The Importance of Considering Approach and Avoidance in the Study of Personal Values

Thesis

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Abstract

Despite suggestions from multiple psychological literatures that motivations to approach positives and to avoid negatives can operate somewhat independently, the personal values literature continues to label and measure personal values in such a way as to place a near exclusive focus on the promotion of positive outcomes. Study 1 adapted a common measure of personal values into two subsets designed to describe the same motivations but in reference to either approach or avoidance, and tested the extent to which these scales differed within respondents and whether they were more appropriately modeled as expressing one or two latent variables. Studies 2a and 2b built upon the observed divergence in the measures introduced in Study 1 by demonstrating that value measures rewritten as to be framed in terms of avoidance better predicted behaviors similarly construed in terms of avoidance, and vice-versa. Study 3 expanded on the findings of Studies 2a and 2b by demonstrating that the incremental and at times individually greater predictive ability of these avoidance-reframed measures held up in the more value-ambiguous context that is receiving a COVID-19 vaccination. These findings primarily suggest that value theorists should consider the correspondence between the framing of value measures and of associated outcomes, and also pose some broader questions for the ways in which personal values are conceptualized.

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Chapter 1. Introduction

Once one begins to study personal values, it quickly becomes clear how omnipresent they are in the language and sentiments expressed throughout society. Whether it be individuals discussing values as being a critical gauge for their compatibility with other individuals or organizations, politicians appealing to national and political values for their power to persuade or justify, or individuals describing the effects of their family, religion, or upbringing on their present-day selves, values clearly constitute an important part of what it means to be an agent existing within a larger social system. It has even been suggested that values comprise such a critical portion of a self as to be more expressive of a person's true self than their actual personality traits and characteristics - in some cases our values might make us who we are more so than who we *actually* are (Roccas et al., 2014).

Psychological researchers from a variety of domains have seemed to agree with this general centrality of personal values in human life. Aside from investigating their degree of self-expressiveness, considerable research has investigated not only their ubiquity and commonality in cultures across the globe (Schwartz, 1992), but also their ability to shape and motivate behavior both within and outside of the laboratory. Early research into personal values using the value self-confrontation procedure demonstrated that a manipulation aimed at modifying values could produce long-term changes in

attitudes and behaviors, in some cases lasting as long as 17-21 months (Rokeach & Cochrane, 1972; Rokeach & McLellan, 1972; Rokeach, 1973). More recently, priming participants with certain values has been shown to affect expressions of in-group favoritism (Hertel & Kerr, 2001), increasing the accessibility of a value has been shown to enhance resistance to changing related attitudes and behaviors (Blankenship, Wegener, & Murray, 2015), prompting reflections on a specific value has been linked to increased subsequent pro-value behavior (Maio et al., 2001), and affirming the self through reflecting on one's values has in many contexts been shown to reduce ego-defensive behaviors such as stereotyping and prejudice (as in Fein & Spencer, 1997). This is of course but a sampling of the wide range of contexts in which personal values have been employed as tools to influence and understand human behavior.

As with most psychological constructs, to discuss values in any considerable level of detail it is important to first arrive at a shared understanding of the nature of the construct. Despite occasional semantic variations, definitions of personal values in the psychology literature generally center around a collection of characteristics that distinguish them from other cognitive elements such as attitudes, beliefs, and norms. Namely, values are decontextualized (or trans-situational) and abstract goals (sometimes described instead as being guiding principles or beliefs about the preferable) that vary in their degree of importance and serve as guides for an individual's behaviors and perceptions (Rokeach, 1973; Sagiv & Roccas, 2017; Schwartz, 1992).

The relative ordering of values in terms of importance is an especially critical feature and is the basis for the primary means of assessing personal values. Given that

personal values generally represent ideals that are normatively desirable (such as *freedom, equality,* or *dependability*), what is often more indicative of an individual's relation to these values is how they are differentially important compared to one another; one might think that *freedom* and *equality* are equally good, but which is more important? Many situations afford choices or actions that differentially facilitate or express one or more values, and the choices people make are considered to express a sort of calculus that prioritizes maximizing the most important values. In other words, *freedom* and *equality* might both be highly desirable to an individual, but when faced with a situation that requires choosing one over the other, values theorists propose that an individual will choose the action that expresses or realizes their more important (compared to less important) values.

Furthermore, an extensive body of research supports the idea that a consistent set of value archetypes manifests in cultures across the globe, and that these values are interrelated in such a way as to form a circular motivational continuum (or *circumplex*) (Schwartz, 1992; Steinmetz, Isidor, & Baeuerle, 2012; Borg, Bardi, & Schwartz, 2013; Maio, Pakizeh, Cheung, & Rees, 2009; Bardi et al., 2009 - among many others). This circular structure, which forms the basis for the influential Schwartz' theory of basic values (Schwartz 1992; Schwartz, 2017), describes the relations between values such that values positioned adjacent or nearby one another in the circular structure tend to be positively correlated, whereas values on opposite ends of the circle tend to be negatively correlated and considered to be motivationally incompatible with one another.

Despite values being considered to guide behavior in theory, and despite the evidence that manipulations and procedures involving values can produce detectable changes in behavior, researchers have faced mixed results (both across studies and across values) when attempting to explain and predict real-world behaviors using individuals' values. In fact, some have even gone as far as to conclude that values only rarely guide behavior, and only in a small portion of individuals (Kristiansen & Hotte, 1996; McClelland, 1987). Other researchers have proposed a diverse set of moderators to explain why values questionnaires in some cases help us understand and predict individuals' behaviors, but not in others. Bardi and Schwartz (2003), for example, attempted to map the full range of values in Schwartz' circumplex model to corresponding value-expressive behaviors to investigate the strength of value-behavior relations. After assessing participant values and their self-reported behaviors, they found a considerable range of value-behavior correlations, with some values being only weakly correlated with behaviors (the lowest being .30), whereas others correlated fairly highly (the highest at .67). From this, they concluded that some values simply relate more strongly to behaviors that express them, and that norms are a critical factor that can obscure values' influence on behavior. Skimina et al. (2018), in a study involving experience sampling, noted that real-time behaviors often lack some degree of volition, and found that non-volitional acts were poorly predicted by responses to values questionnaires and did not replicate the pattern of interrelations described by Schwartz' circumplex model. Eyal et al. (2009) invoked construal level theory in support of their hypothesis that values, due to their abstract nature, would exert a stronger influence on

more distant behaviors rather than proximal ones. They concluded support for this hypothesis through their demonstration of a higher correspondence between values and behaviors that participants planned for the distant future compared to behaviors planned for the more proximal future.

Value Instantiation

Another compelling moderator proposed to explain observed gaps between values and behavior is the notion of value *instantiation*. Hanel et al. (2017) introduced a model of the value-behavior relation that highlights the considerable degree of variance in the ways in which individuals can construe behaviors in light of values. They posited that processes of categorization and abstraction, that can vary substantially across individuals, are necessary for individuals to determine how and when it is appropriate to apply abstract categories or ideals such as values to concrete behaviors and contexts. An instantiation of a value in this framework refers to a behavior that is considered to be an *instance of* or an expression of the value; it is the result of a process of relating the broad category of a value to a narrow one of a behavior. The central argument of instantiation research is that a value should only influence a behavior to the extent that an individual perceives (explicitly or otherwise) the behavior as being connected to or expressive of said value.

Some initial indirect evidence that attention to instantiations is warranted comes from research demonstrating that Turkey, despite displaying significantly higher levels of discrimination against women, rates the importance of *equality* virtually identically to its

European peers. This pattern suggests differences in the degree to which gender equality is perceived as a typical instantiation of the value of equality between Turkey and other nations (Tansel et al., 2014). Evidence from another domain comes from research showing that increasing the salience of environmental values increased typical pro-environmental behaviors (recycling) but not behaviors that serve the same end but are less typical (using energy-saving electronic modes, using scrap paper, etc.) (Evans et al., 2013). More directly, Maio, Hahn, Frost, and Cheung (2009) investigated effects of typicality and found that exposing individuals to highly typical instances of a value (or behaviors that are commonly viewed as being value-expressive) increased subsequent pro-value behavior when compared to exposure to atypical instances. These sorts of findings strongly suggest that the importance of a value does not directly correspond with all behaviors that tend to further its ends. Rather, it is clear that a degree of subjectivity in the instantiation process leads to significant variance in how individuals translate their abstract values into concrete behaviors. Thus, understanding the degree to which an individual associates a certain context or behavior with a value is a critical piece of the value-behavior puzzle (for more: Hanel et al., 2018).

Approach Versus Avoidance Values

The present research, in part, aims to propose another explanation for observed gaps in value-behavior relations by focusing attention primarily on the means through which values are represented and assessed. Specifically, I hypothesize that the norm of describing and measuring values primarily in terms of the attainment of or movement

towards positive ideals fails to adequately capture and predict behaviors that are motivated by or construed in terms of the avoidance of or movement away from negative states. Multiple influential theories in social psychology, in fact, support such a distinction and disjunction between drives towards the positive and drives away from the negative. My intent here is not to adopt any one of them in whole to inform the current work on values but, rather, to outline that similar distinctions have been fruitful across a range of research domains and outcomes.

From as far back as the 1960s, theorists in the goals and achievement literature have described disjunctions between approach and avoidance motivations. Atkinson and Litwin (1960) describe two scales that differ in their measurement of the motives to succeed and to avoid failure, and subsequently demonstrated that the strength of these different motives carries implications for outcomes such as task selection, persistence, and efficiency. Other researchers in the same domain have investigated similar distinctions and found differences in other outcomes such as the extent to which approach or avoidance motivations differentially relate to outcomes such as intrinsic motivation and task performance (Elliot & Church, 1997).

