our collaborators from Paraiba (Brazil) and Karnataka (India). However, any mistakes would cause an underestimation of the number of typical instantiations or the degree of typicality.

Second, because most participants were students in specific regions of each nation, the results should be treated with caution if trying to generalize to the population of each country (see Appendix B for an empirical discussion of whether students are an accurate estimate of the general public). For example, although entrance exams are required for Brazilians and were mentioned as examples of success by them, these are also required for certain positions in India and the UK, but Indian and UK participants did not mention these instantiations. It could be the case that the specific samples of respondents in the UK were less likely to be students pursuing these professions. Different samples in these two nations might have been more likely to mention the relevant exams.

Finally, the answers in the Indian data were more heterogeneous (i.e., fewer typical instantiations) and grammatically challenging. Most of the Indian participants did not have English as a first language, despite having classes and seminars in English both in school and at university. As a result, English proficiency varied substantially between participants. Another possible explanation for the perceived heterogeneity is that Indian participants responded in a way following a line of thought that was too unique for me to follow. This is sometimes a problem in anthropological research (Barley, 1986). However, I tried to ameliorate this problem by working closely together with our Indian collaborator.

Overall, Study 4 revealed that most examples that are spontaneously attached to values are more similar than different across countries. Nevertheless, many of the instances for which between-country differences were found can be linked to contextual factors. However, most of these differences are considered small even in the common frequentist framework.

Study 5: Matching instantiations to values

In Study 4 I found that, although few instantiations were mentioned by more than 50 percent of the participants in each country, some were mentioned more frequently by participants in one country than one or both of the other countries. Of importance, these instantiations were produced spontaneously as examples of the value concepts. It remains to be seen whether they were valid examples of the value concepts. If they are valid examples, then people should be able to identify the value that elicited the example. The aim of Study 5 was to test whether instantiations can be reliably matched to the values from which they were derived.

Method

Participants in Brazil. In Brazil, 427 under- and postgraduate students (mainly in psychology), from João Pessoa participated ($M_{\text{age}} = 23.42$, $SD_{\text{age}} = 6.96$, 64.60% women). Participants were not compensated.

Participants in the UK. British participants were 250 psychology undergraduate students ($M_{\text{age}} = 19.32$, $SD_{\text{age}} = 2.25$, 89.00% women) from Cardiff University. They received course credits in exchange for their participation. Prior to any data analysis, 42 non-British participants were excluded. Eleven participants failed to pass the instructional manipulation check (IMC; Oppenheimer et al., 2009), but were not excluded because no IMC was used in the Brazilian sample. Excluding them did not change the pattern of results.

Material and Procedure. First, all participants completed a short version of the Schwartz Value Survey (SVS; Schwartz, 1992), consisting of the 23 values used in Study 4. Participants were asked to indicate on a 9-point scale how much each of 23 values is an important guiding principle in their life. Examples include “FREEDOM

(freedom of action and thought)” and “FAMILY SECURITY (safety for loved ones)”.

The SVS was not analysed for the present study.

Next, 138 instantiations were chosen for matching them with values, six for each of the 23 values. The instantiations were chosen mainly based on the results of Study 4, but also for exploratory purposes. The instantiations used were *a priori* categorized as either typical (i.e., mentioned) in the United Kingdom, typical in both countries, typical in Brazil, or not typical in either country. The latter were instantiations that I generated for exploratory purposes, based on perceived relevance to the present research and also based on previous studies. These were used when there were fewer than six instantiations that seemed suitable in the first three categories. For example, Maio, Hahn, et al. (2009) found that discrimination against left-handed people is an atypical instantiation for equality for British participants (cf. Chapter 1). Nevertheless, discrimination against left-handed people was considered as highly unacceptable. Thus, I expected that this atypical instantiation would be recognized as being promoted by equality by British participants and also, presumably, by Brazilian participants.

The instantiations selected from Study 4 were chosen based on the frequency with which they were mentioned in each country, while balancing the instantiations that were mentioned in both countries with those mentioned in only one country but not the other. Typical instantiations for protecting the environment, for example, were (1) “Putting certain rubbish in recycle bins rather than general waste”, (2) “Making sure the lights are off”, (3) “Walk instead of using car for short distances”, (4) “Throwing garbage in the bin”, (5) “Saving water”, and (6) “Installing heat insulation in the house”. The first three instantiations were considered as more typical by British than Brazilian participants (Study 4), whereas the fifth instantiation was considered more typical by Brazilian participants. The fourth instantiation was frequently mentioned by participants

in both countries, and the sixth instantiation was added for exploratory purposes. Given the temperature differences between João Pessoa and Cardiff, I expected this last instantiation to be more reliably matched to the value protecting the environment by British than Brazilian participants. A list of all 138 (137 in the UK) instantiations can be found in Table A12 (Appendix A), including the values they were derived from and whether they were mentioned by participants in both countries, just one, or were added by me. (Due to a copy and paste error, one instantiation of honesty, “Borrowing money and giving it back”, was presented twice (to different participants) in the British sample, while “Returning money which you have found or wrongly received” was not presented.)

The instruction for the participants was “Your task in this study is simple: You will be given a specific situation and you are asked to choose the most suitable value in this situation.” This was followed by an example: “Leisure time is promoted most by valuing” followed by six values (success, equality, ambition, wisdom, enjoyment, and respect for tradition), including a seventh option “don’t know” and the solution “A possible answer is the value enjoyment: Leisure time is more related to the value enjoyment than to any other value in this set.” For this example, I intentionally chose a value that is not part of Schwartz’s value model. Both the ordinal position of the ‘correct value’⁷ among the response alternatives and the five alternative values were chosen randomly. The five alternative values were a subset of the 23 values out of Schwartz’s 56 values listed in Study 4. Within the six instantiations of one value both the order and the alternatives were kept constant. The five alternative values were kept constant across both countries. All participants then completed further scales, unrelated

⁷ “Correct” is meant in a relative sense, based on the findings of Study 4 and my theoretical reasoning. Of course, there are no de facto right and wrong answers in tasks like this.

to the present study. On average, each instantiation was matched with values by 71 Brazilian and 41 British respondents.

Brazilian participants completed a paper version of the survey in classroom settings of 10 to 40 people. British participants completed the survey online. To reduce fatigue, each participant completed only one-sixth of the items; each participant responded to one instantiation per value.

Results

To perform the principal analyses, I first counted how often each value was thought to be promoted by an instantiation, separately for each country (Table A12). Next, I compared for each instantiation and country whether the most frequently chosen response option (value or don't know) was chosen significantly more often than the second-most common option, using χ^2 -tests. This is a conservative approach, which at least partly takes the research design (multiple choice) and the influence of the response alternatives into account. For example, if the correct value was chosen by 20 out of 40 British participants, another value by 12, and a third by 8 participants, I would not count it as correctly matched, because the difference between 20 and 12 is not significant, $\chi^2 = 2.00, p = .16$.

Overall, in both countries, most instantiations were correctly matched with the value from which they were derived (Table A12). Out of the 138 (137 in the UK) instantiations, 94 were correctly matched by the Brazilian participants and 110 by the British participants. This difference (94 vs. 110) did not reach statistical significance, $\chi^2 = 1.25, p = .26$. Again, the similarities were much larger: Participants in both countries chose the same value 86 out of 137 times. For another 12 instantiations, no value was chosen significantly more often than the second most frequent value in both countries.

For example, the instantiation “Putting certain rubbish in recycle bins rather than general waste” was correctly identified in both countries by the majority of participants as being promoted by the value protecting the environment (54 out of 67 Brazilian participants did so and 42 out of 43 British participants). In the Brazilian sample, the number of participants who chose protecting the environment differed significantly from the number of participants that chose the second-most frequently chosen value, helpfulness (54 vs. 9, $\chi^2 = 32.14, p < .001$). Overall, Brazilian participants correctly matched 5 out of the 6 instantiations for protecting the environment, and British participants correctly matched all 6 instantiations to protecting the environment. As can be seen in Table 3.3, participants from both countries were approximately equally likely to match instantiations that had been mentioned in both countries (columns 3 and 8), in Brazil, and in the exploratory instantiations (i.e., those made up by me). Brazilian participants had somewhat more difficulty in matching British instantiations compared to British participants, 34 vs 45, albeit this difference did not reach statistical significance, $\chi^2 = 1.53, p = .22$.

Table 3.3

Frequencies of correctly matched instantiations for all values combined and depending on the origin of the instantiation

	Brazilian responses					British responses				
	UK	All	Brazil	None	Sum	UK	All	Brazil	None	Sum
Unity with nature (UN)	2/2		3/3	0/1	5	2/2		3/3	1/1	6
Wisdom (UN)	2/2	1/1	2/3		5	2/2	1/1	1/3		4
World of Beauty (UN)	2/2		0/3	1/1	3	2/2		0/3	1/1	3
Social Justice (UN)	2/2		3/3	1/1	6	2/2		3/3	1/1	6
Broad-mindedness (UN)	0/1		1/3	2/2	3	1/1		1/3	1/2	3
Protecting the environment (UN)	3/3	1/1	1/1	0/1	5	3/3	1/1	1/1	1/1	6
Equality (UN)	1/3		2/2	0/1	3	3/3		2/2	0/1	5
Freedom (SD)	2/2		1/3	1/1	4	2/2		3/3	1/1	6
Creativity (SD)	2/2	1/2	0/2		3	2/2	2/2	1/2		5

	Brazilian responses					British responses				
	UK	All	Brazil	None	Sum	UK	All	Brazil	None	Sum
A varied life (ST)	0/2	0/1	0/3		0	2/2	1/1	1/3		4
Daring (ST)	2/2		2/2	1/2	5	2/2		2/2	2/2	6
Pleasure (HE)	2/2	2/2	1/2		5	2/2	1/2	2/2		5
Success (AC)	2/3		3/3		5	3/3		2/3		5
Ambition (AC)	2/3		2/3		4	3/3		2/3		5
Wealth (PO)	1/2	0/1	0/2	0/1	1	1/2	0/1	0/2	1/1	2
Social Power (PO)	2/2		3/3	1/1	6	2/2		1/3	1/1	4
Family Security (SE)	1/3		1/3		2	3/3		2/3		5
Respect for Tradition (TR)		1/2	3/3	0/1	4		2/2	2/3	0/1	4
Self-discipline (CO)	2/3	1/1	1/1	1/1	5	3/3	1/1	1/1	0/1	5
Obedience (CO)		2/3	2/3		4		3/3	2/3		5
Helpfulness (BE)	0/1	2/2	2/2	0/1	4	1/1	2/2	2/2	0/1	5
Loyalty (BE)	3/3	1/1	2/2		6	3/3	1/1	2/2		6
Honesty (BE)	1/1	1/1	2/2	2/2	6	1/1	1/1	1/1	2/2	5
Sum (max. 138)	34/46	13/18	37/57	10/17	94/138	45/46	16/18	37/56	12/17	110/137

Note. Value type is in brackets. UN = Universalism, SD = Self-direction, ST = Stimulation, HE = Hedonism, AC = Achievement, PO = Power, SE = Security, TR = Tradition, CO = Conformity, BE = Benevolence. UK: Absolute frequency of typical British instantiations (and how often these were correctly matched; All: Frequency of instantiations typical in both countries; Brazil: Frequency of typical Brazilian instantiations; None: Instantiations that were neither typical in Brazil nor the UK (i.e., those generated by me).

In a final step, I computed how often differences occurred based on the taxonomy proposed in Chapter 2, while taking the unequal sample sizes into account. I compared all values that were mentioned by at least half of the participants in one country with the percentage of the same value in the other country. I called it a difference when one option was chosen by at least 50 percent more of the participants in one group than the other. Fifty percent was chosen as a cut-off value to be consistent with the taxonomy proposed in Chapter 2. For example, if 20 percent of the Brazilian participants reported that they thought that a specific instantiation is best promoted by wealth, at least 70 percent of the British participants needed to choose wealth before I would call it a difference.

Differences were found for 5 instantiations (Table A12): “Travelling” was considered to be best promoted by the value of pleasure in the Brazilian sample and by freedom in the British sample (84% of the Brazilian participants chose pleasure vs 25%

of the British participants and 13% of the Brazilian participants chose freedom vs 75% in the British sample; cf. Table A12). “Maintaining a good work life balance” was considered to be promoted by success in the Brazilian, but not in the British sample (73% vs. 12%), whereas British participants correctly matched this instantiation to a varied life more often than Brazilian participants did (79% vs. 6%). “Being able to buy organic food” was considered to be promoted by wealth, but only for British, and not Brazilian participants (61% vs. 6%). “Living your own life and not following the crowd” was considered to be promoted by self-discipline by Brazilian, but not British participants (84% vs. 13%), and vice-versa for freedom (1% vs. 83%). This is an interesting finding because freedom and self-discipline are thought to be motivationally incongruent (Schwartz, 1992), but appear to be related within the Brazilian respondents’ views of their social relationships. “Customer service” was thought to be promoted by social justice by Brazilian participants (61% vs. 7%), but was correctly matched to helpfulness by British participants (83% vs. 21%).

Discussion

The aim of Study 5 was to test the extent to which the instantiations obtained in Study 4 could be recognized as being promoted by the specific value that elicited the translation. Most instantiations were correctly matched in both countries, indicating a relatively similar understanding of which instantiations are related to which values. Interestingly, participants were often able to correctly match instantiations that participants in their nation had not mentioned in the ‘free recall’ design of Study 4. For example, although British participants in Study 4 did not mention saving water as often as Brazilian participants did when asked to identify behaviours that protect the environment, most participants in both countries were able to correctly match saving water to protection of the environment. Thus, the findings in Study 4 and 5 converge

with evidence from cognitive psychology indicating that almost everyone is able to recognize instances of a category, even when the instances are atypical; for example, people can label an ostrich or a penguin as a bird, even though these birds are seldom the first examples that come to mind when participants were asked to name birds (e.g., Mervis & Rosch, 1981). Hence, the instantiations that have been correctly matched can be regarded as valid instantiations, but are potentially atypical when they were not spontaneously generated in Study 4 (notwithstanding the issues that aforementioned issues discussed in the previous chapter).

Interestingly, less than half of the participants in each country indicated that the instantiation “Discrimination against left-handed people” was promoted by equality. This result may indicate that this instantiation is very atypical (cf. Maio, Hahn, et al., 2009). Alternatively, this could be because discrimination is not *promoted* by equality, but thwarted. In other words, the phrasing of this item was probably not meaningful and the results are consequently not interpretable. This could explain why in both countries the most frequent response options for this particular instantiation was “Don’t know”.

Whereas in Study 4 the type of sample (i.e., students) had a clear influence on the responses and therefore decreases generalizability, in Study 5 this may be less of a problem. The matching procedure relies, in my opinion, more strongly on semantic memory than personal experiences, as the matching method is more about recognizing than free recall.

One obvious limitation of Study 5 is the use of fixed response alternatives. These included the six values which could be selected as best promoting a specific instantiation. Although five of the six values were chosen randomly (with the other value being the one related to the instantiation), they were the same across participants and countries for all six instantiations of each value. Consequently, we can compare

findings between participants and regions, but not between value instantiations and values. If the five alternative values had been selected out of all values (e.g., Schwartz's, 1992, 57 values), a much larger sample would have been required to achieve adequate power. In other words, conclusions such as "instantiation A was more reliably matched to value X than instantiation B to value Y" are not justified, because these comparisons also depend on the response alternatives. On the other hand, between-country conclusions such as "instantiation A was more often 'correctly' matched to value X in Brazil than the UK" are justified by the fact that participants in both countries were given the same response alternatives. However, between-country comparisons may also be moderated by the choice of response alternatives. It might be the case that the nature of the differences between regions depends on which response options are offered. Nonetheless, given that these options were chosen randomly, there is no reason to suspect a *systematic* effect of the options on the between-country comparisons.

Study 6: The Importance of Instantiations

The aim of Study 6 was to explore whether typical instantiations are more emotive. Do we experience stronger emotional reactions to instantiations that are central to our mental representations of values than peripheral in these representations? This question is relevant to Nussbaum's (2004) argument that emotions are concerned with valuing. If someone or something is not important to us, we usually do not feel many emotions towards this person or a specific behaviour. If a situation strongly connects to a value (i.e., because it is typical), then it should elicit strong emotions. This view is supported by Frijda's (1988) law of concern: "Emotions arise in response to events that are important to the individual's goals, motives, or concerns" (p. 351).

In this Study, I asked participants to think about emotions that they would be most likely feel if an instantiation is (a) promoted or (b) violated. This rationale is based on the assumption that typicality and importance are at least partly related. I assumed that the promotion of typical instantiations elicits more positive emotions, whereas their violation elicits more negative emotions. Consequently, I expected an interaction between the framing of the instantiation (positive vs negative) and the country in which participants responded. For an instantiation that is considered typical in Brazil, the difference between the positive and negative versions of the instantiation should be larger in Brazil than for most emotions than in the UK.

Furthermore, the larger the difference between positive (and negative, respectively) emotions if the instantiation is promoted rather than violated, the more important an instantiation should be on average for either Brazilian or British participants (cf. Nussbaum, 2004).

Method

Participants. Participants in both countries were psychology students. In Brazil, 154 students from João Pessoa participated ($M_{\text{age}} = 24.31$, $SD = 6.84$, 73.40 percent being female). In the UK, 96 students from Cardiff participated ($M_{\text{age}} = 19.48$, $SD = 0.73$, 85.40 percent being female). Because Studies 5 and 6 were presented together to these samples (with Study 6 following Study 5), all participants in Study 6 also participated in Study 5. After completion of Study 6, participants participated in one or two other studies, unrelated to Study 6.

Procedure and materials. Participants took part using a pen-and-paper questionnaire in Brazil and a computer in the UK. The opening instructions stated, “In this study, you will be given a short description of an act. Please rate how you would feel if someone close to you acted in this way.” Each instantiation was preceded by

“Please rate how you would feel if someone close to you ...” Participants then rated the extent to which they would feel each of seven emotions: happy, surprised, sad, embarrassed, angry, nervous, and proud. Responses were given on a 7-point scale, ranging from 1 (not at all), 4 (neither nor), to 7 (very). Another person was chosen rather than the self (i.e., the participant) as the focus in the instructions to reduce effects of social desirability. This is because most selected typical instantiations are social desirable (e.g., saving water, recycling), which could influence participants’ ratings. Using another person instead should reduce effects of social desirability, because this approach is thought as a less direct way of assessing the importance of instantiations.

I selected 10 instantiations from Study 4 that were mentioned often in one but not the other country. I included two additional instantiations from Study 5 for exploratory purposes. Beginning with the latter two, the instantiations were “installs heat insulation in the house”, “lives in a house with a smoke detector”, “is able to buy organic food”, “recycles rubbish”, “saves water”, “thinks of new artistic painting styles”, “complies with the law”, “buys luxurious things”, “has many good friends”, “installs electric fences around the house”, “is able to keep secrets”, and “completes an exam without cheating”. Next, a negated version of each instantiation was created (e.g., “wasting water” for “saving water” or “does not recycle rubbish” for “recycles rubbish”; see Table A13).

The procedure was the same as in Study 5 and the debriefing of Study 6 was presented together with the debriefings of the other studies at the end.

Design. The study utilized a 2x2-between-subjects design: 2 (Country: Brazil vs. UK) x 2 (Type of instantiation: promoted vs. violated). That is, participants judged how they would feel if a specific instantiation was either promoted or violated by someone close to them. The design was counterbalanced such that every participant responded to

an equal number of promoted and violated instantiations. In other words, each participant made $12 \times 7 = 84$ responses.

Results

First, I report the results of the within- and between-country comparisons (i.e., ANOVAs), before I turn to the correlations between the emotions and value importance ratings. Because I had a specific hypothesis for each interaction, no corrections for multiple comparisons were conducted, as this would have decreased power (e.g., Perneger, 1998).

ANOVAs. The analyses of variance were conducted with the R package “ez” (Lawrence, 2015). Generalized eta squares are reported as effect sizes, because they are better for comparisons across studies than partial eta squares and omega squared, among other effect sizes (Olejnik & Algina, 2003).

Overall, I computed 84 between-subjects ANOVAs. Descriptive statistics and effect sizes can be found in Table A13 (Appendix A). For example, analysis of the exploratory instantiation “installing heat insulation in the house” revealed that British participants were on average happier after contemplating this item, $F(1,230) = 5.95, p = .02, \eta^2 = .03$, and the promoting frame resulted in more happiness, $F(1,230) = 94.70, p < .001, \eta^2 = .29$, but the predicted significant interaction was not significant, $F(1,230) = 3.16, p = .08, \eta^2 = .01$. Thus, participants in both countries were approximately equally happier if someone close to them installed heat insulation in the house than if they did not. The mean difference between installing vs not installing heat insulation in the house (i.e., the two framing conditions) was 1.83 in the Brazilian sample, and 2.50 in the British sample (columns 4 and 5 of Table A13).

Further within-country comparison revealed that participants in both countries responded differently to the promoting and negating version of each instantiation. On

average, the mean (absolute value) of all 84 Cohen's *d*s representing the difference between the versions was 1.07 ($SD = 0.95$) in the Brazilian sample and 1.50 ($SD = 1.12$) in the British sample. This indicates that many of the chosen behaviours were considered emotionally relevant; otherwise the promoting and negating frame would have not elicited any emotions, yielding no effects.

In total, 43 of the 84 interactions reached statistical significance, and 21 of these were in the predicted directions. That is, the difference between the two versions of the instantiation was larger in the country where the instantiation was considered to be typical. For example, although both Brazilian and British respondents were happier if someone close to them saved water than wasted water, the mean difference was larger in the Brazilian than the British sample ($M_{diff} = 5.27$ vs 3.26).

However, 14 interactions were in the opposite direction to the one predicted. That is, the mean difference between the two framing condition was smaller in the country in which the instantiation was assumed to be typical.

In addition, another six interactions were significant for the instantiation "complying with the law" which was typical in both countries and therefore no prediction has been made. The remaining two interactions appeared for the instantiation "completing an exam without cheating" for which no predictions were made. In a next step, I focused only on the eight instantiations with at least a medium effect size of $\geq .13$ for the interaction (Bakeman, 2005; Cohen, 1988). Of those, six were in the predicted directions. Thus, focusing on larger effects yielded better support for the hypothesis.

Finally, a series of pairwise comparisons between the responses given by Brazilian and British participants revealed that British participants reported a higher level of perceived emotions ($M_d = -0.25$) across all seven emotions and 2x12

instantiations. Although this indicated a large degree of similarity ($M_{\text{PCR}} = 90$), in nine of the pairwise comparisons (5.36%), the PCR was below 50. Most of these cases concerned either installing electric fences around the house or living in a house without a smoke detector (Table A13).

Correlations. Positive emotions (e.g., happy) should be positively correlated with the importance of the value when an instantiation of the value is promoted and negatively when the instantiation is negated and vice-versa for negative emotions. For example, people who value more protecting the environment should report feeling happier when recycling is promoted and less happy when recycling is negated. If these effects are stronger for typical than atypical instantiations, then these relations would only be expected in the British, not the Brazilian sample, as recycling was a typical instantiation only in the UK (cf. Study 4). To test this reasoning, I correlated the emotion ratings for each version of the instantiation with the personal value priorities, separately for each nation.

Results indicated that most of the correlations were unsystematic. Out of the 84 (7 emotions x 12 instantiations) pairwise correlation comparisons, only three showed the predicted pattern. First, the personal importance of creativity correlated with less surprise from the instantiation “thinking of new artistic painting styles” ($r(43) = -.33, p = .03$) and more surprise from the negated instantiation ($r(47) = .35, p = .02$). As predicted, this pattern was only found in the British, not the Brazilian sample. In the Brazilian sample, the personal importance of creativity correlated almost equally with both versions (i.e., promoting and negating) of the instantiations ($r_s = .20$ and $.16, p_s > .05$, for surprise). Second, the personal importance of wealth correlated with more happiness from the instantiation “buying luxurious things” ($r(44) = .40, p = .006$) and with less happiness from the negated instantiation ($r(47) = -.29, p = .04$). As predicted,

this pattern was only found in the British, not the Brazilian sample ($r(66) = .34, p = .005$, and $r(60) = .06, p = .67$, respectively). Third, the personal importance of loyalty correlated with less anger from the instantiation “being able to keep secrets” ($r(47) = -.30, p = .04$) and with more anger from the negated instantiation ($r(43) = .31, p = .04$). As predicted, this pattern was only found in the British, not the Brazilian sample ($r(54) = .16, p = .24$, and $r(66) = -.01, p = .95$, respectively). For a fourth instantiation, “completing an exam without cheating”, which was added for exploratory purposes, there was a difference in happiness ratings in the British ($r(44) = .33, p = .02$ with the promoted instantiation, and $r[48] = -.28, p = .047$ with negated instantiation), but not the Brazilian sample ($r[67] = -.01, p = .92$ with the promoted instantiation, and $r[55] = .07, p = .61$ with negated instantiation). Overall, then, the majority of the emotions were unrelated to more than a handful of value importance ratings. This was also the case for within-country comparisons: There were only a few positive correlations of the value importance ratings with the promoted behaviours and a few negative correlations with the negated behaviours. However, the correlations were unsystematic both across behaviours and emotions and vanished after correction for multiple comparisons. In a final step, the three nature value items (protecting the environment, unity with nature, world of beauty) were combined, to increase the reliability ($\alpha = .63$ in the Brazilian sample, $\alpha = .76$ in the British sample). However, the pattern of results with the instantiations of protecting the environment remained the same.

Discussion

This study tested the prediction that participants experience more self-reported emotions when a typical instantiation is promoted or negated, compared to a non-typical one. Following Frijda’s (1988) law of concern, I postulated that typical instantiations

are more central to mental representations of a value, are therefore more important and should consequently elicit a stronger emotional difference when promoted vs negated.

Out of 70 interactions relevant to this prediction, 35 reached statistical significance, suggesting that the influence of the instantiations on the emotion ratings was not the same across countries. However, they varied only partly because of typicality, because only 21 (60 percent) of these interactions were in the predicted direction, with a larger difference between the two versions of the instantiations in the country where the instantiation was considered typical than in the country where the instantiation was considered atypical. The remaining 14 significant interactions pointed in the opposite direction (with a stronger difference for the atypical instantiation).

It remains unclear why this hypothesis was so poorly supported. The remarkable aspect of these findings is that half of the patterns were reliable, but in opposing directions. This suggests that there may be a moderator of whether the typical or atypical instantiations exert a strong emotional effect. However, examining the instantiations and the emotions for which an interaction occurred, I was unable to find such a moderator.

Surprisingly, the value importance ratings barely correlated with the emotion measure. Future studies are needed to explore whether the emotions measure taps a kind of importance which is not measured by the value importance ratings or whether the jump to concrete value instantiations (rather than focusing only on the abstract values; see, e.g., Maio & Olson, 1998) makes the emotional consequences less predictable from the importance of the abstract values. Study 6 can be regarded as a provocative first study in a new project investigating the extent to which the emotions linked to abstract values filter down to the behaviours related to these values.

Notwithstanding this issue, Study 6 at least helped to advance the study of instantiations that are typical in one country but not another. Instantiations for which all the significant interactions were in the predicted directions were “installing heat insulation in the house”, “living in a house with a smoke detector”, “saving water”, and “keeping secrets”. The ability of these instantiations to appear in Study 4, survive the matching test in Study 5, and show the predicted emotional differences in Study 6 makes them ideal candidates for Study 7, the final study of this chapter.

Study 7: Instantiations and Theory of Planned Behaviour

Suppose that you would like to test how well the value of respect for tradition predicts relevant behaviours. You might start by thinking of the behaviours that are relevant to this value. Attending church services would presumably be an appropriate behaviour for a Christian sample, whereas behaving in accordance with the caste system would be more appropriate in a Hindi sample. Switching the behaviours to the other sample type would probably result in very low relations between the value and behaviour, presumably caused by floor effects (e.g., because most Hindi do not attend church services, independent of how much they value traditions).

This example illustrates one of the difficulties in choosing the right behaviour. Any given behaviour can be related to numerous different values. Thus, it is important to know beforehand which behaviours are typical exemplars of the target value. A related approach was used by Bardi and Schwartz (2003; cf. General Introduction, this thesis). They asked participants to generate behaviours that express each of the ten value types of Schwartz's (1992) value model. These behaviours were found to be strongly correlated with the values from which they were derived. However, different results emerged when Pozzebon and Ashton (2009) used Bardi and Schwartz's (2003) measure of value-relevant behaviours, which had been developed in Israel, in Canada. Pozzebon and Ashton found lower correlation coefficients than those that had been obtained by Bardi and Schwartz. Although this trend could be attributable to diverse factors (e.g., sample characteristics, respondent conscientiousness), one possibility is that the behaviours assessed by Bardi and Schwartz were less typical of the values in the Canadian context than in the Israeli one.

The aim of Study 7 was to investigate systematically whether and how typicality can influence the value-behaviour (intention) relation. I did this by selecting two

instantiations that had been found to be typical in one country but not the other countries, yielding six instantiations in total. These were examined using the framework of the Theory of Planned Behaviour (TPB). The TPB predicts that attitudes toward the behaviour, subjective norms, and perceived behaviour control influence the intention to perform the behaviour, which in turn influences the behaviour itself (Ajzen, 1991). The TPB has received strong empirical support across many meta-analyses examining cross-sectional relations between the components of the TPB (Armitage & Conner, 2001; Cooke, Dahdah, Norman, & French, 2016). In contrast, the longitudinal and experimental evidence is equivocal (Sniehotta, Pesseau, & Araújo-Soares, 2014), and many authors have found that additional variables explain variance in behaviour beyond the four core elements. Examples include moral norm, anticipated regret (e.g., Parker, Manstead, & Stradling, 1995; Ravis, Sheeran, & Armitage, 2009), or values (Hrubes, Ajzen, & Daigle, 2001). The conclusion I draw from these findings is that the TPB is a useful framework, but it is not comprehensive in describing the predictors of behaviour and not sufficient as a causal model.

The aforementioned evidence is consistent with the possibility that values may be an additional important factor. Their role in moral judgment is consistent with the role of moral norms, and the role of values in emotion (as documented in Study 6) aligns with the evidence regarding anticipated regret. Indeed, prior evidence indicates that values can predict behaviour and behavioural intentions independently of other factors in the TPB when attitudes toward the behaviour are strongly value-expressive (Maio & Olson, 2000). Thus, values may be another predictor of behavioural intentions (Figure 3.2).

An unanswered question is whether this independent role is more likely when the behaviours are typical instantiations of the value than atypical instantiations. This issue

is theoretically important because it points to different ways in which typicality might affect the role of values in behaviour. This consideration is based on attitude representation theory (ART; Lord & Lepper, 1999) and the model of how instantiations link values and behaviour (Figure 1.5), both described in Chapter 1. The ART postulates, based on previous findings of the authors (e.g., Lord et al., 1984), that attitude-behaviour consistency is moderated by typicality. The model displayed in Figure 1.5 assumes that both personal experiences and social-contextual factors influence the extent to which a behaviour is a prominent instantiation of values. This, in turn, leads to the activation of one or more values that influence which behaviour is chosen in a specific situation (cf. the representation postulate of the ART). Taking both models together, I postulate that it is not only the attitude-behaviour link that is moderated by typicality, but also the value-behaviour link: If an instantiation (here: behaviour or behavioural intention) is more closely linked to a value, the two are more strongly associated. It is important to know whether typicality matters, because it allows us (a) to better predict when values are correlated with behaviour and (b) to explain failed replications.

Given these theoretical considerations, I expected positive relations of the target value (e.g., recycling for protecting the environment) with attitudes, subjective norm, perceived behavioural control, and behavioural intention when the instantiation (e.g., recycling) was typical (here: for the British participants). However, when the instantiation was not typical, I expected the target value to be less strongly related with the four elements of the TPB (for Brazilian and Indian participants). The correlations within the core elements of TPB were expected to be positive for both typical and atypical instantiations. The predictions are shown in Figure 3.2.

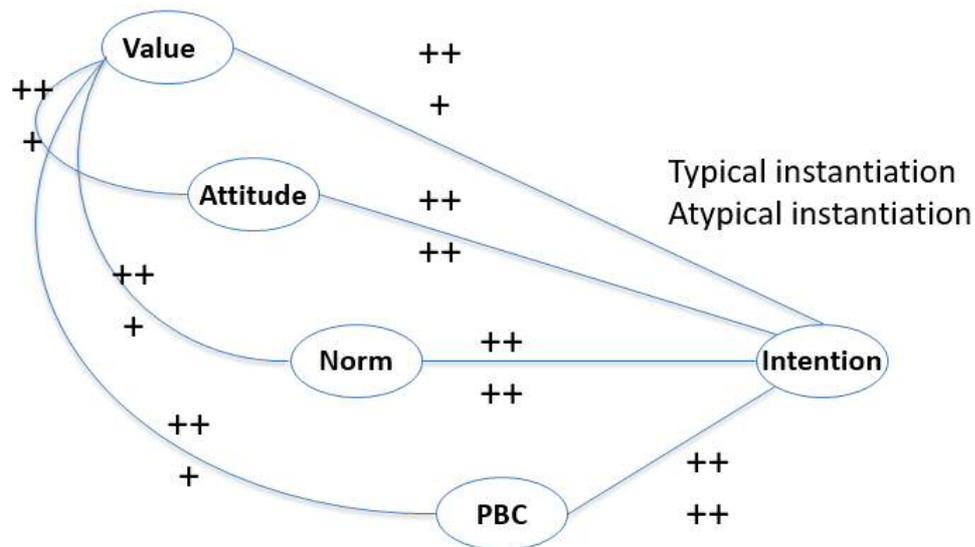


Figure 3.2. Predicted pattern of correlations for a typical and atypical instantiation. The expected correlation signs (++) and (+) are displayed along the lines connecting two nodes: The expected sign for typical instantiations is on top (++), the expected sign for atypical instantiations below (+ and ++).

These predictions focused on behavioural intentions and were not extended to actual behaviour. The reason for this focus was pragmatic. It was not possible to examine actual behaviour for the instantiations I examined (e.g., installing electric fences around houses) for the participant population (who were unlikely to be homeowners). Nonetheless, the extant evidence described above has found that the link between intentions and behaviour is strong and therefore factors influencing intentions have a better chance of altering behaviour than factors that do not alter intentions. For this reason, numerous past studies have adopted the same focus on behavioural intentions, at least in the initial stages of investigation.

Nevertheless, this focus on intentions posed one difficulty: By thinking about their intentions, the participants deliberated about their responses. This means that the intention measure does not tap the spontaneous processes that are relevant to the typicality of value instantiations. Recall from earlier in the chapter and in Chapter 1 that

the *spontaneous* associations between typical instantiations and their related concepts are theoretically stronger than the link between atypical instantiations and the concepts, but this does not mean that people fail to see, upon reflection, connections between atypical instantiations and their associated concepts. In this context, people might easily work backwards from an atypical instantiation of a value to the value itself if they are thinking about the atypical instantiation (e.g., saving water promotes the environment). Indeed, earlier in this chapter I considered evidence that this backtranslation to values does occur. Thus, any effect of typicality in the measure of behavioural intentions would have to occur despite this ability to link most of the instantiations to the actions. The selected instantiations for the Brazil-UK comparisons were all correctly matched (cf. Study 5).

Such an effect of typicality would indicate that the typical instantiations are more predictive because of a feature of typical instantiations other than their spontaneous connection to values (e.g., greater personal importance, fit to ideal). This would provide a basis for looking more closely at these varied features of the instantiations. Also, if this finding emerges, it would have important ramifications for research using self-report measures of value-behaviour relations.

Method

Participants. Across all three countries, 749 participants were included in the analysis. A summary of their descriptive statistics can be found in Table 3.4. The Brazilian and Indian participants were undergraduate and postgraduate students and were not compensated. The Brazilian participants were from north-east Brazil, and all Indian participants were students from a major university in the state of Karnataka. The British participants were recruited from two samples. Sample 1 consisted of psychology undergraduate students who received course credits. Sample 2 comprised 133

participants from Prolific (similar to mturk) who were compensated with £1, 31 psychology undergraduate students who received course credits, and 27 university members (both students and staff) who were given the opportunity to participate in a raffle for two £40 cash prizes.

Prior to any data analysis, 37 Brazilian, 11 Indian, and 24 (sample 1) and 34 (sample 2) British participants were excluded because they either failed twice to respond to the instructional manipulation check (IMC; Oppenheimer et al., 2009) or were not a citizen of the country in which they completed the questionnaire. The latter was only an issue in the UK, with around 10 percent of foreigners in each of the two samples. I also tested whether it was justified to exclude participants by comparing the reliabilities of a few random selected scales among participants who failed the IMC twice with those who did not. Cronbach's α was often higher for the participants who did not fail the IMC twice. For example, in the Brazilian sample, 34 participants failed the IMC twice, while 152 did not. For those who failed twice, the reliability of the four attitudinal items relating to saving water was $\alpha = .24$, whereas for those who did not fail, $\alpha = .72$.

Although such a dramatic drop was not found in the British samples, I also excluded British participants who failed the IMC twice, in order to be consistent.

Table 3.4

Demographics and descriptive statistics Study 7

	Brazil	India	UK (sample 1, sample 2)
n (%female)	152 (71.50)	221 (57.00)	185 (91.30), 191 (56.00)
Age (SD)	24.97 (8.53)	22.35 (1.65)	19.77 (3.22), 23.48 (5.24)
Protecting the environment	5.40 (1.49)	5.84 (1.67)	3.68 (1.79), 4.28 (1.83)
Loyalty	5.38 (1.54)	5.92 (1.34)	5.95 (1.08), 5.38 (1.32)
Family security	6.45 (0.91)	6.25 (1.24)	6.03 (1.24), 5.74 (1.36)

	Brazil	India	UK (sample 1, sample 2)
Ambitious	6.40 (0.97)	5.76 (1.65)	5.32 (1.33), 4.50 (1.85)
Respect for tradition	3.26 (2.11)	5.28 (1.70)	2.33 (1.86), 2.44 (1.85)
A: Saving water	6.76 (0.57, .72)	6.57 (0.74, .69)	6.56 (0.72, .86)
SN: Saving water	6.54 (0.83, .80)	6.12 (1.08, .70)	5.89 (1.06, .88)
PBC: Saving water	5.92 (1.32, .71)	5.00 (1.29, .43)	5.67 (1.02, .69)
Int: Saving water	6.09 (1.44, .95)	6.23 (1.15, .84)	5.54 (1.34, .94)
A: Recycling	6.78 (0.50, .72)	6.21 (0.92, .80)	6.55 (0.63, .80)
SN: Recycling	5.64 (1.45, .86)	5.72 (1.16, .75)	6.05 (1.05, .90)
PBC: Recycling	5.04 (1.47, .77)	4.91 (1.34, .62)	5.73 (1.22, .81)
Int: Recycling	4.16 (1.92, .93)	5.92 (1.23, .88)	6.39 (0.96, .93)
A: Keeping secrets	5.64 (1.40, .92)		3.94 (1.48, .93)
SN: Keeping secrets	5.25 (1.92, .93)		3.70 (1.83, .94)
PBC: Keeping secrets	5.99 (1.10, .57)		5.42 (1.15, .77)
Int: Keeping secrets	5.21 (1.87, .93)		3.81 (1.92, .96)
A: Electric fences	5.49 (1.64, .91)		2.80 (1.28, .92)
SN: Electric fences	5.70 (1.51, .93)		2.32 (1.24, .91)
PBC: Electric fences	4.45 (1.87, .84)		5.51 (1.44, .88)
Int: Electric fences	3.70 (2.12, .96)		1.46 (1.09, .99)
A: Education		6.40 (0.82, .82)	6.50 (0.77, .85)
SN: Education		6.10 (1.08, .84)	6.39 (0.80, .79)
PBC: Education		5.45 (1.17, .49)	5.73 (1.06, .74)
Int: Education		6.09 (1.13, .88)	6.01 (1.32, .95)
A: Traditional clothing		5.97 (1.06, .87)	4.42 (1.07, .89)
SN: Traditional clothing		5.22 (1.48, .86)	3.64 (1.11, .72)
PBC: Traditional clothing		5.43 (1.23, .57)	6.24 (1.04, .81)
Int: Traditional clothing		5.49 (1.45, .90)	2.96 (1.74, .99)

Note. SES is socioeconomic status (Sharma et al., 2012), A stands for attitude, SN for subjective norm, PBC for perceived behaviour control, and Int for intention. Numbers in brackets stand for SD and, if available, Cronbach's α .

Procedure. Brazilian and British participants completed the survey online, while Indian participants completed a pen-and-paper version in classroom settings of around 10 to 50 people. Brazilian participants were invited to participate mainly via Facebook groups of universities in the north-west of Brazil. The location was restricted because I aimed for participants from dry regions, thereby resembling the sample that generated 'saving water' as a typical instantiation of protecting the environment in Study 4.

Materials. All participants first completed the 23-item version of Schwartz's value survey (SVS; Schwartz, 1992), as in Studies 5 and 6. The TPB (Ajzen, 1991) was assessed with a modified version of the measure used by Armitage, Armitage, Conner, Loach, and Willetts (1999), replacing their target behaviour with our behaviours: Saving water, recycling, keeping secrets, installing electric fences around the house (assuming that you have just bought one without electric fences), working hard to complete education with good marks, and wearing traditional clothing.

Armitage et al. (1999) assessed attitudes with four items, and subjective norm, perceived behavioural control, and behavioural intention with three items. Attitudes were assessed with "<behaviour> is in general". Responses were given on a 7-point bipolar scale ranging from 1 (bad, unfavourable, negative, unsatisfactory) to 7 (good, favourable, positive, satisfactory). Subjective norms were assessed with "People who are important to me think I ... <behaviour>", "People who are important to me would ... <behaviour>", and "People who are important to me want me to <behaviour>". Responses were given on a 7-point bipolar scale ranging from 1 (should not, disapprove, unlikely) to 7 (should, approve, likely). Perceived behavioural control was assessed with "Whether or not I <behaviour> is entirely up to me", "How much personal control

do you feel you have over <behaviour>?”, and “How much do you feel that <behaviour> is beyond your control?”. Responses were given on a 7-point bipolar scale ranging from 1 (strongly disagree, very little control, very much) to 7 (strongly agree, complete control, not at all). Behavioural intentions were assessed with “I intend to <behaviour> <time>”, “I plan to <behaviour> <time>”, and “I want to <behaviour> <time>”. Responses were given on a 7-point bipolar scale ranging from 1 (definitely do not) to 7 (definitely do). The selected timeframe was adapted in a way that to be more meaningful to the participants. For “wearing traditional clothing” the timeframe was “at the next opportunities”. For the two behaviours “working hard to complete my education with good marks” and “installing electric fences around the house” the timeframe was “within the next couple of years”. For the remaining three behaviours, “recycling”, “saving water”, and “keeping secrets”, the time frame was “today or tomorrow”.

Finally, participants completed a socioeconomic scale (Sharma et al., 2012), and were asked to indicate their age, gender, and nationality before being debriefed and thanked. However, because the socioeconomic scale calculates the socioeconomic status (SES) as the sum of three items (education, occupation, and income), missing values affect the overall score. Because the number of missing values was not uniformly distributed across countries, the SES was not included in the analyses.

The items in Brazil were translated into Portuguese. Although the quality of the translation of all items into Portuguese was ensured through back-translation, one item assessing perceived behavioural control, “How much do you feel that <behaviour> is beyond your control?” was mistakenly translated into “How much do you feel that <behaviour> is *under* your control?” (emphasis added). Hence, this item was recoded for the Brazilian sample.

The main criterion for selecting instantiations was that they should be typical in one but not the other two countries. However, the instantiation should not be completely atypical in the other two countries, because this could result in floor effects or random responses (see the introduction of this study for examples). To ensure this, the typical instantiations had to be successfully matched in Study 5 (for Brazil and the UK, because no data were available for India). More generally, correctly matching the instantiations to the values was a condition for seeing the instantiation as a valid exemplar of the value.

Saving water was selected because (1) it was spontaneously associated with protecting the environment in the Brazilian, but not the British sample (Study 4), (2) the effects of this instantiation on emotion in Study 6 were in the predicted direction, indicating that Brazilians feel more positive and less negative emotions when someone close to them saved (vs wasted) water compared to British participants (Study 6, Table A13), and (3) because the countryside of Paraiba, the state in Brazil where most of the Brazilian participants are from, has up to 90 percent less annual precipitation compared to Wales where the precipitation is also more uniformly distributed (source: <http://www.worldweatheronline.com>).

Installing electric fences around the house (assuming that you have just bought one without electric fences), was selected because (1) it was only mentioned as a typical instantiation for family security in the Brazilian, but not the British sample, in Study 4, (2) Brazilian participants reported more positive and less negative emotions to the promoted version of this instantiation in Study 6 (Table A13), and (3) because João Pessoa, where most of the Brazilian participants were living, is a more dangerous city than any city in the UK in terms of homicides (Office for National Statistics, 2014; Statista, 2014).

Recycling was selected because (1) it was mentioned more often in the British than Brazilian sample as a typical instantiation for protecting the environment (Study 4)

and (2) because the recycling rate is around 28 percent in the UK, whereas only 1 percent in Brazil (source: <http://www.atlas.d-waste.com/>).

Keeping secrets was selected because (1) it was mentioned more often in the British than Brazilian sample as a typical instantiation for loyalty (Study 4) and (2) for several emotions the predicted interaction was found (Study 6, Table A13).

Working hard to complete education with good marks (ambition) and wearing traditional clothing (respect for tradition) were the two instantiations I considered to be typical in the Indian, but not British sample (Study 4). Because no data from India were collected for Studies 5 and 6, Study 4 provided my only empirical basis for selecting these instantiations.

Design. I used a nested design: All instantiations considered typical in the UK were used in both Brazil and India, and vice-versa. The typical instantiations in India (Brazil) were not used in the Brazilian (Indian) sample. Hence, the focus of the analyses and discussion lies on the comparison Brazil-UK and India-UK, but not on Brazil-India. British participants in Sample 1 completed the same scales as the Brazilian participants, while British participants in Sample 2 the same scales as Indian participants.

Results

First, I tested the fit of the data to my proposed model using structure equation modeling. Next, I tested for measurement equivalence between all three countries. Finally, I tested whether the target value correlated more strongly with the four elements of the TPB when the behaviour was more typical. Note that the fit of an SEM can be evaluated even without established measurement equivalence, because all fit indices (e.g., CFI, RMSEA) are comparing the data with the same hypothetical model (e.g., baseline model or optimal fitting model).

Structure equation modeling. In total, 14 SEMs were computed, using the R packages “latent variable analysis” (lavaan, version 0.5-20; Rosseel, 2012) and “semTools” (version 0.4-11; Pornprasertmanit, Miller, Schoemann, & Rosseel, 2016). As described below, four SEMs were conducted for the Brazilian and Indian samples, respectively, and six SEMs for the two British samples. Results were partly double-checked with AMOS. Because the χ^2 statistic is sensitive to sample size (e.g., Cheung & Rensvold, 2002), I focus on other common fit indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR).

As can be seen in Table 3.5, the model fit for 13 out of the 14 models was adequate (CFI/TLI > .90 and RMSEA < .08) or better (CFI/TLI > .95 and RMSEA < .05; Schout, Lugtig, & Hox, 2012). This indicates that the proposed model (Figure 3.2) fits the data well.

Table 3.5

Fit indices of all 14 SEMs.

	χ^2	p	CFI	TLI	RMSEA	SRMR
Saving water (B/I/U)	177.09/130.66/176.04	all < .001	.87/.93/.94	.83/.90/.93	.11/.07/.09	.09/.09/.11
Recycling (B/I/U)	94.00/178.02/164.30	.04/<.001/<.001	.97/.91/.94	.97/.89/.93	.05/.09/.09	.07/.09/.09
Keeping secrets (B/U)	108.23/122.23	.003/<.001	.97/.98	.96/.97	.06/.06	.06/.07
Electric fences (B/U)	100.98/97.19	.01/.02	.98/.99	.97/.99	.06/.05	.07/.06
Good marks (I/U)	144.51/116.07	<.001/.001	.94/.97	.92/.96	.07/.06	.07/.06
Traditional clothing (I/U)	155.69/120.54	<.001/<.001	.94/.98	.92/.97	.08/.06	.08/.08

Note. All *dfs* = 71, B/I/U: Results for Brazilian, Indian, and British samples (in this order), *df*: degrees of freedom, CFI: Comparative Fit Index, TLI: Tucker-Lewis Index, RMSEA: Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Square Residual.

The standardized path coefficients were also computed (Table 3.6), although they were not central to the hypotheses. For example, the intention to save water was significantly predicted in the Indian sample by attitudes towards saving water ($\beta = .50$) and the value protecting the environment ($\beta = .28$) but not by subjective norm ($\beta = -.00ns$) or perceived behavioural control ($\beta = .25ns$). As shown in the table, all of the four predictors were reliable predictors of intentions in at least four analyses, but none of the four predictors of intention was consistently significant across countries and instantiations.

Table 3.6

Path coefficients of predictors of intention

	Attitude	Subjective norm	Behaviour control	Value
Saving water (B/I/U)	.16/.50 ³ /.11	.24 ¹ /.-00/.36 ³	.23 ² /.25/.25 ²	.05/.28 ³ /.20 ²
Recycling (B/I/U)	.03/-.03/.21 ²	.43 ³ /.37 ³ /.31 ³	.06/.40 ³ /.15	.03/.23 ³ /.07
Keeping secrets (B/U)	.34 ² /.28 ¹	.24 ¹ /.34 ²	.09/.04	.07/-.08
Electric fences (B/U)	.25 ² /.12	.23 ¹ /.43 ²	.24 ² /.-09	-.03/-.17 ²
Good marks (I/U)	.35 ¹ /.27 ¹	.13/.09	.06/.04	.26 ³ /.19 ²
Traditional clothing (I/U)	.31 ² /.07	.20/.66 ³	.11/-.06	.05/-.02

Note. B/I/U: Results for Brazilian, Indian, and British samples (in this order). All paths coefficients are standardized. ¹: $p < .05$, ²: $p < .01$, ³: $p < .001$

Measurement equivalence. To make meaningful comparisons across groups (e.g., comparison of correlation coefficients), a high level of measurement equivalence or measurement invariance needs to be established, depending on the planned analyses (e.g., Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; Hirschfeld & von Brachel, 2014; Vandenberg & Lance, 2000; Wu, Li, & Zumbo, 2007). Establishing

measurement equivalence is especially necessary if we compare naturally occurring groups, such as people from different countries who may understand items in different ways. Without establishing measurement equivalence, we may end up comparing “chopsticks with forks” (Chen, 2008). The levels of equivalence are often considered hierarchically: Testing for a stricter level of invariance is usually only meaningful if previous levels have been established. The first and lowest level, configural equivalence, tests whether the number of latent variables is the same across groups through “constraining the number of factor(s) and the pattern of the free and fixed loadings to be the same across groups” (Wu et al., 2007, p. 7). Configural invariance is needed to establish that the same constructs were measured. Metric or weak equivalence, the second level, tests for equivalence in factor loadings by testing whether one unit change in an item score creates an equal change in the latent variable score in all groups. With metric equivalence established, unstandardized regression coefficients can be compared across groups, as the slope of the regression lines will be similar. The third level, scalar or strong equivalence, tests whether the intercepts of the items are similar across groups. Without scalar equivalence, means of latent variables cannot be meaningfully compared between groups. However, Wu et al. (2007) have argued that not only scalar, but also strict invariance, the fourth level of measurement equivalence, must be met to compare means. Strict invariance tests for equivalence of residual variances. However, there is still disagreement about the necessity of establishing strict invariance (Davidov et al., 2014; Hirschfeld & von Brachel, 2014). There are at least three more levels of equivalence, the so-called structural equivalence, that can be tested across groups, including invariant path coefficients (Vandenberg & Lance, 2000). However, establishing the first three levels of equivalence, configural, metric, and scalar

equivalence, are sufficient for the purpose of the present comparison of correlation coefficients.

Although there are several recommendations for the cut-off criteria between the models (Chen, 2007; Cheung & Rensvold, 2002), I followed the recommendation of Cheung and Rensvold. They indicate that equivalence is established if the difference between two models remains $CFI \leq .01$. Table 3.7 displays the results of all ten measurement equivalence tests. As can be seen in column 5, strong measurement equivalence is not established for the first four models ($\Delta CFI > .01$), but it is established for the remaining six. Strict invariance (i.e., constraining the residuals) was not supported in any of the models tested.

Table 3.7

Results of all ten measurement equivalence tests

		CFI	RMSEA	ΔCFI	$\Delta RMSEA$
Saving water (Brazil – UK)	configural	0.921	0.098	NA	NA
	weak	0.897	0.109	0.024	0.010
	strong	0.894	0.107	0.003	0.002
	strict	0.795	0.144	0.099	0.037
Saving water (India – UK)	configural	0.938	0.078	NA	NA
	weak	0.934	0.078	0.005	0
	strong	0.923	0.082	0.011	0.004
	strict	0.702	0.155	0.221	0.073
Recycling (Brazil – UK)	configural	0.953	0.073	NA	NA
	weak	0.939	0.081	0.014	0.008
	strong	0.929	0.084	0.009	0.003
	strict	0.843	0.121	0.087	0.037

		CFI	RMSEA	Δ CFI	Δ RMSEA
Recycling (India – UK)	configural	0.929	0.085	NA	NA
	weak	0.92	0.087	0.009	0.003
	strong	0.904	0.093	0.016	0.006
	strict	0.723	0.152	0.181	0.059
Keeping secrets (Brazil – UK)	configural	0.974	0.064	NA	NA
	weak	0.968	0.068	0.005	0.004
	strong	0.968	0.066	0	0.002
	strict	0.928	0.095	0.040	0.029
Electric fences (Brazil – UK)	configural	0.986	0.051	NA	NA
	weak	0.981	0.058	0.005	0.007
	strong	0.976	0.063	0.005	0.005
	strict	0.788	0.18	0.188	0.117
Good marks (India – UK)	configural	0.956	0.065	NA	NA
	weak	0.952	0.066	0.004	0.001
	strong	0.949	0.066	0.003	0
	strict	0.863	0.104	0.086	0.038
Traditional clothing (India – UK)	configural	0.963	0.069	NA	NA
	weak	0.959	0.07	0.004	0.001
	strong	0.951	0.074	0.008	0.004
	strict	0.808	0.142	0.144	0.068

Note. CFI is confirmatory fit index, RMSEA is root mean square of error approximation, Δ represents the differences between the current and the previous model.

If measurement equivalence is not established, an alternative approach is to unconstrain (free) one or more items based on the modification indices (Byrne, Shavelson, & Muthén, 1989). If this leads to a Δ CFI < .01, partial measurement

equivalence is established. I followed this approach for the four models for which strong measurement equivalence was not established. I decided to let no more than 3 out of the 13 items freely vary to improve the fit, as freeing more items would have undermined the purpose of the tests for measurement equivalence. After freeing one to three items (either the loadings or intercepts), three models were partially equivalent. This means that correlations and means can be compared across groups. Only the comparison of the model between Brazil and the UK for saving water did not reach scalar equivalence (Table 3.8), because ΔCFI between the model with free loadings to free intercepts was $> .01$. Hence, the correlations between the variables in the model for saving water cannot be meaningfully compared between Brazil and the UK.

Table 3.8

Results of partial measurement equivalence tests

		CFI	RMSEA	ΔCFI	ΔRMSEA
Saving water (Brazil – UK) – 3 items freed	configural	0.922	0.098	NA	NA
	weak	0.916	0.099	0.006	0.001
	strong	0.898	0.107	0.018	0.008
	strict	0.796	0.145	0.104	0.038
Saving water (India – UK) – 2 items freed	configural	0.938	0.078	NA	NA
	weak	0.934	0.078	0.005	0
	strong	0.930	0.079	0.004	0.001
	strict	0.744	0.145	0.186	0.066
Recycling (Brazil – UK) – 3 items freed	configural	0.953	0.073	NA	NA
	weak	0.948	0.074	0.005	0.001
	strong	0.936	0.081	0.012	0.007
	strict	0.856	0.116	0.080	0.035

Recycling (India – UK) – 1 item	configural	0.929	0.085	NA	NA
	weak	0.920	0.087	0.009	0.003
	strong	0.911	0.090	0.009	0.003
	strict	0.729	0.151	0.182	0.061

Note. Δ represents the differences between the current and the previous model.

Comparing correlations. All computed correlation coefficients can be found in Figures 3.2 and 3.3, including the results of the comparisons between independent correlations (omitted when non-significant). The correlations between two elements of the model are displayed in a 4x2 correlation matrix along the paths connecting them. The first column displays the correlations for the Brazilian (Figure 3.3) or Indian sample (Figure 3.4), the second for the British sample (both figures). The first row of this matrix displays the correlations between each of the elements for the instantiation saving water and the value protecting the environment. The first row in all correlation matrices in Figure 3.3 is in grey, because the correlations cannot be meaningfully compared across Brazil and the UK because of a lack of strong measurement equivalence.

Consider the results shown in Figure 3.3. Here, protecting the environment correlated .06 ($p = .51$) with the intention to recycle with in the Brazilian sample, and .22 ($p = .003$) in the British sample. This difference did not reach statistical significance ($z = -1.42, p = .16$). The only predicted differences in correlations between a value and the core elements of the TPB were found for correlations between the importance of family security, on the one hand, and attitudes, subjective norms, and intention in relation to installing an electric fence around the house. For example, the correlation between family security and subjective norm was positive in in the Brazilian sample, but negative in the British sample. The correlations within the core elements of the TPB were similar in size to the ones found in meta-analyses of the TPB (Armitage & Conner, 2001; Ravis et al., 2009). Overall, these findings were influenced by an unexpected lack

of strong correlations between the values and the TPB constructs in the Brazilian data. Therefore, to increase the reliability, I combined the three nature value items (protecting the environment, unity with nature, and world of beauty). The reliabilities were satisfactory to good (Brazil: $\alpha = .58$, India: $\alpha = .64$, UK: $\alpha = .80$). However, the correlational patterns did not change.

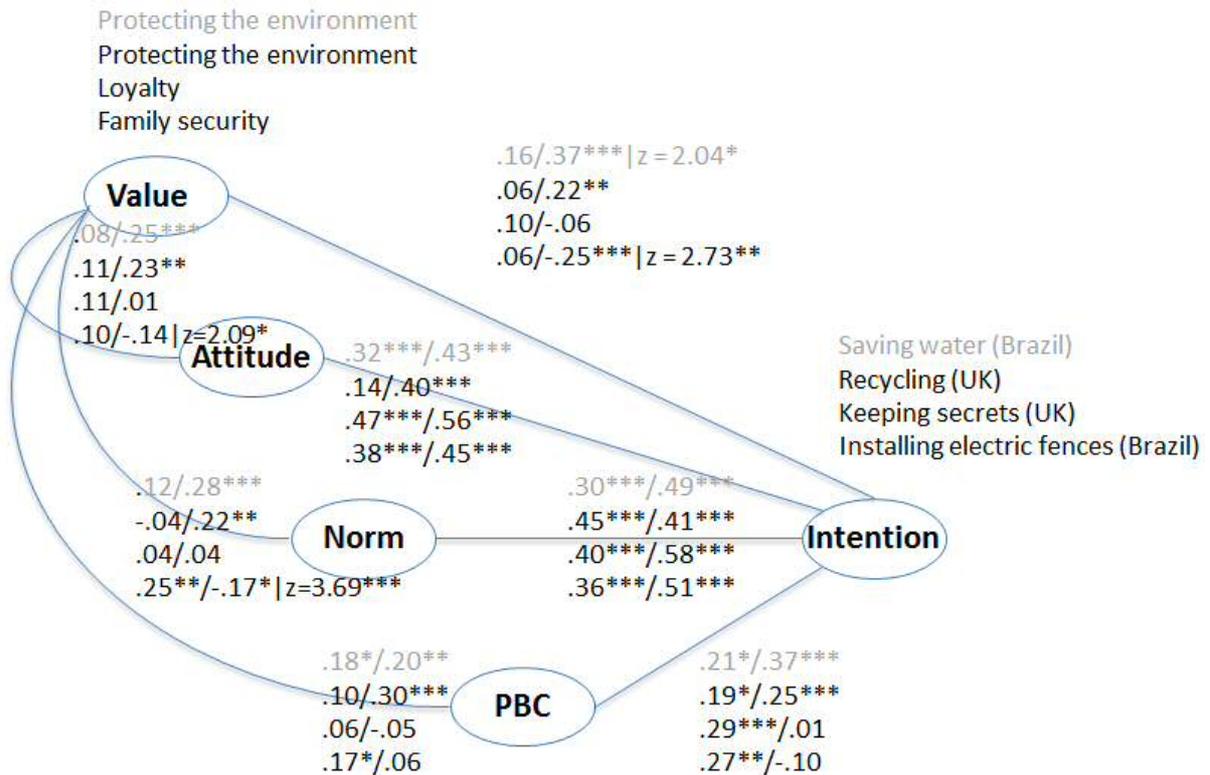


Figure 3.3. Correlation coefficients for the Brazilian and British participants (first and second columns) between elements of the model. Norm is subjective norm, PBC is perceived behaviour control, z is the z statistic of the comparison between two independent correlation coefficients (omitted when non-significant). Correlations for saving water are in light grey because the scales are not invariant (see above) and therefore comparisons are not meaningful.

*: $p < .05$, **: $p < .01$, ***: $p < .001$

Turning to results shown in Figure 3.4, the pattern is markedly different. The samples in India and the UK both exhibited reliable correlations between values and the

TPB constructs. In fact, the correlations were very similar in size and did not reliably differ between the nations. Again, combining the three nature value items to increase reliability did not change the pattern of results. These results support a role of values in all of the behavioural instantiations, without any differences according to the degree to which the behaviour was typical or atypical of the value.

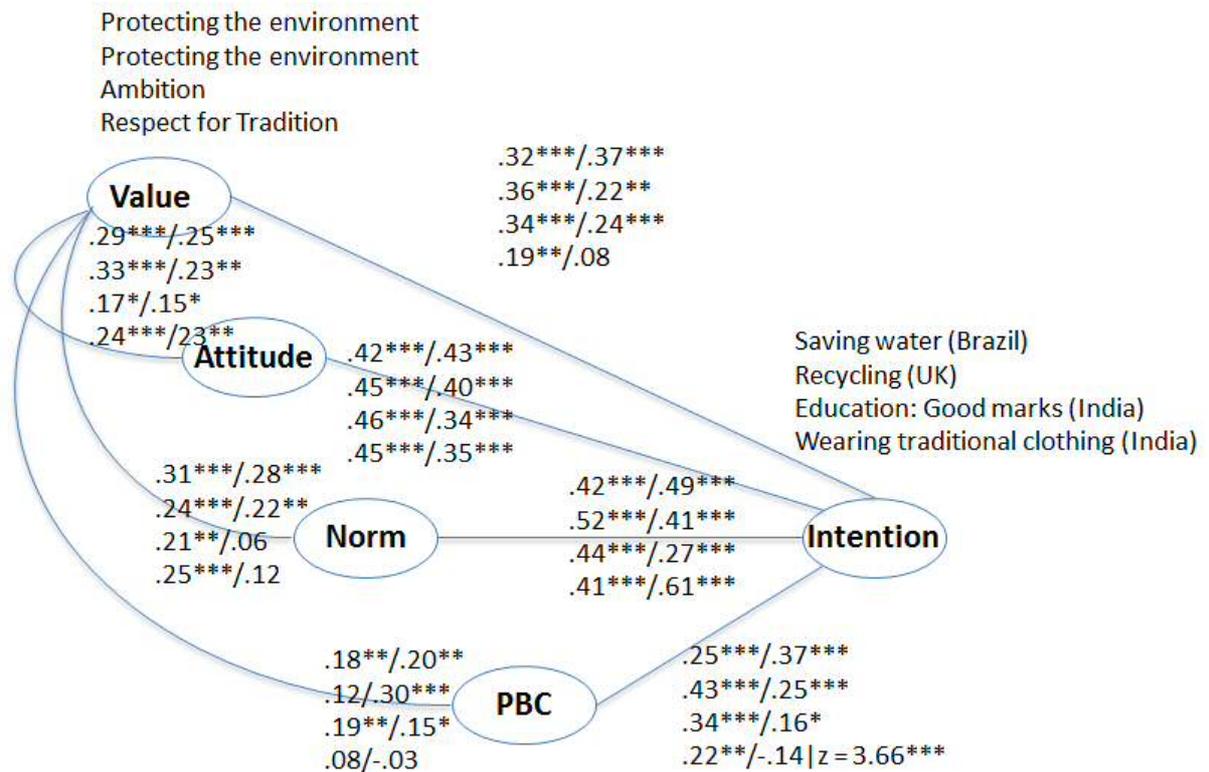


Figure 3.4. Correlation coefficients for the Indian and British participants (first and second column) between all elements of the model. Norm is subjective norm, PBC is perceived behaviour control, z is the z statistic of the comparison between two independent correlation coefficients (omitted when non-significant).

*: $p < .05$, **: $p < .01$, ***: $p < .001$

Discussion

The aim of Study 7 was to test whether typicality influences the relations between values and attitudes, subjective norms, PBC, and intentions. This hypothesis

received only limited support. The correlations between values and the TPB components were similar across countries, and only three differences across a total of 28 correlations were reliable. Specifically, the correlations between family security and attitudes and intentions for installing electric fences around houses differed between the Brazilian and British samples. These differences were partly driven by negative relations between family security and, for example, the intention to install electric fences in the British sample; in this sample, electric fences may be perceived as a *risk* for family security. To some extent, the mixed results may be due to the unexpected, weak correlations between values and all of the TPB constructs in the Brazilian sample. However, there were stronger correlations between these variables in the Indian sample, and no evidence differences between the correlations in the Indian sample and the UK sample. Therefore, it is important to consider other explanations for the weak pattern.

One methodological possibility is that the predicted pattern of differences between correlations did not appear for the remaining seven instantiations because they were not atypical enough in the countries from which they have not been derived. For example, although saving water was found to be more typical in the Brazilian than the British sample in Study 4, calls for saving water do occur in the UK (albeit not as commonly as calls to recycle, for example). Of all the instantiations used, installing electric fences is probably the least typical exemplar in the British sample. This reasoning is in line with Maio, Hahn, et al. (2009) who found that participants engaged more in egalitarian behaviour after contemplating about a typical example of equality (e.g., discrimination against women) compared to an atypical example (e.g., discrimination against left-handers). As I argued in Chapter 1 and found in Study 5, discrimination against left-handers is relatively atypical for equality. In other words, if

Maio, Hahn, et al. had used a somewhat more typical instantiation of equality, they would probably not found this effect.

This possible explanation is given more support from past evidence that personal past experiences moderate the impact of instantiations. As mentioned in Chapter 1, Lord et al. (1991) found that the correlation between attitudes and behaviour was more dependent on typicality when participants were less experienced and less skilled regarding the social category. The same could apply here: Most of the tested instantiations refer to behaviours in which participants are likely to be somewhat experienced (e.g., saving water or working hard for good grades). The only exception is building electric fences around the house. Here, as argued earlier, Brazilians are likely to be more experienced than Britons and this was also the only instantiation where a typicality effect was found. The lack of experience in Britain may render the typicality effect stronger by virtue of a larger difference in typicality between the two nations.

In summary, it may be worth replicating Study 7 using instantiations that are less typical in the countries where the instantiation is not derived, but not so atypical that any resulting effect becomes trivial. Instantiations for such a conceptual replication study should be based not on the results of Study 4 and 6, which is what I did in Study 7, but on the results of Study 5. In particular, I would suggest focusing on the five instantiations, which were *differently* matched to the values in both countries, rather than matched to the same degree. If people do not match the instantiations to the values to the same extent in the countries being compared, then it should be harder to use those values in deciding intentions related to the instantiations.

A different approach is to try and examine spontaneous behaviour, rather than thoughtfully produced behavioural intentions. In addition, participants in all countries presumably differ in the extent to which they consider an instantiation to be typical for a

value. A follow-up study should assess typicality on an individual basis by directly asking the participants about how typical they consider the instantiation for each value to be and then to control for these typicality ratings⁸.

Overall, Study 7 demonstrates that values are associated with behavioural intentions independently of context and typicality. Furthermore, values can be independent predictors of behavioural intentions within the TPB framework, emphasizing the importance of values in guiding our behavioural intentions. Nonetheless, typicality did not systematically influence the relation of values to intentions.

⁸ I am grateful to Ronald Fischer for this suggestion.

Chapter 4: Is There a Bias against Science in Lay-Conceptions of Creativity?

A Cross-Cultural Comparison

The thesis to this point has succeeded in documenting more similarities between nations in values than differences. However, one provocative difference did emerge in Study 4: Art was more strongly associated with the value of creativity in the British sample than the Brazilian one, whereas science was barely mentioned in either of the two countries. This finding is the focus of the present chapter. In Studies 9 and 10, I will explore whether this specific difference in value instantiation can be replicated using different methods. Given that the similarities between countries have been found to be in most cases much larger than differences, it is interesting to explore examples where differences are actually larger, to see if the differences hold. A further aim of this chapter is to explore whether there is a bias against science in lay conceptions of creativity.

Creativity and Science

*It is an all-too familiar scene. I am at a party and meet a couple. "What do you do?" they ask. "I'm a scientist." I can already see the first sign of panic and disengagement. "What kind?" they ask politely. "I'm a molecular biologist. I study how information in my genes is used to make proteins." "Oh, that sounds fascinating and terribly clever. I'm afraid I was never very good at science or maths. I know nothing at all about it." (...) Now imagine the reverse. Suppose I had said: "Oh I really know nothing about literature or arts or music." The same people who proudly proclaim their ignorance about science and maths would consider me an uncivilised boor. – Venki Ramakrishnan in *The Guardian*, 28 February 2016.*

This example, provided by the President of the Royal Society and Nobel laureate, is consistent with negative stereotypes about scientists. Although scientists are usually considered to be helpful and wise, they are also perceived by urban students and high school students as old, frightening, and colourless (McNarry & O'Farrell, 1971). The work of a scientist is sometimes even considered as dull and tedious (Ahlgren & Walberg, 1973; Kind, Jones, & Barmby, 2007; Mead & Métraux, 1957). These results

are also mirrored in research on lay conceptions of creativity, in which artists were judged to be more creative compared to scientists (Glăveanu, 2014). Improving the way in which science is perceived is important, because this may impact the economic future of a country (Osborne, Simon, & Collins, 2003).

In the course of three studies conducted in two countries I investigated the extent to which scientists and the products of natural sciences are perceived as creative and whether the mode of presentation influences the lay-conception. Below I first outline why the lay conception of creativity is important for sciences, before I discuss previous research and the importance of conducting replications outside of Western countries.

Adding creativity to the large body of research about attitudes towards science (e.g., Osborne et al., 2003) is important because creativity is generally considered as a positive construct that can lead to significant progress in every aspect of the life, including art, everyday life, and sciences (Cropley, Kaufman, & Runco, 2010). Therefore, I assume that any profession or product will be evaluated more positively when it is considered to be creative. By contrast, if science is not perceived as creative, this will result in science being evaluated as less attractive. This potential effect has implications for investment in science and for attracting young people into scientific careers.

Before considering lay conceptions of creativity, it is useful to consider issues in the generalizability of psychological findings. Because more than 90% of participants in psychological studies reside in Western countries, with most living in the USA (Arnett, 2008), concerns have been raised about the generalizability of psychological findings. For example, it has been argued that many psychological phenomena cannot easily be generalized from participants of “Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies” to the rest of the world (Henrich et al., 2010, p. 61). It

follows that studies should be replicated outside of WEIRD-countries to address this issue of generalizability.

This claim has been echoed in the emerging study of the cultural psychology of creativity (Glăveanu, 2010a, 2010b). This cultural framework is as an extension of the social psychology of creativity (Glăveanu, 2010a), in which situational causes of (perceived) creativity are emphasized, rather than the internal dispositions that are typically studied (Kasof, 1995). In a cultural framework, creativity can be defined as a “complex socio-cultural-psychological process that, by working with ‘culturally-impregnated’ materials within an intersubjective space, leads to the generation of artifacts that are evaluated as new and significant by one or more persons or communities at a given time” (Glăveanu, 2010a, p. 87). In other words, creativity and the tradition of a culture interact; what is innovative needs to be judged in the context of cultural customs and habits. Consequently, Western understanding of and biases towards creativity should also be examined outside of Western countries, because creativity is socially constructed (Glăveanu, 2010a). In this chapter, I illustrate the importance of this view by comparing the lay-conception of creativity in a typical WEIRD nation, the United Kingdom, with one of the so-called emerging nations: Brazil.

In past research, artistic professions have been found to be perceived as more creative compared to professions from other domains, including scientific domains (Glăveanu, 2014). This phenomenon is called the *art bias* and refers to “the misunderstanding of creativity that equates it with artistic talent” (Runco, 2007, p. 384). The art bias can be explained by the romantic vision of a divinely inspired artist, an idea that can be traced back to ancient Greece (Glăveanu, 2014; Sternberg & Lubart, 1999). This implicit theory of creativity has important implications. For example, parents may think of their children as creative when they are artistic. If a child cannot draw, parents

may not regard them as creative (Runco, 2007), which may result in the ‘golem effect’ (Babad, Inbar, & Rosenthal, 1982), a form of self-fulfilling prophecy whereby low expectations result in low achievement. This highlights why it is important to study lay conceptions of creativity: People usually do not rely on formal definitions and theories of creativity when making their judgments, and their own definitions may be quite different from the formal ones (Lim & Plucker, 2001).

In studies exploring the art bias, comparisons have been made between objects relevant to art and objects not relevant to art. For example, Glăveanu (2011) found that participants predominantly chose an art-related depiction when asked to select a symbol that represents creativity. In a more recent study, Glăveanu (2014) found that participants considered creativity to be a key requirement for professions in the art domain (e.g., painter, writer) to a greater extent than for professions in the natural sciences (e.g., mathematician, engineer), social sciences and humanities (e.g., philosopher, lawyer), and everyday life (e.g., gardener, hairdresser).

However, both of Glăveanu’s studies used participants in WEIRD-countries (mainly UK and USA) and Poland. Investigating the lay-conception of creativity in Brazil would permit further insights into the potential universality of the art bias. Brazil is particularly interesting because *Jeitinho*, the ‘Brazilian way’ of problem solving, is closely linked to creativity (Ferreira, Fischer, Porto, Pilati, & Milfont, 2012). *Jeitinho* may have its origins in an interaction between aftermaths of colonization, corruption, and a hierarchical society (Ferreira et al., 2012). The aim is “to overcome bureaucracy but also to break laws and norms to attain a certain objective” (p. 332) through the use of “creativity, deception, interpersonal empathy, and cordiality” (p. 333). Ferreira et al. identified three components of *Jeitinho*: corruption, creativity, and social norm breaking. Examples include bribing a police officer, coming up with an idea for a birthday present

despite being penniless, and inviting a grandmother to go shopping in order to be able to use one of the parking spots close to a shopping mall that are reserved for the elderly.

It can be argued that both art and *Jeitinho* are strongly related to creativity, because both are related to divergent thinking, an important aspect of creativity (Runco, 2007). Divergent thinking, as opposed to convergent thinking, explores multiple possible solutions for a problem. For example, there are multiple ways to make a painting or sculpture (examples of art), just as there are multiple ways to create a birthday present despite not having any money (example of *Jeitinho*; Ferreira et al., 2012). However, both the means and the ends differ for art and *Jeitinho*: Art involves creating something aesthetically pleasing or emotionally arousing but not necessarily useful (e.g., “art for art’s sake”), whereas *Jeitinho* is more specific, mostly related to solving everyday problems. Furthermore, as noted above, judgment of what is creative depends on traditions that may differ between Brazil and the UK. Moreover, the Brazilian conception of creativity is likely to have been influenced by the notions of ingenuity and resourcefulness inherent in *Jeitinho*. Consequently, I expect the art bias to be more strongly evident among British participants, whereas Brazilian participants are expected to judge professions, objects, and actions related to solving everyday problems as more creative than professions, objects, and actions related to art.