Supporting a somewhat similar distinction, Gray (1981, 1982) argued that two distinct motivational systems form the basis for human behavior. The behavioral activation system (BAS) controls appetitive motivations and is associated with neurological systems that compel individuals to take action towards goals. The behavioral inhibition system (BIS), by contrast, controls more aversive and anxiety-related motives and is associated with neurological systems that inhibit actions that are

likely to produce punishment, pain, or otherwise lead to nonreward. While these theories vary in their scope of application, they all present compelling arguments suggesting that movement away from the negative and movement towards the positive can constitute or reflect distinct, rather than unitary, motives and processes.

Regulatory focus theory (RFT) also argues, in part, against assumptions that movement toward pleasure and away from pain reflect a unitary process or motivation, and argues for distinct regulatory processes of promotion and prevention (Higgins, 1997). Furthermore, the theory describes differences in regulatory *reference*, highlighting that individuals often differ in the reference point they use for their self-regulation. Specifically, Higgins uses the example of two individuals who both desire to be in love. One of these individuals might seek to reduce the discrepancy between their current state and the end state of being in love, whereas the other might seek to increase the discrepancy between their current state and the end state of being lonely/without love. RFT argues and in many cases demonstrates that this distinction is meaningful and carries significant implications for how the individual is likely to act and respond to various forms of feedback. In a similar manner, the present research included recognition of the fact that individuals may differ in the extent to which they construe the same behavior in terms of either approaching some positive end or avoiding the corresponding negative one.

Finally, some early work from the attitudes literature also supports the dissection of what may intuitively seem to be two diametric poles into distinct scales. Kaplan (1972), in a paper exploring attitudinal ambivalence, argued for and tested the utility of

measuring *liking* and *disliking* of a target separately rather than treating them as being antagonistically reciprocal. In some ways this is analogous to measuring the extent to which an individual finds (for example) promoting/facilitating equality important in addition to measuring the extent to which they find preventing/hindering inequality important.

Some of the earliest influential writings on personal values might, in fact, hint at this duality. Milton Rokeach, in defining personal values, said, "To say that a person has a value is to say that he has an [enduring belief] that a specific mode of behavior or end-state of existence is preferred *to an oppositive mode of behavior or end-state*" (Rokeach, 1973, p.25). Here, he clearly describes personal values as not just being comprised of one's desire to achieve or bring about some positive state, but defines them in a more holistic manner that includes at least a consideration of the corresponding and inverse negative state. Regardless of whether Rokeach intended this statement to imply a dualistic rather than unitary approach, he clearly indicated that some recognition of the negative (which is largely missing from contemporary values work) is necessary, and the aforementioned theories make it clear that a dualistic approach/avoidance approach is justified.

This notion of values, at their core, requiring consideration of both appetitive and aversive drives seems to be underappreciated in modern values research. While perhaps not sufficient in and of itself, this underappreciation might be evidenced by a simple examination of the way values are discussed both colloquially and within the literature. More specifically, the way values are defined and labeled places near exclusive focus on

the positive end of some idealistic dimension. One's preference to be closer to some end-state resembling *stimulation* rather than to the contrasting end-states of boredom, dullness, or tedium, is described as itself being the value of stimulation (or more colloquially, excitement). In the values literature, one's preference to be closer to the ideal of achievement and further from the inverse failure is described as being the value itself of *achievement*, defined and described in terms of only one half of a duality[1]. Though it seems clear that the language and labels used to discuss values might be biased towards positivity, that alone might not be a sufficient criticism of the status quo.

Beyond simply examining the language used to *label* and *describe* personal values, it seems clear that in a vast majority of cases values are also *measured* in ways that place disproportionate focus on the attainment of positive states. The Schwartz Value Survey, a staple in the assessment of personal values since its development in the 1990s, measures values by asking participants to indicate the relative importance of ideals such as *equality, a sense of belonging, meaning in life, politeness, wisdom,* and *independence*. Of course individuals could idiosyncratically hold that one or more of these are in fact negative or at least not universally positive, it seems unquestionable that these concepts are the types that people tend to cherish and toward which they seek to move. What do these scales tell us about the degree to which an individual seeks to avoid *inequality, loneliness, meaninglessness, rudeness, foolishness, or dependence?* It seems

[1] This specific example is in stark contrast to the goals and achievement literature previously referenced, wherein achievement motivations are explicitly broken into two distinct components of success-promoting motives and failure-avoiding motives.

to be assumed, based on the construction of this scale, that (a) an individual's relationship with the concept of *wisdom* hydraulically represents their relationship with its inverse of *foolishness*, and that (b) the effects of these dual relationships are unitary in nature, exerting some symmetrical or unified influence on actions, perceptions, and judgments. The latter is an assumption that seems to be adequately challenged by the motivational disjunctions described in regulatory focus theory and the behavioral inhibition/activation research described earlier, and the former is one that the present research was intended to challenge.

This dominance of positively-valenced measures is not only present in the Schwartz Value Survey. A more recent form of personal values measurement, titled the Portrait Values Questionnaire (PVQ-RR, for the revised edition; Schwartz, 2017), presents respondents with short descriptions of hypothetical individuals in such a way as to communicate their placing a high level of importance on a certain value. For instance, the questionnaire includes statements such as "It is important to [him/her] to help the people dear to [him/her]," and "It is important to [him/her] to be personally safe and secure." Respondents then are asked to indicate the extent to which each statement describes an individual that is similar to the respondent. Though not as ubiquitous in this scale, the concerns raised about the Schwartz Value Survey are largely present in this measurement tool as well. Of the 57 total statements in this questionnaire, 47 (approximately 82%) describe individuals who find approaching some positive state important. Only nine (or approximately 16%) statements describe a purely avoidance motivation, with an additional single statement describing a joint motivation (avoiding

disease and protecting one's health). This predominance of approach (or positively-described) motivations in this scale begs the same questions as with the Schwartz Value Survey.

Conceptually, is a personal value more than just one's singular desire to approach some idealized positive state? If so, then some consideration of avoidance of negative states is all but required in both the description and measurement of values. Unless it is demonstrably the case that asking about one's desire to promote positive states captures the inverse desire to avoid the corresponding negative states, then these types of scales could be argued to be lacking both in their content and predictive validities.

Current Studies

The present research was designed to address these concerns in several ways. Firstly, Study 1 was an attempt to address the critical premise of whether or not measures constructed in such a way as to describe the desire to achieve some positive end adequately capture the desire to avoid the corresponding and inverse negative end. Should it be the case that the importance of promoting *wisdom* captures the importance of avoiding *foolishness,* then the status quo may be preserved in that the extant scales could be argued to capture the full range of motivations (along a given dimension) that guide an individual. To test this, the PVQ-RR was adapted into two mirrored versions, each of which described the same general motivational directions as the original but were worded either in terms of approaching positive ends or avoiding

negative ends. These two modified scales were compared to one another to address the extent to which they corresponded.

Studies 2a and 2b built upon Study 1 by investigating the extent to which these value measures written framed in terms of avoidance either (a) outperformed positively-framed measures in predicting behavior, or (b) explained a significant portion of variance in behavior in models alongside positively-framed measures. In these two studies, behaviors that were selected for their narrow expression of specific values were measured, and a matching effect was hypothesized wherein value measures pertaining to avoidance of negative states would better predict behaviors similarly construed in terms of avoidance, and vice versa.

Study 3 expanded upon the findings of Studies 2a and 2b by investigating the differential relations between these value measures that varied in framing and a more value-ambiguous behavior (and related attitudes): receiving a vaccination for COVID-19. Whereas the behaviors in Studies 2a and 2b were expected (both a priori and due to pilot testing by Bardi & Schwartz, 2003) to highly correlate with a singular value, it is much less clear which values are most associated with receiving a vaccine. Many individuals are likely to associate this behavior with values of personal security, societal security, and perhaps even universalism and benevolence. Discourse around the vaccine and pandemic restrictions suggest that a good portion of individuals might also associate these behaviors instead with obedience, power, or freedom. The primary hypothesis of this study was that, in some cases, "avoidance value measures" would outperform their

traditionally promotion-oriented counterparts, and that in some cases would contribute unique predictive ability when in a model containing both.

Chapter 2. Study 1

The primary goal of Study 1 was to test the extent to which values measures diverge when rewritten to describe the same motivations but framed either in terms of avoiding negative outcomes or promoting positive ones. A critical premise for this line of research is that each of these separate framings, rather than wholly representing an individual's preferences for one end of some evaluative dimension over the other, reflect a somewhat polar motivation. In other words, an individual's report that *health* is important to them might not fully capture their preference for health *over illness*[2], but might instead describe a comparably singular preference for promoting health, which is of course likely to coincide with an aversion to (or the importance of avoiding) illness, but not perfectly. To test this critical premise, a common personal values scale was adapted into two forms, one containing items worded to describe the motivation to promote certain positive outcomes or ideals, and one containing items worded to describe the motivation to avoid the corresponding negative outcomes. These two modified scales were compared with one another to assess the extent to which their measures diverged from one another.

[2] or whatever the individual might view as being the corresponding inverse state

Evidence that these opposing framings capture the same underlying construct could support the status quo by suggesting that traditional values measures, which predominantly assess values through referring to positive ideals and outcomes, adequately reflect an individual's holistic set of preferences. However, evidence of these differently-framed measures diverging from one another would raise the question of which framing is more appropriate or effective. If the framing of items affects the responses, it might be reasonable to question which framing is more appropriate or more effective.

Method

Participants

Analyses for Study 1 included data from 260 subjects (124 male, 136 female) enrolled in the Fisher College of Business at The Ohio State University, who earned extra course credit as compensation for their participation. The study was both advertised and completed online, and 18 participants who did not complete the survey were excluded from analyses and are not included in the count listed above. An additional ten participants, not included in the sample size listed above, were excluded from analyses for having no variance in their responses to value measures (i.e. responding to every question with the same answer). Given that the goal of this first study was to investigate the utility of a modified scale, it was especially important to eliminate those displaying no differentiation in their responses.

Materials

PVQ-RR. The PVQ-RR (Schwartz, 2017) is a questionnaire developed to measure the importance of a respondent's personal values. The questionnaire consists of a series of statements describing hypothetical individuals who find specific values important, each of which begins with the sentence stem "It is important to [him/her]..." For example, the questionnaire includes items such as, "It is important to [him/her] to protect [his/her] public image," and "It is important to [him/her] always to look for different things to do." The scale includes a total of 57 such statements, three representing each of the 19 values in Schwartz' refined theory of basic values. The full list of items is included in Appendix A. After reading each statement, respondents were asked to rate the extent to which the individual described is similar to themselves, on a scale ranging from 1 ("Not like me at all") to 6 ("Very much like me"). The degree to which the respondent holds a given value is inferred from the extent to which they rate hypothetical others who apparently hold that value as being similar to themselves. Composite scores for each of the 19 values are obtained by averaging the ratings of each of the three corresponding statements.

PVQ-RR-A. For this research, I created a PVQ-RR-A -- a modified version of the PVQ-RR designed to describe the same motivational goals, but with items reframed in terms of avoiding negative outcomes rather than promoting positive ones. For instance, the statement, "It is important to [him/her] to be a dependable and trustworthy friend," was rewritten to become, "It is important to [him/her] to avoid being an unreliable or untrustworthy friend." Similarly, the statement, "It is important to [him/her]

to obey all the laws," was rephrased as, "It is important to [him/her] to avoid breaking any laws." Each statement within these pairs describes a motivation that might produce virtually identical behaviors as their counterparts but vary in the extent to which the motivation is described in terms of facilitation of a positive outcome or avoidance of a corresponding negative one.

It is important to point out, however, that not every single item in the original PVQ-RR was written in a promotion-framed manner. Of the 57 original items, 47 (or 82%) describe an individual who finds promoting some positive outcome important, whereas only 10 describe a negative or avoidance motivation. Thus, the PVQ-RR-A is not strictly a rewording of every single item in the original PVQ-RR; only those 82% of items that were originally positively-framed were rewritten, such that the *entirety* of the 57 statements in the PVQ-RR-A describe individuals who seek to avoid negative outcomes. The 10 statements describing more negative motivations were unaltered in this version.

PVQ-RR-P. In order to create a comparison for the PVQ-RR-A, I also created a PVQ-RR-P -- a direct inverse of the PVQ-RR-A, with the goal instead being to have a questionnaire consisting of 57 statements solely describing individuals seeking to promote positive ends. Thus, this questionnaire consists of the 82% of the original PVQ-RR that were already written in such a way as to describe individuals seeking to promote positive outcomes, along with the remaining 18% of originally negative items reworded to match the same framing. For instance, here the original statement, "It is important to

[him/her] never to violate rules and regulations," was changed to, "It is important to [him/her] to always follow rules and regulations."

Procedure

Subjects participated in this research study through the completion of an online survey distributed using an anonymized link. After providing informed consent, participants completed measures of personal value importance and of willingness to purchase certain hypothetical products intended to be value-expressive in nature. Participants were randomly assigned to either complete the value measurement or the purchase intention measure first. Furthermore, the ordering of the value measurement section was randomized such that participants either completed the full PVQ-RR-A first or the full PVQ-RR-P first (with the items in each being randomly ordered as well). After having completed both measures of value importance and the measures of purchase intention, participants read a short debriefing and were thanked for their participation.

Results

Figure 1 displays the internal consistency of each of the 38 (19 positively-framed, 19 negatively-framed) value measures. In all but four cases, the internal consistency as assessed by Cronbach's alpha produced confidence intervals that included the commonly accepted threshold of 0.7 (discussed in Cortina, 1993). In the case of both humility measures, the set of items that would comprise the original PVQ-RR measurement for the value produced a 95% confidence interval below this threshold (from 0.48 to

0.66). Thus, in this case, the modified scales do not appear to have reduced the internal consistency of the measure below their shared ancestor. In the case of achievement, the avoidance-framed items were only slightly below the threshold, whereas the positively-framed items (which in this case were the three originally in the PVQ-RR) were only slightly above it. Thus, the inverse framing did not seem to have a significant impact on the internal consistency of the items in this case. In the case of the negatively-framed stimulation items, further research should assess the wording used and determine whether another framing of the items might better preserve internal consistency.

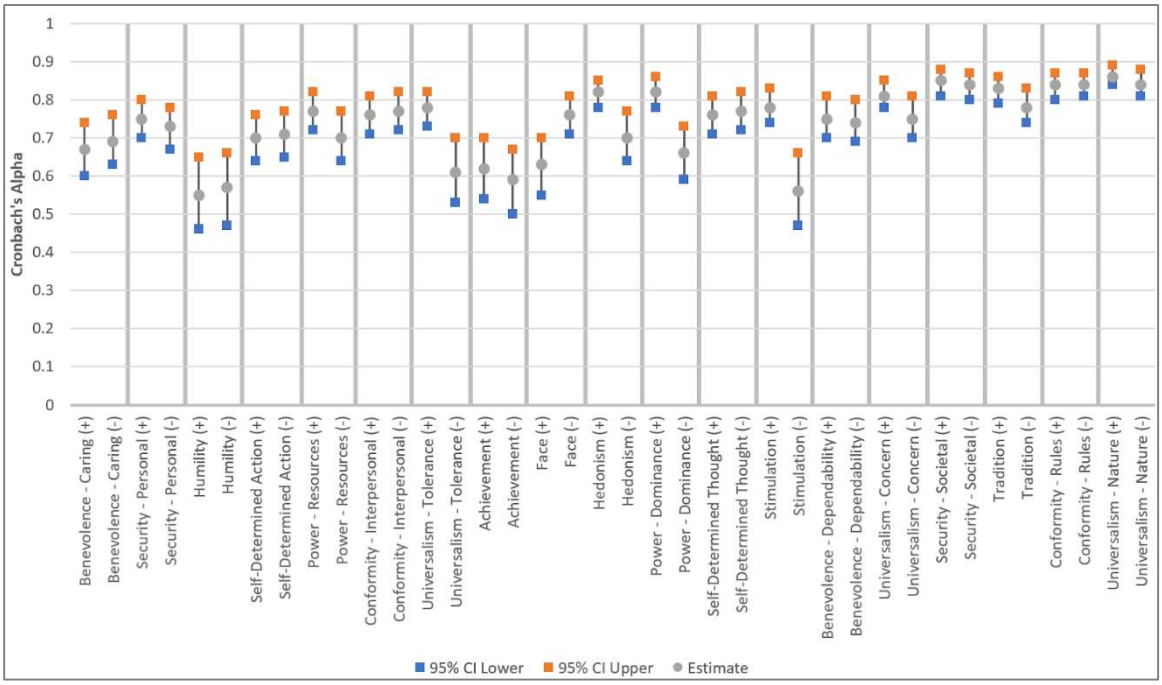

Figure 1. Internal consistency of PVQ-RR-P (+) and PVQ-RR-A (-) measures in Study 1.

A preliminary analysis assessed the extent to which PVQ-RR-A measures correlate with measures of the same values on the PVQ-RR-P. The results show a substantial degree of variance in this regard, with correlations ranging from 0.55 to

0.85. These correlations are displayed in Figure 2. Another analysis of this initial data sought to investigate whether modeling these positively- and negatively-framed value measures as representing separate latent variables resulted in a better fit compared to the alternative hypothesis that all 6 of the items (the three from the PVQ-RR-P and three from PVQ-RR-A meant to measure the same value) were more appropriately characterized as expressing the same underlying construct. Two confirmatory factor analyses were conducted for each of the 19 values in Schwartz' theory of basic values, one analysis testing the fit of a model with one latent variable, and the second testing the fit of a model using two separate but correlated latent variables. Additionally, a test of the difference in Chi-square Goodness of Fit across the nested models tested the extent to which the second, two-factor model was more effective (the difference in Chi-square values is itself, distributed as a Chi-square test with one degree of freedom). Table 1 contains the results of these analyses. Ultimately in 12 of the 19 cases, the model treating the positively- and negatively-framed items as expressing separate latent variables outperformed the single-factor models. In one additional case, the improvement of a two-factor over one-factor model was marginally significant.