Overview of the Present Studies

I followed the two-step design of previous studies that has been described as the gold standard (Glăveanu, 2014): First, qualitative, open-ended data were collected. Second, the results were used to create quantitative response scales (cf. Runco, 2007). In Study 8, which is a subset of Study 4, I have used a qualitative-exploratory design similar to that used in previous studies (e.g., Glăveanu, 2014).⁹ Based on the results, I

⁹ Studies 8 and 9 were designed and the data were collected between February and September 2014. Only later did I become aware of Glăveanu’s (2014) conceptually related study.

developed subsequent studies in which I asked participants how much creativity is needed for several professions (Study 9), and how much creativity is needed to come up with an idea or to create various objects (Study 10).

Because I was interested in the comparison between Brazil and the UK, I excluded all participants who were not from one of these two countries prior to any data analysis. The studies were conducted in Brazilian Portuguese for Brazilian participants. All material was successfully back-translated from Brazilian Portuguese to English.

Study 8: Associations of Creativity

Creativity can be operationalized not only as an ability or disposition, but also as a human value, as in the human value model of Schwartz (1992). He and other researchers define values as abstract ideals that are important guiding principles in one's life (Maio, 2010). In Schwartz's (1992) original model and in a more recent revision (Schwartz et al., 2012), creativity is one of six values that form the value type *self-direction*, which expresses independent thoughts and actions.

In Study 8, I used this value-based approach because of recent research describing how the effects of values on behaviour depend on the concrete actions and issues that people see as typical examples of the values (Hanel et al., in press; Maio, 2010; Maio, Hahn, et al., 2009). This led me to begin to document differences in the examples people use for diverse values across cultures, and creativity is one of the values I examined. Specifically, as shown in the present study, I have utilized a qualitative exploratory design with open-ended questions about the examples people associate with creativity as an important ideal. This approach complements previous approaches using other methods (e.g., Glăveanu, 2014), allowing me to add convergent validity to the qualitative art bias research and directly examine a potential bias against science. The study described below reports a more detailed analysis of the data

described in Study 4. Specifically, Study 8 focuses on how often participants have mentioned specific words, independent of their frequencies. The

Method

Participants. The sample included 34 Brazilian ($M_{\text{age}} = 26.18$, $SD = 6.50$, 22 females) and 33 British ($M_{\text{age}} = 22.94$, $SD = 10.41$, 25 females) participants. Brazilian participants were not compensated; British participants were given the option to participate in a prize draw of three cash prizes.

Material and procedure. To measure socioeconomic status, the “Kuppuswamy Socioeconomic Scale” (Sharma et al., 2012) was used, which consists of three items, which are summed up to one score: Education, Occupation and Family Income per month. In order to adjust the income classes, the official income distribution from both countries were used. Socio-economic status (SES) did not differ between Brazil ($M = 17.74$, $SD = 4.97$) and the UK ($M = 17.42$, $SD = 6.22$, $t[60.48] = 0.82$, $p = .82$). As the SES scale ranges from 3 to 29, participants in both countries had on average a mid-range SES.

Participants were asked to list typical situations in which they considered creativity as important (among other values not considered in this chapter). They were also asked to include a “short description of the people in the situation and what they do”. Next, two examples were given for two ideals that are not in the Schwartz’s (1992) model of values: For example, the value ‘enjoyment’ could be relevant during leisure time. Relevant people in the situation can be friends and the family. They could spend time together at the beach or playing games at home. Participants were asked to list at least two to three different situations and up to seven in total. Subsequently, they completed socio-demographic items. The average length of the response was

approximately the same in Brazil and the UK: 69 words vs 56 words, $\chi^2 = 1.35, p = .24$.

All participants completed the survey online.

Results

To test whether British and Brazilian participants associated creativity less with science and more with art, I counted how often participants in both countries mentioned the words science or scientist (*ciência/cientista* in Portuguese), and art or artist (*arte/artista*). I also counted how often branches of natural sciences, problem (*problema*), new (*novo*), and *Jeitinho* were mentioned. Counting the frequency was possible because neither negations (e.g., “not doing art”) nor periphrases (e.g., “creating something that did not exist before” for “new”) for the terms were used. “Science” and “scientist” were mentioned by 1 Brazilian participant once and by 4 British participants 6 times. Neither the former difference (1 vs. 4), nor the latter (1 vs. 6) reached significance ($\chi^2 = 1.80, p = .18$, and $\chi^2 = 3.57, p = .06$, respectively). Next, I looked at the following more specific terms: “physics” and “physicist”, “chemistry” and “chemist”, “biology” and “biologist”, “engineering” and “engineer”, and “mathematics” and “mathematician”. Overall, these terms were mentioned by 2 Brazilian participants 3 times and by 2 British participants twice.

“Art” and “artist” were mentioned by 4 Brazilian participants in total 6 times and by 23 British participants 46 times. Both ways of counting (i.e., number of participants or number of instances) revealed a significant difference between the two groups: $\chi^2 = 13.37, p < .001$ and $\chi^2 = 30.77, p < .001$, respectively. “Problem” was mentioned by 2 Brazilian participants 4 times and by 7 British participants 12 times. The former difference (2 vs. 7) did not reach significance ($\chi^2 = 2.78, p = .10$), while the latter (4 vs 12) did ($\chi^2 = 4.00, p = .046$). “New” was mentioned by 8 Brazilian participants 12 times and by 12 British participants 27 times. The former difference (8 vs. 12) did not

reach significance ($\chi^2 = 0.80, p = .37$), while the latter did ($\chi^2 = 5.77, p = .02$). *Jeitinho* was not mentioned at all.

Discussion

In this qualitative study, I found evidence of a bias against science and support for the existence of the art bias. In both countries less than 10% of the participants thought about science or its branches when thinking about typical situations in which creativity is relevant or about people in those situations. The art bias was only found in the British sample, where the term “art” was mentioned by 70% of the participants when asked what situations and persons they consider typical for creativity. In contrast, only 12% of Brazilian participants thought about art when asked what situations and persons they consider typical for creativity. The findings from the British sample stand in contrast with Glăveanu (2014). He found that art-related questions were rarely phrased, using a mixed British and US-American sample of participants who were asked to generate questions to determine whether an object is creative. This indicates that a relatively small change of methodology has an influence on whether or not evidence of the art bias is found and that the art bias is not as reliable as it was previously assumed (Runco, 2007).

Findings relating to the concepts of ‘problem’ and ‘new’ were mixed. In both cases, only the absolute frequency with which a term was used was significant, but the number of participants was not. Surprisingly, Brazilian participants did not mention *Jeitinho* at all, even in the form of paraphrase, despite creativity being one of its three factors (Ferreira et al., 2012). Nonetheless, as in Chapter 3, this result should be considered in light of the limitations in relying solely on spontaneous open-ended measures to form concept maps.

Study 9: Creativity of Various Professions

Study 9 aimed to conceptually replicate Study 8's finding that (a) science is less strongly associated with creativity compared to art, and (b) that British participants consider art as more typical for creativity than Brazilian participants, but this time using a procedure that asked participants to rate how much creativity is needed for each of 12 professions. The professions were selected from the art domain, from domains for which I considered problem solving to be relevant (everyday life domain), and from the science domain. Of importance, this procedure asked participants to reflect on links between creativity and these domains, instead of assessing spontaneous links between creativity and the domains, as had been done in Study 8. I expected that participants from both countries would easily recognize creativity in art, once this question was posed, relative to the other professions. At the same time, however, they should differ in perceptions of the degree of creativity needed for art versus the other professions. With regard to between-country comparisons, I expected Brazilian participants to evaluate professions related to the everyday life domain as more creative compared to British participants. I did not have any hypothesis relating to scientists, because their work can, in my understanding, involve both convergent and divergent thinking (i.e., both problem solving and artistic aspects).

Method

Power analysis. Based on the results of Study 8, I expected medium to large effects. For the power analysis, I chose the rather conservative effect size of $d = .5$ and a power of .9, which resulted in a minimum sample size of 86 participants per country.

Participants. Brazilian participants were 154 undergraduate psychology students at the Federal University of Paraiba, in João Pessoa, Brazil (113 females, 39 males, 2 did not report their gender). Their mean age was 24.15 years ($SD = 7.09$, $range = 17-58$).

All participated on a voluntary basis during class. British participants were 96 undergraduate psychology students from Cardiff University, United Kingdom (81 females, 11 males, 4 did not report their gender). Their mean age was 19.48 years ($SD = 0.73$, $range = 18-22$). All of them participated for course credit.

Material and procedure. In total, I examined 12 professions. Six were selected from the art domain (craftsman, landscaper, painter, sculptor, singer, and writer), three from the science domain (mathematician, philosopher, and scientist), and three from the everyday life domain (builder, mechanic, and physician). Participants were asked to rate “How much creativity is needed for each of the following professions”, followed by a 7-point Likert scale ranging from 1 (no creativity) to 7 (very much creativity) with 4 (moderate amount) as the midpoint. Brazilian participants completed the study with pen and paper in a classroom of approximately 30 students. The British participants completed the survey online.

Results

The generalized eta square is reported as the effect size for the ANOVA designs because of its comparability across a variety of research designs (Olejnik & Algina, 2003). Further, Welch’s t-tests were computed, which are considered to be more reliable even if the assumption of variance homogeneity is met (Ruxton, 2006). Consistent with previous studies of this thesis, I also reported the PCR and AE as an estimator of the similarities between groups.

Ratings of creativity. I computed a mixed-model ANOVA with country as the between-participants factor and the three domains of professions as the within-participants factor. The main effect for country was significant, $F(1, 248) = 29.19$, $p < .001$, $\eta^2 = .07$, as was the effect for domain, $F(2, 496) = 337.89$, $p < .001$, $\eta^2 = .36$, and the interaction, $F(2, 496) = 14.75$, $p < .001$, $\eta^2 = .02$.

As predicted, Brazilians judged professions from the everyday life domain as more creative ($M = 4.88$, $SD = 1.35$) compared to British participants ($M = 3.94$, $SD = 1.01$), $t(240.04) = 6.31$, $p < .001$, $d = 0.77$, PCR = 70, AE = .16. Brazilians also tended to judge professions from the art domain as more creative ($M = 6.39$, $SD = 0.73$) compared to British participants ($M = 6.27$, $SD = 0.51$), although this difference did not reach statistical significance, $t(245.07) = 1.57$, $p = .12$, $d = 0.19$, PCR = 92, AE = .02. Finally, Brazilians judged professions from the science domain as more creative ($M = 5.08$, $SD = 1.34$) compared to British participants ($M = 4.39$, $SD = 1.07$), $t(233.93) = 4.46$, $p < .001$, $d = 0.55$, PCR = 78, AE = .12. Controlling for age and gender did not change the pattern of results.

Because the pattern of results was not consistent in each domain, Table 4.1 reports the results separately for each profession. For example, mathematicians were considered as relatively least creative in both countries ($M = 4.26$ and $M = 2.96$). No correction for multiple comparisons was used because I had specific hypotheses for 9 of the 12 professions and I did not want to lose power (Perneger, 1998).

Paired within-country t-tests revealed that both in Brazil and the UK creativity was considered to be more important for professions from the art domain compared to professions from the science domain ($ds = 1.21$ and 2.25 , $ps < .001$, PCRs = 55 and 26, AEs = .22 and .31) and everyday life domain ($ds = 1.39$ and 2.92 , $ps < .001$, PCRs = 49 and 14, AEs = .25 and .39). The within-country differences between the science domain and the everyday life domain were small ($ds = .14$ and $.44$, $ps = .04$ and $< .001$, PCRs = 94 and 83, AEs = .03 and .08).

Table 4.3

Comparing the subjective amount of creativity needed for each profession between Brazil and the UK.

	Profession	Brazil		UK		df	t	d	95% CI of d	PCR	AE
		M	SD	M	SD						
Everyday Life	Builder	5.69	1.32	4.49	1.34	205.40	6.85 ***	0.90	0.63, 1.17	65	.20
	Mechanic	4.27	1.70	3.82	1.38	235.15	2.24 *	0.28	0.02, 0.54	89	.08
	Physician	4.65	1.83	3.50	1.44	240.12	5.54 ***	0.68	0.42, 0.95	73	.19
	Craftsman	6.75	0.64	6.18	0.89	161.07	5.42 ***	0.76	0.49, 1.03	70	.10
	Landscaper	6.46	0.98	6.33	0.85	222.67	1.04	0.13	-0.13, 0.39	95	.02
Art	Painter	6.06	1.34	6.65	0.68	228.80	-4.53 ***	-0.53	-0.79, -0.26	79	.10
	Sculptor	6.63	0.84	6.60	0.86	200.84	0.26	0.03	-0.23, 0.30	99	.01
	Singer	5.77	1.62	5.08	1.45	224.44	3.44 ***	0.44	0.18, 0.70	83	.12
	Writer	6.68	0.90	6.75	0.54	247.53	-0.72	-0.08	-0.34, 0.17	97	.01
Science	Mathematician	4.26	1.75	2.96	1.44	231.83	6.33 ***	0.80	0.53, 1.07	69	.22
	Philosopher	5.01	1.86	5.70	1.19	244.96	-3.52 ***	-0.42	-0.68, -0.16	83	.12
	Scientist	5.92	1.57	4.57	1.46	218.47	6.91 ***	0.89	0.62, 1.16	66	.23

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Study 9 revealed a hierarchy of professions in terms of the amount of creativity perceived to be needed for each of them, revealing a strong art bias. Participants in both countries judged professions from the art domain as needing more creativity compared to professions from the other two domains. More importantly, Brazilians judged creativity as more relevant to professions from the everyday life domain (for which I considered problem solving to be relevant) and as less relevant to professions from the art domain, compared to British participants.

Within the British sample, I replicated the findings for the four professions also used by Glăveanu (2014): Writers were perceived as most creative, followed by painters, philosophers, and mathematicians, who were perceived as least creative.

Interestingly, within both the art and the science domains, some professions were perceived as needing more creativity by Brazilian participants, whereas other professions were seen as needing more creativity by British participants. For example, Brazilian participants perceived craftsmen as needing more creativity, whereas British participants perceived painters as needing more creativity. A possible explanation relates to the typicality of the disciplines for the category of art. For example, painter, the profession for which I found the strongest effect, may be considered the most typical art profession, whereas craftsman and singer are the least typical. In other words, there may be cultural differences in the perceived typicality of the professions. This is in line with findings from cognitive psychology, indicating that more typical members are learned and categorized faster (e.g., Medin & Smith, 1984).

From a similarity perspective, similarities between countries were again larger than differences. The smallest amount of similarity was found for builder, the largest for sculptor. This indicates that Brazilian and British participants had a broadly similar understanding of how creative various professions are. Within the typical mean-difference framework this finding would have gone unnoticed.

The within-country comparisons revealed an absolute difference for three out of the six comparisons, based on the PCR. This indicates that the distributions of the art and science as well as everyday life domains overlapped less than 50 percent. However, because the AE was in all cases below .50, it cannot be decided whether differences or similarities are larger for these within-group comparisons.

Unlike Study 8, Study 9 found larger similarities between Brazilian and British respondents. However, this might be due to the specific method used. Another method might reveal again larger differences between Brazilians and Britons. I explored this possibility in Study 10, using pictures depicting objects related to art, engineering, or mathematics.

Study 10: Creativity Needed for Creation of Various Objects

In Study 10, I tested whether presenting pictures depicting objects would result in larger differences between Brazilian and British respondents (like Study 8), or would result in larger similarities (like Study 9). Further, I was interested whether this method would still reveal the art bias in lay conceptions of creativity. The objects were related to art, engineering, or mathematics (e.g., impressionist painting, a steam engine, and mathematical formulae or proofs). Based on the findings of Study 8 and 9, I again expected to find that objects related to art would be perceived as more creative, followed by engineering and mathematical objects. I further expected this effect to be stronger in Brazil than in the UK.

Method

Power analysis. I again assumed an effect size of Cohen's $d = 0.50$, resulting in a target sample of 86 participants per country with a power of .90.

Participants. Participants were 81 from Brazil with a mean age of 24.50 (SD = 7.60, 57% female, 11% missing values) and 90 from the UK with a mean age of 18.83 (SD = 1.02, 91% female, 1% missing). Brazilian participants were not compensated for their participation, and British participants received course credit.

Procedure. Brazilian participants were recruited via Facebook. I targeted psychology students by posting a short advertisement for the study in psychological groups in and around João Pessoa, where data for Studies 8 and 9 were collected.

British participants were undergraduate psychology students from Cardiff University. All participants completed the survey online.

Material. I selected 26 pictures displaying various objects. Twenty-two were chosen to be related to art, engineering, or mathematics. The remaining 4 pictures were included as ‘filler’-pictures, because they were thought to depict low-creativity objects. The 22 pictures were categorized by a graduate student of art history. She categorized 10 pictures as art related and 12 as related to problem solving or engineering, on the grounds that the objects they depict fulfil a specific purpose and consequently solve a specific problem. In a next step, I moved three pictures from the engineering category to a separate mathematics category, namely Einstein’s formula $E = mc^2$ written on a chalkboard, a mathematical proof, and the chemical formula for vitamin B12. The remaining pictures depicting objects related to engineering were a clamp, a gramophone, the structural features of a house, a large and complex traffic junction, a light bulb, a plane, many water slides in a swimming pool, a very early steam engine, and a Roman aqueduct. Although engineering is often not perceived as science, it is clearly based on physics, mathematics, and chemistry. The art related objects were 6 paintings (Leonardo da Vinci’s Vitruvian man, a Chinese painting, an impressionist painting, a modern painting, a large scale painting on the street, and a graffiti by Banksy), 3 sculptures (Michelangelo’s David, a steel horse, and an African sculpture), and a large hedge maze. The low creativity objects were a buttered slice of toast, a wooden pile, a simple wooden bridge made of a few planks, and a campfire. All pictures can be found in Appendix A.

The instructions were “You are going to see different objects that were all created by humans. *You will be asked to rate the amount of creativity that was needed to come up with the idea for the object and the creation of the object.*” The item below

each picture used the same wording: “Amount of creativity needed to come up with the idea for and the creation of this object”. Responses were given on a slider ranging from 0 to 100. Reliabilities for all three scales (art, engineering/science, and mathematics) were $\geq .75$ in both countries (Table 4.2).

Results

To test whether the participants understood and followed the instructions, I first compared the low creativity pictures with the art related, engineering, and mathematical pictures. Both in Brazil and the UK, the four low creativity items were judged to be lower in creativity ($d_s = 0.97 - 1.84$, $p_s < .001$, PCRs = 63 – 36, AEs = .23 – .34, see Table 4.2).

Next, a mixed-model ANOVA was conducted with type of picture (art, engineering, and mathematics) as the within-participants factor and country (Brazil vs UK) as the between-participants factor. The main effect for country was significant, $F(1, 162) = 34.07$, $p < .001$, $\eta^2 = .12$, as was the effect for domain, $F(2, 324) = 13.99$, $p < .001$, $\eta^2 = .03$. The interaction did not reach significance, $F(2, 324) = 0.86$, $p = .43$, $\eta^2 = .002$.

The results of independent sample Welch’s t-tests can be found in Table 4.2. As expected, Brazilian participants rated objects related to engineering as more creative than British participants, but surprisingly also did so for the other two categories of picture.

Because the interaction was not significant, the four categories were compared using within-participants t-tests across both countries. All categories differed significantly from each other at $p < .001$, except art and mathematics ($p = .93$). Again, no corrections for multiple comparisons were used for the reasons stated above (doing so would not have changed the pattern of results).

Table 4.4

Comparison of objects across countries

	Brazil			UK			<i>df</i>	<i>t</i>	<i>d</i>	95% <i>CI</i> of <i>d</i>	PCR	AE
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α						
Art (10)	72.91	14.57	.84	61.39	12.49	.81	152.68	5.46***	0.86	0.53, 1.18	67	.12
Engineering (9)	81.53	12.77	.84	66.40	15.00	.85	163.96	7.02***	1.08	0.75, 1.41	59	.15
Mathematics (3)	73.17	23.37	.75	61.25	22.97	.83	156.37	3.28**	0.51	0.20, 0.83	80	.12
Low creativity (4)	49.67	25.02	.69	32.53	21.30	.68	146.26	4.61***	0.74	0.42, 1.07	71	.17

Note. Number of items/pictures are in brackets. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

In Study 10, I found that objects related to engineering were perceived as more creative compared to the other three categories. Furthermore, art and mathematical objects were perceived as equally creative. From a similarity perspective, all between- and within-country comparisons revealed clearly higher levels of similarity, replicating the Study 9 findings that Brazilians and British participants gave relatively similar responses.

Most important, the pattern of results is different from the one observed in Study 9, where art related professions were judged to be more creative. This difference between studies indicates that the type of stimuli used (names of professions vs. pictures) may determine the perceptions of creativity, which raises doubts about the generalizability of art bias. If I had compared only the low creativity objects with the art objects, I would have found clear evidence for the art bias in both countries. It is possible that other factors have influenced participants' ratings, such as the 'wow-factor' or novelty. For example, a large-scale painting on the street, displaying a three dimensional crevasse (see Appendix A), was rated as most creative of all objects, both in Brazil and the UK. However, if the streets in Brazil and the UK were full of such

large-scale paintings, participants would likely have rated the painting in my study as less creative.

This issue calls for more research using a within-study comparison of different types of stimuli. It is not a trivial issue whether inferences about a value like creativity depend on whether people imagine an abstract profession or concrete outputs of the profession. In cognition more generally, it is not assumed that processing of exemplars will map cleanly from one level or form of representation to another (e.g., from linguistic to pictorial). From a practical perspective, this difference may matter if people draw on their inferences about professions when choosing a career as opposed to drawing on their inferences about visual depictions of the outputs of these professions.

General Discussion

Across three studies I explored whether (1) there is a bias against science, and (2) there is a bias towards art in lay conception of creativity, and (3) the findings can be replicated in a non-Western country. Study 8 revealed a spontaneous association of art with creativity, but only in the British sample and not the Brazilian one. Science or scientists were barely spontaneously associated with creativity by participants in either country. In Study 9, both Brazilian and British participants considered professions in the art domain as needing more creativity compared to professions in the everyday life and science domains. However, this effect was stronger in the UK than in Brazil. In contrast, in Study 10, I found that in both countries objects related to engineering were rated as needing more creativity than were objects related to art. Further, one of the primary outcomes of mathematics, formulae and proofs, were rated as needing the same amount of creativity as art objects.

The results are interesting from a similarity perspective as well. In Study 8, I found that art was spontaneously associated more often with creativity in a British than

in a Brazilian sample, revealing an absolute difference. However, in none of the subsequent 16 between-group comparisons was I able to replicate this finding. Because this absolute difference found in Study 8 was based on a relatively small sample ($N = 67$) a replication would be desirable before drawing strong conclusions.

Taken together, these findings support the claim of Henrich et al. (2010) that findings need to be replicated outside of Western countries, in that results in all three studies differed significantly between Brazil and the UK within the classical difference framework (i.e., mean comparison). This, together with the finding that Brazilians judged all objects as requiring more creativity than British participants did, supports the claim made by Glăveanu (2010a, 2010b) that perceptions of creativity differ between countries. This finding that Brazilians rated in Study 9 and 10 everything on average as more creative can potentially be explained if the material used was more new to Brazilians than Britons. In particular, the objects used in Study 10 are mainly centred around Europe (e.g., Michelangelo, steam engine). Further, there is evidence that Brazilians assign higher arousal ratings to emotional photographs compared to US-Americans (Ribeiro, Pompéia, & Bueno, 2005), which raises the possibility that Brazilians may be more easily aroused and impressed than Britons and rated therefore the professions and objects as more creative.

Consequently, findings concerning lay conceptions of creativity should not be generalized from one country to another. This point is also supported in a recent study which found some differences between Chinese and US-American participants regarding which cues are indicators of creativity: breakthrough, surprise, and potential were indicators in both countries, but easy-to-use, feasible, and for-a-mass-market were only seen as cues in China (Loewenstein & Mueller, 2016).

The current findings also imply that the art bias is not universal and that it depends on the method (cf. Glăveanu, 2014). The art bias was stronger in the UK, stronger when the creativity of professions from different domains was rated, and was absent when pictures displaying objects from various domains were used.

This leads to an important implication. If policy makers, companies, and teachers want to improve the image of science (Ahlgren & Walberg, 1973; Kind et al., 2007; Mead & Métraux, 1957), they should display the outcomes of sciences in a concrete way. One possible way to do this would be to utilize the finding that creativity is usually perceived as positive (Cropley et al., 2010) and to emphasize that creativity is also an important element within science by displaying the outcome of science. This may be especially relevant for students with a lower socioeconomic status, given that they are likely to have, almost by definition, a more vague impression of science. This also points to an important limitation of my studies: The participants were mainly university students. Further studies are needed to test whether the findings can be replicated in a school student sample and whether they can be used to change attitudes towards sciences.

From a theoretical point of view, the present research raises the question of the definition of creativity, because creativity is differently conceived across countries, unlike scientific definitions of creativity. This is in line with previous research which has found differences between Chinese and US-American lay conceptions of creativity and therefore suggested a need to differentiate between ‘folk creativity’ and the scientific study of creativity (cf. Loewenstein & Mueller, 2016). Differentiating between a scientific and lay person understanding of creativity is also important because the lay conception of creativity was found to influence how much specific products are desired (Paletz & Peng, 2008).

In summary, results indicate that there are both differences and similarities in what is thought of as creative in two countries. In two studies, I found a bias against science – scientists were less strongly associated with creativity compared to art, and I also demonstrated in Study 10 how this effect can be reversed.

Chapter 5: General Discussion

Across ten studies, I found considerable similarities across countries and various other social categories such as age, education, or religious denominations, supporting the moderate universalism claim in cross-cultural research (Berry et al., 2011). This finding applied to both quantitative and qualitative data. Further, even when differences were found, they were not replicated in subsequent studies using different methods.

A second aim of this thesis was to explore – within the predominant mean difference framework – whether the country of origin of people has an influence on how human values are instantiated and some potential implications of this results. Findings indicate that the context partly influences on how people instantiate values, but there were far more similarities in value instantiation than differences.

Finally, I tested some implications of differences of value instantiations across Brazil, India, and the UK. Contrary to my expectations, specific differences in spontaneous value instantiations were not replicated with the use of more deliberative measures, and typicality did not moderate the value-behaviour instantiation link. Nevertheless, these studies have important implications, which have been discussed in the previous two chapters. In the following sections, I summarize and discuss the implications of all results in a broader context, before suggesting an alternative approach to understanding culture.

Discussion of Chapter 2

The aim of Chapter 2 was threefold: first, to introduce two new effect size measures for estimating similarities across groups; second, to test whether similarities across groups of various categories are larger than differences; and third, to test whether presenting similarity statistics leads to more accurate perceptions of effects in lay reading of reports.

Summary of Studies 1-3. In Study 1, I investigated the extent of similarities across six categories (countries, religious denominations, age, gender, income, and education) and 22 variables in a large dataset, containing data from 60 countries in all five inhabited continents. The average amount of similarity was above 90 percent, with countries being least similar (average similarity was 80 percent) in comparison to the other categories (e.g., gender). Study 2 replicated the findings of Study 1 with another large dataset, containing data from 29 European countries. Finally, Study 3 revealed that presenting research by superimposing two normal distributions leads to a more accurate estimate of similarities, compared to presenting two columns with confidence intervals. Further, Cohen's *d* was judged to be less clear and informative compared to the two proposed similarity effect sizes PCR and PCS.

Implications and future directions. Taken together, the results of Studies 1 and 2 indicate that, to put it provocatively, the findings from previous research have been oversold. Based on significant mean differences, people incorrectly see two or more groups as more different than they are (for a similar critique of correlational designs, see Gardner & Neufeld, 2013). This does not mean that mean differences, even small ones, are unimportant. Small effects can still be impressive (Prentice & Miller, 1992). For example, cultural values – aggregated value scores on a country-level – are, despite the fact that country explains less than 10 percent of the variance (Fischer & Schwartz, 2011), still very strong predictors of national indices such as the Human Developmental Index, Freedom of Press, or the Global Peace Index (Basabe & Valencia, 2007; Fischer & Hanke, 2009; Hanel et al., 2016; Schwartz, 2006). Nonetheless, scientists presenting such findings should balance their presentation of mean differences with appropriate information about similarity, to avoid leading consumers to have exaggerated perceptions of differences.

Instead of dismissing small effects, I prefer to emphasize the importance of transparency in statistical reporting. In recent years, many calls have been made to increase openness and transparency in scientific research (e.g., Morey, Chambers, et al., 2016; Simmons, Nelson, & Simonsohn, 2011). However, these calls have focused on preregistration, openness, and transparency relating to methodological and general statistical issues, such as reporting all variables and conditions, and making the raw data and statistical analysis scripts publicly available. There is still no standard transparent way in which statistical findings are reported, even within the classical difference framework. Common effect sizes such as Cohen's d or those related to the amount of explained variance (e.g., R^2 , η^2 , ICC[1]) are often undiscussed or difficult to interpret (cf. Sharpe, 2013). Reporting similarity statistics should increase transparency, because they are easily understood in terms of one of the most basic statistical units: percentages.

The finding that similarities across groups are usually far larger than differences has further implications for the interpretation of previous research, which may help us to understand the replication crisis better. To foreshadow, I assume that neither 'culture' nor most experimental manipulations or interventions have an equivalent impact on all participants. Instead, the influence is mostly limited to a subset of participants. Consequently, the predominant approach to reporting psychological findings as an effect that either does or does not exist is an oversimplification. Instead, to increase transparency of statistical reporting, the number of participants who differ between groups should be estimated. Just to give two examples: How many Germans have a higher trust in science compared to Brazilians? And what is the percentage of participants for whom an intervention or experimental manipulation had an effect? As illustrated in Chapter 2, none of the common statistical values (e.g., t and p , Bayes factor, Cohen's d) address these issues. Reporting similarity effect sizes such as the

ones suggested in Chapter 2 should help to put empirical findings into context and lead people to evaluate them more appropriately. If the similarity is 81 percent ($d = .48$), this indicates that the percentage of participants for whom a difference emerged is likely to be around 19 percent or smaller.¹⁰ Of course, it may also be useful to replace or supplement commonly used effect sizes with alternative effect size measures, such as the probability of superiority (Ruscio, 2008). In the current example, 81% similarity means that there is a 63% chance that a person drawn at random from the group with the larger mean will have a higher score a person randomly drawn from the group with the smaller mean.

No longer looking at the results of studies in a dichotomous way – an effect either does or does not exist – also fits the fact that effect sizes and p -values vary a lot, especially with smaller sample sizes (Halsey et al., 2015; Klein et al., 2014): Group affiliations such as being Brazilian or German may only affect a relatively small number of participants (e.g., those who are highly identified with their nationality). Similarly, being in an experimental vs. control group may affect only those who are highly attentive to the experimental instructions. If this small number of participants is not in the sample, the means will no longer differ significantly. Consequently, a failure to replicate a previous finding can be due not only to dubious research practices (e.g., p -hacking, selective reporting), but also to the fact that the researchers' sample of participants did not include those individuals (or contexts) for whom the effect occurs. Especially in small samples, adding or removing just a few participants can determine whether or not an effect is significant.

¹⁰ This is only an estimate, because it is also possible that all participants in one group score slightly higher than participants in another group. However, this interpretation is unlikely, as usually the maximum and minimum observed values (e.g., on a Likert scale) are very similar in two groups (see also the discussion of the many lab replication project below, Klein et al., 2014).

Depending on the research question, the focus of a paper could rely more on the estimated amount of similarity or on the estimated amount of participants for whom an effect worked. Take the “many labs” replication project as an example (Klein et al., 2014). Here, 13 classic and contemporary effects (e.g., anchoring or priming studies) were replicated within 36 samples. For all effects, the effect sizes varied greatly, within both US and non-US-samples (i.e., there was large sampling variance). This indicates that a given experimental manipulation (e.g., priming) did not have the same effect in all samples. This can be explained in terms of the effect being stronger for some participants than for others. In the samples with the largest effect sizes, there were more participants for whom priming had an effect.

There is a need for more studies exploring how scientific findings can be best communicated, both to scientists and to the general public. Study 3 supports this argument by providing preliminary evidence that the current way of reporting the results of scientific studies can lead – at least for some participants – to an overestimation of differences: Presenting research by superimposing two normal distributions leads to a more accurate estimate of similarities compared to the more common way of presenting two columns with confidence intervals. Also, results further indicate that presenting results using Cohen’s d is less clear and informative compared to PCR and PCS. This finding was independent of participants’ educational level and statistical expertise, which indicates that even statistical experts would benefit if results were presented using similarity effect sizes.

To reduce the likelihood of any negative consequences of portraying research findings in a more balanced and transparent way, additional studies could explore which effect sizes are most easily understood. For example, future studies could compare more commonly used effect sizes, including the amount of explained variance (e.g., r^2), the

probability of superiority, or even Bayes factors or p-values. This can be done using the types of items used in Study 3 or real world examples, including studies investigating which ways of presenting data lead to changes in attitudinal variables, such as attitudes towards immigrants. Furthermore, increased transparency might increase trust in science (cf. Rawlins, 2008). The changes required to report and discuss statistical results more transparently could be implemented within the ongoing changes of how to increase openness and transparency in data collection and analyses (e.g., Morey, Chambers, et al., 2016; Nosek & Bar-Anan, 2012; Wagenmakers, Wetzels, Borsboom, Maas, & Kievit, 2012).

Discussion of Chapter 3

The studies described in Chapter 3 had two main aims. The first was to explore whether people instantiate values differently within and between countries. The second aim was to explore whether differences in how people instantiate values predict different associations of values with behaviour intention across countries. In this subsection, I briefly summarize the methods and key findings of each study described in Chapter 3, before discussing the implications and future research directions. An in-depth discussion of each study can be found in Chapter 3.

Summary of Studies 4-7. Study 4 used a qualitative approach to explore whether values are differently instantiated across people and countries. Participants were mainly students from Brazil, India, and the UK. Although the results show some differences across countries, the within country differences were larger, replicating findings for values on an abstract level (Fischer & Schwartz, 2011). Results further supported the hypothesis that instantiations are partly shaped by contextual factors.

In Study 5, Brazilian and British participants were asked to choose the value that best promoted a given instantiation. In general, participants from both countries

selected the value from which the instantiation was originally derived. For only 5 out of 138 items, Brazilian and British participants identified different values as promoting a specific instantiation, indicating a high degree of shared understanding about the associations between various values and behaviours.

The main assumption underlying Study 6 was that people feel more positive emotion when value-promoting instantiations are enacted, and more negative emotion when value-promoting instantiations are not enacted. I also assumed that typical instantiations are more important, because things that are more important are, I assumed, more likely to be mentioned in response to questions about typicality. However, these assumptions were only partly supported by the data from Brazil and the UK. Only 60 percent of the significant cases were in the predicted directions, in the sense that participants reported a larger difference in self-reported emotions between the promoted and negated version of an instantiation when the instantiation was typical. In the remaining 40 percent the pattern was in the opposite direction. The emotions attached to the instantiations in both countries were more similar than different and only varied to a limited extent as a function of typicality.

Study 7 tested whether typicality influences the relations between values and behavioural intentions across three countries: Brazil, India, and the UK. Results indicated that the patterns of correlations across countries were more similar than different. However, within the framework of the TPB, values were sometimes independent predictors of behavioural intentions. Typicality did not consistently influence value-behaviour relations within the TPB.

Implications and future directions. Chapter 3 showed strong links between the value instantiations identified in Study 4 and the values. That is, the instantiations were successfully matched into the values, had partly significant value-congruent emotional

impacts, and significant links to behavioural intentions. At the same time, however, these relations were not consistently moderated by the observed typicality of the exemplars recorded in Study 4. That is, people were able to connect even the relatively atypical actions to the values.

Chapter 3 discussed how this pattern may arise under conditions that allow people to thoughtfully reflect on the value instantiations. Aside from this speculation, it is possible to draw other implications from these findings. For instance, Study 4 demonstrated that people may spontaneously associate different behaviours with each abstract value. This supports Wittgenstein's (1922) claim that many (philosophical) problems can be explained through linguistic misunderstandings. Take the value of protecting the environment, for example. If a Brazilian, an Indian, and a British person were to talk about the importance of protecting the environment, they might easily talk past each other, because they could have partially different understandings of it. For example, the Briton might refer to protecting the environment as entailing the reduction of carbon emissions, whereas the Brazilian and Indian individuals might refer to putting rubbish into a bin. (Of course, this difference is important even if other aforementioned factors, such as conversational norms, make the spontaneous elicitation of instantiations an imperfect way of mapping concepts.)

One conclusion from Study 4 is therefore that debate, discussion, and behavioural change interventions may be more constructive if they link the abstract values being considered with their more concrete exemplars. Linking actions to abstract values carries a prescriptive, motivational impetus, which can predict behaviour independently of attitudes, norms, and other constructs often used to predict behaviour (Maio & Olson, 2000; Schwartz & Tessler, 1972). By making values' connections to an action explicit, people can reason through their relevant attitudes and intentions to

achieve better fit with their values. This approach would support intervention programs, which must deal with the fact that several behaviours are closely linked to values. For example, protecting the environment is usually considered to be an important value (Schwartz & Bardi, 2001), but can be linked to a variety of behaviours. Nonetheless, some behaviours are more damaging to the environment than others. For example, it may be more beneficial to alert participants to the fact that avoiding short distance flights or installing good heat insulation are effective ways of protecting the environment, instead of simply reminding people that protecting the environment is important. Most people already agree that this value is important, and they might imagine less impactful behaviours (e.g., recycling) as showing their support for the value. Highlighting particular important behaviours in connection with the value may help to change the motivational impetus attached to the important actions and their perceived typicality with respect to the value.

The findings of Study 4 further demonstrate that value instantiations are partly influenced by the context in which participants live (e.g., country). This finding can potentially contribute to our understanding of the genesis of human values (cf. Joas, 2000). Although values are very similar across countries (see Studies 1 & 2), the relatively small differences are, as stated above, still surprisingly strongly related on a national level to national indices, such as economic development (Schwartz, 2006). This indicates that personal experiences can shape the self-rated importance of values, albeit to a small degree. Figure 5.1 presents a model of how personal experiences come to shape human values and importance ratings. The basic premise of this model is that children do not 'possess' values at an abstract level (cf. Döring, Blauensteiner, Aryus, Drögekamp, & Bilsky, 2010); instead, they have personal experiences which are later combined into abstract values. For example, they may celebrate religious festivals

annually or bake the same cake every time they visit their grandparents. At some point, children learn that these experiences are related to respecting traditions. If they are, perhaps when they are university students, and asked to think about the importance of their values, they may evaluate how much they like the experiences they associate with each of the values. If the experiences associated with a specific value are judged to be positive and relevant, participants are more likely to rate this value as high in importance. Which behaviours and experiences are associated with values differs across participants, as the results of Study 4 indicate.