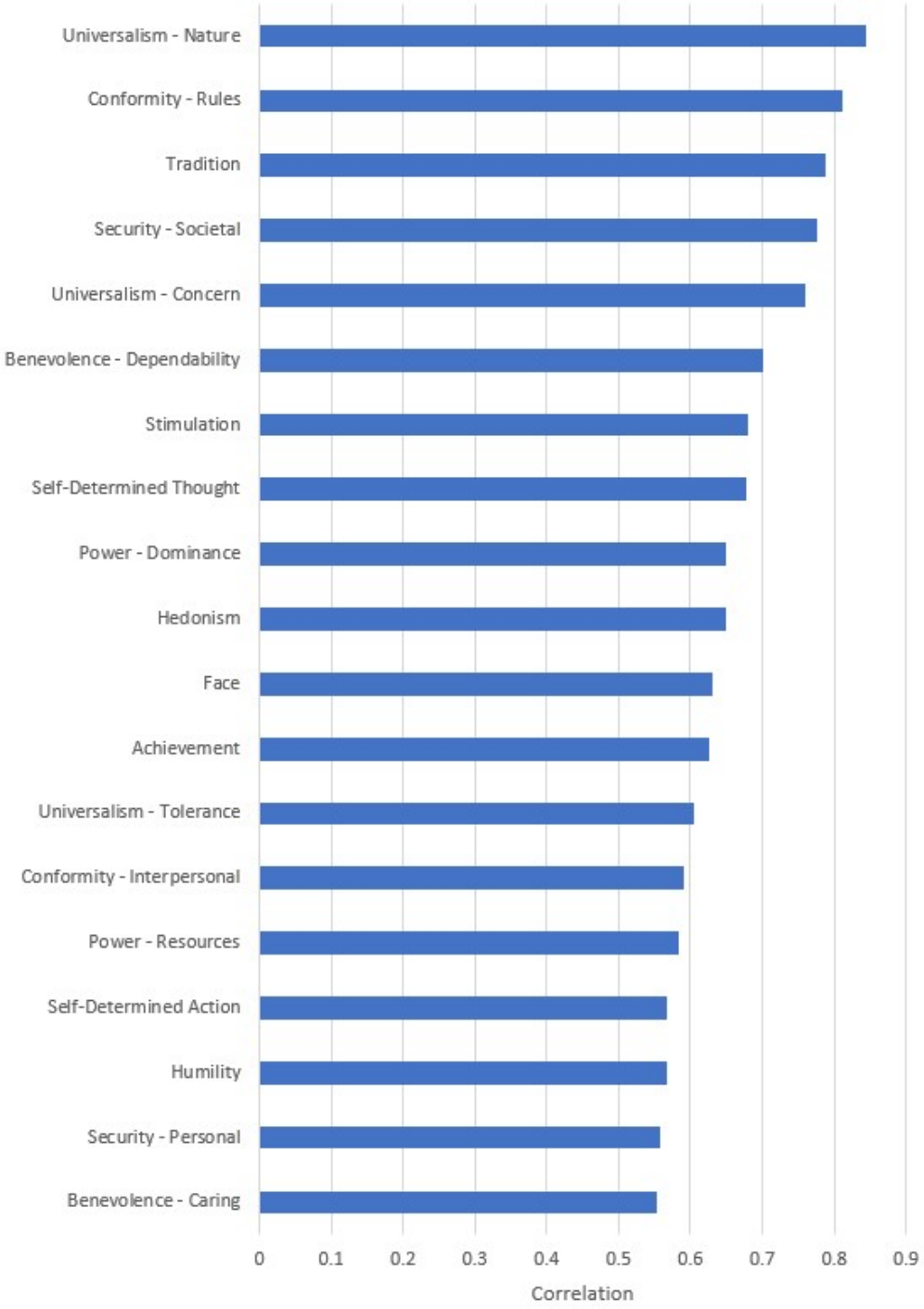

Figure 2. Correlations between approach and avoidance values.

Table 1. Two- vs one-factor confirmatory analysis results for approach and avoidance values.

Value	Model	Df	AIC	BIC	Chisq	Chisq diff	Df diff	Pr(>Chisq)	Sig
Benevolence - Caring	1-Factor	9	4253.6	4296.3	52.439				
	2-Factor	8	4217.5	4263.7	14.293	38.146	1	0.000	***
Security - Personal	1-Factor	9	4429.4	4472.1	95.371				
	2-Factor	8	4392.4	4438.6	56.383	38.988	1	0.000	***
Humility	1-Factor	9	4552.7	4595.4	10.367				
	2-Factor	8	4554.7	4600.9	10.352	0.015197	1	0.902	ns
Self-Determined Action	1-Factor	9	4457.8	4500.5	40.914				
	2-Factor	8	4436.7	4483	17.81	23.104	1	0.000	***
Power - Resources	1-Factor	9	4652.5	4695.2	81.115				
	2-Factor	8	4634.9	4681.1	61.467	19.647	1	0.000	***
Conformity - Interpersonal	1-Factor	9	4478.8	4521.4	52.954				
	2-Factor	8	4439.9	4486.1	12.073	40.881	1	0.000	***
Universalism - Tolerance	1-Factor	9	4343.5	4386.2	47.324				
	2-Factor	8	4338.4	4384.6	40.16	7.1641	1	0.007	**
Achievement	1-Factor	9	4502.6	4545.3	128.89				
	2-Factor	8	4501.7	4547.9	125.93	2.9564	1	0.086	m
Face	1-Factor	9	4491.6	4534.2	48.475				
	2-Factor	8	4491.9	4538.1	46.811	1.6634	1	0.197	ns
Hedonism	1-Factor	9	4102.5	4145.1	54.584				
	2-Factor	8	4091.2	4137.4	41.28	13.304	1	0.000	***
Power - Dominance	1-Factor	9	4660.5	4703.1	31.122				
	2-Factor	8	4655.8	4702	24.447	6.6757	1	0.010	**
Self-Determined Thought	1-Factor	9	4151.8	4194.5	17.6232				
	2-Factor	8	4142	4188.3	5.8133	11.81	1	0.001	***
Stimulation	1-Factor	9	4479.6	4522.2	11.347				
	2-Factor	8	4481.6	4527.8	11.346	0.0010275	1	0.974	ns
Benevolence - Dependability	1-Factor	9	3936.7	3979.3	41.42				
	2-Factor	8	3930.2	3976.4	32.916	8.5036	1	0.004	**
Universalism - Concern	1-Factor	9	4178.7	4221.4	24.552				
	2-Factor	8	4178.7	4225	22.566	1.9853	1	0.159	ns
Security - Societal	1-Factor	9	4040.5	4083.2	22.0053				
	2-Factor	8	4027	4073.2	6.4287	15.577	1	0.000	***
Tradition	1-Factor	9	4576.2	4618.9	31.907				
	2-Factor	8	4577.4	4623.7	31.089	0.81747	1	0.366	ns
Conformity - Rules	1-Factor	9	4088.5	4131.1	16.693				
	2-Factor	8	4085.8	4132	12.021	4.6714	1	0.031	*
Universalism - Nature	1-Factor	9	3884	3926.7	10.8633				
	2-Factor	8	3884.8	3931	9.6801	1.1831	1	0.2767	ns

Discussion – Study 1

Given the findings of this first study, it appears to be the case that value measures, when reframed to describe the avoidance of a negative state, operate somewhat independently from the same measures framed in terms of approaching the corresponding positive end. This is of course not to say that these measures or the constructs they represent are entirely independent - we should expect to (and in fact do) see a non-trivial amount of covariance between the two. However, these results do suggest that understanding how an individual feels about approaching one end of a value spectrum (i.e. stimulation) might not adequately convey their feelings towards avoiding its contrasting end (i.e. dullness). To the extent that behaviors might be differentially related to or expressive of these contrasting end-states, we may expect that a focus on only one might in many cases hinder our ability to understand and predict an individual's behavior. This is the primary question that the subsequent studies sought to explore; these negatively-framed value scores (which I will at times refer to as avoidance value measures) might diverge from their traditionally positively-oriented counterparts, but do they increase our understanding of an individual's attitudes or behavior in a significant manner?

Chapter 3. Study 2a

The goal of this second pair of studies was to build upon the findings of the first by exploring whether or not these divergent avoidance value measures significantly enhance the ability to predict (and therefore, in a sense, to understand) especially value-expressive behaviors. To test this, a set of behaviors that was pre-tested to narrowly express specific values was borrowed from past research (Bardi & Schwartz, 2003) in order to test several hypotheses regarding the predictive utility of avoidance values. Firstly, Study 2 sought to test whether it was in fact the case that behaviors could be differentially perceived as being expressive of facilitating a positive end as opposed to avoiding the corresponding negative one (is saving money just as much about becoming rich as it is avoiding being poor?). Given Study 1's demonstration that these values and their avoidance counterparts can diverge in terms of individuals' ratings of their importance, a demonstration that behaviors themselves could be viewed as more expressive of one framing over the other might suggest that in some cases, one of these framings might in fact be more effective in predicting (and might play a larger role in guiding) behavior. For instance, whereas traditionally values theorists might expect items assessing the value of promoting personal safety to predict one's frequency of wearing a helmet, perhaps motivations to wear a helmet are instead better captured by the same items reframed to assess the importance of avoiding danger, which Study 1 demonstrated is not entirely explained by its contrast. This served as the second goal of

Study 2, with a central hypothesis being that behaviors viewed as being more related to avoiding a negative end will be better predicted by avoidance-framed value measures, whereas behaviors viewed as being more related to promoting a positive end will be better predicted by more traditional positively-framed value measures.

Two specific values and their associated behaviors were selected to be the focus of this study. The values of interpersonal conformity and personal security were selected for two reasons. Firstly, these values were ones that demonstrated lower correlations between positive and negative framed measures in Study 1 (notice their positioning in Figure 2). Secondly, the list of behaviors tested and employed by Bardi and Schwartz (2003) for these two values included a mix of behaviors that seemed to express goals of both promoting and preventing positive and negative outcomes, respectively.

Method

Participants

Analyses for Study 2a included data from 182 subjects (100 male, 80 female, 2 unspecified) recruited through Amazon's Mechanical Turk (MTurk) system. Participants received $1.50 for their participation. The study was both advertised and completed entirely online, and 30 participants who did not complete the survey were excluded from analyses and are not included in the count listed above. An additional 9 participants were excluded from analyses (and the count above) for having no variance in their responses to value measures (i.e. answering every value measure with the same response).

Procedure

Subjects participated in this study through the completion of an online survey distributed using an anonymized link. After providing informed consent, participants completed the portions of the PVQ-RR-P and PVQ-RR-A that assessed the values of interpersonal conformity and personal security, and also reported their attitudes towards those same values. Half of the participants completed the values measures first, the other half completed the evaluations first. After these two measures, participants reported the frequency with which they've performed several behaviors over the past year. Finally, after completing the BIS/BAS scale, participants reported the extent to which they viewed the behaviors measured earlier as being related to their corresponding approach and avoidance values.

Materials

Value Importance Measures. Given that this study was focused on behaviors meant to narrowly express two values, the choice was made to measure only those two corresponding values rather than to have participants complete the full 114 items of the combined PVQ-RR-A and -P. The value items included were the items from the PVQ-RR-A and -P (which both have their items included in Appendix A) relating to interpersonal conformity and personal security. The included items were shuffled together and presented in random order.

Value Evaluation/Attitudinal Measures. In order to test secondary hypotheses (unreported here) regarding both (a) the relation between value *importance* and

evaluations of the value, and (b) the differential efficacy of using value importance versus attitudes towards the same value in predicting behavior, a set of items asked participants to evaluate the values. Namely, participants were asked to evaluate "pursuing safety, wellness, and stability," "avoiding danger, illness, and instability," "pleasing others," and "avoiding upsetting others," to assess their attitudes towards the values of personal conformity both positively- and negatively-framed, and interpersonal conformity both positively- and negatively-framed, respectively. These values were evaluated using 4 Likert scales ranging from 1-9 with the scale anchors of *bad/good, foolish/wise, harmful/beneficial, and undesirable/desirable*.

Behavior Frequency. In accordance with the research from which the behaviors were borrowed (i.e., Bardi & Schwartz, 2003), participants were asked to indicate how frequently they have performed certain behaviors *relative to their opportunities to do so*. The provision of this clause was meant to account for individuals who might have simply lacked sufficient opportunities to perform the behavior, and to only measure how likely an individual was to perform it when feasible to do so. The full list of behaviors and instructions can be found in Appendix B.

BIS Scale. The BIS/BAS scale was developed by Carver and White (1994) to measure two general and distinct motivational systems proposed to underlie human behavior. Namely, the authors argued that a behavioral approach system (BAS) regulates appetitive motivations, or those that involve moving towards desired outcomes, whereas a behavioral inhibition system (BIS) regulates aversive motivations that involve the avoidance of unpleasant outcomes. Carver and White developed this scale specifically to

measure the differential sensitivity of these two systems across different individuals. Given the present research's focus on the distinction between approaching positives and avoiding negatives, the BIS subscale appeared useful to include. The full scale is included in Appendix C.

Value Relatedness Measures. Given previous theoretical and empirical suggestions that a critical component in the value-behavior relation is the extent to which an individual idiosyncratically associates a behavior with any given value[3], several items were included in this study assessing the extent to which participants viewed the measured behaviors as being related to their corresponding values. Additionally, relatedness was measured separately for approach- and avoidance-framed values. For behaviors related to personal security, participants were asked to indicate on a 7-point scale ranging from 0 (unrelated) to 7 (very related) how related the behaviors were to both "promoting safety, wellness, or stability" and to "avoiding danger, illness, or instability." For interpersonal conformity behaviors, the same scale was used to assess relatedness to "pleasing others," and "avoiding upsetting others."

Results

Internal analyses revealed that, in virtually every case, *evaluations* of a value (i.e. the *desirability* of the value) were strongly outperformed by the *importance* of the value in predicting behaviors. Though this might suggest that importance of a value could play a larger role in influencing behavior than the desirability or positivity of the value, closer

[3] or in the words of some past research, the extent to which an individual regards the behavior as being *an instantiation of* the value

analyses and further research is needed to more closely examine the mechanism behind this difference. Another explanation could be that attitudes towards these concepts tend to be quite positive, leading to ceiling effects that limit their predictive ability. Indeed, the data did suggest that evaluations of the values (personal security, m = 8.4, sd = 0.88; interpersonal conformity, m = 6.73, sd = 1.53) tended to be proportionally higher on their 9-point scales than did their value importance counterparts on their 6-point scales (personal security, m = 4.91, sd = 0.87; interpersonal conformity, m = 4.05, sd = 1.14). Future research could test a procedure wherein individuals first view the entire set of values in Schwartz' values theory and then indicate the most desirable and least desirable value before completing their evaluations (as is done with value importance scales like the Schwartz Value Survey; Schwartz, 1992). This might increase differentiation in these evaluations and subsequently increase their predictive ability. Regardless of the mechanism behind this differential efficacy, the present research will continue with a focus on value importance (as measured by the PVQ-RR variants) rather than on the desirability of a value.

One of the key hypotheses of this study and a major premise of this line of research was that behaviors would be viewed as differentially related to either promoting the positive end of a value versus avoiding the contrasting negative end. In order to test this hypothesis, two researchers independently generated predictions, for each behavior, about whether it appeared to express predominantly approach or avoidance motives. Both researchers independently reached the same conclusions, and these a priori predictions are listed alongside the behaviors in Appendix B and also are made

clear in Figures 3 and 4, which show the results of paired t-tests assessing these differences in relatedness. Namely, these tests indicated that all but one of the behaviors significantly differed in the extent to which they were associated with approaching a positive end as opposed to avoiding its corresponding negative. These differences were not only statistically significant but also directionally consistent with our a priori hypotheses.

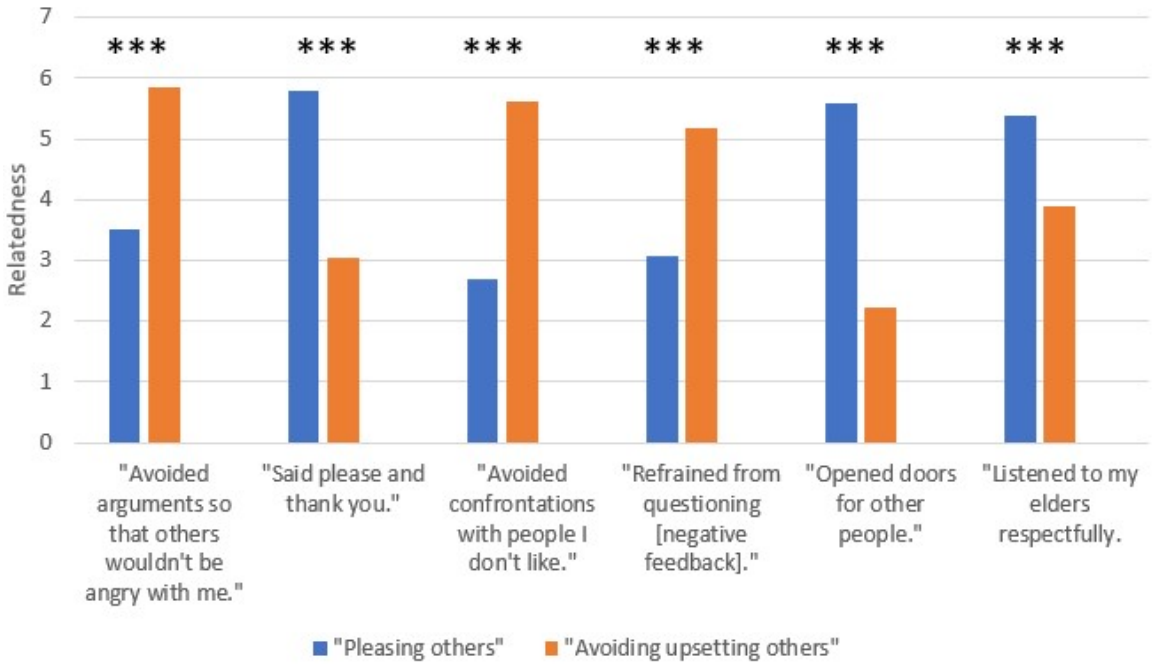

Figure 3. Relatedness of behaviors used in Studies 2a and 2b to pleasing others vs avoiding upsetting others.

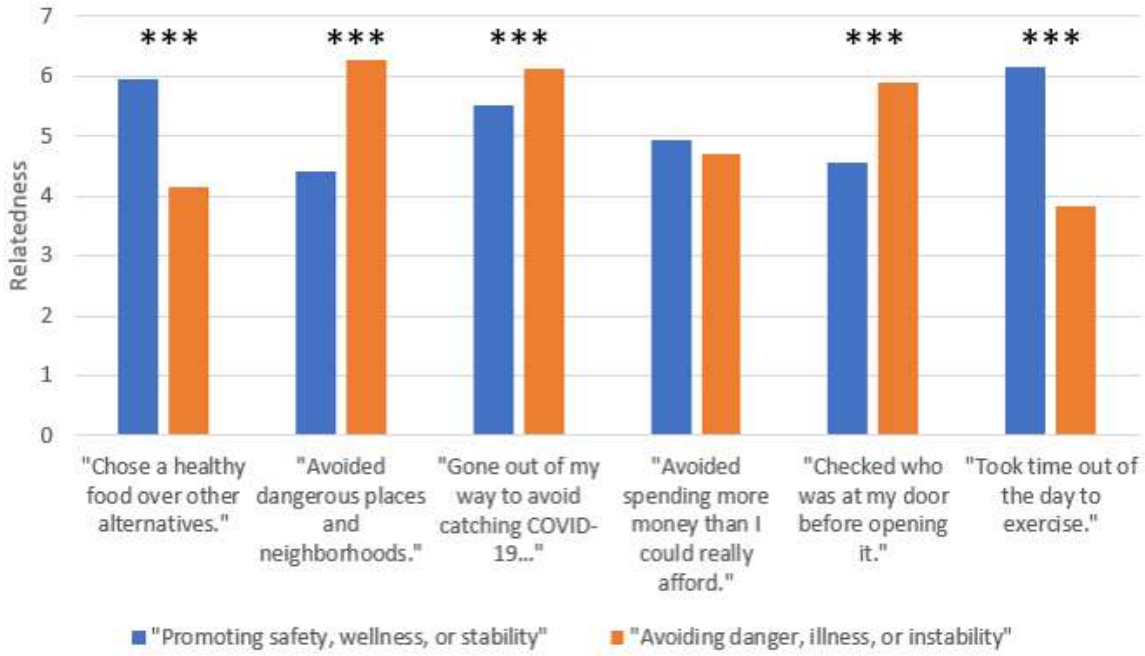

Figure 4. Relatedness of behaviors in Study 2a to promoting safety, wellness, and stability vs avoiding danger, illness, or instability.

A Note on Weighted Value Importance

The present research took an approach that is not typical in values research by weighing value importance by its relatedness to a given context or behavior. Given the previous discussion of value instantiation, this decision was made in order to account for how relevant participants perceived values to be to the behaviors in question. Similar procedures have been used in other domains wherein the interpretation of a single variable is largely uninformative without the other. For instance, in the rejection sensitivity literature, the aversiveness of an outcome is multiplied by its perceived likelihood, as it makes little sense to consider the aversiveness of a rejection outcome if an individual views it as nearly impossible or at least extremely unlikely (for instance, Downey & Feldman, 1996). Similarly, the theory of reasoned action uses a

multiplicative weighting procedure in modeling the relations between beliefs and attitudes. In this theory, an belief about the (un)desirability of some event or outcome is likely to influence attitudes *only* to the extent that the event or outcome is viewed as being likely to occur, and measures of the desirability X likelihood perceptions are often multiplied before they are summed to predict overall attitudes (Fishbein, 1963). Similar logic applies here; the importance of a value in understanding and predicting behavior only makes sense to the extent that an individual considers it to be related to the behavior. One's valuing of *equality*, no matter how important, is likely to play no role in the selection of sandwiches, for instance, because it is unlikely that the behavior will be construed as being related to the value. Similarly, relatedness by itself tells us little about an individual's behavior and should only matter to the extent that a value is important. An individual could find *equality* to be highly relevant to hiring considerations, but relevance itself matters little if the individual does not find the value to be important in the first place. Thus, the primary analyses in this research used measures of importance multiplied by measures of relatedness as primary predictors of behavioral and attitudinal outcomes.