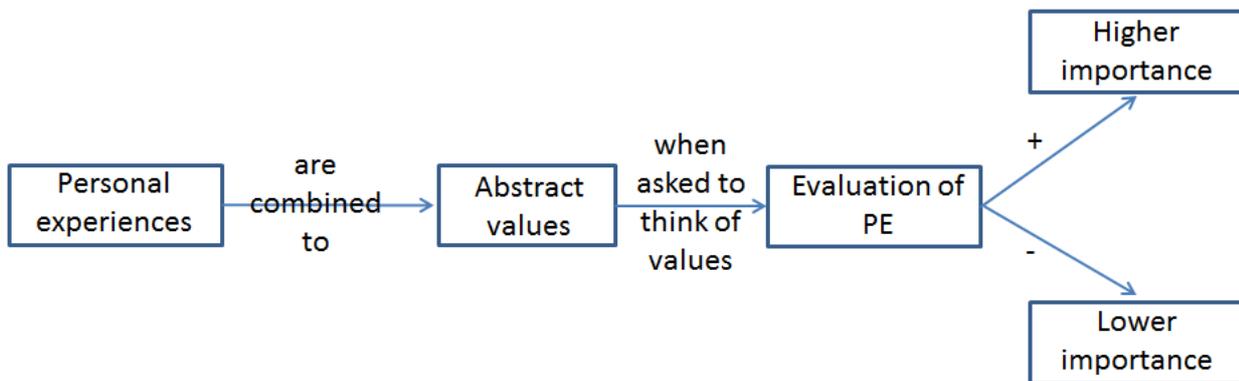


Figure 5.1. A model of the genesis of abstract values and importance ratings. PE stands for personal experiences.

This model has two main implications. First, when participants rate how important a value is to them, they are not actually rating the value itself (e.g., respect for tradition or equality), but rather the personal experiences that they associate with the value. Second, personal experiences and how they are evaluated differ across countries and this could account for differences in value importance ratings. For example, in societies that value tradition, people are more likely, by definition, to have many traditions that are personally experienced. This influence of the society on the person may in turn contribute to the higher importance attached to tradition, as the experiences shape the common endorsement of the value (Hanel, Easterbrook, et al., 2016; Schwartz,

2006). Presumably, many of the instantiations mentioned by the participants in Study 4 are personal experiences, which, although the design of Study 4 suggests otherwise, may be encountered before the values developed on an abstract level. In theory, this reciprocal relationship between the person and his or her social environment has a powerful effect on the commonalities in mental representations of values.

This process leads to an intriguing question: Do different instantiations cause differences in importance ratings of values? For example, are people who value security more likely to think about the benefits (e.g., lower crime rate) arising from instantiations that promote this value, whereas those who do not value security highly think more about the potential risks (e.g., loss of freedom) arising from instantiations that promote this value when completing a value survey? This reasoning is in line with the finding of Asch (1940). He found that participants who ranked politicians as more likeable had more popular politicians in mind compared to those who ranked politicians as less likeable. This further implies that priming some value instantiations may lead to greater endorsement of the values than other (equally applicable) value instantiations. To my knowledge, this effect of value instantiations remains to be explored (but see Seligman & Katz, 1996, for a related design).

Discussion of Chapter 4

Chapter 4 further explored two findings from Study 4: (1) neither Brazilian nor British participants associated science with creativity, and (2) British participants more often spontaneously associated art with creativity than did Brazilian participants.

Summary of Studies 8 to 10

Study 8 found that art was more spontaneously associated with creativity among British than Brazilian participants. Science and scientists were not spontaneously associated with creativity, both in Brazil and in the UK. In Study 9, I found that artistic

professions were perceived to be more creative compared to professions from everyday life and science domains. This effect was stronger in the British than in the Brazilian sample. However, when actual objects were displayed, this effect reversed in both countries (Study 10). Objects related to engineering – but not mathematics – were perceived as more creative compared to art-related objects. This is an interesting case where novel, somewhat atypical exemplars of a value actually lead to stronger inferences about the value, and it invites further exploration in future research.

Implications and future directions. Notwithstanding the theoretical questions raised in Chapter 4, there are interesting applied implications. Chapter 4 considered how the positive image of creativity (Cropley et al., 2010) could be used to improve the perception of science. If concrete outcomes of scientific research are displayed (e.g., steam engine) and the amount of creativity needed to come up with the idea for the product is emphasized, spill-over effects from the positive image of creativity to science could be created.

This assumption is based on two underlying mechanisms. First, in creativity research a fixed mindset is distinguished from the growth mindset – these are differently related to problem solving. For example, a fixed mindset was found to be negatively related to problem solving (Karwowski, 2014). Second, this distinction can be used to reduce the influence of stereotype threat: Seeing intelligence as malleable rather than fixed resulted in a lower influence of the stereotype threat and higher enjoyment of the academic process (Aronson, Fried, & Good, 2002). As noted in the introduction to Chapter 4, equating creativity with artistic talent may result in the ‘golem effect’ (Babad et al., 1982), a form of self-fulfilling prophecy whereby low expectations result in low achievement. This might arise because, for example, parents may think of their children as creative when they are artistic. If a child cannot draw, parents may not regard the

child as creative (Runco, 2007). Hence, this process is very similar to the one described in the stereotype threat literature (Steele & Aronson, 1995). Thus, equating creativity with skills other than artistic talent might result in seeing creativity as more malleable and, consequently, reduce the golem effect (Aronson et al., 2002). My findings suggest this may be particularly important in the UK and less so in Brazil, where the link between creativity and art is weaker.

Rethinking the Concept of Culture

Culture is the most often used construct in cross-cultural research. It has been defined in various ways, for example by Hofstede (2001) as the “the collective programming of the mind that distinguishes the members of one group or category of people from another” (p. 9). Culture further determines “the uniqueness of a human group in the same way personality determines the uniqueness of an individual” (p. 10). This definition of Hofstede has been challenged, because the assumption that there exist both “substantial within-group agreement and between-group differences” (Schwartz, 2014b, p. 6) has been empirically rebutted. For both personality traits and values, within-country variability has been found to be 9 to 15 times larger than between-country variability (Allik, 2005; Berry et al., 2011; Fischer & Schwartz, 2011). Based on these and other similar findings (see Chapter 1), it has been argued that larger differences can be found between groups with a different socioeconomic background (Greenfield, 2014) or across variables other than values (Morris, 2014).

However, both Greenfield (2014) and Morris (2014), as well as most other researchers who claimed to have found large differences across countries (cf. Chapter 1), based their conclusions on comparisons between means and the rules of thumb proposed by Cohen (1992) concerning when an effect size should be called small, medium, or large. In Chapter 2, I demonstrated that equating mean differences with

group differences is mostly unjustified because even “highly significant” differences between means usually involve large similarities between the groups in question. In fact, the average similarity found in Studies 1 and 2 across various categories and variables was above 90 percent. Also, the within-country variability in how values are instantiated is substantially larger than the between-country variability (Chapter 3) and such differences were not replicated when another method was used (Studies 9 and 10). Nevertheless, in Studies 1 and 2 some differences between countries were found for variables such as moral attitudes towards personal-sexual issues. Further, as stated in the Discussion of Chapter 2, studying other variables or participant groups might have resulted in smaller similarities, and perhaps even stronger evidence of differences.

Based on these findings and reflections, I propose a more flexible view of culture: Individuals or groups of individuals belong to different cultures if they are more different than similar on a specific variable, following the taxonomy proposed in Chapter 2. If all or most members of two groups differ from each other on a specific variable, they belong to different cultures. For example, in Study 1, I found that Pakistanis, on the one hand, and Dutch and Swedish participants, on the other, displayed medium-sized differences in their moral attitudes towards personal-sexual issues such as abortion or homosexuality. However, for many other variables (cf. Table A1), the similarities between these groups were again larger than the differences. This means that the majority of Pakistani and Dutch/Swedish participants belong to different cultures, but only with regard of moral attitudes towards personal-sexual issues. For many other variables, they are culturally the same.

In a similar manner, the UK and most European countries belong to both similar and different cultures. They belong to different cultures with regard to the side of the road on which people drive, currency, language, and the size of university tuition fees.

However, with regard to many other societal, political, and psychological variables, they belong to the same culture (see also www.oecd.org). To phrase it more broadly: If two groups of people differ along variable X, they belong to two cultures on X. There is little empirical support for the default approach in cross-cultural research, which is to ascribe people living in one country a lot of attributes simply because this country differs from other countries in terms of mean scores on an abstract dimension. In Chapter 1, I cited several studies in which researchers failed to find differences between so-called individualistic and collectivistic countries, despite the fact that differences were or could have been expected based on differences in the individualism-collectivism dimension (e.g., Berry et al., 2011; A. P. Fiske, 2002; Georgas et al., 2006; Lee & Johnson-Laird, 2006; Nisbett, 2004). In other words, people should be distinguished directly on psychological variables, rather than using demographic ones (e.g., country of origin) to infer psychological differences.

This view of culture as variable dependent can stimulate more empirically driven research. For example, the large similarities found between Eastern and Western countries on individualism (e.g., self-direction) and collectivism (e.g., tradition values) also indicate that approximately half of the participants in a Western country (e.g., USA) score higher on individualism than half of the participants of an Eastern country (e.g., Japan) – *and vice versa*. A large cluster-analysis could be used to explore what distinguishes those scoring high on individualism from those scoring low on it (e.g., type of profession). This could also be done across many categories and variables to find groups of people who differ on one or more variables.

Limitations

Before drawing some general conclusions, I want to acknowledge two general limitations. Firstly, when I claim that similarities are larger than differences, I actually

mean “similarities between the groups of people investigated here (e.g., Brazilians and Indians or low vs. higher educated people from 60 countries) and the around 60 variables used across the 10 studies.” That is, knowing the country of origin or the education level of an individual does not say much about his or her attitudes or about how he or she instantiates values. It does not mean that people are similar to each other or that countries are similar on *all* variables.

This aside, it could be argued that those findings do not matter. A person might therefore ask why should it matter if various groups of people hold the same human values or have a similar degree of trust in science. Instead, it could be argued that it matters more to distinguish between individuals who differ on other variables such as advocating the capital punishment or flying short-distances instead of relying on public transportation. Furthermore, a focus on similarities is not possible if people are separated into two distinct, non-overlapping groups defined by the variable of interest. Nevertheless, people and scientists use group categories to makes sense of patterns in variables. Thus, for most variables used in psychology and the social and medical sciences, a focus on similarities is meaningful and increases transparency in the reporting of statistical analyses regarding groups.

Another limitation is that Studies 4 to 10 relied on student samples. The extent to which the quantitative Studies 4 to 9 can be generalised to the public is unclear. Therefore, I conducted another study addressing whether the results from student samples can be generalised to the general public across a range of variables. The resulting paper is currently under revision (Hanel & Vione, 2016) and can be found in Appendix B. There, I use the mean-difference framework to test whether differences between student samples and the general public exist and, if so, whether the differences are systematic. Across 59 countries and 12 personality (Big-5) and attitudinal variables,

I found that differences between students and general public were quite substantial, with the differences contradicting previous findings. The differences between the students and general public could not, contrary to my expectations, be explained by two frequently used cultural variables, embeddedness and intellectual autonomy (Schwartz, 2006).

In summary, the results indicate that generalising from students to the general public is problematic when personality and attitudinal variables are used, because students differ from the general public in ways that are not systematic. Consequently, the findings of Studies 4 to 10 need to be replicated with more general samples. That is, when students of countries A and B differ statistically significantly from each other, this does not mean that the general public of countries A and B also differ significantly from each other (see the example in discussion section of Appendix B).

Finally, another limitation is that the similarity statistics described here are only applicable to group comparisons. Continuous variables (e.g., age) had to be grouped in a reasoned but somewhat arbitrary manner in order to facilitate the comparisons. Future studies are also needed to develop similarity statistics for advanced correlational designs (e.g., multiple regression). One possibility could be to reframe the amount of explained variance in terms of the degree of similarity between variables.

Final Conclusions

Throughout history, people have thought of foreigners as being different. For example, the ancient Greeks tended to consider all foreign people to be barbarians, and inferior to themselves, and the Chinese of the Han dynasty regarded foreigners as illiterate nomads (Harrison, 2002). Even today people from other countries are perceived as different and as inferior but threatening. These prejudicial views may ironically be supported in part by the scientific obsession with difference (Fanelli, 2010;

Open Science Collaboration, 2015), even in cross-cultural research (Brouwers et al., 2004). Researchers usually compare group means and, if they are different, they tend to conclude that the groups themselves are also different. However, the differences are often tiny in magnitude in comparison to the similarities, as I demonstrated mainly in Chapter 2 but also in other chapters. For a more balanced portrayal of research findings, similarities between groups should be reported and discussed alongside the differences.

Emphasizing similarities when communicating with the general public would arguably make it harder to discriminate against others. This strategy is already commonly used by newspapers, the police, and politicians who seek to dismiss claims that foreigners or refugees engage in more criminal activity than the indigenous population (Bell, Machin, & Fasani, 2010; Townsend, 2013). Extending this practice to values, attitudes, and other psychological variables is likely to benefit tolerance and social integration and can be achieved quite easily.

Appendix A – Material and Tables

Table of Contents

- **Materials for Chapters 2**
- **Tables of Detailed Results – Chapter 2**
- **Tables of Detailed Results – Chapter 3**
- **Pictures used in Study 10**

Materials for Chapter 2

Wordings of the items of the different factors as reported in the official SPSS datasets of the World Values Survey (Study 1) and European Social Survey (Study 2). The exact wordings and positions in the questionnaire can be found on the webpages of the two surveys (<http://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp> and <http://www.europeansocialsurvey.org/data/download.html?r=6>)

Measures in Study 1

Items used in WVS-factors

Trust in people you know: (1) How much you trust: Your family; (2) How much you trust: Your neighbourhood; (3) How much you trust: People you know personally

Trust in strangers: (1) How much you trust: People you meet for the first time; (2) How much you trust: People of another religion; (3) How much you trust: People of another nationality.

Understanding of democracy: Democracy: Governments tax the rich and subsidize the poor; (2) Democracy: People choose their leaders in free elections; (3) Democracy: People receive state aid for unemployment; (4) Democracy: Civil rights protect people's liberty from state oppression; (5) Democracy: The state makes people's incomes equal; (6) Democracy: Women have the same rights as men.

Confidence in political institutions: (1) [How much] Confidence [do you have in]: The police; (2) Confidence: The courts; (3) Confidence: The government (in your nation's

capital); (4) Confidence: Political Parties; (5) Confidence: Parliament; (6) Confidence: The civil service.

Perceived respect of the own society towards elderly: (1) People over 70: are seen as friendly [by own society]; (2) People over 70: are seen as competent [by own society]; (3) People over 70: viewed with respect [by own society].

Ageism: (1) Older people get more than their fair share from the government; (2) Older people are a burden on society; (3) Companies that employ young people perform better than those that employ people of different ages; (4) Old people have too much political influence.

Trust in Science: (1) Science and technology are making our lives healthier, easier, and more comfortable; (2) Because of science and technology, there will be more opportunities for the next generation; (3) The world is better off, or worse off, because of science and technology.

Science skepticism: (1) We depend too much on science and not enough on faith; (2) One of the bad effects of science is that it breaks down people's ideas of right and wrong; (3) It is not important for me to know about science in my daily life.

Attitudes towards personal-sexual issues: (1) [Do you think it is] Justifiable: Homosexuality; (2) Justifiable: Prostitution; (3) Justifiable: Abortion; (4) Justifiable: Divorce; (5) Justifiable: Sex before marriage; (6) Justifiable: Suicide; (7) Justifiable: Euthanasia.

Attitudes towards dishonest-illegal issues: (1) Justifiable: Claiming government benefits to which you are not entitled; (2) Justifiable: Avoiding a fare on public transport; (3) Justifiable: Stealing property; (4) Justifiable: Cheating on taxes if you have a chance; (5) Justifiable: Someone accepting a bribe in the course of their duties.

Attitudes towards (domestic) violence: (1) Justifiable: For a man to beat his wife; (2) Justifiable: Parents beating children; (3) Justifiable: Violence against other people.

Political attitudes. Self-positioning in political scale from 1 (left) to 10 (right).

Measures in Study 2

To facilitate the computation of our factors, I report below the SPSS labels as provided in the data file of the ESS.

Political activities. (1) Contacted politician or government official last 12 months; (2) Worked in political party or action group last 12 months; (3) Worked in another organization or association last 12 months; (4) Worn or displayed campaign badge/sticker last 12 months; (5) Signed petition last 12 months; (6) Taken part in lawful public demonstration last 12 months.

Attitudes towards immigrants. (1) Allow many/few immigrants of same race/ethnic group as majority; (2) Allow many/few immigrants of different race/ethnic group from majority; (3) Allow many/few immigrants from poorer countries outside Europe; (4) Immigration bad or good for country's economy; (5) Country's cultural life undermined or enriched by immigrants; (6) Immigrants make country worse or better place to live.

Feeling depressed. (1) Felt depressed, how often past week; (2) Felt everything did as effort, how often past week; (3) Sleep was restless, how often past week; (4) Felt lonely, how often past week; (5) Felt sad, how often past week; (6) Could not get going, how often past week; (7) Felt anxious, how often past week.

Subjective happiness. (1) Were happy, how often past week; (2) Enjoyed life, how often past week; (3) Had lot of energy, how often past week; (4) Felt calm and peaceful, how often past week.

Feeling optimistic. (1) Always optimistic about my future; (2) In general feel very positive about myself; (3) Free to decide how to live my life; (4) Feel accomplishment from

what I do; (5) There are a lot of things I am good at; (6) Feel what I do in life is valuable and worthwhile.

Pessimistic worldview. (1) Little chance to show how capable I am; (2) When things go wrong in my life it takes a long time to get back to normal; (3) Hard to be hopeful about the future of the world; (4) For most people in country life is getting worse.

Trust in other people (bipolar scale). (1) Most people can be trusted or you can't be too careful; (2) Most people try to take advantage of you or try to be fair; (3) Most of the time people helpful or mostly looking out for themselves.

Trust in political institutions. (1) Trust in the country's parliament; (2) Trust in the legal system; (3) Trust in the police; (4) Trust in politicians; (5) Trust in political parties; (6) Trust in the European Parliament; (7) Trust in the United Nations.

Relationships with neighbours. (1) Feel people in local area help one another; (2) Feel people treat you with respect; (3) Feel close to the people in local area.

Relationships with other people. (1) Feel appreciated by people you are close to; (2) Receive help and support from people you are close to; (3) Provide help and support to people you are close to.

Trust in democratic rights. (1) Citizens have the final say on political issues by voting directly in referendums; (2) The courts treat everyone the same; (3) The courts are able to stop the government acting beyond its authority; (4) Governing parties are punished in elections when they have done a bad job; (5) The government protects all citizens against poverty; (6) The government explains its decisions to voters; (7) The government takes measures to reduce differences in income levels.

Trust in democratic processes. (1) National elections are free and fair; (2) Voters discuss politics with people they know before deciding how to vote; (3) Different political parties offer clear alternatives to one another; (4) Opposition parties are free to criticise the

government; (5) The media are free to criticise the government; (6) The media provide citizens with reliable information to judge the government.

Political attitudes. Placement on a political left right scale from 0 (left) to 10 (right).

Religiosity. (1) Belonging to a particular religion or denomination; (2) How religious are you? (3) How often do you attend religious services apart from special occasions? (4) How often do you pray apart from religious services?

Tables of Detailed Results, Chapter 2

The following tables provide detailed results for each category, variable, and statistic. Tables A1 to A6 provide results for Study 1, A7 to A12 results for Study 2.

Tables Study 1

Table A1

Comparisons of the 10 value types and 12 other variables between countries

	Cohen's d		PCR			PCS				AE		
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	\geq 90	$\geq .95$	Min	Med AE	Max AE
Security	.37	1.76	85	36	19	38	80	17	3	31	.20	.40
Tradition (25)	.41	2.65	84	31	16	19	79	12	2	15	.20	.60
Conformity (4)	.32	2.03	87	40	20	31	82	15	1	26	.20	.60
Benevolence (2)	.35	2.42	86	35	18	23	80	16	2	19	.20	.60
Universalism	.32	1.87	87	40	21	35	82	18	2	28	.20	.40
Self-direction (1)	.29	1.74	88	43	23	38	82	14	1	37	.20	.60
Stimulation (8)	.32	2.05	87	39	20	31	80	10	1	27	.20	.60
Hedonism (32)	.45	1.98	82	29	15	32	78	10	1	36	.20	.60
Achievement (33)	.41	2.63	84	31	15	19	78	12	1	20	.20	.80
Power (46)	.50	2.40	80	26	13	23	76	7	.5	24	.20	.60
Trust in known people	.34	1.83	86	37	19	36	82	23	6	40	0	.33
Trust in strangers (2)	.41	2.22	84	34	17	27	80	13	1	28	.11	.56
Understanding of democracy	.39	1.98	84	35	18	32	80	16	3	25	.09	.39
Confidence in political institutions (46)	.51	3.09	80	26	12	12	76	10	1	16	.11	.64
Perceived respect for elderly	.31	2.19	88	41	23	27	83	23	4	31	.08	.50
Ageism	.47	1.85	82	27	15	36	78	13	2	31	.08	.33
Trust in science	.31	1.60	88	40	23	42	83	22	3	39	.07	.37
Skepticism towards science	.36	1.81	86	37	19	36	82	18	2	35	.07	.37
Morality: attitudes towards personal- sexual issues (75)	.73	3.79	71	19	9	6	67	14	4	12	.17	.67

Morality: attitudes towards dishonest-illegal issues	.36	1.87	86	36	18	35	87	38	16	31	.07	.33
Morality: attitudes towards (domestic) violence	.44	3.42	83	32	17	9	82	31	14	11	.07	.41
Left-right attitude	.25	1.43	90	50	30	47	80	9	.07	43	.11	.33
Average	.39	2.21	84	35	18	29	80	16	3	29	.14	.50

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent. Numbers in brackets indicate the number of countries that differ significantly (absolute difference).

Table A2

Comparisons of the 10 value types and 12 other variables between religious denominations across 56 countries

	Cohen's d		PCR			PCS				AE		
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	$\geq .90$	$\geq .95$	Min	Med AE	Max AE
Security	.22	.57	91	57	29	78	87	43	14	70	0	0
Tradition	.30	.68	88	46	18	73	86	32	0	68	0	.20
Conformity	.25	.73	90	50	18	72	87	46	11	67	0	.20
Benevolence	.23	.76	91	50	18	70	87	43	7	67	0	.20
Universalism	.19	.52	92	71	39	80	90	54	11	75	0	.20
Self-direction	.15	.49	94	71	46	80	90	50	14	78	0	.20
Stimulation	.25	.68	90	50	21	73	88	36	4	72	.20	.40
Hedonism	.30	.81	88	43	21	69	86	39	7	66	0	.40
Achievement	.24	.78	90	50	21	70	88	43	7	67	.20	.20
Power	.32	.74	87	39	21	71	86	25	0	71	.20	.40
Trust in known people	.19	.61	92	57	25	76	89	43	14	72	0	.11
Trust in strangers	.26	.74	90	50	21	71	88	43	0	72	.11	.22
Understanding of democracy	.25	.88	90	50	29	66	90	46	7	66	.07	.20
Confidence in political institutions	.31	.77	88	43	29	70	86	25	4	68	.08	.17
Perceived respect for elderly	.14	.32	94	86	43	87	93	68	29	84	.08	.08
Ageism	.37	1.02	85	32	21	61	85	25	11	60	.08	.17

Trust in science	.29	1.04	89	39	21	60	87	32	7	54	.08	.26
Skepticism towards science	.11	.30	96	93	54	88	92	64	21	82	.04	.07
Morality: attitudes towards personal-sexual issues	.38	1.37	85	32	18	49	82	21	7	47	.11	.29
Morality: attitudes towards dishonest-illegal issues	.14	.92	94	71	43	64	94	75	43	61	.04	.24
Morality: attitudes towards (domestic) violence	.29	1.17	89	43	18	56	87	39	14	63	.07	.22
Left-right attitude	.16	.51	94	68	36	80	86	32	0	75	0	.22
Average	.24	.75	90	54	28	71	88	42	10	68	.06	.21

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A3

Comparisons of the 10 value types and 12 other variables between different income classes

	Cohen's d		PCR			PCS				AE		
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	≥ 90	$\geq .95$	Min	Med AE	Max AE
Security	.03	.11	99	100	100	96	96	93	60	88	0	0
Tradition	.05	.18	98	100	91	93	95	69	56	85	0	0
Conformity	.04	.12	99	100	100	95	97	80	62	86	0	0
Benevolence	.08	.27	97	98	73	89	95	82	49	83	0	0
Universalism	.05	.17	98	100	76	93	96	82	60	87	0	0
Self-direction	.15	.37	94	69	38	85	91	56	18	83	.20	.20
Stimulation	.18	.41	93	67	38	84	91	53	18	82	.20	.20
Hedonism	.15	.36	94	73	40	86	91	69	18	84	0	0
Achievement	.14	.35	94	71	38	86	91	58	20	83	0	.20
Power	.20	.50	92	58	27	80	89	47	13	77	.20	.40
Trust in known people	.08	.25	97	100	69	90	94	93	40	89	0	0
Trust in strangers	.13	.38	95	87	49	85	93	80	27	82	0	.11

Understanding of democracy	.11	.27	96	98	60	89	92	78	27	83	.02	.06
Confidence in political institutions	.19	.47	93	64	33	81	92	62	22	81	.06	.14
Perceived respect for elderly	.08	.22	97	100	78	91	94	73	40	85	0	.08
Ageism	.09	.29	97	87	58	88	95	84	56	86	0	0
Trust in science	.19	.46	92	67	36	82	91	60	22	79	.04	.11
Skepticism towards science	.06	.15	97	100	84	94	92	69	36	80	.04	.04
Morality: attitudes towards personal-sexual issues	.06	.27	98	98	78	89	94	98	49	88	.02	.06
Morality: attitudes towards dishonest-illegal issues	.09	.33	96	91	64	87	96	100	64	90	.02	.04
Morality: attitudes towards (domestic) violence	.09	.18	97	100	69	93	95	100	51	90	.04	.08
Left-right attitude	.17	.55	93	67	33	78	84	33	13	71	.11	.22
Average	.11	.30	96	86	61	88	93	73	37	84	.04	.09

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A4

Comparisons of the 10 value types and 12 other variables between educational groups

	Cohen's d		PCR				PCS				AE	
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	≥ 90	$\geq .95$	Min	Med AE	Max AE
Security	.06	.21	98	100	83	92	96	86	58	87	0	0
Tradition	.15	.39	94	81	42	84	93	67	31	80	0	0
Conformity	.06	.17	98	100	94	93	96	92	64	88	0	0
Benevolence	.07	.21	97	100	86	92	96	97	67	88	0	0
Universalism	.05	.14	98	100	94	94	96	97	56	89	0	0
Self-direction	.13	.40	95	92	50	84	94	83	31	85	.10	.20
Stimulation	.13	.28	95	92	47	89	92	75	31	86	0	.20

Hedonism	.07	.29	97	97	69	88	95	94	42	86	0	0
Achievement	.04	.11	98	100	100	96	96	100	78	92	0	0
Power	.06	.16	97	100	86	94	94	92	42	88	0	0
Trust in known people	.07	.24	97	100	67	90	95	78	44	86	0	0
Trust in strangers	.15	.42	94	81	42	83	93	75	25	82	0	.11
Understanding of democracy	.07	.21	97	100	81	92	95	94	50	88	.02	.04
Confidence in political institutions	.04	.12	98	100	100	95	96	97	58	89	.06	.06
Perceived respect for elderly	.04	.15	98	100	97	94	96	100	64	90	0	.08
Ageism	.13	.48	95	83	47	81	94	81	39	82	0	.11
Trust in science	.14	.39	95	89	47	85	95	89	47	86	.04	.07
Skepticism towards science	.12	.36	95	86	56	86	95	83	56	85	.04	.07
Morality: attitudes towards personal- sexual issues	.23	.67	91	52	25	74	90	50	17	68	.06	.19
Morality: attitudes towards dishonest- illegal issues	.08	.21	97	100	86	92	97	100	89	92	.02	.03
Morality: attitudes towards (domestic) violence	.12	.46	95	83	61	82	95	78	50	79	.04	.11
Left-right attitude	.05	.18	98	100	89	93	95	94	44	90	0	.11
Average	.09	.28	96	93	70	89	95	86	49	86	.02	.06

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A5

Comparisons of the 10 value types and 12 other variables between gender

	Cohen's d		PCR		PCS			AE		
	Med d	Max. d	Med >= .90	Med >= .95	Min	Med >= 90	Max >= .95	Min	Med AE	Max AE
Security	.08		97			96			0	
Tradition	.06		98			97			0	

Conformity	.04	98	98	0
Benevolence	.01	100	98	0
Universalism	.04	98	98	0
Self-direction	.11	95	95	.20
Stimulation	.25	90	89	.20
Hedonism	.08	97	97	0
Achievement	.14	95	95	0
Power	.14	94	94	0
Trust in known people	.04	98	99	0
Trust in strangers	.04	98	98	0
Understanding of democracy	.07	97	97	.02
Confidence in political institutions	.03	99	99	.02
Perceived respect for elderly	.01	100	99	0
Ageism	.10	96	95	0
Trust in science	.05	98	98	.04
Skepticism towards science	.06	98	97	.04
Morality: attitudes towards personal-sexual issues	.00	100	99	0
Morality: attitudes towards dishonest-illegal issues	.06	98	98	.02
Morality: attitudes towards (domestic) violence	.12	95	95	.04
Left-right attitude	.01	99	96	0
Average	.07	97	97	.03

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A65

Comparisons of the 10 value types and 12 other variables between age cohorts

	Cohen's d		PCR		PCS			AE				
	Med	Max.	Med	$\geq .90$	$\geq .95$	Min	Med	$\geq .90$	$\geq .95$	Min	Med	Max
	d	d								AE	AE	
Security	.05	.12	98	100	100	95	97	100	93	94	0	0
Tradition	.05	.13	98	100	98	95	98	100	93	94	0	0
Conformity	.03	.10	99	100	100	96	98	100	100	96	0	0
Benevolence	.05	.17	98	100	93	93	97	100	91	93	0	0

Universalism	.03	.07	99	100	100	97	98	100	100	96	0	0
Self-direction	.18	.52	93	71	36	80	92	64	31	78	.20	.20
Stimulation	.30	.90	88	42	18	65	87	38	16	64	.20	.40
Hedonism	.21	.73	91	56	29	71	91	56	27	72	.20	.40
Achievement	.25	.75	90	49	22	71	90	51	20	71	0	.20
Power	.26	.75	90	49	20	71	90	53	18	70	.20	.40
Trust in known people	.09	.30	97	93	69	88	97	98	73	90	0	0
Trust in strangers	.07	.23	97	100	78	91	97	100	73	90	0	0
Understanding of democracy	.08	.25	97	100	73	90	97	100	71	90	.02	.06
Confidence in political institutions	.03	.12	99	100	100	95	98	100	84	93	0	.06
Perceived respect for elderly	.03	.08	99	100	100	97	98	100	100	97	0	0
Ageism	.15	.49	94	71	42	81	93	64	31	77	0	.08
Trust in science	.04	.15	98	100	93	94	97	100	91	93	0	.04
Skepticism towards science	.02	.09	99	100	100	96	98	100	100	95	0	.04
Morality: attitudes towards personal-sexual issues	.05	.15	98	100	98	94	97	100	80	94	.02	.04
Morality: attitudes towards dishonest-illegal issues	.14	.46	94	76	40	82	94	78	44	83	.02	.09
Morality: attitudes towards (domestic) violence	.16	.46	94	76	40	82	93	67	36	81	.04	.11
Left-right attitude	.03	.07	99	100	100	97	98	100	100	96	0	.11
Average	.10	.32	96	86	70	87	95	85	67	87	.04	.10

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, >= 90/95: Percentage of pairs with a PCR or PCS above 90/95 percent.

Tables Study 2

Table A7

Comparisons of the 10 value types and 14 other variables between countries

	Cohen's d		PCR				PCS				AE	
	Med	Max.	Med	>= .90	>= .95	Min	Med	>= .90	>= .95	Min	Med	Max
	d	d									AE	AE
Security	.41	1.62	84	32	16	42	82	20	4	38	.10	.40
Tradition	.34	1.27	86	38	19	53	84	27	6	54	.10	.20
Conformity	.28	1.28	89	46	23	52	87	34	7	52	.10	.30
Benevolence	.31	1.50	88	42	21	45	84	29	5	47	.10	.30

Universalism	.30	1.37	88	44	23	49	87	34	11	54	.07	.27
Self-direction	.24	.95	90	50	25	64	88	38	8	61	.10	.20
Stimulation	.15	.68	94	74	42	73	91	54	8	74	.10	.20
Hedonism	.33	.98	87	40	19	62	85	24	3	61	.10	.30
Achievement	.40	1.64	84	34	17	41	83	26	2	37	.10	.40
Power	.40	1.47	84	33	18	46	83	26	4	48	.10	.40
Political activities	.36	1.91	86	36	19	34	90	49	25	48	0	.33
Attitudes towards immigrants	.41	2.06	84	33	16	30	82	17	3	36	.09	.42
Feeling depressed	.33	1.48	87	37	17	46	84	30	10	36	.05	.24
Subjective happiness	.24	.89	91	52	27	66	87	31	3	64	.08	.17
Feeling optimistic	.26	.83	90	49	24	68	87	34	9	65	.04	.13
Pessimistic world view	.49	2.00	81	26	13	32	81	22	6	38	.06	.38
Trust in other people	.52	1.81	80	25	11	37	78	19	3	38	.10	.33
Trust in political institutions	.55	2.28	78	25	12	25	77	18	3	28	.11	.44
Relationship to neighbors	.23	1.05	91	55	28	60	88	41	10	59	.06	.19
Relationship to other people	.23	.86	91	54	28	67	89	46	17	63	.03	.14
Trust in democratic rights	.26	1.34	90	48	23	50	88	40	11	56	.04	.19
Trust in democratic processes	.23	.91	91	52	30	65	88	42	14	64	.03	.15
Left-right scale	.16	.95	94	68	39	64	85	21	3	58	0	.10
Religiosity (17)	.53	2.44	79	27	16	22	74	10	0.5	22	.19	.72
Average	.33	1.40	87	43	22	50	85	31	7	50	.08	.29

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent. Numbers in brackets indicate the number of countries where similarities are smaller than differences.

Table A8

Comparisons of the 10 value types and 14 other variables between gender

	Cohen's d	PCR	PCS	AE
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	Med d	Max. d	Med ≥ .90	≥ .95	Min	Med ≥ 90	≥ 95	Min	Med AE	Max AE
Security	.17		93			93			0	
Tradition	.14		95			95			0	
Conformity	.02		99			98			0	
Benevolence	.15		94			92			0	
Universalism	.12		95			95			0	
Self-direction	.12		95			94			.1	
Stimulation	.20		92			93			.1	
Hedonism	.17		93			94			0	
Achievement	.16		94			94			0	
Power	.18		93			93			0	
Political activities	.11		95			97			0	
Attitudes towards immigrants	.03		99			99			.01	
Feeling depressed	.27		89			88			.05	
Subjective happiness	.17		93			94			.08	
Feeling optimistic	.11		96			96			0	
Pessimistic world view	.13		95			95			.06	
Trust in other people	.01		100			98			0	
Trust in political institutions	.04		99			98			0	
Relationship to neighbors	.03		99			97			0	
Relationship to other people	.10		96			96			.02	
Trust in democratic rights	.05		98			98			.01	
Trust in democratic processes	.07		97			96			.02	
Left-right scale	.05		98			96			0	
Religiosity	.32		87			86			.12	
Average	.12		95			95			.02	

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, ≥ 90/95: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A9

Comparisons of the 10 value types and 14 other variables between income groups

	Cohen's d		PCR			PCS				AE		
	Med d	Max. d	Med	>= .90	>= .95	Min	Med	>= .90	>= .95	Min	Med AE	Max AE
Security	.13	.38	95	87	49	85	94	78	38	84	0	.10
Tradition	.19	.50	93	64	33	80	92	58	29	78	.10	.20
Conformity	.11	.30	96	93	58	88	95	89	49	86	.10	.10
Benevolence	.02	.06	99	100	100	98	97	100	89	94	0	0
Universalism	.02	.07	99	100	100	97	97	100	87	93	0	0
Self-direction	.12	.35	95	93	51	86	95	89	44	86	0	.10
Stimulation	.12	.36	95	93	51	86	94	78	44	86	0	.10
Hedonism	.13	.38	95	80	49	85	95	78	42	84	0	.10
Achievement	.06	.29	97	98	73	88	96	98	60	89	0	.10
Power	.07	.25	97	100	78	90	96	100	58	90	0	0
Political activities	.16	.36	94	78	44	86	95	87	47	88	0	0
Attitudes towards immigrants	.19	.49	92	67	38	81	92	62	27	79	.04	.13
Feeling depressed	.25	.82	90	51	20	68	89	44	18	65	.05	.14
Subjective happiness	.18	.67	93	62	33	74	92	60	33	74	.08	.17
Feeling optimistic	.18	.58	93	62	33	77	93	69	38	81	0	.04
Pessimistic world view	.36	1.06	86	33	9	60	86	31	9	59	.06	.19
Trust in other people	.20	.57	92	64	33	78	92	62	31	79	.03	.13
Trust in political institutions	.18	.48	93	69	36	81	92	56	29	79	.04	.12
Relationship to neighbors	.02	.12	99	100	100	95	96	100	73	91	0	.03
Relationship to other people	.13	.40	95	80	47	84	94	78	40	83	.02	.03
Trust in democratic rights	.04	.14	98	100	93	95	97	100	89	92	.01	.04
Trust in democratic processes	.08	.23	97	100	73	91	96	96	60	89	.02	.03
Left-right scale	.08	.27	97	98	71	89	95	93	47	88	0	0
Religiosity	.19	.47	92	60	33	82	92	60	27	80	.08	.20
Average	.13	.40	95	81	54	84	94	78	46	83	.03	.09

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table 6

Comparisons of the 10 value types and 14 other variables between education groups

	Cohen's d		PCR			PCS				AE		
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	\geq 90	$\geq .95$	Min	Med AE	Max AE
Security	.12	.26	95	95	52	89	96	100	57	90	0	0
Tradition	.19	.49	92	71	29	81	92	57	29	80	.1	.2
Conformity	.10	.24	96	100	71	90	96	100	67	90	.1	.1
Benevolence	.04	.19	98	100	76	93	97	100	67	92	0	0
Universalism	.08	.19	97	100	67	92	96	100	76	93	0	0
Self-direction	.23	.54	91	57	24	79	91	67	24	80	.1	.1
Stimulation	.16	.55	94	67	48	79	94	71	38	79	.1	.2
Hedonism	.14	.48	94	81	48	81	93	71	24	83	.1	.2
Achievement	.19	.42	93	76	29	83	93	76	29	84	.1	.2
Power	.12	.30	95	90	57	88	95	90	67	89	0	0
Political activities	.28	.61	89	48	14	76	93	57	29	81	0	0
Attitudes towards immigrants	.35	.80	86	33	29	69	84	33	24	69	.09	.20
Feeling depressed	.18	.59	93	52	29	77	92	62	33	76	.05	.10
Subjective happiness	.12	.45	95	76	52	82	95	76	48	81	.08	.17
Feeling optimistic	.19	.48	93	71	29	81	94	86	33	86	0	.04
Pessimistic world view	.34	.87	87	38	19	66	87	38	19	67	.06	.19
Trust in other people	.21	.48	92	62	33	81	91	57	33	81	.03	.13
Trust in political institutions	.15	.43	94	71	38	83	92	67	29	82	.04	.11
Relationship to neighbors	.07	.19	97	100	76	92	95	95	48	89	.03	.03
Relationship to other people	.13	.32	95	90	52	87	95	86	48	86	.01	.03
Trust in democratic rights	.03	.17	99	100	71	93	98	100	71	92	.01	.03
Trust in democratic processes	.18	.55	93	62	19	78	91	52	14	74	.03	.1

Left-right scale	.02	.05	99	100	100	98	96	100	57	91	0	0
Religiosity	.12	.51	95	71	52	80	93	71	38	79	.05	.21
Average	.16	.42	94	75	46	83	93	76	42	83	.05	.10

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Table A11

Comparisons of the 10 value types and 14 other variables between age groups

	Cohen's d		PCR				PCS				AE	
	Med d	Max. d	Med	$\geq .90$	$\geq .95$	Min	Med	≥ 90	$\geq .95$	Min	Med AE	Max AE
Security	.08	.28	97	98	78	89	96	98	67	88	0	0
Tradition	.23	.65	91	56	22	74	91	53	27	73	.10	.20
Conformity	.16	.56	94	69	36	78	93	69	36	77	.10	.10
Benevolence	.03	.08	99	100	100	97	98	100	98	95	0	0
Universalism	.06	.26	98	98	80	90	97	100	78	91	0	.07
Self-direction	.15	.47	94	78	44	81	94	76	38	81	.10	.10
Stimulation	.41	1.29	84	31	9	52	84	27	11	56	.10	.30
Hedonism	.34	1.07	86	38	13	59	87	38	18	59	.10	.30
Achievement	.32	.90	87	38	16	65	89	36	18	65	.10	.20
Power	.22	.62	91	58	24	76	92	62	27	77	.10	.20
Political activities	.08	.31	97	89	69	88	97	100	82	91	0	0
Attitudes towards immigrants	.14	.48	95	78	44	81	93	71	40	80	.03	.12
Feeling depressed	.15	.53	94	80	42	79	94	71	42	78	.05	.10
Subjective happiness	.17	.53	93	73	40	79	93	73	36	79	.08	.08
Feeling optimistic	.10	.38	96	89	60	85	96	93	64	88	0	.04
Pessimistic world view	.16	.51	94	78	40	80	93	78	33	80	.06	.06
Trust in other people	.03	.12	99	100	100	95	96	100	71	90	0	.03
Trust in political institutions	.05	.33	98	82	80	87	98	82	78	86	.01	.07
Relationship to neighbors	.11	.33	96	93	58	87	95	84	51	85	.03	.08
Relationship to other people	.05	.14	98	100	96	95	97	100	98	95	.01	.03
Trust in democratic rights	.07	.23	97	100	82	91	97	100	73	90	.01	.04

Trust in democratic processes	.06	.28	97	89	64	89	96	84	62	86	.02	.05
Left-right scale	.05	.14	98	100	96	94	95	100	56	90	0	0
Religiosity	.19	.61	93	64	38	76	91	60	27	74	.08	.24
Average	.14	.46	94	78	55	82	94	77	51	81	.05	.10

Note. PCR: Percentage of common responses, PCS: Percentage of common scores, AE: absolute effect. Med: Median, $\geq 90/95$: Percentage of pairs with a PCR or PCS above 90/95 percent.

Tables and Figures of detailed results – Chapter 3

Detailed results of Study 4

Words which were mentioned at least 10 times were analysed. Quotation marks indicate that a response of a participant is listed. Numbers in brackets indicate how easy it was to discover the meaning of the specific word: 1: very much variance between the answers with the given keywords (no pattern among the responses is recognizable), 5: very little variance (i.e. the answers are all very similar in their meaning). Figures are based on the results from the UK.

Protecting the environment

Table 7

UK results of university sample for Protecting the environment

Word	Meaning (Instantiation)	Absolute Frequency
family	“family and friends” as relevant people (5)	30
friend	“family and friends” as relevant people (5)	22
recycle	“recycling”, “putting certain rubbish in recycle bins rather than general waste” (5)	18
work	“cycling to and from work instead of driving” (3)	18
environment	“protect the environment” (4)	17
car	share the car, walk instead of using car for short distances (3)	16
person	people who try to protect the environment (2)	16
rubbish	“putting rubbish in the bin not the floor” (4)	16
litter	“putting rubbish in the bin not the floor” (4)	16
walk	“travelling to work etc. using public transport bikes or walking rather than using a car” (3)	15
light	“making sure the lights are off” (4)	15
bin	using bins (3)	15
waste	“disposal of waste”, recycling waste (3)	13
protect	“protect the environment” (4)	12
emission	“reducing carbon emissions” (4)	11
reduce	“reducing carbon emissions” (4)	11
animal	“culling of animals”, “preserving animal habitats” (2)	10

Table 8

Brazil results of university sample for Protecting the environment

Word	Meaning (Instantiation)	Absolute Frequency
garbage	"Recyclables". "Garbage in bin" (5)	69
play	"Throwing trash in the trash" (5) (subset of "garbage")	39
environment	"Environment" (5)	30
environment	"Environment"	27
water	"Save water" control water consumption (4)	20
street	"Helping homeless animals." "Throwing garbage in the street" (3)	19
business	"Companies that look after the environment" situations to punish companies that pollute (4) (but people do not think about this while shopping -> hypocritical)	18
population	"People throw trash in the bin." "Population separating garbage" situations where the people throw trash enquiry (5)	15
home	"Decorate your home so you do not pollute" situations of water saving (4)	14
animal	"Helping animals" (2)	13
protect	"Protect the environment" (5)	13
all	"All people" (1)	13
pollution	"Pollution of rivers". "Noise" (4)	12
use	"Using water" situations of water use (5)	12
car	"Riding car" (4)	10
avoid	"Avoiding polluting the environment" (5)	10
plastic	"Plastic bags" (3)	10
pollute	"Polluting the environment" (4)	10
beach	"Take the garbage thrown into the beach" (4)	10
projects	"Public initiative projects of clean cities" situations where it asks for the development of projects to protect the environment (4)	10
river	"Littering the rivers." "River sewage" (3)	10
trees	"Cutting trees." "Toppling trees" (4)	10

Table 9

India results of university sample for Protecting the environment

Word	Meaning (Instantiation)	Absolute Frequency
person	“people” (3)	28
clean	“cleaning”, “keep clean” (4)	12

Equality

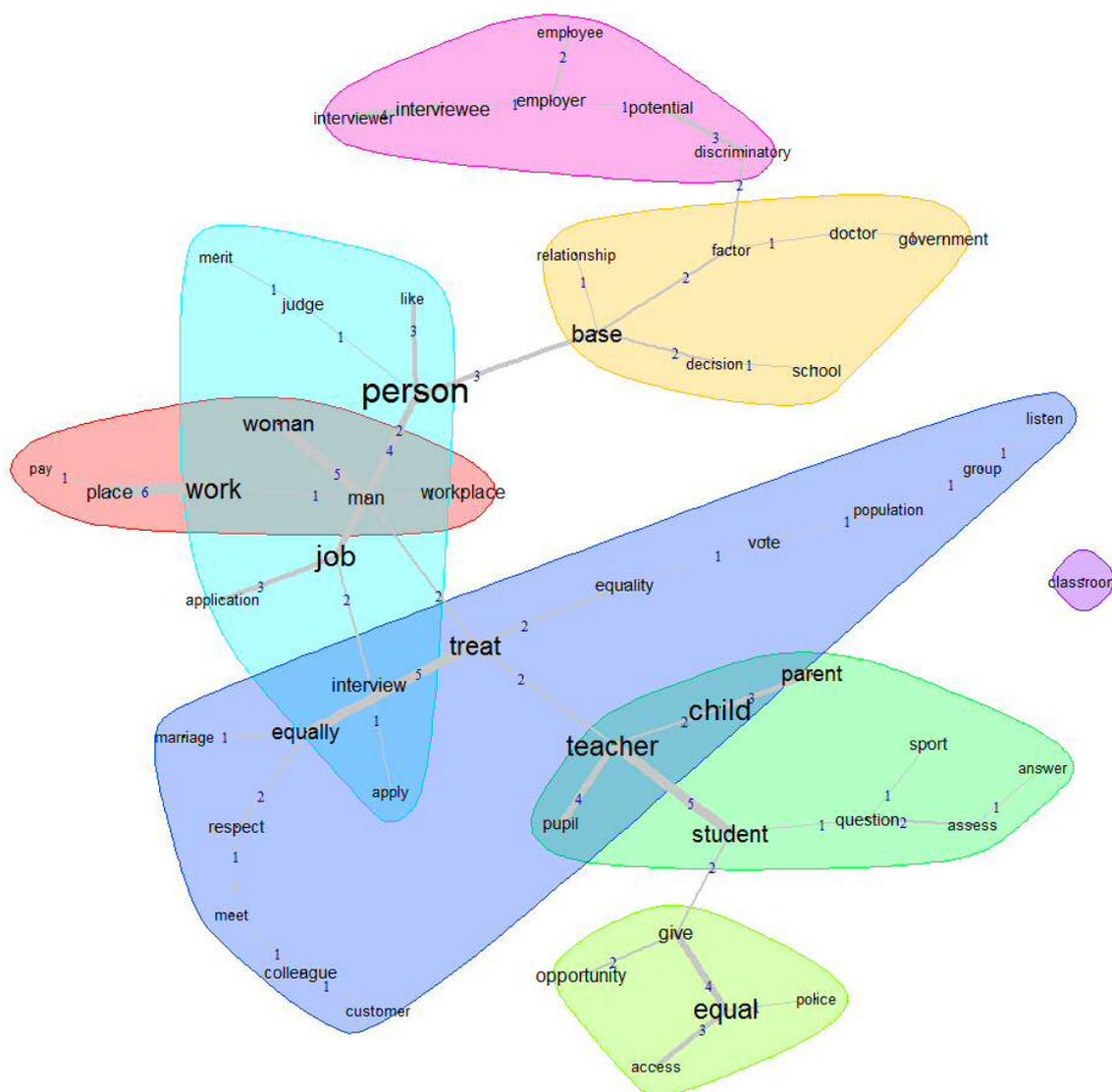


Figure 5. Result of the graphical similarity analysis for 'Equality' (UK only). Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 10

UK results of university sample Equality

Word	Meaning (Instantiation)	Absolute Frequency
person	(no pattern recognizable)	18
child	"all children are allowed to use all equipment, given the same opportunities"; treating all children equally (4)	13
job	"job application", "job interview" (4)	13
teacher	"teacher" as relevant person in the situation (4)	12
equal	equal rights and equal opportunities (5)	11
student	"students/pupils" as relevant people in the situation (3)	11
work	"work place" as typical situation, "men and women should be treated equally in the work place" (4)	11
treat	"treat all pupils equally" (3)	10

Table 11

Brazil results of university sample Equality

Word	Meaning (Instantiation)	Freq.
all	"Everyone deserves an equal chance." "Everyone is entitled to an opportunity "(4)	23
same	"The opportunity is the same for both sexes." "Everyone being treated the same way regardless of the preference of sex" (4)	19
right	"Claiming your rights." "A university should be an equal right for all people." "Same rights for everyone regardless of color" (5)	13
black	"The common people in favor of mostly blacks" "abolish the black and white racism" (3)	13
woman	"Rights for men and women." "That woman and man have no difference" (4)	11
quota	"University quotas for blacks with Indians and mestizos." "Quota for disabled"	10
child	"Children with mental problems." "Children and young people who are in a state of obesity" (4)	10
man	"Men and women in work situations." "Law so that men and women have no difference" (3)	10
mother	"Mother sharing food" (2)	10
public	"entrance exams for public positions for all races" (3)	10
your	"Right to pronounce your ideas." "Each performs its function" (3)	10

Table 12

India results of university sample for Equality

Word	Meaning (Instantiation)	Absolute Frequency
Person	People from various casts, religious backgrounds, or socio-economic status (3)	38
Cast(ism)/categories/sc and st	Discrimination based on cast (5)	17
Work	working hard, equal work (3)	17
Friend	Friends and family (3)	16
Student	Students and castism (3)	16
Give	Giving equal opportunities (4)	15
Treat	Treat everyone equally (5)	12
Women	Women equality (4)	12
Equal	Treat people equal (4)	11
Time	(no pattern recognizable)	10

Wisdom

friend	“friends” as relevant people (5)	29
parent	“parents teaching their children about life” and “parents” as relevant people (4)	25
student	“giving students advice”, “students” as relevant people (4)	22
child	give guidance/pass knowledge to children, teaching children (4)	20
make	“making [important/serious] decisions” (4)	20
give	“Giving advice” (older person, friend) (5)	19
family	“family” as relevant people (5)	19
decision	“making [important/serious] decisions” (4)	17
wisdom	“passing on their wisdom”, “having wisdom” (3)	16
teach	“teaching or explaining something” (3)	16
decide	deciding about something important (4)	14
teacher	“teacher” as relevant people (5)	13
experience	“using past knowledge and experiences” (4)	13
knowledge	using/sharing knowledge (3)	12
exam	“exam” as typical situation in which wisdom is important (5)	12
work	(no pattern recognizable)	10
thing	(no pattern recognizable)	10
listen	listening to other people (4)	10
life	(no pattern recognizable)	10

Table 14

Brazil results of university sample for Wisdom

Word	Meaning (Instantiation)	Absolute Frequency
friend	"Receiving advise from friends" (4)	17
wisdom	"Wisdom to deal with conflicts" wisdom to solve conflicts (5)	16
know	"How to deal with awkward situations" (4)	13
other	"Talk to others" (3)	11
its	"Wisdom" (3)	11
knowledge	"Spread your knowledge" use knowledge to relate to other people	10

Table 15

India results of university sample for Wisdom

Word	Meaning (Instantiation)	Absolute Frequency
Person	(no pattern recognizable)	23

Unity with nature

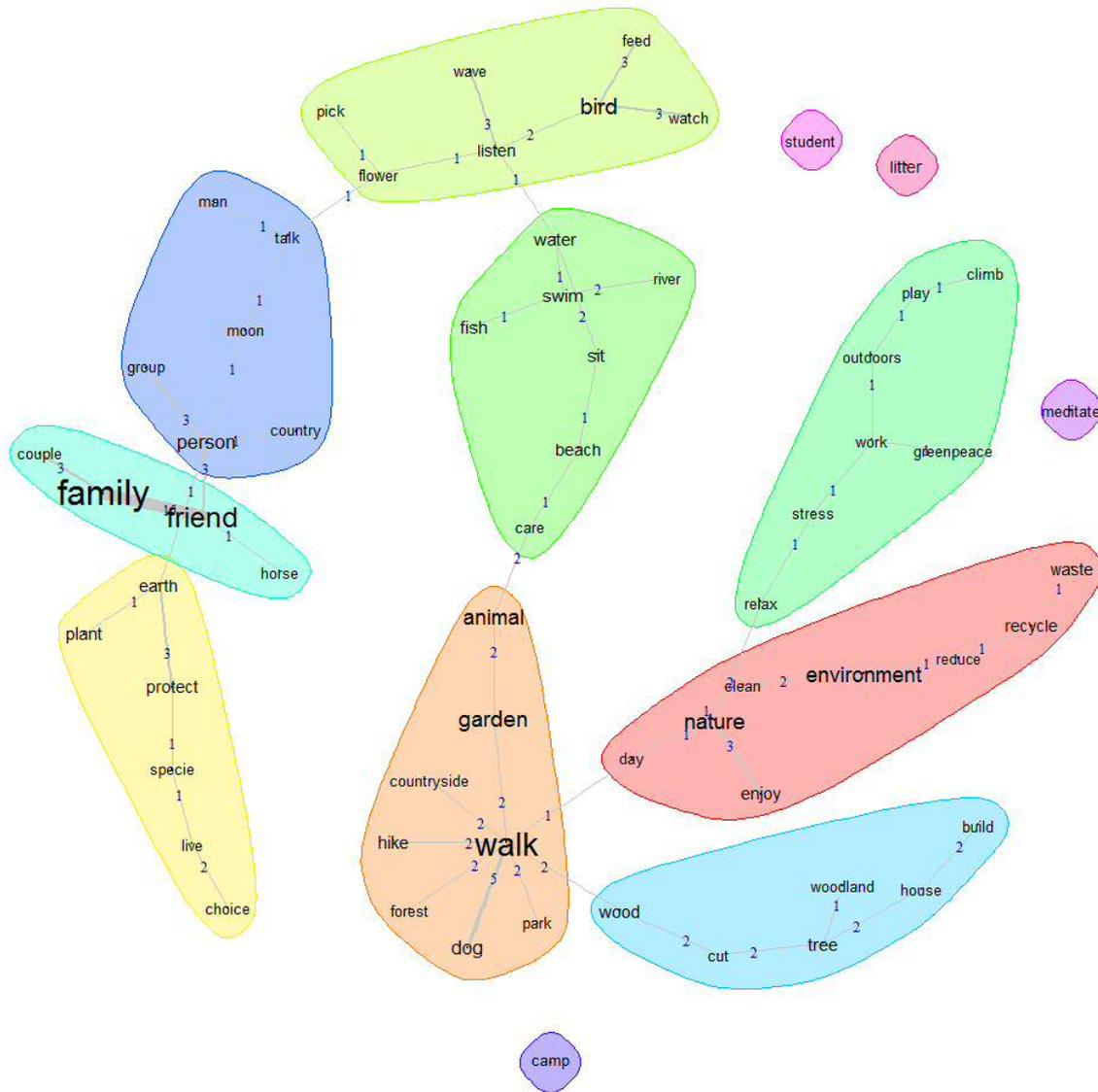


Figure 7. Result of the graphical similarity analysis for 'Unity with Nature'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 16

UK results of university sample for Unity with nature

Word	Meaning (Instantiation)	Absolute Frequency
family	“family” as relevant people (5)	28
walk	“walking the dog”, walking outside (5)	25
friend	“friend” as relevant people (5)	20
nature	“being in nature” (2)	12
garden	being in the garden (5)	12
bird	“bird watching”, “feeding birds” (5)	12
environment	“looking after the environment” (3)	11
animal	“observing animals”, “helping animals” (4)	11
person	(no pattern recognizable)	10

Table 17

Brazil results of university sample for Unity with nature

Word	Meaning (Instantiation)	Absolute Frequency
nature	"Preserve nature", "closer to nature" (5)	40
friend	"Meet friends" meet with friends in places with nature (forests and beaches) (4)	28
animal	"Animal care" (4)	23
all	Refers to humans and animals (2)	23
plant	"Plant Trees" planting trees with friends (5)	19
beach	"Walking at the beach" walk along the beach with friends, family and boyfriends / girlfriends (4)	19
other	"etc." idea of variety (2)	16
care	"Animal care" (5)	15
garbage	"Garbage disposal" In which situations it discards the trash Correctly (4)	14
same	"Himself" myself (2)	11
environment	"Do not pollute the environment" situations of environmental protection (5)	10
familiar	"Weekend with relatives in the countryside" enjoy nature with family	10
yours	"Taking care of the animals that are under your care" animal care (2)	10

Table 18

India results of university sample for Unity with Nature

Word	Meaning (Instantiation)	Absolute Frequency
Family	(no pattern recognizable)	13
Friend	(no pattern recognizable)	13
Nature	(no pattern recognizable)	13
Person	(no pattern recognizable)	13

Table 19

UK results of university sample for World of Beauty

Word	Meaning (Instantiation)	Absolute Frequency
beauty	"beauty pageants" (3)	29
Family	"family" as relevant people (5)	26
Friend	"friend" as relevant people (5)	23
Person	(no pattern recognizable)	23
Walk	walking outside (4)	21
world	(no pattern recognizable)	14
partner	"partner" as relevant people (5)	13
holiday	"holiday" as typical situation (4)	12
model	"models celebrities" (4)	10
beach	"beach" as typical place (4)	10

Table 20

Brazil results of university sample for World of Beauty

Word	Meaning (Instantiation)	Absolute Frequency
be	(no pattern recognizable)	29
beauty	"Natural Beauties" (2)	25
my	"My Family" (3)	23
world	"Beautiful World". "World security". "Better world" (3)	18
friend	"Friends enjoying." "Friends having fun." Friends talking "(5)	17
family	"Playing family". "With my family enjoying life" (5)	15
all	"All people" (3)	15
child	"Working children" "needy children" (4)	13
woman	"Beautiful women" pleasant situations with women (4)	12
care	"Take care of his own body." be careful with the body and family (4)	10
its	"Activities" (3)	10
life	"Healthier life" (4)	10

Table 21

India results of university sample for World of Beauty

Word	Meaning (Instantiation)	Absolute Frequency
Person	(no pattern recognizable)	26
Nature	Protect nature (3)	13
Beauty	Beauty of nature (2)	12
Friend	Friends and family (3)	11

Broad-mindedness

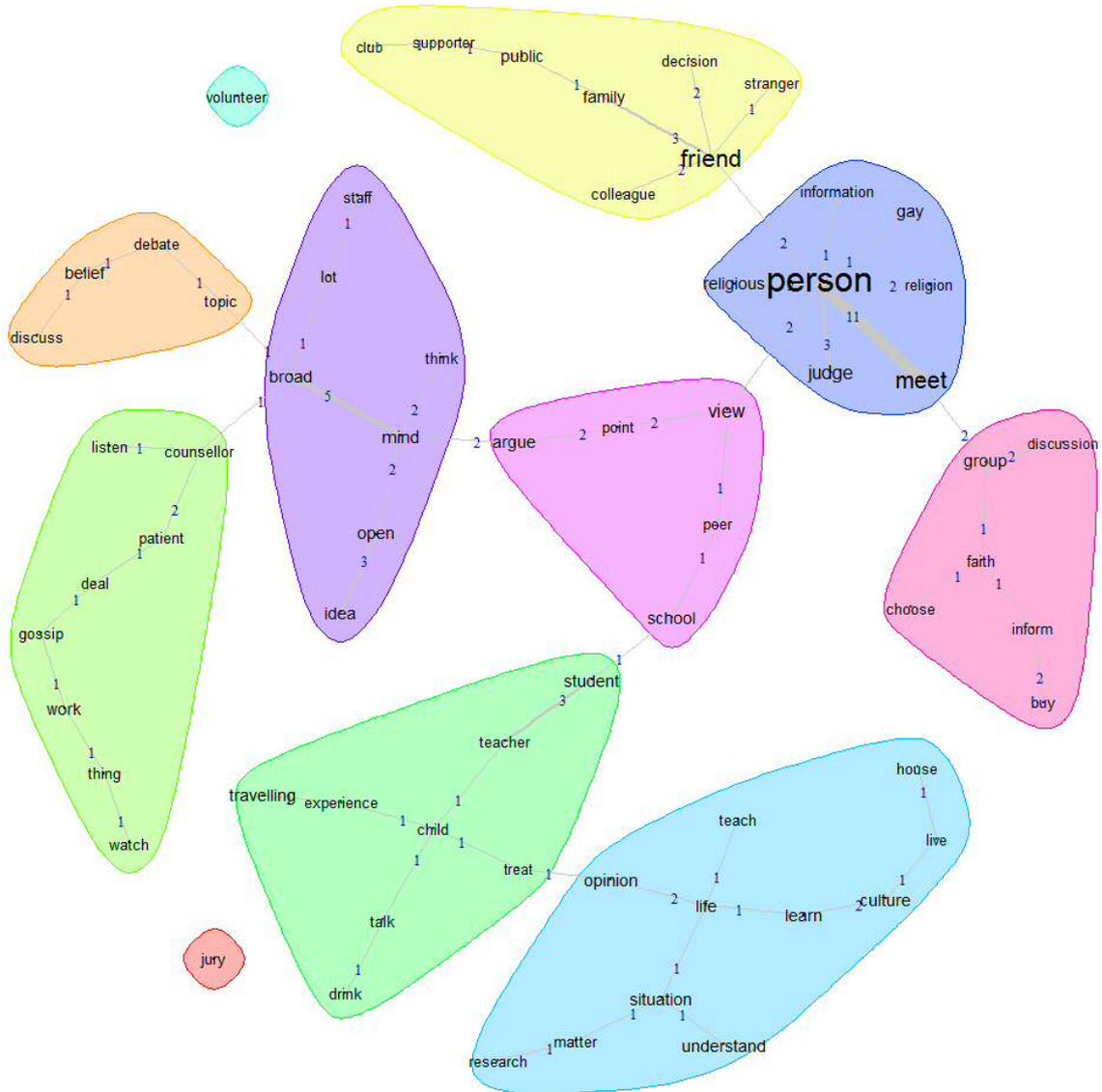


Figure 9. Result of the graphical similarity analysis for 'Broad-mindedness'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 22

UK results of university sample for Broad-mindedness

Word	Meaning (Instantiation)	Absolute Frequency
person	“meeting new people” (3)	34
friend	“friend” as relevant people (2)	17

meet	“meeting new people” (4)	15
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Table 23

Brazil results of university sample for Broad-mindedness

Word	Meaning (Instantiation)	Absolute Frequency
friend	"Friends living the moment" situations of drug use, homosexual relationships and talking controversial topics (3)	20
new	"New ideas". "New opportunities" (5)	18
all	"All accepting". "Everyone debating" (4)	16
society	"Society against homophobia". "Society against bullying" situations against prejudice (4)	15
its	"Your life." "Ideas" (4)	13
son	"Gay Son" situations against prejudice (5)	12
other	"Another sexual orientation" (4)	12
life	"Better life" (3)	11
father	"Father and grandparents are dedicated to teaching" situations where parents accept the differences of the sounds (3)	10
its	"Your Dream". "Their lifestyle" (2)	10

Table 24

India results of university sample for Broad-mindedness

Word	Meaning (Instantiation)	Absolute Frequency
Person	“helping people” (3)	24
Friend	Family and friends (3)	17
Family	Family and friends (3)	16
Help	Helping (poor) people (4)	10

Social Justice

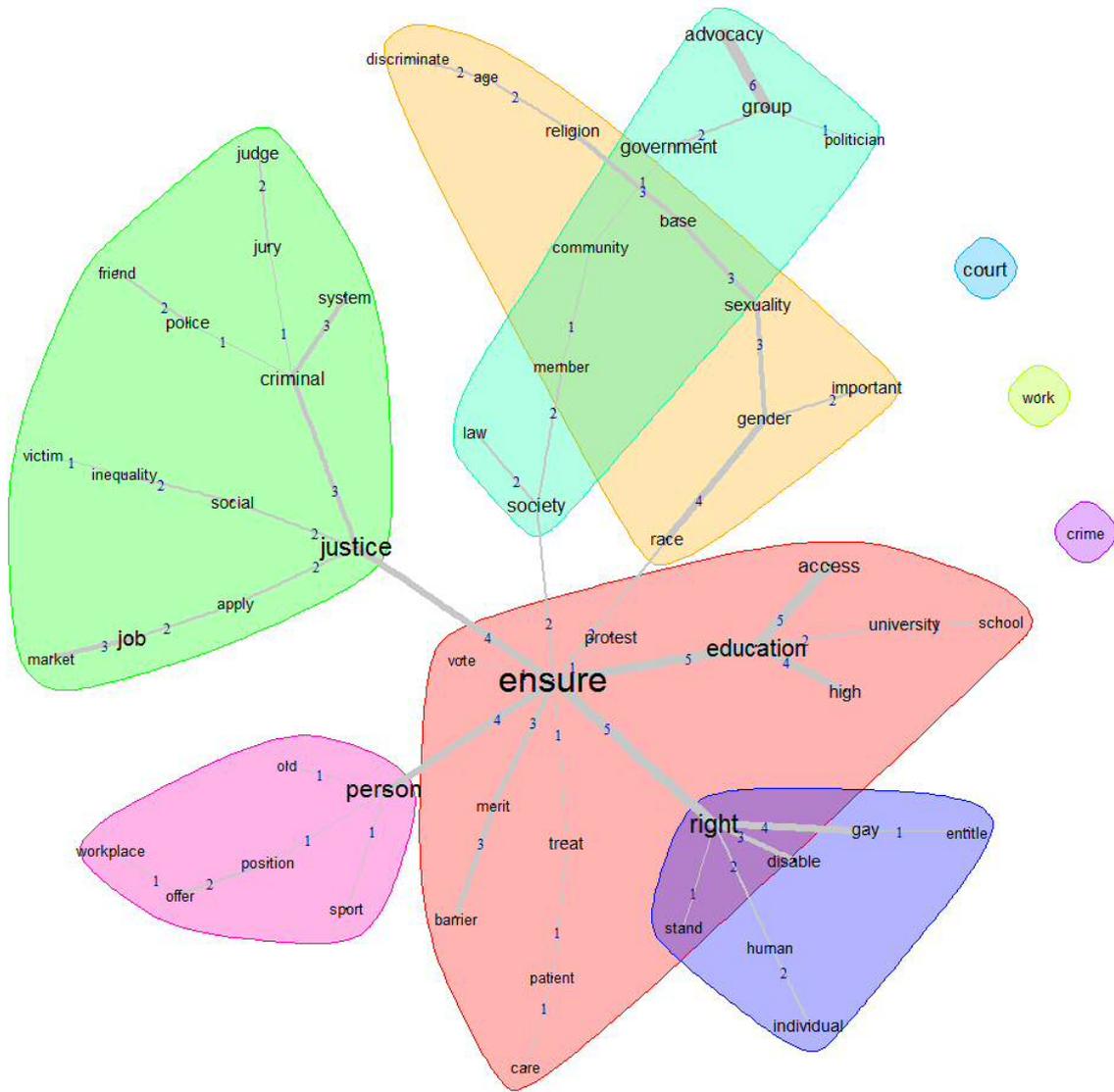


Figure 10. Result of the graphical similarity analysis for ‘Social Justice’. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 25

UK results of university sample for Social Justice

Word	Meaning (Instantiation)	Absolute Frequency
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ensure	“ensuring that justice is applied equally to all” (4)	23
person	(no pattern recognizable)	14
justice	“making sure that people treated wrongly get justice over those that did them wrong” (3)	13
right	“gay rights”, “disabled rights” (4)	13
education	“ensuring that there is no barrier other than merit in access to higher education” (4)	11
job	“applying for job” (2)	10

Table 26

Brazil results of university sample for Social Justice

Word	Meaning (Instantiation)	Absolute Frequency
right	"Political rights" common related to health, education and security (5)	27
public	"Public services". "Public schools" (5)	20
all	"All people" (3)	20
government	"Government social policies" situations where the government Should help the population, eg enforce the law and providing public services (4)	15
population	"Working population". "People going to the streets"	15
political	"Corrupt politicians" (5)	14
education	"Education in schools". "Traffic education" (5)	13
teacher	"Primary school teachers" (4)	13
fight	"Fighting for the rights" situations against prejudice, injustice and crimes (4)	12
society	"Struggling society" / fighting against difficulties in society (3)	11
citizen	"Citizens demanding their rights" (5)	10
Seniors	"Elderly in homes for asylum" situations on the needs of the elderly and health care eg	10

Table 27

India results of university sample for Social Justice

Word	Meaning (Instantiation)	Absolute Frequency
Girl	Discrimination of girls (5)	10
Person	(no pattern recognizable)	10

Creativity

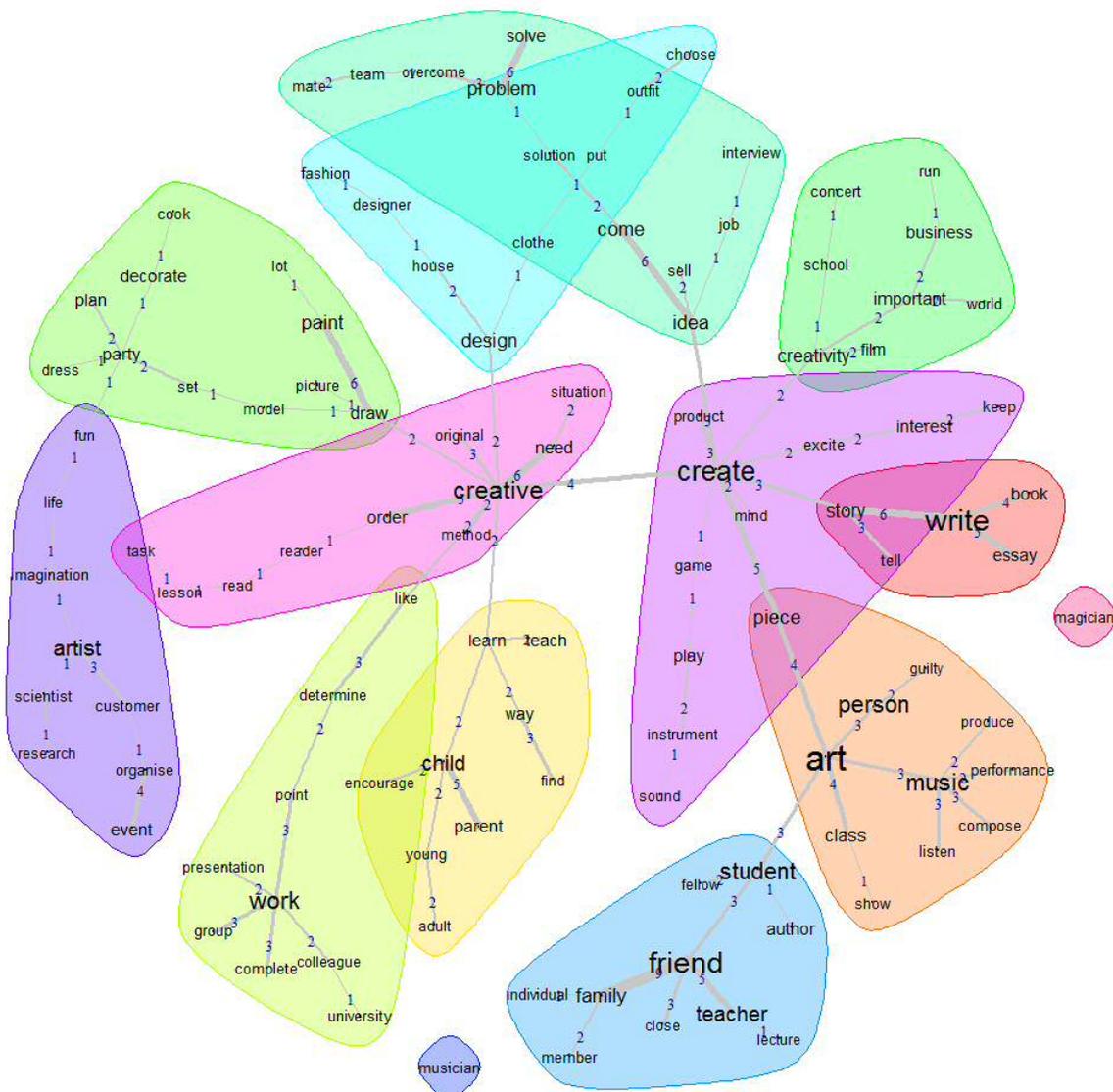


Figure 11. Result of the graphical similarity analysis for ‘Creativity’. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 28

UK results of university sample for Creativity

Word	Meaning (Instantiation)	Absolute Frequency
art	“making art”, “art classes” (3)	40
write	writing an essay/book/poem (4)	29
friend	“friend” as relevant people (5)	29
create	“creating art” [including books] (4)	28
make	making something new (3)	23
music	“Making music”, “Composing music”, “listening to music” (4)	22
creative	Being/thinking creative is helpful/important (4)	21
work	“Working as a group in uni”, “When thinking of new ideas - Could be at work” (3)	20
person	“person” as relevant people (5)	20
student	“students” as relevant people (4)	19
child	important for children to learn new things (2)	19
artist	“artists” as relevant people (5)	17
teacher	“teacher” as relevant people (3)	16
idea	“coming up with novel ideas” (5)	15
family	“family” as relevant people (5)	14
come	“come up with new ideas” (5)	13
problem	“problem solving” (5)	12
piece	“creating a piece of art” (4)	12
paint	“painting” (5)	12
story	“writing a story” (4)	11
draw	“drawing” (4)	11
design	designing something new (3)	11
creativity	(no pattern recognizable)	11
need	(no pattern recognizable)	10
class	“art class” (4)	10