The focal hypothesis of this study was regarding the extent to which behaviors could be differentially predicted by the two forms of value measurement. Namely, the goal was to test whether avoidance value measures (1) would serve as better single predictors for avoidance-oriented behaviors, and (2) whether they would contribute a significant degree of predictive capability when added to a model using only positively-framed value measures. The complement was also hypothesized; specifically that

approach- or promotion-type behaviors would be more effectively predicted using positive value measures, and that positive value measures being added to a model of only avoidance values would produce a significant increase in the ability to predict those types of behaviors.

To test the first hypothesis, two multiple regression analyses were conducted to predict each behavior: one that used (weighted) positively-framed value importance, and one using weighted avoidance value importance. Behavioral measures were standardized prior to analyses. The results (depicted in *Single-Value Models* portion of Table 2) show that in all but two cases, the model using the framing-consistent value measure (i.e. avoidance values for avoidance/prevention behaviors and approach values for approach/promotion behaviors) produced better predictions (assessed in terms of R^2) than their framing-inconsistent counterparts, which in some cases produced models that were not statistically significant at all.

Tests of the second hypothesis built upon the first by testing whether this difference was statistically significant. For each behavior, an additional linear regression was conducted that combined the models described previously. This combined model predicted behaviors using the importance and relatedness for both the positively- and negatively-framed value measures with a goal to test whether the value measure that matched the framing of the behavior explained some significant portion of variance beyond that of the framing-inconsistent value measure. The combined model was compared against the single-value, framing-*inconsistent* model using an analysis of variance test to determine whether the more complex model constituted a significant

improvement. Results of these combined models and ANOVA tests can be found in the final column of Table 2. In all but one case, the addition of the framing-consistent measure produced a significant increase in predictive ability above and beyond using the framing-inconsistent measure alone.

More complex models that separate out main effects of value importance and value relatedness and the interaction of importance and relatedness can be found in Appendix E. It is worth noting that it is expected that across cases, different combinations of value importance, relatedness, or an interaction term could form the primary significant predictors in a model. Specifically, it makes sense to expect that relatedness may serve as a more potent main effect predictor in cases whereby a value is generally viewed as being important (or for some other reason varies little in importance). In a case where a value is almost always viewed as being important in a given sample, what might better predict behaviors are differences in the extent to which the value is deemed relevant to the behavior. Similarly, there may be cases whereby relevance itself tends to be high in a sample, and thus differences in importance might serve to better predict outcomes.

It is finally worth noting that including scores on the BIS scale did not significantly change any of the patterns described above. Its inclusion in some models did improve overall model fit, but the individual differences did not interact with the matching effects described, nor did they appear to subsume the significance of other predictors in the models.

Table 2. Comparison of model fits predicting behavior in Study 2a

		Single-Value Models						Combined Value Models					
		Approach Value Model			Avoidance Value Model			Approach Value		Avoidance Value			
		Estimate	SE	R^2	Estimate	SE	R^2	Estimate	SE	Estimate	SE	R^2	Improved Fit? (F)
Interpersonal Conformity	Behavior 1 (-)	**0.025*** **	0.007	**0.064*** **	**0.049*** **	0.007	**0.221*** **	**0.014***	0.007	**0.045*** **	0.007	**0.24*** **	**41.586*** **
	Behavior 2 (+)	**0.016*** **	0.006	**0.039*** **	0.003	0.005	0.001	**0.016*** **	0.006	0	0.005	**0.039***	**7.0383*** **
	Behavior 3 (-)	0.015†	0.008	0.019†	**0.031*** **	0.008	**0.08*** **	0.007	0.008	**0.029*** **	0.008	**0.083*** **	**12.532*** **
	Behavior 4 (-)	0.012	0.010	0.008	**0.041*** **	0.010	**0.081*** **	0.001	0.01	**0.04*** **	0.011	**0.081*** **	**14.1*** **
	Behavior 5 (+)	**0.023*** **	0.008	**0.043*** **	**0.026*** **	0.008	**0.057*** **	**0.019***	0.008	**0.023*** **	0.008	**0.087*** **	**5.8662***
	Behavior 6 (+)	**0.046*** **	0.007	**0.196*** **	0.013†	0.007	0.02†	**0.046*** **	0.007	0.001	0.007	**0.196*** **	**39.028*** **
Personal Security	Behavior 1 (+)	**0.028*** **	0.008	**0.059*** **	**0.018*** **	0.006	**0.041*** **	**0.023*** **	0.009	0.012†	0.007	**0.076*** **	**6.8587*** **
	Behavior 2 (-)	**0.012***	0.005	**0.026***	**0.05*** **	0.007	**0.216*** **	0.002	0.005	**0.049*** **	0.007	**0.216*** **	**43.432*** **
	Behavior 3 (-)	**0.025*** **	0.007	**0.069*** **	**0.038*** **	0.008	**0.124*** **	0.01	0.008	**0.032*** **	0.009	**0.132*** **	**13.045*** **
	Behavior 4 (-)	0.012†	0.007	0.017†	0.011†	0.006	0.015†	0.009	0.007	0.007	0.007	0.024	1.1382
	Behavior 5 (-)	**0.018***	0.007	**0.036***	**0.039*** **	0.007	**0.132*** **	0.004	0.007	**0.037*** **	0.008	**0.134*** **	**20.274*** **
	Behavior 6 (+)	**0.034*** **	0.011	**0.051*** **	0.003	0.008	0.001	**0.035*** **	0.011	-0.002	0.008	**0.051*** **	**9.4901*** **

†p < .10. *p < .05. **p < .01. ***p < .001

Note. The behavior titles are color-coded and denoted with a symbol in parentheses to indicate a priori predictions (which were supported as shown in Figures 3 and 4) about which value measurement type would best predict the behavior. The final column on the portion describes the results of a statistical test of whether or not the predicted value significantly improved a model containing only its counterpart.

Chapter 4. Study 2b

The goal of Study 2b was to replicate the results of Study 2a using a separate sample and with a few alterations. Perhaps the most significant change is the inclusion of the full set of PVQ-RR-P and PVQ-RR-A items, as opposed to only including the items for the values that the included behaviors were meant to express. There are some suggestions (such as in Schwartz, 1992) that given the generally desirable nature of the values in Schwartz theory of basic values, a measuring of the full set of values allows for more differentiation in that respondents can identify their most- and least-important values and rate the others accordingly. By contrast, the assessment of only a small set of values (without the ability to anchor in terms of superlative values) could lead to the select few being rated highly on importance regardless of their comparative position in one's value hierarchy.

Furthermore, Study 2b included measures of respondents' attitudes towards the behavior being predicted, whereas in Study 2a, evaluative measures were aimed at the value itself. This is especially worthy of investigation given past proposals that attitudes toward the behavior or toward the target of the behavior serve as the predominant mediators between values and behavior (Schwartz, 2017). Beyond this proposed mediation, attitudes themselves have been suggested to be affected by downstream

influences of values, and therefore are reasonably considered as outcomes of value dynamics in addition to committed behaviors (Blankenship, Wegener, & Murray, 2012).

With the introduction of a set of attitudinal measures for each behavior, and an increase of 102 value measurement items over Study 2a (administering the full PVQ-RR-P and PVQ-RR-A rather than 2/19 of the items in them), the choice was made to focus only on behaviors related to interpersonal conformity in Study 2b. The choice to include interpersonal conformity behaviors rather than personal security behaviors was in part informed by the extent to which interpersonal conformity behaviors showed slightly stronger evidence of the anticipated matching effects in Study 2a (see Table 2).

Method

Participants

Analyses for Study 2b included data from 98 subjects (66 male, 32 female) enrolled in an introductory Psychology class at The Ohio State University. Participants earned research credit as compensation for their participation. The study was both advertised and completed online. Five participants were excluded from analyses for having no variance in their responses to value measures (i.e. answering every value measure with the same response).

Procedure

Subjects participated in this study through the completion of an online survey. After providing informed consent, participants completed a measure of personal values (consisting of both the full PVQ-RR-P and PVQ-RR-A) and indicated the frequency with which they had performed several behaviors expressive of interpersonal

conformity (listed in Appendix B) over the past year. These two measures were counterbalanced such that half of the participants completed values measures first, and half completed behavior measures first. After completing both of these measures, participants were asked to evaluate the behaviors measured alongside indicating their level of certainty in their evaluation of the behavior and their ambivalence towards the behavior. Finally, participants indicated the extent to which they viewed each of the behaviors as being related to either "pleasing others" or "avoiding upsetting others."

Materials

Value Importance. Value importance was assessed using the PVQ-RR-A and PVQ-RR-P, as described in Study 1.

Behavior Frequency. Behaviors were measured in the same manner as in Study 2a. However, only the six behaviors expressive of interpersonal conformity were included in this study, whereas the six related to personal security were omitted.

Behavior Evaluation / Attitude Towards Behaviors. In Study 2b, the included behaviors were treated as the object of evaluation in the same way that values were evaluated in Study 2a.

Attitude Certainty. In addition to the same attitudinal/evaluation measures employed in Study 2a (albeit using the behaviors in this study as objects of evaluation as opposed to the value), participants indicated how *confident* and how *sure* they were of their evaluation, both on 9-point Likert scales. These measures were included to test hypotheses not central to the present research and thus not reported here.