Table 29

Brazil results of university sample for Creativity

Word	Meaning (Instantiation)	Absolute Frequency
work	"Be original work" (5)	23
create	"Creating beautiful things." "Creating strategies to achieve the goal" (4)	19
new	"New projects". "Create new products." "Proposing new ideas" (4)	18

business	"Companies looking for new ways." "Companies seeking growth" (4)	13
friend	"Debating issues with friends" (4)	12
creativity	"Can reach a solution with creativity" (4) ['The Brazilian way']	12
your	"Improve their lives" (4)	12
different	"Seek different things" (4)	11
creative	"Needs to be very creative" (4)	10
day	"Scientific articles produced daily" (3)	10

Table 30

India results of university sample for Creativity

Word	Meaning (Instantiation)	Absolute Frequency
Creative	Being creative is useful	20
Person	(no pattern recognizable)	16
Friend	(no pattern recognizable)	14
Student	(no pattern recognizable)	12

Freedom

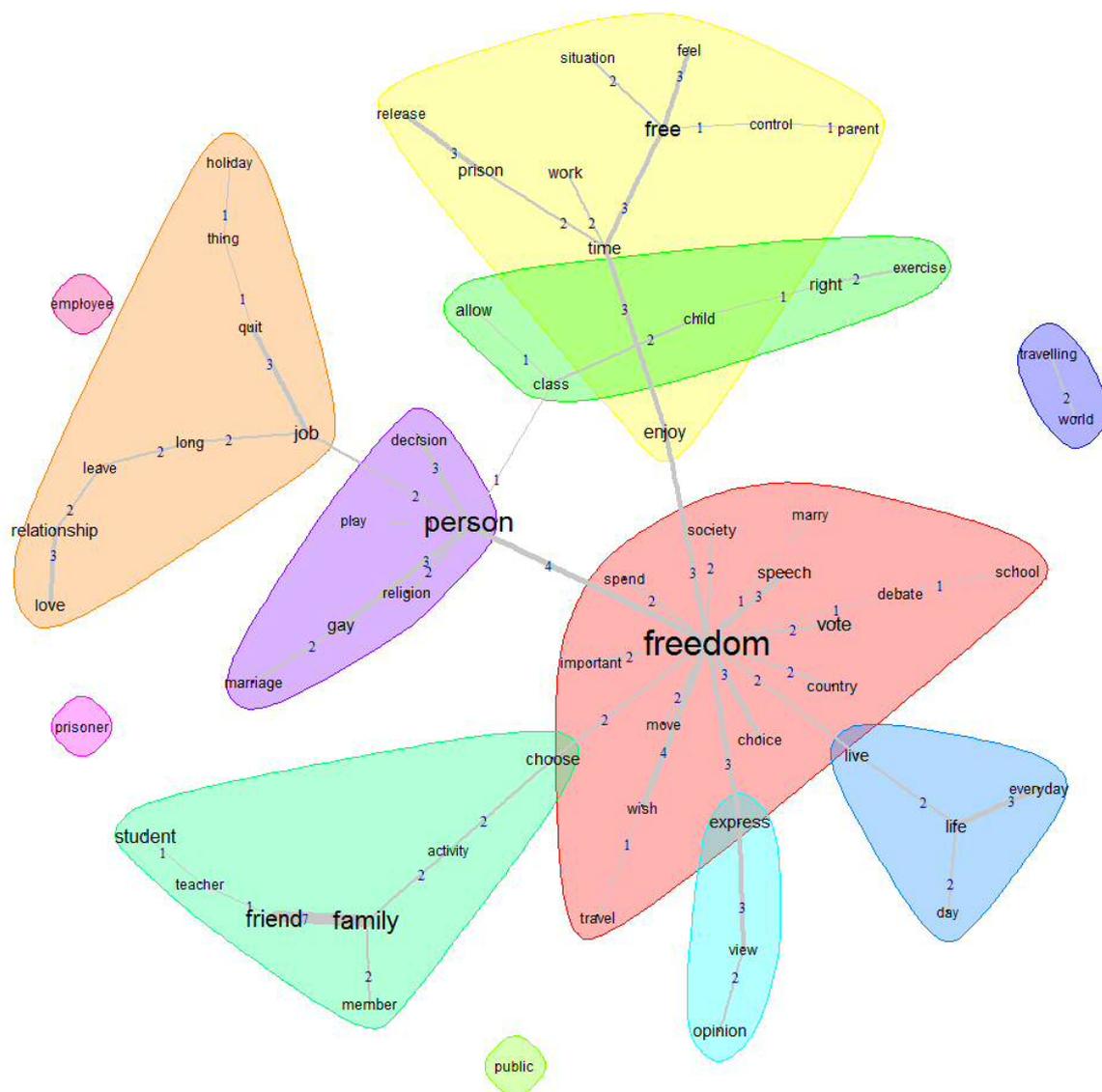


Figure 12. Result of the graphical similarity analysis for 'Freedom'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 31

UK results of university sample for Freedom

Word	Meaning (Instantiation)	Absolute Frequency
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freedom	freedom rights. [More positive than negative liberty rights mentioned] (4)	36
person	persons as relevant people (2)	26
family	“family” as relevant people (5)	22
friend	“friends” as relevant people (5)	17
free	“free to choose”, “free from the oppression” (3)	14
vote	“voting” (4)	12
job	“deciding on a job” (3)	12
student	“students” as relevant people (4)	11
enjoy	enjoying life (3)	10
choose	having the possibility to choose between different things (3)	10

Table 32

Brazil results of university sample for Freedom

Word	Meaning (Instantiation)	Absolute Frequency
People	"people knowing different places" (4)	32
Freedom	"freedom of speech" (4)	21
Friends	"friends and people knowing different places" (3)	20
your	"exercising their freedom." "Defending your opinion" (3)	18
want	"I want to travel" (2)	11
travel	"travel without a plan." "Traveling with friends". "Family travels to have fun" (4)	11
Young	"young adults and the elderly" (2)	10
All	"all cultures of freedom" (2)	10

Table 33

India results of university sample for Freedom

Word	Meaning (Instantiation)	Absolute Frequency
Freedom	(no pattern recognizable)	24
Friend	(no pattern recognizable)	18
Family	(no pattern recognizable)	17
Person	(no pattern recognizable)	16
Student	Students need more freedom (4)	14
Time	(no pattern recognizable)	10

work	“keep work life balance maintain”, “varying roles at work”, “balance school work and social life” (4)	37
friend	“friends” as relevant people (5)	37
person	“people” as relevant people (3)	23
life	“work life balance” (2)	20
family	“family” as relevant people (5)	18
vary	“varied life”, do varied things (5)	14
student	“students” as relevant people (3)	12
experience	gaining new/different experiences (4)	12
activity	trying new/different activities (4)	12
thing	“do a variety of things” (3)	11
job	(no pattern recognizable)	10

Table 35

Brazil results of university sample for A varied life

Word	Meaning (Instantiation)	Absolute Frequency
friend	"Friends and family going to new places". "Female friends enjoying" (4)	31
new	"New cultures". "New foods". "New friends" (5)	21
work	"Business traveling." "Working in several shifts" (4)	18
life	"Healthier life". " choosing new ways of living" (3)	17
family	"Family out of routine search through travel" (3)	13
know	"See the world". "Meet new people" (5)	12
day	"Travel on a daily basis with people." "Daily basis busy life routine" (4)	12
travel	"Traveling and seeing the world." "You travel your friends and family" (4)	12
search	"Attempts to make things." "Try to learn new traditions" (5)	11
familiar	"Practicing different sports with friends and family" (4)	11
work	"Coworkers, family and friends encouraging" (3)	11
different	"Practice different sports." "Seeing different places" (4)	10
several	"Working at various jobs." "Work in various shifts" (4)	10

Table 36

India results of university sample for A varied life

Word	Meaning (Instantiation)	Absolute Frequency
life	(no pattern recognizable)	23
friend	(no pattern recognizable)	20

family	(no pattern recognizable)	16
person	(no pattern recognizable)	15

Daring

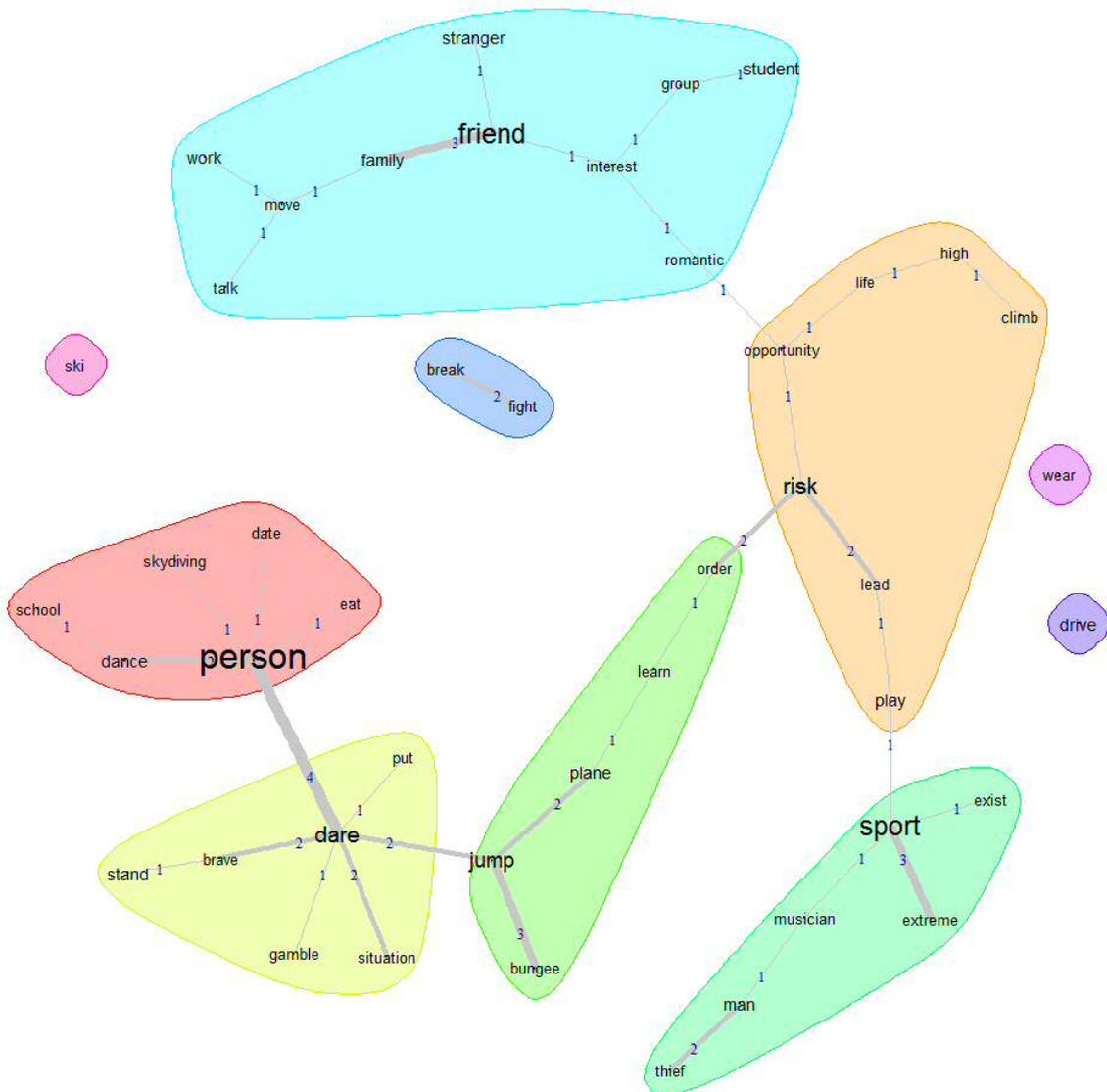


Figure 14. Result of the graphical similarity analysis for 'Daring'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 37

UK results of university sample for Daring

Word	Meaning (Instantiation)	Absolute Frequency
person	(no pattern recognizable)	25
sport	“extreme sports” (3)	17
friend	“friends” as relevant people (5)	15
dare	(no pattern recognizable)	12
risk	“have to take risks in order to try and win” (3)	10

Table 38

Brazil results of university sample for Daring

Word	Meaning (Instantiation)	Absolute Frequency
Studying	"taking a test without studying." "Leaving home to study in another city"	10

Table 39

India results of university sample for Daring

Word	Meaning (Instantiation)	Absolute Frequency
dare	(no pattern recognizable)	15
person	(no pattern recognizable)	15
situation	(no pattern recognizable)	14

friend	“spending time with family and friends”, “friends” as relevant people (4)	59
family	“spending time with family and friends”, “family” as relevant people (4)	38
enjoy	“Doing something you enjoy, such as a hobby”, “enjoy a fulfilling sexual relationship with their partner”, “enjoying food” (4)	29
person	“people” as relevant people (3)	24
eat	“enjoying food when eating”, “eating together” (5)	24
time	“spending time with family and friends”, “leisure time” (4)	21
watch	“watching a film” (4)	17
work	(no pattern recognizable)	16
talk	“talking” (5)	14
play	“playing games” (4)	14
drink	“drinking”, “having a drink” (4)	14
partner	“partner” as relevant people (5) [with whom you can have pleasure]	13
holiday	“on holiday” (4)	12
boyfriend	“spending time with my boyfriend” (5)	11

Table 41

Brazil results of university sample for Pleasure

Word	Meaning (Instantiation)	Absolute Frequency
friend	"Friends and family going to the movies." "Friends boyfriend playing video games" (4)	65
family	"Family and friends having fun." "Family and friends having fun playing football" (5)	32
be	"Being in the presence of nice people" (4)	30
pleasure	"Experiencing pleasure in the work." "Pleasurable feeling of satisfaction" (3)	26
boyfriend	"boy- or girlfriends and family traveling to see new places" (2)	21
day	"Going to the cafeteria every day." "relief the stress of everyday life" (4)	16
work	"Experiencing pleasure in the work." "Happy to be working together" (4)	16
eat	"Eating good food". "Friends and family eating in a bar" (4)	14
familiar	"To shop with friends and family." "Family Reunion" (3)	14
know	"Sightseeing", "Going to parks laughing with family" (4) [visiting, seeing, meeting, knowing have the same meaning in Portuguese in this context]	13
husband	"Husband, friend and family activities for practicing a healthier life" (4)	13
time	"Times of relaxation", "pleasant time" (4)	12

individual	"Individuals exercising" (3)	11
life	"Healthier life". "Living in family life" (4)	11
attend	"Watch a football game." "Watch a movie with a loved person" (3)	10

Table 42

India results of university sample for Pleasure

Word	Meaning (Instantiation)	Absolute Frequency
friend	family and friends (3)	18
person	(no pattern recognizable)	17
happy	(no pattern recognizable)	10

work	“Team members work hard to win and be successful in their sport”, “working hard to meet deadlines and achieve goals” (3)	33
student	“student striving for top grades”, “students” as relevant people (4)	28
exam	““passing your exams”, being good in exams (4)	22
job	“a job interview”, “in a job” (4)	20
friend	“friends” as relevant people (4)	20
win	winning in order to be successful, e.g. a lottery, a game (3)	17
sport	“sports competition”, “sports” as relevant situation (4)	17
university	“university” as a relevant place (4)	16
family	“successful home and family life”, “family” as relevant people (3)	16
hard	“studying hard to do well in exams”, “work hard in order to be successful” (4)	14
achieve	“achieve goals” (3)	14
successful	“aim to be successful” (4)	13
success	having success (4)	13
goal	“achieve goals” (3)	12
race	doing a race (2)	11
team	“Team members work hard to win and be successful” (mostly sport teams) (4)	10
person	(no pattern recognizable)	10

Table 44

Brazil results of university sample for Success

Word	Meaning (Instantiation)	Absolute Frequency
person	"People are approved in some selection" (5) [i.e. passing an entrance exam]	41
success	"Financial success". "Success in studies" (4)	24
get	"Able to meet objectives." (4)	23
friend	"Friends celebrating his professional career" victorious situations friends (5) [e.g. if you have passed an entrance exam]	19
business	"Private company" (3)	15
family	"Family get to have a good income." "Families having fun on the beach" (5)	15
life	"Overcome the obstacles of life" (4)	15
study	"Studying for an entrance exams and passing them" (4)	14
its	"His family". "Their goals" (3)	14
familiar	"Family congratulating the success" (3)	12
goal	"Life goals". "Personal goals" (4)	12
my	"My life". "My mother" (3)	12
pass	"Passing the entrance exams." (5)	12
professional	"Professional achievement". "Professional recognition" (4)	12

employment	"Get a job" (5)	11
achievement	"Personal fulfillment." "Professional achievement". "fulfilling of dreams" (5)	11
doctorate	"Finishing a doctorate" (5)	10

Table 45

India results of university sample for Success

Word	Meaning (Instantiation)	Absolute Frequency
friend	family and other people (4)	28
person	(no pattern recognizable)	28
family	family and friends (3)	21
life	(no pattern recognizable)	15
success	(no pattern recognizable)	15
work	working hard (4)	13
hard	working or trying hard (5)	12
good	being good (3)	11
job	(no pattern recognizable)	10

job	“applying for a new job”, “doing their job as best they can maybe to earn a promotion” (4)	31
work	“working to achieve their goal” (5)	25
student	“students” as relevant people (5)	24
achieve	“working to achieve their goal” (4) (similar to ‘success’ instantiation)	15
university	“university” as a relevant place (4) (similar to ‘success’ instantiation)	13
team	“Being in a competitive sports team” (3) (very similar to ‘success’ instantiation)	13
person	(no pattern recognizable)	13
hard	“working and training hard to achieve success” (4) (similar to ‘success’ instantiation)	13
sport	“sport” as relevant situation (4)	12
career	“career” as relevant situation (4)	12
school	“attending school and working hard to achieve good grades” (4)	10

Table 47

Brazil results of university sample for Ambition

Word	Meaning (Instantiation)	Absolute Frequency
family	"Having children, friends and family" wish to build a Family (4)	14
want	"Want it all". "Want sth. what you don't have" (4)	14
get	"Get the top job." "Get a raise" Achieve professional success (5)	13
other	"Always passing in front of the other" (3) [i.e. in order to pass entrance exams]	13
post	"Get the top job", "office" (4) [same like “get”]	10
colleague	"Colleague being jealous" (4)	10
society	"Competitive society". "Capitalist society" (4)	10

Table 48

India results of university sample for Ambition

Word	Meaning (Instantiation)	Absolute Frequency
job	Getting a good job (4)	18
education	(no pattern recognizable)	17
good	good job (3), good education (2)	17
person	(no pattern recognizable)	17

Table 49

UK results of university sample for Wealth

Word	Meaning (Instantiation)	Absolute Frequency
family	“providing for a family”, “family” as relevant people (3)	26
buy	“buying a house” (3)	24
person	(no pattern recognizable)	23
wealth	“those with more wealth have greater choice in this” (3)	17
money	(no pattern recognizable)	16
friend	“friends” as relevant people (4)	16
child	“provide children with what they need” (4)	13
shop	“going shopping”, food and clothes (5)	12
house	“buying a house” (4)	11
wealthy	(no pattern recognizable)	10
food	“buying food” (3)	10
afford	being able to afford expensive things (4)	10

Table 50

Brazil results of university sample for Wealth

Word	Meaning (Instantiation)	Absolute Frequency
friend	"Family and friends traveling" (5)	33
family	"Family friends have a healthy life." "Family living comfortable" (5)	31
wealth	"Family since greater wealth that does not exist" attaches great Importance to interpersonal relationships (4) [i.e. the most important thing what you can have is a family]	12
familiar	"Family environment". "Family members caring" (4)	10
health	"Taking care of health" (5)	10
life	"Celebrating Life". "Improving the quality of life" (3)	10

Table 51

India results of university sample for Wealth

Word	Meaning (Instantiation)	Absolute Frequency
family	(no pattern recognizable)	22
friend	(no pattern recognizable)	18

Table 52

UK results of university sample for Social Power

Word	Meaning (Instantiation)	Absolute Frequency
person	(no pattern recognizable)	27
power	"social power", (2)	25
social	"having good social power will help greatly", "The person with the highest social power is the person who decides" (3)	23
police	"police" as relevant people with social power (4)	23
group	"group" as relevant people (3)	17
friend	"friends" as relevant people (4)	16
work	(no pattern recognizable)	14
teacher	"teachers" as relevant people with social power (4)	14
vote	"trying to persuade people to vote for them" (5)	12
student	"teacher has power to teach students", "students as relevant people (4)	12
child	"parents trying to discipline children" (3)	12

Table 53

Brazil results of university sample for Social Power

Word	Meaning (Instantiation)	Absolute Frequency
society	"Welfare of society". "Democratic society" related to social situations common (5) [General well-being of society]	23
child	"Children and adolescents promoting sports." "School feeding and housing of children" (3)	13
family	"Social workers helping families' situations In which families receive help (4)	13
right	"Right of citizens" (5)	12
improvement	"Improvements to the population"; "Improvements to the community" (4)	12
community	"Community, family and friends" (5)	11
government	"Government that helps in feeding" (5)	10

Table 54

India results of university sample for Social Power

Word	Meaning (Instantiation)	Absolute Frequency
person	(no pattern recognizable)	37
give	give rights to people (12)	12
social	social power (3)	12
girl	(no pattern recognizable)	11
work	(no pattern recognizable)	10

Table 55

UK results of university sample for Family Security

Word	Meaning (Instantiation)	Absolute Frequency
family	“comforting other family members” (including financial support), “family” as relevant people (4)	87
child	“keeping watch of the children, making sure they do not run off etc.” staying in contact with children (4)	24
member	“family members” as relevant people (4)	20
parent	“children/ parents” as relevant people (4)	18
time	“supporting each other during hard times” (2)	14
support	“providing support and advice, being there no matter what, sticking together”, “supporting you if you get into difficulties, providing a stable home” (5)	14
provide	provide support/reassurance/help	13
home	“providing a stable home life” (3)	10
holiday	“holiday” as a relevant situation (5)	10

Table 56

Brazil results of university sample for Family Security

Word	Meaning (Instantiation)	Freq.
son	"Dad took son to play in the park." "Safety at home for parents and children" (3)	37
father	"Physical presence of parents" (3)	36
mother	"Father and mother come home" (3)	35
family	"Leisure on the beach with the whole family." "Taking care of all the family" (4)	32
all	"The whole family strolling carriage" (3)	22
security	"Electronic security". "Needing more security and police at the streets" (4)	20
home	"Installed electric fences in the wall of your home to feel safer" (3)	18
brother	"health insurance for me, mother, father, sister, and nephew." "Support mother and brother" (2)	16
familiar	"Contribute to the family income." "Mother and Father ensuring family financial situation" (4)	15
your	"Pay your taxes". Woman denounces her husband for domestic violence "(2)	15
your	"Having the risk of your home being burgled." " violence in public transport in your city" (2)	11

Table 57

India results of university sample for Family Security

Word	Meaning (Instantiation)	Absolute Frequency
family	(no pattern recognizable)	51
security	security of one's family (5)	14
life	security of one's life (4)	13
member	family member (5)	13
person	(no pattern recognizable)	12
child	(no pattern recognizable)	11
care	caring about others (3), not caring about others (3)	10

Respect for Tradition

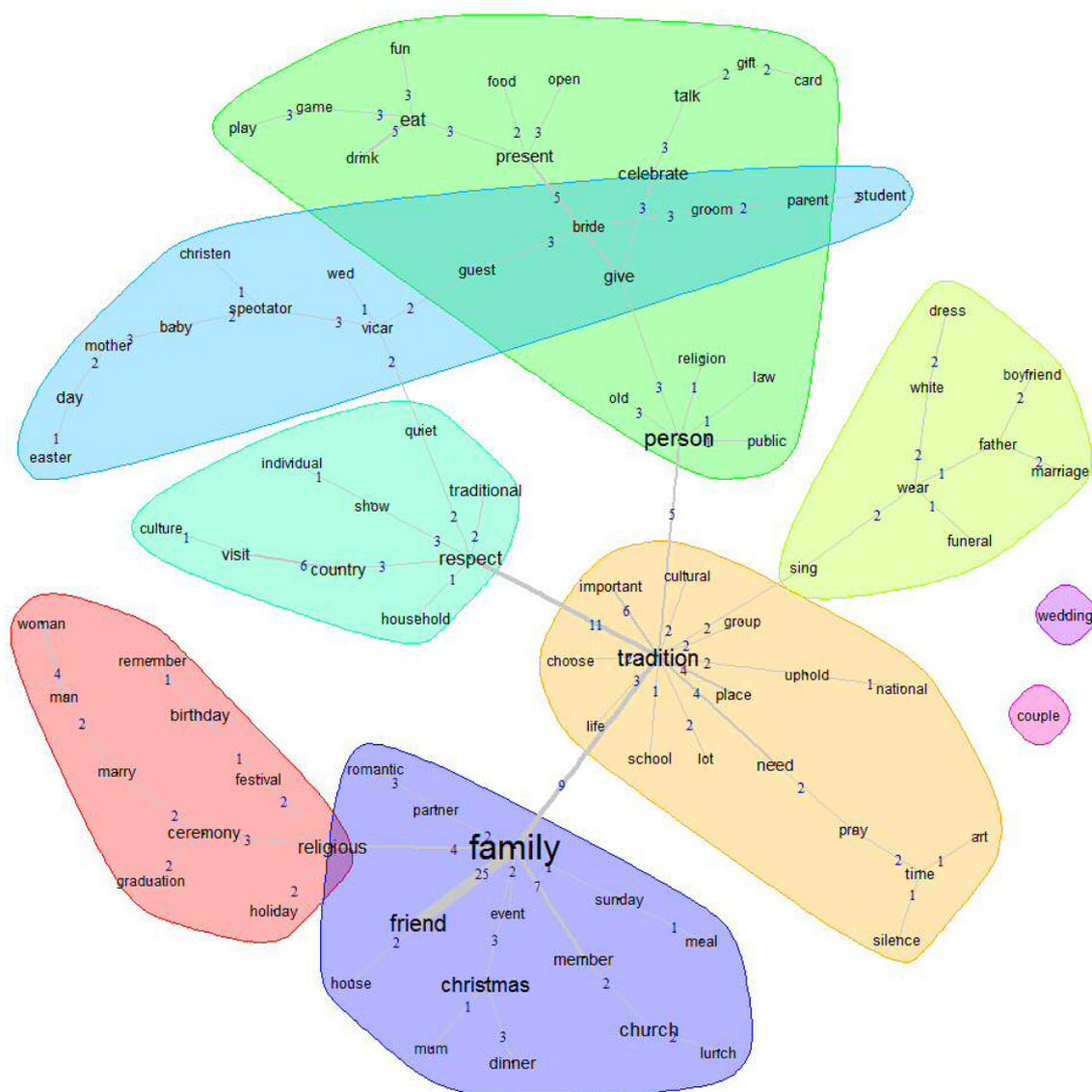


Figure 21. Result of the graphical similarity analysis for 'Respect for tradition'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 58

UK results of university sample for Respect for Tradition

Word	Meaning (Instantiation)	Absolute Frequency
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family	“family” as relevant people (4)	68
tradition	respecting/understanding traditions (3)	35
person	“persons” as relevant people who follow traditions (4)	33
friend	“friends” as relevant people (5)	30
Christmas	Having Christmas dinner with family, spending time with family during Christmas (5)	24
respect	“respecting the traditions” in various situations (4)	20
church	“church” as a relevant place (5)	19
religious	“religious ceremonies” (3)	16
eat	“Eating Christmas lunch together”, “Eating, drinking, helping to clear up together, swapping news” (3)	16
celebrate	Celebrating Christmas, marriage, birthday... (4)	13
present	giving presents for Christmas or birthday (4)	12
day	fathers/mother/valentines etc. day (4)	11
ceremony	Religious and graduation ceremonies (4)	10
birthday	“birthday” as relevant situation (5)	10

Table 59

Brazil results of university sample for Respect for Tradition

Word	Meaning (Instantiation)	Freq.
family	"Celebrating festive days new, Christmas year, St. John's, Carnival, Easter lunch with family". "Family celebrating an event" (4)	32
father	"Respect the request of the parents." "respect the parents" (5)	26
son	"Presence of children in cults or services." "Son hear teachings of his father" (4)	23
your	"Respecting others' opinions regardless of their culture" (3)	18
tradition	"Keeping alive the traditions." "Annually celebrate something that considers a family tradition" (4)	18
respect	"Respect your elders". "respect the parents" (4)	17
all	"Following the tradition of all the men of the family must graduate" (3)	16
friend	"Family and friends having fun." "Respect for religious beliefs neighbors friends" (4)	14
respect	"Respect for the family." "Respect the holy holidays." (the 'Saint holidays'), "Respect for tradition" (5)	13
familiar	"Family usually having lunch." "Ethical and respectful family" (4)	12
festival	"Religious festivals". "Cultural feast". "June festivals" (5)	11
follow	"Members of society follow certain dressing code." "Follow the traditions of their grandparents" (4)	11
city	"Show the tradition of his city." "Anniversary celebration of the city" (4)	10

Table 60

India results of university sample for Respect for Tradition

Word	Meaning (Instantiation)	Absolute Frequency
tradition	(no pattern recognizable)	26
person	(no pattern recognizable)	23
family	(no pattern recognizable)	18
respect	(no pattern recognizable)	17
wear	wearing traditional dresses (5)	16
traditional	traditional dresses (4)	15
dresses	wearing traditional dresses (5)	13
festival	(no pattern recognizable)	13
friend	(no pattern recognizable)	13
culture	(no pattern recognizable)	10

Self-discipline

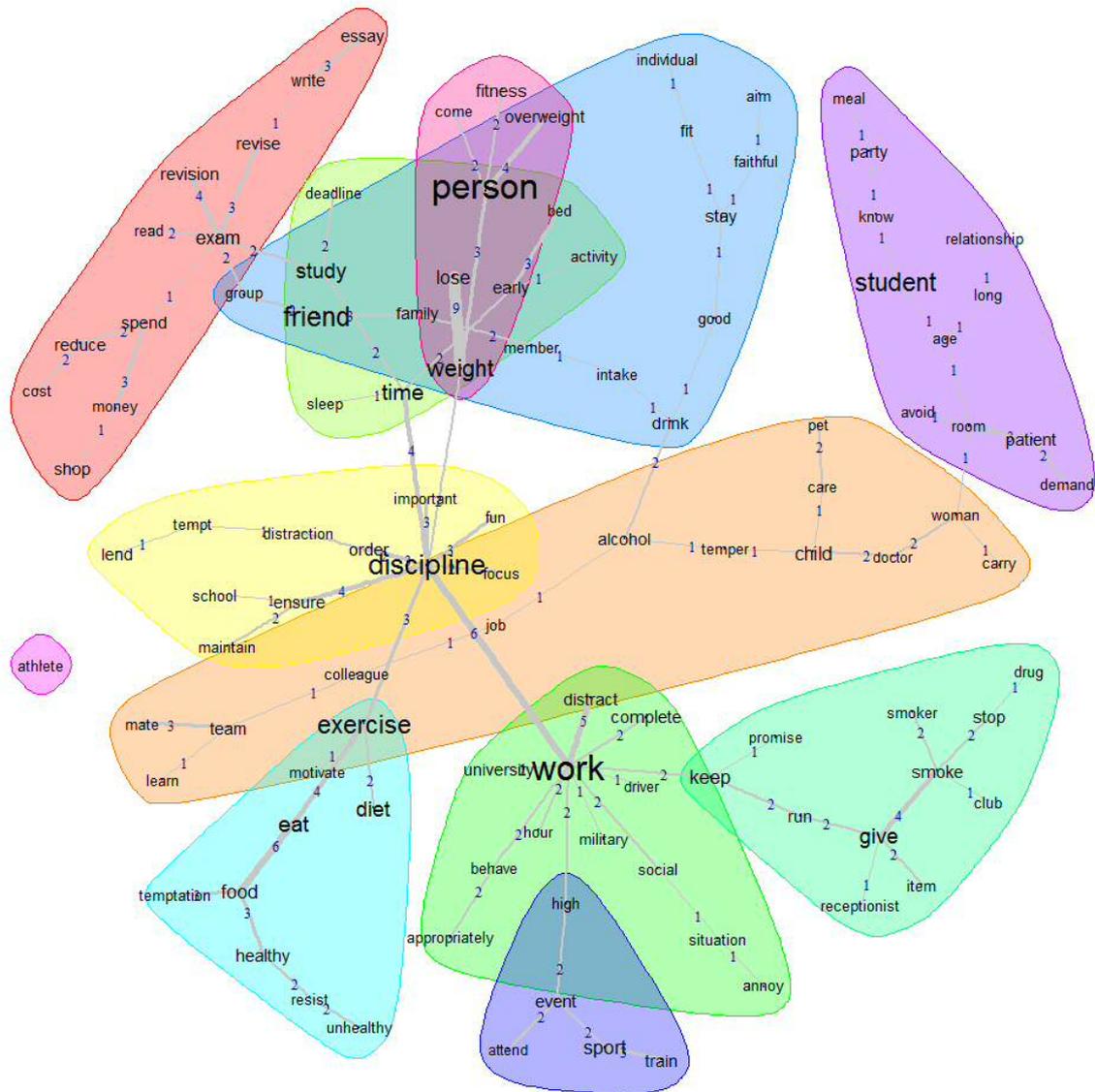


Figure 22. Result of the graphical similarity analysis for ‘Self-discipline’. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 61

UK results of university sample for Self-discipline

Word	Meaning (Instantiation)	Absolute Frequency
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work	“get work done trying your best to succeed” (3)	34
person	“people” as relevant people, who are or should be self-disciplined (4)	34
discipline	“need to discipline yourself” (3)	24
friend	“friends” as relevant people (5)	22
student	“students” as relevant people (5)	19
exercise	“exercising” (4)	19
weight	“losing weight” (5)	17
time	(no pattern recognizable)	15
eat	“Not eating all of the food”, “Resisting the urge to eat unhealthy food” (5)	15
give	“Giving up smoking”, “Have to keep motivating yourself to run even if you want to give up” (3)	14
diet	“dieting” (5)	13
study	“studying” (5)	12
sport	training/playing sport (4)	11
exam	“exams” as relevant situations (4)	11
lose	“losing weight” (5)	10
keep	keeping yourself motivated/healthy (4)	10

Table 62

Brazil results of university sample for Self-discipline

Word	Meaning (Instantiation)	Freq.
your	"Succeed in your professional career." "Have discipline in your work routine " (4)	23
all	"Do all the work." "Every athlete needs discipline." "Every society needs a lot of self-discipline" (4)	14
day	"Control in a situation of everyday life" (3)	12
teacher	"Teachers teaching a new language." "Teachers and students studying" (4)	12
friend	"Family leisure family friends in the park" (2)	11
student	"Student does not respect the teachers." "Students completing the course" (4)	10
family	"My family supports me and encourages me to be better qualified at work" (3)	10

Table 63

India results of university sample for Self-discipline

Word	Meaning (Instantiation)	Absolute Frequency
discipline	“self-discipline” (5), “should maintain self-discipline” (3)	33

person	“people” as relevant people, who are or should be self-disciplined (5)	22
friend	“friends” as relevant people (5)	16
work	“work” as typical activity (4), “work” place (4)	16
student	“students” as relevant people (5)	13
family	“family” as relevant people (5)	11

Obedience

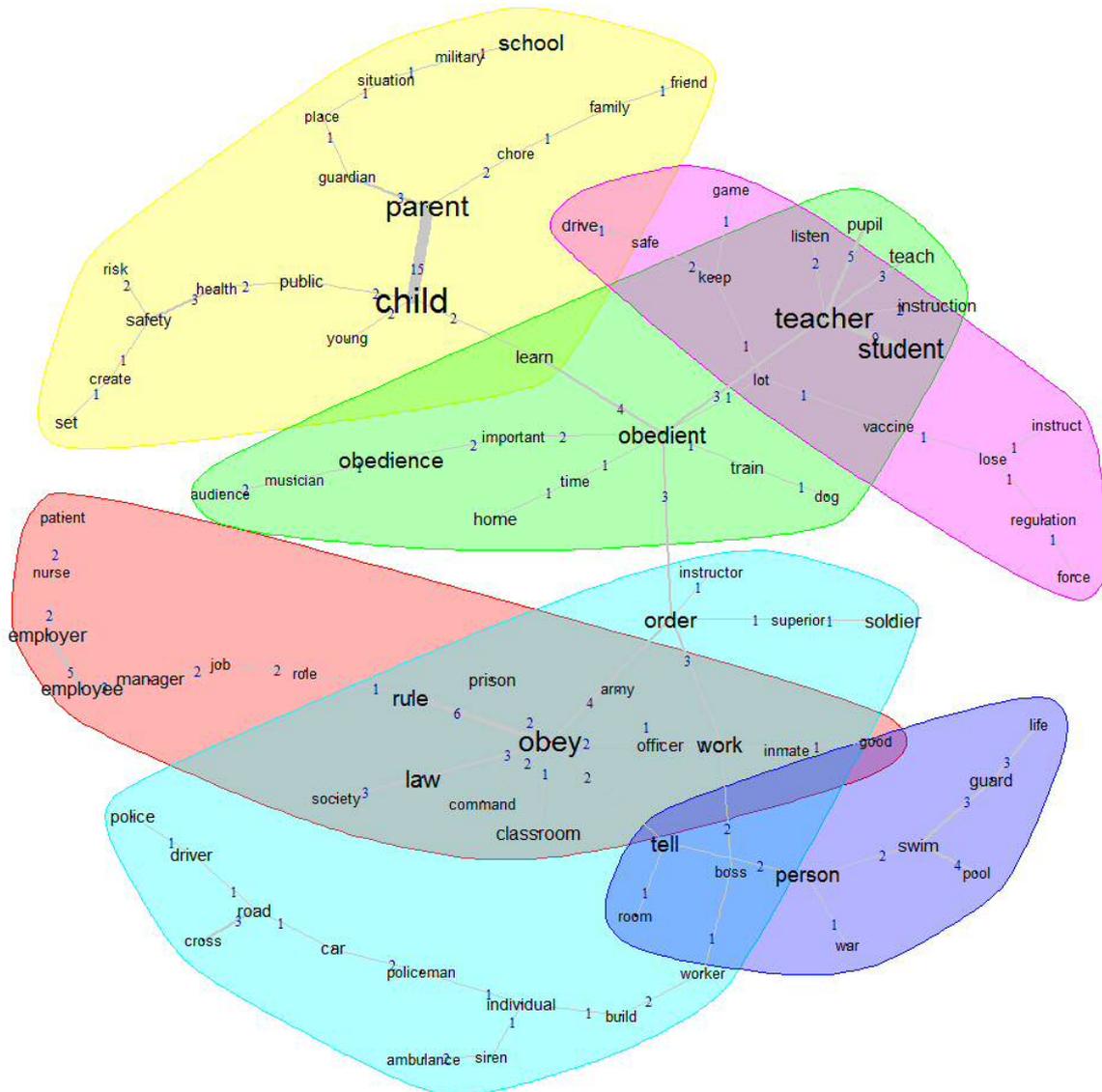


Figure 23. Result of the graphical similarity analysis for ‘Obedience’. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 64

UK results of university sample for Obedience

Word	Meaning (Instantiation)	Absolute Frequency
child	"Children need to be obedient" (4)	31
obey	"obey the law", "obeying rules" (3)	23
teacher	"obey teachers" (4)	22
parent	"parents" as relevant people, to whom you have to be obedient (4)	22
student	"students" as relevant people, who have to be obedient (4)	21
order	obeying orders (5)	15
obedient	"attending school, being obedient as required by teachers", "you [should] be obedient, you would learn and experience more than less obedient interns" (4)	15
obedience	(no pattern recognizable)	15
law	"Compliance with the law", "obey the law" (5)	14
work	"at work" as relevant situation (4)	13
tell	High-ranking person tells inferiors what to do (4)	13
school	"attending school, being obedient as required by teachers" (5)	13
rule	obeying/following rules (4)	12
person	(no pattern recognizable)	12
employee	"employees" as relevant people, who have to be obedient (4)	10

Table 65

Brazil results of university sample for Obedience

Word	Meaning (Instantiation)	Freq.
father	"Obey the parents." "listening to your parents" (4)	49
obey	"Obey parents even without agreeing." "Obey the seniors." "Obey the rules" (5)	43
son	"Son or daughter compliance to rules." "Apologize father and SON" (4)	28
teacher	"Respect to the professor." "Classroom teacher and students who learn" (4)	22
student	"Students who learn." "Students who respect staff members" (4)	21
ask	"Parent and father asking to do things". "Professor asks for silence" (5)	20
rule	"Accept boss' rule." "Employees and companies following rules" (4)	20
follow	"Follow the rules imposed by government." "Following the instructions" (4)	19

mother	" obey mother and father." "help your mother when she asks" (4)	14
old	"listen to older people." "take advices from older people". "be obedient to older people" (5)	14
friend	"Having respect for a friend" (3)	12
respect	"Obeying and respecting older people". "respect older people." "Respect for parents" (5)	12
class	"Obedience in classroom." "Attend to classes and obey the rules" (4)	11
law	"Follow the law". " obey the traffic law." "Obey the laws of the government" (5)	10

Table 66

India results of university sample for Obedience

Word	Meaning (Instantiation)	Absolute Frequency
work	"at work" (4)	19
teacher	"teacher" as typical people to whom one need to obey	16
family	(no pattern recognizable)	14
obedience/obedient	(no pattern recognizable)	14
student	"student must be obedient" (2)	14
person	(no pattern recognizable)	10

Helpfulness

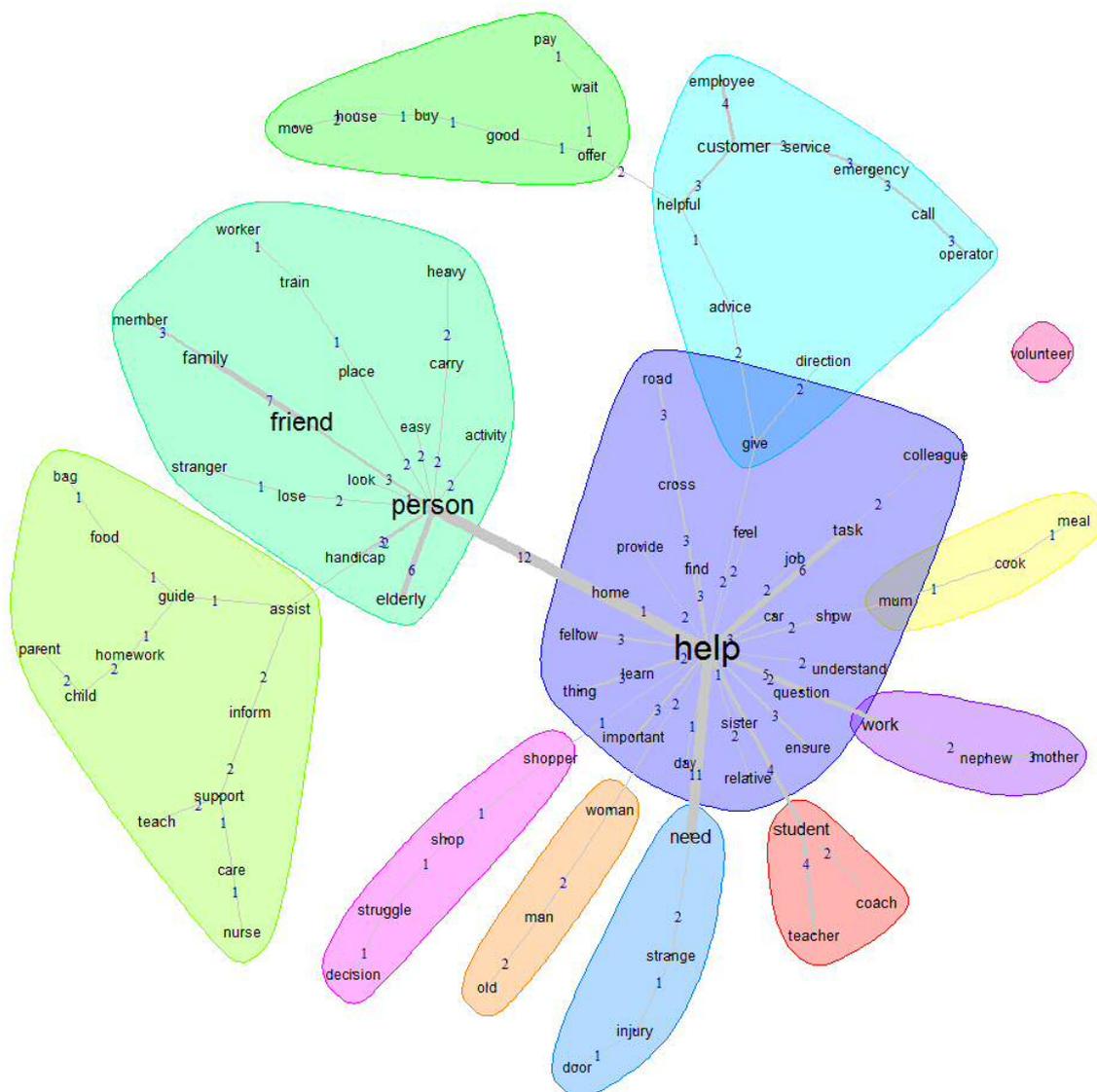


Figure 24. Result of the graphical similarity analysis for 'Helpfulness'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 67

UK results of university sample for Helpfulness

Word	Meaning (Instantiation)	Absolute Frequency
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help	helping other people (4)	67
person	helping (elderly) people (3)	45
friend	“friends” as relevant people (5)	37
need	helping someone in need (3)	17
work	“helping with work situations” (2)	13
student	“students” as relevant people (4)	12
family	“family” as relevant people (4)	12
customer	“customer service” (4)	11

Table 68

Brazil results of university sample for Helpfulness

Word	Meaning (Instantiation)	Freq.
help	"Helping friends and family." "Help in difficult moments parents friends and family" (4)	45
friend	"Hear a familiar friend when needed" (4)	41
work	"Help work colleagues". "Offer help to another coworker" (4)	40
colleague	"Colleague offer help to another colleague." "Help the 'next one', neighbor or co-worker" (5)	24
elderly	"Helping an elderly cross the street." "Gives rise to an elderly passenger who has no where to sit" (5)	18
street	"Crossing the street elder or child." "Help a blind man cross the street" (5)	17
help	"Help poor people." "Help by giving food." "Helping people in poverty" (4)	15
give	"Gives a lift to another." "Giving another people place to sit" (4)	15
family	"Help needy families." "Understand the demands of other families" (4)	15
offer	"Help support". "Offer a ride." "Offer to help your mother" (5)	15
student	"College students are helping their colleagues" (3)	14
familiar	"Help friend and family when they are moving." "Pay a bill of a family" (4)	14
service	"Provide the requested service." "Performing free services" (4)	13
passenger	"A passenger offer your place to another" (4)	12
always	"Always present on the job." "In the leisure area is always helpful" (4)	11
ask	"Family and friends need help and ask for it" "A friend asks you to solve a problem" (4)	10
specify	"Families need and ask for help." "One needs a ride." "Poor people need of food" (4)	10

Table 70

UK results of university sample for Loyalty

Word	Meaning (Instantiation)	Absolute Frequency
friend	“standing by your friends and being loyal to them”, “friends” as relevant people (4)	64
family	“family” as relevant people, being loyal towards your family (3)	23
work	“in a work place” (4)	22
person	(no pattern recognizable)	22
relationship	“in a relationship” (5)	19
support	“Supporting your team at football, rugby”, “supporting each other” (e.g. family, friends) (4)	18
loyal	“A stranger shows romantic interest in you, but you stay loyal to your boyfriend, girlfriend”, “standing by your friends and being loyal to them” (4)	17
team	“Staying Loyal to team by no underhand tactics and by good teamwork” (4)	15
colleague	“defending a colleague” (2)	15
time	spending time with close ones if they are in trouble (2)	13
partner	“partner” as relevant people (4)	13
stay	“staying loyal” (5)	12
secret	“keeping secrets” (4)	10

Table 71

Brazil results of university sample for Loyalty

Word	Meaning (Instantiation)	Freq.
friend	"Do not lie to friend." "Friends who help in the crisis" (4)	72
loyalty	"In every marriage there must be loyalty." "Have loyalty to your boss." (4)	25
familiar	"Family always be faithful." "Help friends and family" (3)	23
fair	"Relationship shows a couple loyal to another." "Be loyal to those we love." "Always be loyal and true to who is on our side" (4)	20
business	"Demonstrate loyalty to the company that trusted him." "Have commitment to the company" (4)	17
always	"Always attend the same company." "Always be faithful and loyal to those who are always on our side" (4)	15
all	"Come together at all times" (3)	15
help	"Friends who help in the crisis." "Help a needy person on the street." "Is always willing to help" (5)	14

colleague	"Co-workers being fair" (3)	13
friendship	"The person is loyal to a friendship." "Friendship two friends keeping in touch whenever possible" (4)	12
brother	"When a brother helps his other brother" (3)	12
dog	"Dog shows loyalty to his master" (5)	11
husband	"Husband respecting his wife." "Husband and wife being loyal to the commitment of marriage" (4)	11
woman	"Marriage husband and wife." "" Woman is being faithful to her husband "(4)	11
boyfriend	"The girlfriend of a friend is flirting with me" (3)	11
money	"Working with money." "You lend money to friends" (4)	10
employee	"Loyalty of an employee in the company" (5)	10

Table 72

India results of university sample for Loyalty

Word	Meaning (Instantiation)	Absolute Frequency
person	(no pattern recognizable)	12
loyal	(no pattern recognizable)	10

Honesty

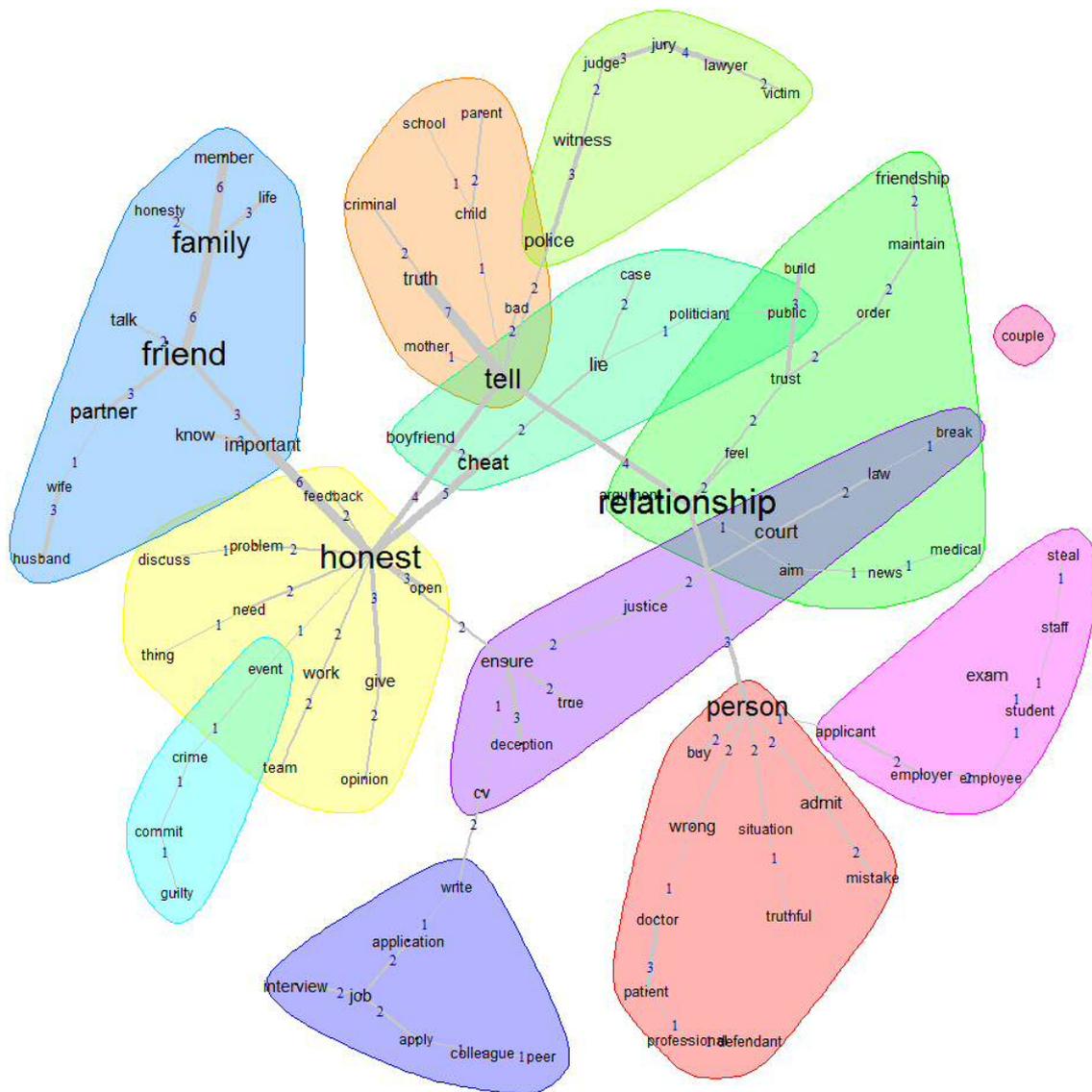


Figure 26. Result of the graphical similarity analysis for 'Honesty'. Numbers indicate how often two words were mentioned together in single responses. Same colours indicate that words were mentioned together.

Table 73

UK results of university sample for Honesty

Word	Meaning (Instantiation)	Absolute Frequency
relationship	"in a relationship" (4)	31
honest	"being honest" to friends, family etc. (4)	30
friend	"friends" as relevant people (5)	30
family	"family" as relevant people (4)	25
person	(no pattern recognizable)	22
tell	telling the truth (4)	21
partner	"partner" as relevant people (5)	13
cheat	"not cheating" (4)	13
lie	do not lie (4)	12
police	(no pattern recognizable)	11
court	"court" as relevant situation (5)	11

Table 74

Brazil results of university sample for Honesty

Word	Meaning (Instantiation)	Freq.
money	"Politicians stealing government money." "Someone finds money on the ground and returns." "Returns the money he received" (4)	21
find	"Find money". "Find documents and deliver the right person" (4)	15
return	"Get a wrong change and return." "Do not keep the money for themselves returning to the owner" (5)	15
other	"Be true to each other no lies." "Friends are honest with each other" (4)	15
change	"Get a wrong change and return" (5)	15
friend	"I am honest to friends." "Borrow money and give it back" (5)	14
receive	"Get a wrong change and return." "Return the money he received wrong" (5)	13
its	"Perceiving and understanding comprising its existence" (3)	13
honest	"An honest person". "My mother she is an example of honest person." "An honest person does not accept what is not yours" (4)	12
wrong	"Does not accept wrong change." "Get a wrong change and return" (5)	10

Table 75

India results of university sample for Honesty

Word	Meaning (Instantiation)	Absolute Frequency
person	“person” as typical people who should be honest (3)	34
friend	(no pattern recognizable)	25
situation	(no pattern recognizable)	18
honest	“should be honest” (4)	16
family	(no pattern recognizable)	12
parent	“parents” as typical people	11
time	(no pattern recognizable)	11
respect	Being honest is to show respect to other people (5)	10
work	To “work” as a typical activity for which honesty is important	10

Detailed results of Study 5

Table A12

Study 5: Absolute frequencies of how often an instantiation thought to be related with various values (Brazil – UK)

	Brazil							United Kingdom						
	Creativity							Creativity						
	Varied	Equality	y	Wisdom	Loyalty	Unity	?	Varied	Equality	y	Wisdom	Loyalty	Unity	?
Unity with Nature														
Walking outside (1u1)	13	4	1	2	3	47		2		2				39
Being in the garden (1u2)	4		3		2	57	1							40
Preserving the environment (1b1)			4	24	1	43								42
Planting trees (1b2)		1		9		58			1					43
Walking on the beach (1b3)	17	3	1	1	1	53	1	3						37
Spending a few hours in the park (1n1)	30	1	1			40	1	1						40
Wisdom	Wisdom	Daring	Success	Honesty	Unity	Varied		Wisdom	Daring	Success	Honesty	Unity	Varied	
Giving advice (2u1)	63		1	2		1	1	29			14			
Making important decisions (2u2)	60	6	5	2				29		10				
Explaining something (2a1)	65	1	1	7			1	37		1	4			
Receiving advice (2b1)	63	1	3	3		2		35		2	7			
Solving conflicts (2b2)	61	1		3			2	19		1	20			
Dealing with awkward situations (2b3)	31	22		1		12	4	15	6		16		3	1
A World of Beauty														
				Obedien							Obedien			
	Power	Broad	Security	ce	Beauty	Wisdom		Power	Broad	Security	ce	Beauty	Wisdom	
Beauty pageants (3u1)	7	2	2	1	51	2	5	7	1		2	28		5
Walking outside (3u2)	3	16	3	1	39	4	1	1				38		1
Having fun with friends (3b1)	13	26	1	1	14	5	2	8	17	6		3		9
Enjoying life with close relatives (3b2)	2		56	3	3	9	4			42		1		
Taking care of one's own body (3b3)	1	4	3	5	31	24	5	1	2	3	5	12	13	4
Enjoying an art museum (3n1)	1	14			43	9			5			35		1
Social Justice														
	Wealth	Justice	Loyalty	Power	Ambiti	Wisdom		Wealth	Justice	Loyalty	Power	Ambiti	Wisdom	

Gay rights (4u1)	2	57	2	4		2	0		35	1	3	1	3
Ensuring that equity is applied equally to all (4u2)		65	3	3		1	1	1	35		2		1
Public services (4b1)	1	49	1	14		1	2	1	32		6	1	2
Fighting against prejudices and crimes (4b2)		68		2					44				
Fighting against difficulties in the society (4b3)	1	58	2	3	2	1			39			1	
Ensuring animal rights (4n1)		39	12	1		15	4		37	1			2 1
Broad-mindedness	Protect	Justice	Freedom	Daring	Broad	Honesty		Protect	Justice	Freedom	Daring	Broad	Honesty
Meeting new people (5u1)		1	38	1	29	1				5	5	32	1
Living in the moment (5b1)			47	8	11	1				17	20	3	
Reducing prejudices (5b2)		34	15		20	1			19	3		20	
Accepting other social orientations (5b3)		8	6		53		1		3	2		39	
Approaching strangers (5b1)		2	13	14	39	1	4			4	13	22	
Reading authors with different political views (5n2)		2	8		66		1		1	4		36	
Protecting the environment	Varied	Helpfuln	Wealth	Protect	Unity	Daring		Varied	Helpfuln	Wealth	Protect	Unity	Daring
Putting certain rubbish in recycle bins rather than general waste* (6u1)		9		54	3	1			1		42		
Making sure the lights are off (6u2)	3	21	4	36	7	1	5		1		39		
Walk instead of using car for short distances (6u3)	8	2	1	48	6						38	4	
Throwing garbage in the bin (6a1)				61	8	1	1		4		36	3	1
Saving water* (6b1)		6	3	52	11				1	1	35	3	
Installing heat insulation in the house* (6n1)	10	8	25	11		3	3	1	4	8	25		2
Equality	Obedien	Creativit	Equality	Protect	Discipli	Security		Obedien	Creativit	Equality	Protect	Discipli	Security
Allowing all children to use all equipment (7u1)	5	8	20	1	10	12	4	4	5	22		6	2 4
Fair evaluation of job applications (7u2)	2	5	34	1	22	4	4			39		1	
Fair treatment in the work place (7u3)	10		46	1	16					42			
Treating everyone in the same way without regard to their sex (7b1)			66							44			
University quotas for blacks and Indians (7b2)	2		65		1		9			39			1
Discrimination against left-handed people (7n1)		2	22		10		3	1	1	17			2

	Helpfuln						Helpfuln						
	Honesty	Success	ess	Pleasure	Protect	Freedom ?	Honesty	Success	ess	Pleasure	Protect	Freedom ?	
Freedom													
The right to vote (8u1)	4		11	2		47 3			1			39 3	
Having the possibility to choose (8u2)		3	1	1	1	67						40	
Knowing people from different places (8b1)		1	2	30		41 1		2	5	1		28 6	
Defending one's own opinion (8b2)	7	1	2			62	6	2				34 2	
Traveling (8b3)		1		56	1	9				10		30	
Questioning religious authorities (8n1)	1		3	3	1	47 4	6					32 3	
	Disciplin			Obedien		Creativit	Disciplin			Obedien		Creativit	
Creativity	e	Tradition	Varied	ce	Protect	y	e	Tradition	Varied	ce	Protect	y	
Making art (9u1)	1	2	4	1	1	60 1						43	
Painting (9u2)	1		5		1	60						40	
Being original at work (9b1)	24	2	2	5	1	36 2						40 1	
Companies who aim to prosper (9b2)	30	4	1	4		27 0	16	1		2	1	16 8	
Solving problems (9a1)	27	1	3	3	2	31 6	8		1	2		26 2	
Thinking of new ideas (9a2)			5		1	60						41	
A varied life	Success	Justice	Tradition	Pleasure	Broad	Varied	Success	Justice	Tradition	Pleasure	Broad	Varied	
Maintaining a good work life balance (10u1)	49			13		4 1	5			3		34 1	
Gaining new experiences (10u2)	22			10	11	33				1	8	31	
Trying different activities (10a1)	18	1		11	5	30 2					13	27 1	
Trying new food (10b1)			2	30	10	30 1				3	16	25	
Trying to learn new traditions (10b2)	1		15	5	36	13 1		1	14		20	5	
Practicing different sports (10b3)	1			25	2	39	2			7	1	31	
	Obedien						Obedien						
Daring	ce	Wisdom	Tradition	Honesty	Beauty	Daring	ce	Wisdom	Tradition	Honesty	Beauty	Daring	
Doing extreme sports (11u1)		5	1	1	3	56						42	
Risk-taking (11u2)	1	1	2		2	63 3						40	
Taking a test without studying (11b1)	1	8			1	55 8		1				37 4	
Leaving home to study in another city (11b2)		14			1	50 2		4			3	37	
Participating in an experiment that was not approved by an ethics committee (11n1)	1	1	8	1		49 6	9		1			26 4	

Being able to celebrate life (15b2)	24	30	7	5	2	5	1	30	4	5			1
Being able to buy organic food* (15n1)	29	15	6	4		2	2	5	3		25		8
Social Power	Success	Unity	Power	Protect	Wealth	Varied		Success	Unity	Power	Protect	Wealth	Varied
Making decisions which are followed by other people (16u1)	5		41			7	3	1		41			1
Trying to persuade people to vote for you (16u2)	3	1	58		1	2	8	2		37			
Providing welfare to society (16b1)	7	2	29	4	1	8	3	4		18	3	3	2
Strengthening the rights of citizens (16b2)	7	3	48			2	9	4	1	32			7
Being able to make improvements within a community (16b3)	7	1	49	2	4	1	3	7	3	14	10	2	1
Controlling other people (16n1)			59		5	2	6	1		38			2
Family Security	Helpfuln	Justice	Ambitio	Creativit	Securit	Beauty		Helpfuln	Justice	Ambitio	Creativit	Securit	Beauty
Comforting close relatives (17u1)	37	6	1	1	25		1	8				34	
Keeping watch over the children (17u2)	34	4	1		27		1	5	1			34	
Providing a stable home life (17u3)	7		2		59		1	2				40	
Leisure time on the beach with close relatives (17b1)	9	1		6	18	28	6					28	14
Installing electric fences for your home* (17b2)	1	1		2	69				1		1	36	2
Ensuring a good income (17b3)	6	4	38		25	2	2	1		20		20	
Respect for Traditon	Tradition	Pleasure	Helpfuln	Beauty	Success	Creativit		Tradition	Pleasure	Helpfuln	Beauty	Success	Creativit
Celebrating religious ceremonies (18a1)	60	10	1	2			2	42					
Spending time with family at Christmas (18a2)	39	29	3		2			29	10		1		
Honouring your parents' requests (18b1)	53		12	1	1			30		10			2
Listening to your father's advice (18b2)	53	2	8	1	5			22		11		6	1
Celebrating the anniversary of the city in which you live (18b3)	63	2	1		1			35			4	1	
Celebrating a carnival (18n1)	23	35		5			8	19	19		1		2
Self-discipline	Freedom	Honesty	Power	Creativit	Discipli	Wealth		Freedom	Honesty	Power	Creativit	Discipli	Wealth
Exercising (19u1)	23			5	37	1	1	2				38	1
Losing weight (19u2)	10			3	51	1	4	1	1			38	
Quitting smoking (19u3)	8			1	55	1	3					41	

Succeeding in your professional career (19a1)	1	8	8	4	32	18	1	1		1	3	28	9	
Doing all your work (19b1)	1	8		2	63	1	1					40		
Living your own life and not following the crowd (19n1)	1	8		2	63	1	1	33	1		1	5		
Obedience	Wisdom	Obedience	Freedom	Discipline	Tradition	Equality	Wisdom	Obedience	Freedom	Discipline	Tradition	Equality		
Complying with the law* (20a1)	6	46		11	5	3		39		2		2		
Children need to comply (20a2)	5	49		13	6		1	38			2			
A high-ranking person telling inferiors what to do (20a3)	8	33	3	5	5		9	3	32		1	1	1	3
Listening to older people (20b1)	26	27					13	31	5			7	1	
Attending classes and following the rules (20b2)	5	41	1	19	2	1		1	30		9			
Helping your mother if she asks for it (20b3)	2	60		1	2	2		1	30	1		5	2	2
Helpfulness	Broad	Varied	Justice	Helpfulness	Tradition	Creativity		Broad	Varied	Justice	Helpfulness	Tradition	Creativity	
Customer service (21u1)	2	1	43	15	1		9	1		3	35			3
Supporting other people (21a1)	1	1	4	59	2			4		6	30			
Supporting colleagues (21a2)	3			63	2		1	1		2	38	1		
Offering a lift (21b1)	5	17		35	1	6	3				43	1		
Giving food to poor people (21b2)	3	1	25	43				1		11	28			
Accepting a gift (21n1)	17	7		14	18	1	9	5	2	2	1	16	1	3
Loyalty	Creativity	Obedience	Protect	Loyalty	Varied	Helpfulness		Creativity	Obedience	Protect	Loyalty	Varied	Helpfulness	
Supporting your rugby team (22u1)				38	18	3	8				41			2
Defending a colleague (22u2)				56	1	14	2		1		36		4	
Keeping secrets* (22u3)	1	3		59	3	1					39			3
Standing by your friends (22a1)				47		22					44			
A husband who respects his wife (22b1)		3		61		2					39			1
Always working for the same company (22b2)	1	4	1	49	1	8	7		3		38			
Honesty	Justice	Wisdom	Honesty	Discipline	Power	Pleasure		Justice	Wisdom	Honesty	Discipline	Power	Pleasure	
Not cheating (23u1)	1	6	56	10				2	1	34	6			
Telling the truth (23a1)		3	61	2						40				

Returning money which you have found or wrongly received (23b1)^	3		65		1			
Borrowing money and giving it back (23b2)	2	1	62	2		5	73	4
Completing an exam without cheating* (23n1)		7	56	7	1		40	
Informing a car owner when you have accidentally damaged his/her car (23n2)	6	1	70			1	39	

Note. Most frequent chosen value in bold if significant different from the second most often chosen value. ?: "Don't know". Unity: Unity with nature, Beauty: A world of beauty, Protect: Protecting the environment, Justice: Social Justice, Broad: Broad-mindedness, Varied: A varied life, Power: Social power, Security: Family security, Tradition: Respect for Tradition, Discipline: Self-discipline.

1u1 is the first instantiation mentioned by British participants of the first value (here: Unity with nature), 2b3 is the third instantiation mentioned by Brazilian participants of the second value. The letter "a" in the middle stands for all (i.e., mentioned in all two countries), the letter "n" indicates that the instantiation was not mentioned by the participants in none of the two countries (i.e., was created by me).

Detailed results of Study 6

Table A13

Study 6: Descriptive statistics and mixed ANOVA statistics

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η _C	F_V	p_V	η _V	F_IA	p_IA	η _IA
installs heat insulation in the house (6n1)-happy	-0.53	0.005	1.83	2.50	-0.66	230	5.95	0.016	0.03	94.70	0.000	0.29	3.16	0.077	0.01
installs heat insulation in the house (6n1)-surprised	-0.23	0.238	0.77	-0.76	1.53	220	23.54	0.000	0.10	0.27	0.606	0.00	9.91	0.002	0.04
installs heat insulation in the house (6n1)-sad	-0.12	0.545	-0.87	-2.48	1.61	212	26.48	0.000	0.11	76.78	0.000	0.27	19.96	0.000	0.09
installs heat insulation in the house (6n1)-embarrassed	-0.19	0.322	-0.51	-1.10	0.59	213	8.23	0.005	0.04	18.72	0.000	0.08	2.71	0.101	0.01
installs heat insulation in the house (6n1)-angry	-0.36	0.069	-1.12	-1.96	0.83	215	13.89	0.000	0.06	56.88	0.000	0.21	4.40	0.037	0.02
installs heat insulation in the house (6n1)-nervous	-0.32	0.109	-1.08	-1.26	0.18	211	3.87	0.051	0.02	36.04	0.000	0.15	0.21	0.649	0.00
installs heat insulation in the house (6n1)-proud	-0.22	0.254	1.71	1.51	0.20	214	5.38	0.021	0.02	53.44	0.000	0.20	0.20	0.655	0.00
does not install heat insulation in the house (6n1-R)-happy	-0.12	0.525													
does not install heat insulation in the house (6n1-R)-surprised	-1.09	0.000													
does not install heat insulation in the house (6n1-R)-sad	-1.11	0.000													
does not install heat insulation in the house (6n1-R)-embarrassed	-0.55	0.005													
does not install heat insulation in the house (6n1-R)-angry	-0.63	0.001													
does not install heat insulation in the house (6n1-R)-nervous	-0.27	0.169													
does not install heat insulation in the house (6n1-R)-proud	-0.46	0.019													
lives in a house without a smoke detector (11n2)-happy	0.10	0.598	-1.99	-3.46	1.48	225	5.89	0.016	0.03	125.35	0.000	0.36	9.83	0.002	0.04
lives in a house without a smoke detector (11n2)-surprised	-1.46	0.000	-1.85	3.62	-5.48	223	0.23	0.629	0.00	3.32	0.070	0.01	141.22	0.000	0.39
lives in a house without a smoke detector (11n2)-sad	-0.83	0.000	0.78	2.22	-1.44	210	12.89	0.000	0.06	49.07	0.000	0.19	12.77	0.000	0.06
lives in a house without a smoke detector (11n2)-embarrassed	-0.81	0.000	0.06	1.60	-1.54	214	4.30	0.039	0.02	15.43	0.000	0.07	17.52	0.000	0.08
lives in a house without a smoke detector (11n2)-angry	-1.50	0.000	0.44	2.85	-2.41	213	39.14	0.000	0.16	63.92	0.000	0.23	41.51	0.000	0.16
lives in a house without a smoke detector (11n2)-nervous	-1.88	0.000	0.57	3.62	-3.05	212	72.83	0.000	0.26	93.58	0.000	0.31	59.22	0.000	0.22
lives in a house without a smoke detector (11n2)-proud	-0.30	0.122	-1.54	-1.67	0.13	212	3.80	0.052	0.02	46.76	0.000	0.18	0.08	0.779	0.00

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η_C	F_V	p_V	η_V	F_IA	p_IA	η_{IA}
lives in a house with a smoke detector (11n2 - R)-happy	-0.75	0.000													
lives in a house with a smoke detector (11n2 - R)-surprised	1.77	0.000													
lives in a house with a smoke detector (11n2 - R)-sad	0.01	0.952													
lives in a house with a smoke detector (11n2 - R)-embarrassed	0.32	0.108													
lives in a house with a smoke detector (11n2 - R)-angry	0.03	0.867													
lives in a house with a smoke detector (11n2 - R)-nervous	-0.15	0.458													
lives in a house with a smoke detector (11n2 - R)-proud	-0.26	0.192													
is able to buy organic food (15n1)-happy	-0.11	0.569	2.60	1.59	1.02	225	10.42	0.001	0.04	116.23	0.000	0.34	6.12	0.014	0.03
is able to buy organic food (15n1)-surprised	-0.01	0.970	0.87	-0.16	1.03	217	5.42	0.021	0.02	3.63	0.058	0.02	5.12	0.025	0.02
is able to buy organic food (15n1)-sad	-0.16	0.413	-1.22	-1.77	0.55	216	5.24	0.023	0.02	48.36	0.000	0.18	1.71	0.192	0.01
is able to buy organic food (15n1)-embarrassed	-0.10	0.587	-0.54	-1.02	0.48	215	3.67	0.057	0.02	15.75	0.000	0.07	1.57	0.211	0.01
is able to buy organic food (15n1)-angry	-0.22	0.264	-0.56	-1.08	0.52	211	8.16	0.005	0.04	17.79	0.000	0.08	1.93	0.166	0.01
is able to buy organic food (15n1)-nervous	-0.01	0.962	-0.34	-1.07	0.73	212	3.82	0.052	0.02	11.81	0.001	0.05	3.53	0.062	0.02
is able to buy organic food (15n1)-proud	0.16	0.404	2.39	0.77	1.62	213	4.09	0.045	0.02	54.24	0.000	0.20	12.25	0.001	0.05
is unable to buy organic food (15n1-R)-happy	-0.86	0.000													
is unable to buy organic food (15n1-R)-surprised	-0.63	0.001													
is unable to buy organic food (15n1-R)-sad	-0.43	0.028													
is unable to buy organic food (15n1-R)-embarrassed	-0.39	0.046													
is unable to buy organic food (15n1-R)-angry	-0.54	0.007													
is unable to buy organic food (15n1-R)-nervous	-0.52	0.008													
is unable to buy organic food (15n1-R)-proud	-1.12	0.000													
recycles rubbish (6u1)-happy	0.22	0.262	3.85	3.37	0.49	221	0.10	0.755	0.00	294.40	0.000	0.57	1.26	0.262	0.01
recycles rubbish (6u1)-surprised	1.35	0.000	1.90	-1.74	3.64	214	3.25	0.073	0.02	2.00	0.159	0.01	58.92	0.000	0.22
recycles rubbish (6u1)-sad	-0.19	0.324	-2.18	-2.24	0.06	220	1.47	0.226	0.01	94.05	0.000	0.30	0.02	0.893	0.00
recycles rubbish (6u1)-embarrassed	-0.18	0.373	-1.38	-1.65	0.27	209	2.40	0.123	0.01	45.67	0.000	0.18	0.36	0.548	0.00
recycles rubbish (6u1)-angry	-0.42	0.033	-2.35	-2.21	-0.15	212	2.69	0.103	0.01	110.21	0.000	0.34	0.11	0.738	0.00
recycles rubbish (6u1)-nervous	-0.51	0.010	-1.76	-0.54	-1.21	212	0.33	0.566	0.00	35.34	0.000	0.14	8.30	0.004	0.04