Subjective Ambivalence. Participants were asked to indicate their level of agreement, from 1 (strongly disagree) to 7 (strongly agree) with the following statements for each behavior: (a) "My thoughts about ___ are conflicted," (b) "My thoughts about ___ are mixed," and (c) "I feel indecisive about ___." These responses were averaged to form a composite score of subjective ambivalence. As with attitude certainty, these measures were intended to test secondary hypotheses, and analyses involving them are not reported here.

Value Relatedness Measures. Value relatedness was measured in an identical manner as in Study 2a.

Results

Tests of focal hypotheses were conducted in an identical manner to Study 2a. First, two regression models (one for the positively-framed measures, and one for the avoidance value measures) containing weighted importance of the value as predictors were constructed for each behavior, with each behavior being standardized prior to analysis. These models were compared against one another to determine whether avoidance value models better fit for models predicting avoidance/prevention behaviors, and vice-versa. Second, combined models involving the previously mentioned predictors for *both* approach and avoidance values were compared to the single, framing-*inconsistent* model using an analysis of variance test, to determine whether the addition of the framing-*consistent* measure produced a statistically significant increase in prediction of the DV beyond its alternative (i.e. does the "right" measure really tell you something that the "wrong" one does not?).

Findings (outlined in Table 3) fairly replicate the findings of Study 2a by once again demonstrating that in all of the cases where behaviors could be predicted at all, (a) the measure consistent with the framing of the behavior served as a more potent standalone predictor, and (b) the addition of the framing-consistent measure into a model involving only the framing-inconsistent measure constitutes a significant improvement in model fit, implying that the framing-consistent measure explains some degree of variance that is not captured by the inconsistent measure. In predicting four of the six behaviors, a pattern consistent with hypotheses was observed. In another two of the six, behaviors were not significantly predicted by any of the three models constructed, which does not lend support to our hypotheses, but might not pose a significant challenge to them. Given that the present hypotheses surround the differential efficacy of value measures framed in certain ways, cases where values do not seem to predict a behavior at all regardless of framing could be argued to be an indictment of the general predictive ability of values more than of the differential efficacy of opposing framings. More complex models that separate out main effects of value importance and relatedness of the behavior to the value and their interaction can be found in Appendix F.

Table 3. Comparison of model fits predicting behavior in Study 2b

Interpersonal Conformity

	Single-Value Models						Combined Value Models					
	Approach Value Model			Avoidance Value Model			Approach Value		Avoidance Value			
	Estimate	SE	R^2	Estimate	SE	R^2	Estimate	SE	Estimate	SE	R^2	Improved Fit? (F)
Behavior 1 (-)	0.007	0.013	0.003	**0.051*** **	0.013	**0.144*** **	-0.014	0.013	**0.058*** **	0.015	**0.156*** **	**15.861*** **
Behavior 2 (+)	0.021†	0.012	0.031†	0.023†	0.013	0.034†	0.015	0.013	0.018	0.014	0.049	1.432
Behavior 3 (-)	0.018	0.014	0.019	**0.043** **	0.014	**0.1** **	0.011	0.014	**0.041** **	0.014	**0.106** **	**8.642** **
Behavior 4 (-)	0.008	0.015	0.003	**0.031***	0.014	**0.054***	-0.006	0.016	**0.034***	0.015	0.056†	**4.938***
Behavior 5 (+)	0.011	0.013	0.009	0.002	0.015	0	0.012	0.014	-0.002	0.015	0.009	0.773
Behavior 6 (+)	**0.038** **	0.013	**0.094** **	**0.025***	0.013	**0.044***	**0.033***	0.014	0.012	0.013	**0.103** **	**5.756***

†p < .10. *p < .05. **p < .01. ***p < .001

Note. The behavior titles are color-coded and denoted with a symbol in parentheses to indicate a priori predictions (which were supported as shown in Figures 3 and 4) about which value measurement type would best predict the behavior. The final column on the portion describes the results of a statistical test of whether or not the predicted value significantly improved a model containing only its counterpart.

Study 2b additionally expanded upon Study 2a by including models predicting *attitudes* towards a behavior in addition to models predicting frequency of that behavior. The models (shown in Table 4) demonstrated a general lack of predictive efficacy compared to the models predicting frequency of self-reported behavior. In four of the six cases, attitudes towards the behavior could neither be significantly predicted by individual approach or avoidance measures, nor by a model combining both types of value measures. In the two cases where an attitude could be predicted, however, the pattern appears to support the general hypothesis of differential efficacy, where adding a more related value increased predictive ability.

Table 4. Comparison of model fits predicting attitudes in Study 2b

Interpersonal Conformity	Single-Value Models						Combined Value Models					
	Approach Value Model			Avoidance Value Model			Approach Value		Avoidance Value		R^2	Improved Fit? (F)
	Estimate	SE	R^2	Estimate	SE	R^2	Estimate	SE	Estimate	SE		
Behavior 1 (-)	0.018	0.013	0.021	0.016	0.014	0.014	0.014	0.014	0.009	0.016	0.025	0.363
Behavior 2 (+)	0.018	0.012	0.023	0.016	0.013	0.016	0.015	0.013	0.011	0.014	0.03	1.257
Behavior 3 (-)	-0.009	0.014	0.004	**0.034***	0.014	**0.061***	-0.016	0.014	**0.037***	0.014	**0.074***	**6.639***
Behavior 4 (-)	0.02	0.015	0.02	0.014	0.014	0.011	0.017	0.016	0.008	0.015	0.023	0.243
Behavior 5 (+)	0.011	0.013	0.009	-0.002	0.014	0	0.013	0.014	-0.007	0.015	0.011	0.969
Behavior 6 (+)	**0.03***	0.013	**0.055***	-0.012	0.013	0.009	**0.042****	0.014	**-0.028***	0.014	**0.099***	**8.826****

$^{\dagger}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$

Note. The behavior titles are color-coded and denoted with a symbol in parentheses to indicate a priori predictions (which were supported as shown in Figures 3 and 4) about which value measurement type would best predict the behavior. The final column on the portion describes the results of a statistical test of whether or not the predicted value significantly improved a model containing only its counterpart.

Discussion – Studies 2a and 2b

Regarding behavioral prediction, with the largely replicated pattern of findings demonstrated by Studies 2a and 2b, it seems that the way in which values are described in their measurement scales carries significant implications for their ability to predict behavior. When a value is construed in terms of promoting some positive end in its measurement (such as when respondents are asked questions about the importance of [promoting] *safety*), the respondent's answer appears to correlate more strongly with behaviors construed as fulfilling those same ends, compared to behaviors that, by contrast, might be construed in terms of *avoiding danger*. Although in some cases the disjunction in these motivations or construals can seem unintuitive (is caring about being safe not the same as caring about avoiding danger?), the findings of both Studies 2a and 2b suggest individuals do in fact associate different behaviors with each of these ends of

the safety-danger continuum, and also suggest that which end is explicitly asked about in a scale matters.

Regarding the newly-introduced evaluative measures, Study 2b failed to find consistent evidence of values predicting attitudes towards a behavior. This might seem to conflict with past suggestions that attitudes in large part mediate value-behavior relations (Schwartz, 2017), but a lack of predictive ability in this context could also signal that the behaviors measured were generally regarded as positive. Such a ceiling effect could limit the extent to which attitudes could be predicted by corresponding values, whereas the inclusion of a set of behaviors more varied in their desirability might better elucidate such relations. Future research should explore this explanation by including behaviors that vary more in the degree to which they are generally perceived as being desirable or positive.

Chapter 5. Study 3

Studies 2a and 2b measured and predicted a set of behaviors that were pre-tested and carefully selected for the extent to which they narrowly expressed specific values. The primary goal of Study 3 was to expand on these findings by testing the incremental efficacy of avoidance value measures in explaining more value-ambiguous behaviors. Namely, in the midst of a global pandemic, there is a clear interest in understanding the factors that predispose individuals to not only think positively of vaccination, but also to actually receive the vaccine. One might notice, however, that the discourse surrounding vaccination (and mask-wearing) appears to reveal a wide range of values that individuals associate with these pandemic-combatting behaviors. Many clearly view mask-wearing and vaccination as emblematic of safety, benevolence, and universalism, whereas some others appear to primarily associate these behaviors instead with issues of conformity, obedience, freedom, or power. Whereas the present research has demonstrated a clear utility of considering values in terms of their negative light when understanding narrowly value-expressive behavior, can the same utility be demonstrated in a context which is not only incredibly relevant and charged but also one that involves a high degree of value-ambiguity? The primary hypothesis of Study 3 was that for some values, avoidance-framed value measures would serve as better predictors (for both attitudes and behavior/intentions) than positively-framed measures, and similar

to the analyses in Studies 2a and 2b, that these avoidance measures would contribute a significant degree of predictive ability to a model containing only traditional positive value measures.

Method

Participants

Study 3 involved 398 subjects (225 male, 171 female, 2 unspecified) enrolled in the Fisher College of Business at The Ohio State University, who earned research credit as compensation for their participation. The study was both advertised and completed online. Twenty-seven participants were excluded from analyses for their incompleteness of a majority of the items. Data was collected on two occasions, such that individuals participating on the second occasion could have been participants in the first. To account for this, after filling out values measures, a question asked participants whether they had participated in a similar study earlier this semester that asked the same set of questions. Seventy-six participants answered yes to this question and were excluded from analyses. This left a total of 295 subjects included in analyses.

Procedure

After providing informed consent, participants began the study by completing both the full PVQ-RR-P and PVQ-RR-A, counterbalanced such that half completed one first, and half completed the other first. Afterwards, participants completed four sets of items in random order: (a) a set of items asking whether or not they had been vaccinated

(and if not, 3 items assessing their intentions to do so), (b) a set of items assessing the participants' perceived norms surrounding vaccination, (c) a set of items assessing attitudes towards the behavior "getting vaccinated," and (d) a set of items assessing subjective ambivalence towards "getting vaccinated." Subsequently, participants indicated the extent to which they found "getting vaccinated" to be related to each of the basic values in Schwartz' theory, framed both positively and negatively (descriptions in Appendix D). Half of the participants indicated relatedness to the full set of values framed positively first, and the other half responded to values framed negatively first. Finally, participants indicated their political orientation before being thanked for their participation.