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η_C	F_V	p_V	η_V	F_IA	p_IA	η_{IA}
recycles rubbish (6u1)-proud	0.10	0.618	3.83	3.56	0.27	214	0.03	0.873	0.00	252.41	0.000	0.54	0.33	0.569	0.00
does not recycle rubbish (6u1-R)-happy	-0.10	0.601													
does not recycle rubbish (6u1-R)-surprised	-0.77	0.000													
does not recycle rubbish (6u1-R)-sad	-0.15	0.424													
does not recycle rubbish (6u1-R)-embarrassed	-0.25	0.210													
does not recycle rubbish (6u1-R)-angry	-0.14	0.469													
does not recycle rubbish (6u1-R)-nervous	0.37	0.058													
does not recycle rubbish (6u1-R)-proud	-0.06	0.762													
saves water (6b1)-happy	0.74	0.000	5.27	3.26	2.02	227	0.49	0.484	0.00	1233.26	0.000	0.84	61.10	0.000	0.21
saves water (6b1)-surprised	0.85	0.000	0.71	-0.88	1.60	212	6.17	0.014	0.03	0.01	0.919	0.00	11.42	0.001	0.05
saves water (6b1)-sad	0.01	0.964	-3.73	-2.25	-1.48	220	12.03	0.001	0.05	202.87	0.000	0.48	11.19	0.001	0.05
saves water (6b1)-embarrassed	-0.05	0.785	-2.55	-1.71	-0.84	211	2.90	0.090	0.01	103.63	0.000	0.33	3.79	0.053	0.02
saves water (6b1)-angry	0.25	0.203	-3.32	-2.82	-0.50	216	7.54	0.007	0.03	206.61	0.000	0.49	1.29	0.257	0.01
saves water (6b1)-nervous	0.16	0.416	-2.51	-1.69	-0.82	212	7.49	0.007	0.03	92.64	0.000	0.30	3.28	0.071	0.02
saves water (6b1)-proud	0.76	0.000	4.60	2.50	2.11	212	2.77	0.098	0.01	323.63	0.000	0.60	25.96	0.000	0.11
wastes water (6b1-R)-happy	-1.73	0.000													
wastes water (6b1-R)-surprised	-0.12	0.554													
wastes water (6b1-R)-sad	0.80	0.000													
wastes water (6b1-R)-embarrassed	0.40	0.039													
wastes water (6b1-R)-angry	0.47	0.015													
wastes water (6b1-R)-nervous	0.53	0.007													
wastes water (6b1-R)-proud	-0.65	0.001													
thinks of new artistic painting styles (9u1)-happy	-0.83	0.000	1.70	2.03	-0.33	222	36.20	0.000	0.14	85.78	0.000	0.28	0.66	0.419	0.00
thinks of new artistic painting styles (9u1)-surprised	-0.01	0.962	1.55	1.31	0.24	222	0.35	0.553	0.00	40.07	0.000	0.15	0.27	0.606	0.00
thinks of new artistic painting styles (9u1)-sad	-0.23	0.237	-1.20	-0.80	-0.41	216	0.39	0.535	0.00	20.52	0.000	0.09	0.77	0.380	0.00
thinks of new artistic painting styles (9u1)-embarrassed	-0.41	0.039	-0.77	-0.42	-0.35	215	3.00	0.085	0.01	9.94	0.002	0.04	0.76	0.383	0.00
thinks of new artistic painting styles (9u1)-angry	-0.47	0.018	-0.56	-0.61	0.05	209	8.97	0.003	0.04	9.67	0.002	0.04	0.02	0.890	0.00

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η_C	F_V	p_V	η_V	F_IA	p_IA	η_{IA}
thinks of new artistic painting styles (9u1)-nervous	-0.75	0.000	-0.73	-0.26	-0.47	211	10.45	0.001	0.05	7.35	0.007	0.03	1.43	0.233	0.01
thinks of new artistic painting styles (9u1)-proud	-1.04	0.000	1.86	3.01	-1.15	210	30.61	0.000	0.13	108.31	0.000	0.34	6.27	0.013	0.03
does not think of new artistic painting styles (9u1-R)-happy	-0.81	0.000													
does not think of new artistic painting styles (9u1-R)-surprised	-0.16	0.410													
does not think of new artistic painting styles (9u1-R)-sad	0.03	0.873													
does not think of new artistic painting styles (9u1-R)-embarrassed	-0.11	0.579													
does not think of new artistic painting styles (9u1-R)-angry	-0.38	0.056													
does not think of new artistic painting styles (9u1-R)-nervous	-0.24	0.215													
does not think of new artistic painting styles (9u1-R)-proud	-0.45	0.025													
complies with the law (20a1)-happy	0.37	0.050	4.78	4.14	0.63	225	0.70	0.403	0.00	826.87	0.000	0.79	3.91	0.049	0.02
complies with the law (20a1)-surprised	1.31	0.000	0.35	-3.69	4.04	213	1.45	0.230	0.01	35.74	0.000	0.14	72.88	0.000	0.25
complies with the law (20a1)-sad	-0.09	0.649	-3.44	-3.39	-0.05	216	0.08	0.775	0.00	279.55	0.000	0.56	0.01	0.905	0.00
complies with the law (20a1)-embarrassed	0.11	0.575	-2.51	-3.42	0.91	212	2.98	0.086	0.01	189.44	0.000	0.47	4.59	0.033	0.02
complies with the law (20a1)-angry	0.02	0.907	-3.09	-3.91	0.82	216	4.56	0.034	0.02	345.78	0.000	0.62	4.78	0.030	0.02
complies with the law (20a1)-nervous	0.24	0.220	-2.46	-3.60	1.15	213	2.43	0.121	0.01	210.77	0.000	0.50	7.81	0.006	0.04
complies with the law (20a1)-proud	0.33	0.091	4.20	3.34	0.87	216	0.66	0.417	0.00	349.66	0.000	0.62	4.36	0.038	0.02
does not comply with the law (20a1-R)-happy	-0.16	0.400													
does not comply with the law (20a1-R)-surprised	-1.03	0.000													
does not comply with the law (20a1-R)-sad	-0.02	0.923													
does not comply with the law (20a1-R)-embarrassed	-0.41	0.036													
does not comply with the law (20a1-R)-angry	-0.46	0.018													
does not comply with the law (20a1-R)-nervous	-0.49	0.012													
does not comply with the law (20a1-R)-proud	-0.24	0.219													
buys luxurious things (15u3)-happy	-0.59	0.002	0.02	0.90	-0.87	223	6.38	0.012	0.03	3.50	0.063	0.02	4.26	0.040	0.02
buys luxurious things (15u3)-surprised	-0.32	0.094	-0.13	0.36	-0.49	219	1.69	0.195	0.01	0.11	0.745	0.00	1.14	0.288	0.01
buys luxurious things (15u3)-sad	-0.58	0.003	-0.21	-0.11	-0.10	215	13.30	0.000	0.06	0.74	0.390	0.00	0.06	0.804	0.00

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η_C	F_V	p_V	η_V	F_IA	p_IA	η_{IA}
buys luxurious things (15u3)-embarrassed	-0.54	0.007	-0.08	0.66	-0.74	215	4.91	0.028	0.02	1.44	0.231	0.01	3.47	0.064	0.02
buys luxurious things (15u3)-angry	-0.75	0.000	0.12	0.49	-0.37	212	18.61	0.000	0.08	2.79	0.096	0.01	1.21	0.274	0.01
buys luxurious things (15u3)-nervous	-0.64	0.001	0.03	0.50	-0.47	211	10.56	0.001	0.05	1.69	0.195	0.01	1.82	0.179	0.01
buys luxurious things (15u3)-proud	-0.36	0.066	-0.17	0.30	-0.47	214	3.15	0.077	0.01	0.01	0.921	0.00	0.86	0.356	0.00
does not buy luxurious things (15u3-R)-happy	-0.07	0.721													
does not buy luxurious things (15u3-R)-surprised	-0.03	0.869													
does not buy luxurious things (15u3-R)-sad	-0.43	0.029													
does not buy luxurious things (15u3-R)-embarrassed	-0.05	0.786													
does not buy luxurious things (15u3-R)-angry	-0.44	0.026													
does not buy luxurious things (15u3-R)-nervous	-0.26	0.180													
does not buy luxurious things (15u3-R)-proud	-0.12	0.528													
has many good friends (15b1)-happy	0.03	0.855	4.59	4.37	0.23	226	0.18	0.669	0.00	852.78	0.000	0.79	0.53	0.468	0.00
has many good friends (15b1)-surprised	1.05	0.000	0.32	-2.68	3.00	215	1.78	0.184	0.01	16.19	0.000	0.07	38.01	0.000	0.15
has many good friends (15b1)-sad	-0.04	0.855	-3.26	-3.91	0.65	219	3.32	0.070	0.01	315.60	0.000	0.59	2.62	0.107	0.01
has many good friends (15b1)-embarrassed	0.03	0.896	-1.88	-1.50	-0.38	213	1.18	0.279	0.01	75.25	0.000	0.26	0.92	0.340	0.00
has many good friends (15b1)-angry	-0.01	0.956	-0.78	-1.74	0.96	212	6.40	0.012	0.03	38.05	0.000	0.15	6.07	0.015	0.03
has many good friends (15b1)-nervous	-0.06	0.768	-0.79	-1.78	0.98	213	7.33	0.007	0.03	35.32	0.000	0.14	5.62	0.019	0.03
has many good friends (15b1)-proud	0.26	0.184	3.84	1.97	1.88	213	4.34	0.038	0.02	202.88	0.000	0.49	18.90	0.000	0.08
does not have many good friends (15b1-R)-happy	-0.17	0.395													
does not have many good friends (15b1-R)-surprised	-0.65	0.001													
does not have many good friends (15b1-R)-sad	-0.37	0.056													
does not have many good friends (15b1-R)-embarrassed	0.22	0.248													
does not have many good friends (15b1-R)-angry	-0.56	0.005													
does not have many good friends (15b1-R)-nervous	-0.59	0.003													
does not have many good friends (15b1-R)-proud	-1.14	0.000													
installs electric fences around the house (17b2)-happy	0.73	0.000	1.95	-1.22	3.16	218	1.20	0.274	0.01	6.69	0.010	0.03	47.03	0.000	0.18
installs electric fences around the house (17b2)-surprised	-1.23	0.000	0.70	2.98	-2.28	223	23.24	0.000	0.09	47.86	0.000	0.18	22.20	0.000	0.09

	d	p of d	Brazil M-diff	UK M- diff	Brazil - UK M-diff	df2	F_C	p_C	η_C	F_V	p_V	η_V	F_IA	p_IA	η_{IA}
is unable to keep secrets (22u3-R)-nervous	-0.50	0.012													
is unable to keep secrets (22u3-R)-proud	-0.10	0.624													
completes an exam without cheating (23n1)-happy	-0.08	0.676	4.42	4.47	-0.05	219	0.32	0.572	0.00	651.89	0.000	0.75	0.02	0.891	0.00
completes an exam without cheating (23n1)-surprised	0.80	0.000	0.14	-3.60	3.73	211	1.50	0.222	0.01	33.33	0.000	0.14	50.87	0.000	0.19
completes an exam without cheating (23n1)-sad	-0.44	0.027	-3.23	-2.83	-0.40	219	2.48	0.117	0.01	158.86	0.000	0.42	0.65	0.420	0.00
completes an exam without cheating (23n1)-embarrassed	-0.36	0.065	-2.34	-2.61	0.28	211	6.87	0.009	0.03	104.21	0.000	0.33	0.32	0.570	0.00
completes an exam without cheating (23n1)-angry	-0.52	0.010	-2.57	-3.46	0.88	213	21.87	0.000	0.09	177.20	0.000	0.45	3.89	0.050	0.02
completes an exam without cheating (23n1)-nervous	-0.63	0.002	-2.41	-1.71	-0.70	212	2.38	0.125	0.01	79.91	0.000	0.27	2.16	0.143	0.01
completes an exam without cheating (23n1)-proud	-0.12	0.536	3.99	4.55	-0.56	210	0.05	0.820	0.00	402.34	0.000	0.66	1.71	0.193	0.01
completes an exam by cheating (23n1-R)-happy	-0.08	0.688													
completes an exam by cheating (23n1-R)-surprised	-1.17	0.000													
completes an exam by cheating (23n1-R)-sad	-0.09	0.642													
completes an exam by cheating (23n1-R)-embarrassed	-0.37	0.061													
completes an exam by cheating (23n1-R)-angry	-0.75	0.000													
completes an exam by cheating (23n1-R)-nervous	-0.01	0.971													
completes an exam by cheating (23n1-R)-proud	0.31	0.124													

Note. For convenience, the stronger effects are in bold ($|d| > .70$ and $\eta > .04$); d: Cohen's d, whereas positive values indicate that Brazilians are scoring higher; p of d: p-values of a two-sided between-subject t-test (Brazil – UK); M-diff: mean difference between positive and negative framing of instantiation within each country; Brazil – UK M-diff: Difference of M-diff (i.e., Brazil M-diff minus UK M-diff); df2: denominator degrees of freedom (all df1 were 1 and are therefore omitted); F_C: F-value country; p_C: p-value country; η_C : generalized omega square country; V: version (i.e., framing of instantiation, positive vs. negative); IA: interaction; -R is the recoded, i.e., reversed framed instantiation; for the explanation of (6n1) etc. see note of Table A12.

Stimulus pictures Study 10



Art -
3D-Street-Art-The-C
revass.jpg



Art - african
sculptor.jpg



Art -
Bansky-Flower-Brick
-Thrower.jpg



Art - Chinese
painting.jpg



Art -
Impressionism.jpg



Art - Maze at Hever
Castle.JPG



Art -
Michelangelo's_Davi
d.JPG



Art - modern art
painting.jpg



Art - steel horse.jpg



Art - vitruvian study
Leonardo.jpg



Engineering -
gramophone.jpg



Engineering -
plane.png



Engineering -
aqueduct.jpg



Engineering -
clamp.jpg



Engineering -
housebuilding.jpg



Engineering -
Junctions.jpg



Engineering - light
bulb.jpg



Engineering -
Slides.JPG



Engineering - Steam
engine James
Watt.jpg



Low creativity -
buttered-toast.jpg



Low creativity -
Campfire.jpg



Low creativity -
Pole.jpg



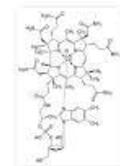
Low creativity -
Small pont.jpg



Mathematics -
e=mc2.jpg



Mathematics -
Proof.PNG



Mathematics -
vitamin b12.png

Appendix B: Do students provide an accurate estimate of the general public?

(Manuscript accepted for publication in PlosOne)

Abstract

Most psychological studies rely on student samples. Students are usually considered as more homogenous than representative samples both within and across countries. However, little is known about the nature of the differences between student and representative samples. This is an important gap, also because knowledge about the degree of difference between student and representative samples may allow to infer from the former to the latter group. Across 59 countries and 12 personality (Big-5) and attitudinal variables we found that differences between students and general public were partly substantial, incoherent, and contradicted previous findings. Two often used cultural variables, embeddedness and intellectual autonomy, failed to explain the differences between both groups across countries. We further found that students vary as much as the general population both between and within countries. In summary, our results indicate that generalizing from students to the general public is problematic when personal and attitudinal variables are used, as students vary mostly randomly from the general public. Findings are also discussed in terms of the replication crisis within psychology.

Student samples are extremely common in psychological and cross-cultural studies due to the facility of recruitment, lower cost of administration, and assumed lower response bias (e.g., Arnett, 2008). In cross-cultural research for example, students are thought to reduce the variability in the sample due to differences in education levels (Saucier et al., 2015), and were found to give a moderately good estimate of representative or teachers samples (Diener, Diener, & Diener, 1995; Fischer & Schwartz, 2011). However, many concerns are raised in using student samples for psychological studies regarding issues of representativeness, generalizability, and comparability of results (Henrich et al., 2010; Peterson & Merunka, 2014; Sears, 1986). For example, Greenfield (2014) argued that differences between socioeconomic groups are larger than differences between countries. As students have usually high socioeconomic status, this further challenges the generalizability of data from students. Indeed, students are, on average, more homogeneous than non-student participants, as a large second-order meta-analysis revealed (Peterson, 2001). Importantly, in this study the non-student samples were often only another subgroup from the general public (e.g., housewives).

To the best of our knowledge, no study has systematically compared students with the general public across many countries. For example, are students indeed more homogeneous across countries and is it legitimate to generalize from student samples to the general public? In the present paper we intend to explore potential differences between student and representative samples and to shed more light on potential predictors of the difference between student and representative samples: The mere existence of such differences is not problematic as long as they can be systematically predicted. We focus on variables which are important in personal and social psychology:

Five personality variables (the Big-5 dimensions) and seven attitudinal variables such as moral attitudes or respect towards the elderly.

Two important variables in cross-cultural research are collectivism or embeddedness, and individualism or autonomy (Schwartz, 2006). For example, people in autonomous countries prefer to stand out and to follow their own goals (Schwartz, 2006). This would suggest that students in autonomous countries are more likely to follow their own goals than students in embedded countries, who, in contrast, will adopt the goals of the general public. Therefore, we expect that the difference between students and the general public vary as a function of how autonomous or embedded a society is.

The present study further investigates some under explored issues. Specifically, we aim to compare students with the general public from 59 countries across several variables, expecting that students are, in general, more homogeneous than the general public, both across countries (Hypothesis 1a) and also within countries (Hypothesis 1b). Furthermore, we aim to explain the difference between students and the general public as well as the variability within student samples. We expect that the difference between students and the general public is larger in more autonomous countries, as there is less pressure to adjust one's own personality, attitudes and views along with the general population (Hypothesis 2a). With the reverse true for embeddedness (Hypothesis 2b), because of the large negative correlation with autonomy (Schwartz, 2006). In line with this argument, we also expect that within-student variability is greater in autonomous countries as there is more acceptance of individual development (Hypothesis 3a). With the reverse true for embeddedness (Hypothesis 3b). This view is also supported by the finding that, across 80 countries, autonomy was strongly and positively correlated with

income and democratization (Schwartz, 2006). In summary, we are interested in patterns of variability, not mean differences.

Hypotheses 2a and 2b require some further evaluations. Based on previous research we further assumed, that for several variables the sign of the difference is the same across countries. For example, a large cross-sectional study found systematic personality (Big-5) differences between younger and older participants (Srivastava, John, Gosling, & Potter, 2003). Younger participants scored higher on neuroticism and openness to new experiences, but lower on agreeableness and conscientiousness compared to older participants. No relation was found between age and extraversion. Hence, we assumed that all student samples score higher on neuroticism and openness to new experiences but lower on agreeableness and conscientiousness. However, we expect that the magnitude of the difference between students and the general public is larger in countries higher in intellectual autonomy.

The present study is also interesting from another point of view. Recently, it was found that more than half of the studies within psychology could not be replicated (Open Science Collaboration, 2015). However, this reproducibility project was criticized for not taking contextual differences into account, as some studies were replicated in another country, which may have partly caused the low reproducibility rate (Bavel, Mende-Siedlecki, Brady, & Reinero, 2016). This is in line with calls for studies to explore whether effects vary across contexts and if so, how (Gelman, 2014). If we find systematic differences between students and the general public (Hypotheses 2a and 2b) this would allow us to make specific predictions about when a study, which compares students and the general public, can be replicated in a different context.

Method

Participants. We used the most recent version of the World Values Survey (WVS, 6th round), which includes samples of 86,272 general public participants (51.20% female) from 60 countries, with a mean age of 41.68 years ($SD = 16.58$). Data were retrieved from <http://www.worldvaluessurvey.org> (data set released on 16 April 2015). Data from Argentina were excluded as the employment status was missing. Of the remaining 84,737 participants, 6,352 reported being students ($M = 105.90$ per country, $SD = 79.24$), leaving 78,385 non-students ($M = 1328.22$, $SD = 442.45$). Non-surprisingly, across all 59 countries the general public was almost twice as old ($M = 43.23$, $SD = 16.10$) as the students ($M = 21.98$, $SD = 6.64$, $d = 2.74$). Also, students were on average more educated than the general public, $t(8301.14) = 51.42$, $d = 0.68$. Because the non-students vary strongly with regard to factors such as their income, education, employment status, and political attitudes within each country, we refer to the non-student samples as general public.

Materials. In total, we used two independent and twelve dependent variables. The independent variables were embeddedness as an estimator of collectivism, and intellectual autonomy as a proxy for individualism (Schwartz, 2006). Both are part of Schwartz' (2006) cultural value orientation model. To measure the cultural value orientations, participants were asked to indicate on a 9-point scale how much each of the 56 values is a guiding principle in their life. Examples include "FREEDOM (freedom of action and thought)" for intellectual autonomy and "OBEDIENT (dutiful, meeting obligations)" for embeddedness. The 56 values were combined to form seven CVOs, including embeddedness and intellectual autonomy (Schwartz, 2006). The data were centered on an individual bases, i.e., the individual overall mean for the 56 items was subtracted from each participant response. This was done to correct for individual scale

use tendencies and to investigate the relative importance of CVOs (Schwartz, 1992, 2006). The CVOs were made publicly available by Schwartz (Schwartz, 2008).

The dependent variables were chosen out of the wide range of variables available in the WVS, based on good reliabilities ($\alpha \geq .70$). We used the items of the Morally Debatable Scale (Harding & Phillips, 1986), which were divided into three sub-scales after a principal component analysis [cf. 13]: attitudes towards liberal personal-sexual behaviours (7 items, $\alpha = .89$), dishonest-illegal behaviours (5 items, $\alpha = .83$), and domestic violence (3 items, $\alpha = .78$). For example, participants were asked how justifiable they find homosexuality or abortion (personal-sexual behaviours), stealing property or accepting a bribe (dishonest-illegal), and a man beating his wife (domestic violence). Responses were given on a 10 point scale, ranging from 1 (never justifiable) to 10 (always justifiable).

The other variables were trust in strangers (e.g., “How much do you trust people of another religion?”, 3 items, $\alpha = .79$), understanding of democracy (e.g., is “Governments tax the rich and subsidize the poor” an essential characteristic of democracy?, 6 items, $\alpha = .74$), confidence in political institutions (e.g., “How much trust do you have in the parliament?”, 6 items, $\alpha = .87$), and perceived respect of own society towards elderly (e.g., “People over 70 are viewed with respect by my society”, 3 items, $\alpha = .71$).

Additionally, we included the ten-item personality inventory which measures each of the so called Big-5 dimensions of personality with two items (Gosling, Rentfrow, & Swann Jr., 2003). The five dimensions are extraversion (e.g., “I see myself as someone who is outgoing, sociable”), agreeableness (e.g., “I see myself as someone who is generally trusting”), conscientiousness (e.g., “I see myself as someone who does a thorough job”), neuroticism (e.g., “I see myself as someone who gets nervous easily”),

and openness to new experiences (e.g., “I see myself as someone who has few artistic interests” [reversed coded]). One item of each dimension was reversed coded.

Responses were given on a 5 point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). As the measure was designed to measure five broad dimensions with only two items, reliabilities were as expected (Gosling, n.d.) low ($\alpha \leq .39$).

Nevertheless, other psychometric qualities such as convergent validity or test-retest reliabilities were found to be good (Gosling et al., 2003). Data for this measure was available for 25 countries.

Results

We have made the transformed data available (i.e., the summary statistics for all 60 countries) for Hypotheses 2a and 2b along with the R script used to compute them. The other steps of the analyses (i.e., the tests for Hypotheses 1 and 3) can be reproduced with the R script and the original WVS data which can be obtained from www.worldvaluessurvey.org.

To test Hypothesis 1a – are students more homogeneous compared to the representative sample? –, we first computed separate medians for each group, country, and variable, as some variables were skewed. Variation of the medians within the students across the 59 countries was then compared with the variation within the general public, using a Levene test for each of the 7 DVs. This tested the null hypothesis that the variances of the medians do not differ between both groups. For example, the standard deviation of the medians for the student samples for trust in science across all 59 countries was 0.31, and for the general public samples 0.32 (see Table 1, columns 2-3 for *SDs*). Contrary to Hypothesis 1a, none of the Levene tests reached statistical significance, neither for the Big-5 (all $F_s[1, 48] < 2.70, p_s > .10$) nor the seven attitudinal variables (all $F_s[1, 116] < 1.05, p_s > .30$), indicating that the variation of the

medians was approximately the same for students and the general public across all 59 countries. To test Hypothesis 1b, we computed the within-country variability (standard deviation) separate for each of the two groups and each country and compared the *SDs* using independent sample t-tests. None of the twelve t-tests reached statistical significance, neither for the Big-5 dimensions ($ts[23] \leq |0.80|$, $ps > .43$, and $ds \leq |.22|$) nor seven attitudinal variables ($ts[57] \leq |1.97|$, $ps > .05$, and $ds \leq |.36|$). Because the medians may not be normal distributed, we additionally computed twelve Wilcoxon rank sum test. However, results remained the same (all $ps > .06$). This indicates that students were on average as heterogeneous as the general public both between and within countries.

Hypotheses 2a and 2b stated that the difference between students and the general public is greater in autonomous countries, and smaller in embedded ones. Cohen's *ds* were computed as a measure of the difference between the two groups for all 59 countries. Cohen's *ds* differed up to $|.80|$, but mainly between $-.5$ and $.5$, whereas the distribution of *ds* were mostly normal with a mean of around 0 (see Table 1, column 4 for the means of *d*). Next, we correlated the absolute value of *d* for each variable with the country average score for intellectual autonomy and embeddedness.

Table 1

Zero-order correlation coefficient of Cohen's d (student vs. general public) and within country variance of students with predictors

	SD Stud	SD GP	r	Cohen's d		Variance	
				Embed	Intellectual Autonomy	Embed	Intellectual Autonomy
Extraversion	0.25	0.20	0.10	-.22	.37	-.65**	.61*
Agreeableness	0.40	0.54	-0.08	-.01	.14	.63**	-.52*
Conscientiousness	0.67	0.70	-0.25	-.51*	.38	.06	-.07

Neuroticism	0.29	0.25	0.03	-.27	.22	-.31	.43
Openness	0.36	0.32	-0.02	-.13	.11	-.52*	.56*
MA: Domestic violence	0.89	0.92	0.06	-.11	.14	.18	-.21
MA: Dishonest-illegal behavior	0.75	0.73	0.18	-.47**	.49**	.16	-.20
MA: Personal-sexual behavior	1.74	1.56	0.21	-.10	.07	-.35*	.24
Trust in strangers	0.31	0.32	-0.04	-.11	.18	.07	-.17
Understanding of democracy	0.81	0.77	-0.03	.30	-.22	.38*	-.40**
Confidence in pol. Institutions	0.40	0.41	-0.03	-.20	.26	.20	-.22
Respects towards elderly	0.38	0.38	-0.02	-.02	-.08	.23	-.31

Note. SD: Standard deviation, Stud: Students, GP: General public, Embed: Embeddedness, \bar{d} : mean standardized difference of students to general public (if $d > 0$: Students score higher); N of countries for SD (columns 2-3) = 25 (Big-5) and 58-59, N of countries (columns 5-8) = 16 (Big-5) and 39-40.

* $p < .05$, ** $p < .01$

The predicted pattern of results for Hypotheses 2a and 2b was found only for moral attitudes towards dishonest-illegal (Table 1, columns 5-6). In countries with higher embeddedness values, students endorsed moral attitudes towards dishonest-illegal behaviours more similarly to the general public. The reverse pattern was observed in countries high in intellectual autonomy (this is not surprising, given that embeddedness and intellectual autonomy were strongly negatively correlated, $r = -.87$). Of the remaining 22 correlations only one reached statistical significance (Table 1, columns 5-6).

We have also used the Human Developmental Index (United Nations Developmental Programme, 2014) and the Democracy Index (Economist Intelligence Unit, 2012) as independent variables. However, because of high correlations with intellectual autonomy ($r = .70$ and $r = .64$, respectively), results were very similar and are, therefore, omitted. We have further added the tightness scores (Gelfand et al., 2011)

as an independent variables for 20 countries. This also did not change the pattern of results.

Because of this failure to find a predictor for the difference between students and general public, we investigated the d-scores more closely. Within each variable, some of the ds were positive, others negative, both with and without reaching statistical significance. To give an illustration, we have selected six countries for two of the personality variables and eight countries for the remaining seven variables and plotted the d-scores for each variable (Figures 1-3). Countries were selected based on the number of participants which originate from them on average in psychological research (Arnett, 2008) and effect size. Please note that in some countries effect sizes were larger than the ones depicted here (see data). Figure 1 depicts the d-scores for conscientiousness and openness for six countries. For example, students in Brazil, China, and Germany were less conscientious than the general public, but more in Colombia and Pakistan. In Figure 2, the d-scores for moral attitudes towards (domestic) violence, dishonest-illegal behaviour, and towards personal-sexual behaviours are depicted. In Figure 3 the d-scores for trust in strangers, understanding of democracy, and perceived respect towards elderly are displayed. Some differences between the students and the general public were larger compared to others (e.g., moral attitudes towards dishonest-illegal behaviours vs. understanding of democracy).

Additionally, we explored the percentage of occasions for which the null-hypothesis was supported or the alternative hypothesis. For this, we computed the Bayes factor (BF) for all 537 student-general public comparison, as the classical frequentist approach does not allow to address the question whether the data supports the null hypothesis (Dienes, 2014). BFs were computed with the R package BayesFactor (2016), with the default prior of $r = .707$. Out of the 537 computed BFs, 23 showed strong

support for the null hypothesis ($BF < 1/10$), 299 moderate support ($BF < 1/3$), 97 moderate support for the alternative hypothesis ($BF > 3$) and 78 strong support for the alternative hypothesis ($BF > 10$). For the remaining 40 BFs neither support for the alternative nor null hypotheses was found ($1/3 < BF < 3$).

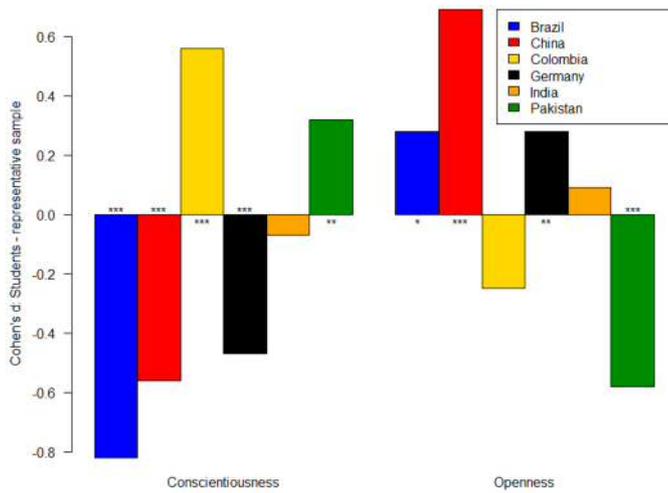


Figure 1. Cohen's d of student - general public comparisons for two of the Big-5 dimensions. See text for explanation.

* $p < .05$, ** $p < .01$, *** $p < .001$.

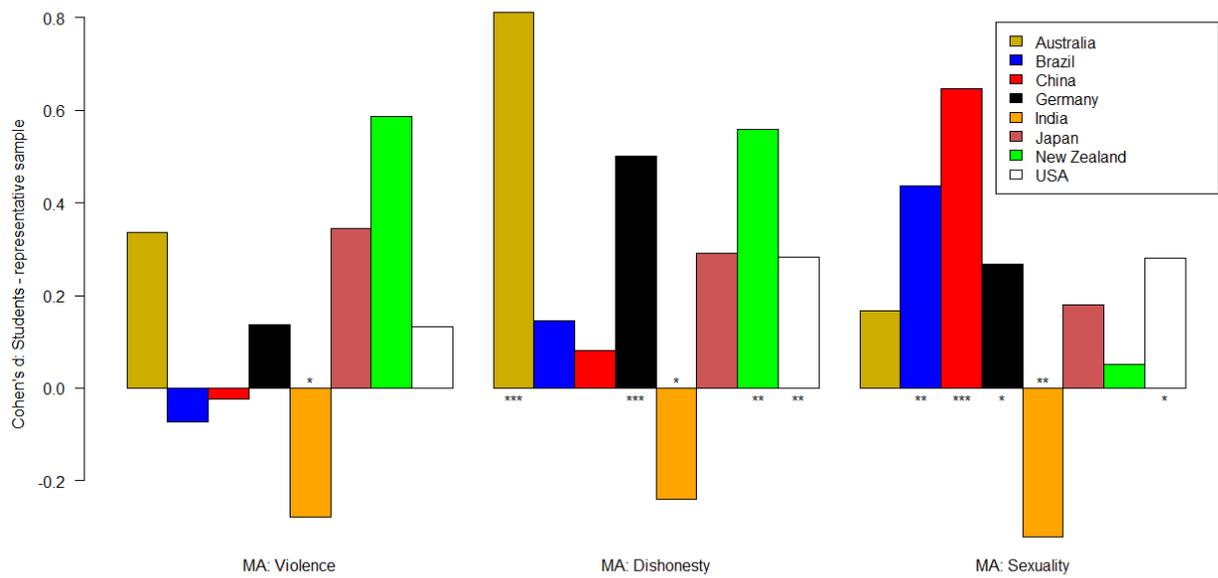


Figure 2. Cohen's d of student - general public comparisons for moral attitudes (MA).

See text for explanation.

*p < .05, **p < .01, ***p < .001.

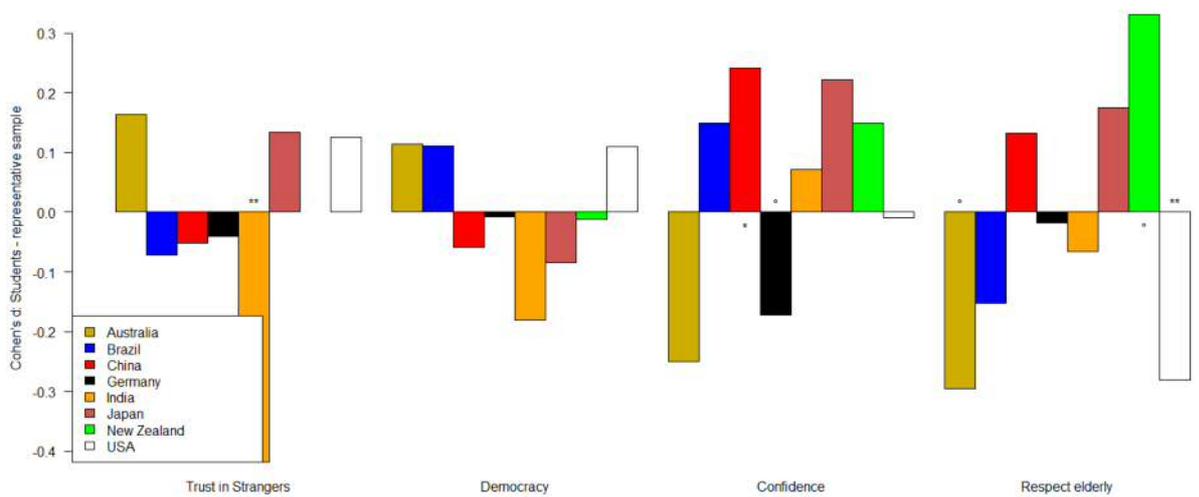


Figure 3. Cohen's d of student - general public comparisons for several attitudinal variables.

° < .08, *p < .05, **p < .01, ***p < .001.

To test Hypotheses 3a and 3b – students in countries with high (vs. low) intellectual autonomy (vs. embeddedness) values are more heterogeneous – the standard deviation of students within each country was computed and correlated with the average intellectual autonomy and embeddedness score of each country. This was done for all twelve variables. This hypothesis was only partially supported for extraversion, openness, and moral attitudes towards personal-sexual behaviours. Specifically, students in countries high in embeddedness were on average more homogenous, i.e., the variance was lower. For the variables agreeableness and understanding of democracy the pattern of correlations was even the opposite of the expected. The pattern of results for the remaining variables was mixed (Table 1, columns 7-8).

Discussion

Contrary to previous findings (Peterson, 2001) and reflections (Greenfield, 2014), students were across 59 countries and twelve variables as heterogeneous as the general public. Also, for some variables students scored higher (lower) in some countries than the general public, although previous research has implied that students should score lower (higher) because of age effects (Srivastava et al., 2003). However, consistent with previous findings (Peterson, 2001), we were neither able to explain the difference between students and the general public nor the variability of students across countries. Differences between students and the general public in some countries were positive, negative, or non-significant (cf. Peterson & Merunka, 2014). This challenges the claim that students are a moderately accurate estimate for the representative sample (Diener et al., 1995; Druckman & Kam, 2011).

Implications and limitations. Our findings have important implications for psychological research. First, we demonstrated that students vary both across and within countries as much as the general public. This means that universities do not influence

personality attitudes of students or at least not in the same way across countries and/or subjects. A possible explanation for this is that the subject of study has an impact on psychological variables. For example, it was found that psychology students increasingly value benevolence over the course of three years, whereas business students increasingly value achievement and power (Bardi, Buchanan, Goodwin, Slabu, & Robinson, 2014). In other words, the apparent random differences between students and general public across countries may be partly attributed to differences in the subject of the students; we did not control for the subject, as we did not have any data available for this and the average student sample size of 105 per country would have been too small to conduct subgroup analyses. Hence, this would be a possible way to go for a further cross-cultural study, to compare students from different subjects across countries.

Moreover, because students are both younger and more educated than the general public, we do not know if age or level of education – or an interaction – is responsible for the large variability within the student sample. Next, we have found that neither embeddedness nor autonomy predicted the difference between students and the general public, indicating that students in embedded countries differ as much from the general public as in autonomous countries. In other words, autonomy and embeddedness, as measured within a society, do not predict attitudes of students relative to the general public. Also, we found that students, despite being on average only half of the age, scored in some countries higher on conscientiousness and agreeableness and lower on neuroticism and openness. This partly relativizes findings from cross-sectional studies which imply that younger people score lower on conscientiousness and agreeableness but higher on neuroticism and openness (Srivastava et al., 2003). Together, this further supports the claim that generalizing from students to the general public within personal and social psychology is problematic (e.g., Henrich et al., 2010;

Sears, 1986), at least whilst we do not know what predicts those differences. Our Bayesian analyses further supported this claim. In order to be able to generalize from the students to the general public, we would require that they do not differ. However, our Bayesian analysis revealed that for only 23 out of 537 comparisons (4%) strong evidence for the null hypothesis.

To illustrate why generalizing from students to the general public is problematic, assume a researcher wants to test her hypothesis that Chinese are more open towards new experiences than Pakistani. She collects one student sample in each country and finds allegedly strong support for her hypothesis, $t(204) = 9.84$, $p < .0001$, $d = 1.38$ (data for this example is taken from WVS). However, this strong effect is biased, as the general public between both countries barely differ, $d = 0.15$ (because of the large sample size the difference is still significant: $t[2826] = 3.81$, $p = .0001$, see Figure 1).

Overall, this indicates that we cannot generalize from student samples to the general public, because they differ randomly across countries and variables, based on our current knowledge. These findings are also relevant, as they provide limitations with regard to the replicability of psychological research and may also explain failed replication. Take the variable ‘perceived respect towards elderly’ as an example. The difference between the student samples and general public was, even in industrialized countries such as Australia, Germany, New Zealand, and the USA, highly inconsistent (Figure 3). The results from New Zealand for example failed to replicate in any of the three other countries.

In sum, the failure to replicate psychological findings may not only be due to low power, questionable research practices such as p-hacking, HARKing, or publication bias (Button et al., 2013; Kerr, 1998; Open Science Collaboration, 2015; Simmons et al., 2011), but also because effects of context were not considered in the replication.

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