Materials

Value Importance. Value importance was assessed using the PVQ-RR-A and PVQ-RR-P, as described in Study 1.

Evaluation of Vaccination. Participants were asked to evaluate "getting vaccinated" along the same evaluative dimensions used in studies 2a and 2b.

Subjective Ambivalence. The same subjective ambivalence measures were used as in Study 2b, but with the object of evaluation/ambivalence instead being the action "getting vaccinated."

Vaccination Behaviors & Intentions. Participants were asked to indicate whether or not they were currently eligible to receive a COVID-19 vaccine. If they indicated they were eligible, they were asked whether or not they have received the

vaccine. If the participant either indicated they had not yet received the vaccine or that they were not yet eligible, they were asked three questions assessing their intentions. The first question asked "To what extent do you intend to get vaccinated for COVID-19?" and employed a response scale ranging from 1 ("I absolutely DO NOT plan on getting the vaccine") to 7 ("I absolutely plan on getting the vaccine"). The second question asked, "What are your plans regarding the COVID-19 vaccine?" and allowed participants to select options from a seven-point scale that ranged from, "I definitely will NOT get the vaccine," and "I most likely will not get the vaccine," to, "I most likely will get the vaccine," and, "I definitely will get the vaccine." The third and final intention item asked participants to indicate their agreement with the statement, "I plan on getting vaccinated for COVID-19," on a scale ranging from 1 (Strongly disagree) to 7 (Strongly agree). A 95% confidence interval assessing the internal consistency of these three items ranged from $\alpha = 0.96$ to $\alpha = 0.97$, so the items were averaged into a single composite measure for intention. Those who indicated they already received the vaccine (a total of 164) were coded as having maximal intentions on all three items. Intention scores were standardized prior to analyses.

Perceived Vaccination Norms. Participants were asked to indicate the extent to which friends, family members, and classmates (separately) "are pro-vaccine," "intend to get vaccinated," and "have been vaccinated if eligible." They then responded to a single item for each of these three groups which asked, "The feelings and behaviors of [my friends / my family members / my classmates] are important to me," and allowed for responses ranging from 1 (Strongly disagree) to 7 (Strongly agree). To compute a

composite score for norms, each of the three items for each group (friends, family, classmates) was first averaged. Then, each average was multiplied by its corresponding importance rating, such that the opinions of a group were weighted according to how important that group is to the individual. Then, the average of these three weighted scores was taken and standardized for analyses.

Relatedness Measures. Similar to studies 2a and 2b, participants indicated the extent to which they viewed "Getting a vaccine" as related to various values, on a scale ranging from 1 ("very unrelated") to 6 ("very related"). In this case, relatedness was measured for each value in both positively- and negative-framed manners. Rather than referring to the values by their theoretical labels, a short phrase was used for each to capture the essence of the value in plain language. These phrases were based on the descriptions / definitions of each value in Schwartz (2017), and are listed in Appendix D. Responses were standardized prior to analysis for ease of interpretation.

Political Ideology. Political ideology was measured using a single item that asked participants to rate themselves on a scale ranging from 1 ("Extremely liberal") to 7 ("Extremely conservative"). Responses were standardized prior to analysis for ease of interpretation.

Results

As with Study 2b, Study 3 sought to demonstrate the differential and additional predictive ability of avoidance value measures in predicting both attitudes and behavior/behavioral intentions. Thus, for both behavior and attitudes, three regression models were constructed for each of the 19 basic values in Schwartz's theory of values:

(a) one model predicting the outcome (either attitude or behavior/intent) using a weighted approach value, (b) one predicting the outcome using a weighted avoidance value, and (c) one combined model incorporating both approach and avoidance value measures as predictors. The outcome variables for these models were both standardized prior to analyses. Models including political ideology and norms as controls can be found in Appendices I and J. These controls, while improving the predictive models, tended to subsume the statistical significance of personal values (moreso for the models predicting intentions than attitudes - the reason for this difference is not immediately clear) and thus obscured any differential effectiveness that was the focal hypothesis of this study.

Detailed results of these models can be found in Tables 5 (intentions) and 6 (attitudes). More complex models that separate out main effects and interaction terms can be found in Appendices G and H. Regarding the attitude prediction models, in seven of the 19 cases, avoidance value measures produced a statistically significant increase in model fit when added to a model utilizing only approach value measures as predictors. In several of the comparisons between single-predictor models, avoidance value models individually explained more of the variance in attitudes (according to R^2 fit indices) than did approach value models.

Table 5. Comparison of across-value models predicting vaccination intentions

	Single-Value Models						Combined Models					Avoidance Values Improve Model? (F)
	Approach Value Model			Avoidance Value Model								
	Approach Value Estimate	SE	R^2	Avoidance Value Estimate	SE	R^2	Approach Value Estimate	SE	Avoidance Value Estimate	SE	R^2	
Benevolence (Caring)	**0.036*** **	0.007	**0.074*** **	**0.034*** **	0.007	**0.072*** **	**0.022***	0.01	**0.02***	0.01	**0.087*** **	**4.136***
Security (Personal)	**0.046*** **	0.007	**0.117*** **	**0.029*** **	0.008	**0.046*** **	**0.044*** **	0.01	0.003	0.01	**0.117*** **	0.092
Humility	0.01	0.008	0.006	**0.025** **	0.008	**0.032** **	0.002	0.01	**0.024** **	0.01	**0.032** **	**8.141** **
Self-Direction (Action)	**0.025*** **	0.007	**0.042*** **	0	0.008	0	**0.032*** **	0.01	-0.017†	0.01	**0.054*** **	3.755†
Power (Resources)	0.001	0.009	0	0.01	0.008	0.005	-0.007	0.01	0.013	0.01	0.006	1.894
Conformity (Interpersonal)	**0.025*** **	0.007	**0.04*** **	**0.026*** **	0.007	**0.041*** **	0.015†	0.01	0.016†	0.01	**0.05*** **	3.385
Universalism (Tolerance)	**0.019** **	0.007	**0.022** **	0.01	0.008	0.005	**0.018***	0.01	0.001	0.01	**0.022***	0.004
Achievement	**0.017***	0.007	**0.021***	0.006	0.008	0.002	**0.022***	0.01	-0.009	0.01	**0.024***	0.858
Face	0.01	0.008	0.005	0	0.009	0	0.014	0.01	-0.009	0.01	0.008	0.741
Hedonism	**0.019** **	0.007	**0.024** **	**0.035*** **	0.008	**0.064*** **	0.01	0.01	**0.031*** **	0.01	**0.07*** **	**14.705*** **
Power (Dominance)	-0.011	0.008	0.007	0.006	0.008	0.002	**-0.019***	0.01	0.015	0.01	0.016†	2.714
Self-Determination (Thought)	**0.019** **	0.007	**0.025** **	-0.004	0.008	0.001	**0.031*** **	0.01	**-0.024***	0.01	**0.047*** **	**6.662***
Stimulation	**0.028*** **	0.007	**0.055*** **	0.013†	0.008	0.009†	**0.03*** **	0.01	-0.004	0.01	**0.056*** **	0.206
Benevolence (Dependability)	**0.043*** **	0.007	**0.115*** **	**0.031*** **	0.007	**0.066*** **	**0.041*** **	0.01	0.002	0.01	**0.115*** **	0.063
Universalism (Concern)	**0.039*** **	0.007	**0.103*** **	**0.025*** **	0.007	**0.045*** **	**0.038*** **	0.01	0.001	0.01	**0.103*** **	0.031
Security (Societal)	**0.02***	0.008	**0.02***	**0.027*** **	0.008	**0.038*** **	0.003	0.01	0.025*	0.01	**0.038** **	**5.748***
Tradition	-0.011	0.008	0.007	-0.003	0.008	0	-0.019†	0.01	0.011	0.01	0.01	0.952
Conformity (Rules)	**0.023** **	0.008	**0.027** **	0.001	0.008	0	**0.037*** **	0.01	**-0.023***	0.01	**0.043** **	**4.843***
Universalism (Nature)	**0.015***	0.008	**0.013***	0.008	0.008	0.004	0.021†	0.01	-0.008	0.01	0.014	0.404

†p< .10. *p < .05. **p < .01. ***p < .001

Note. Values were weighted by their relevance as described in Study 2a. The final column indicates whether the combined model (adding in measures of avoidance values) constituted a statistically significant improvement over the approach value only model.

Table 6. Comparison of across-value models predicting attitudes towards vaccination

	Single-Value Models						Combined Models					Avoidance Values Improve Model? (F)
	Approach Value Model			Avoidance Value Model								
	Approach Value Estimate	SE	R^2	Avoidance Value Estimate	SE	R^2	Approach Value Estimate	SE	Avoidance Value Estimate	SE	R^2	
Benevolence (Caring)	**-0.035*** **	0.007	**0.072*** **	**-0.031*** **	0.007	**0.064*** **	**-0.023***	0.01	-0.016†	0.01	**0.081*** **	2.999†
Security (Personal)	**-0.036*** **	0.007	**0.078*** **	**-0.026*** **	0.007	**0.039*** **	**-0.033*** **	0.01	-0.005	0.01	**0.079*** **	0.321
Humility	0.004	0.008	0.001	-0.014†	0.007	0.011†	0.011	0.01	**-0.018***	0.01	0.016†	**5.124***
Self-Direction (Action)	-0.01	0.007	0.006	**0.019***	0.007	**0.019***	**-0.023** **	0.01	**0.031*** **	0.01	**0.045*** **	**13.697*** **
Power (Resources)	**0.017***	0.008	**0.012***	-0.006	0.008	0.002	**0.031** **	0.01	**-0.022***	0.01	**0.028** **	**5.782***
Conformity (Interpersonal)	**-0.027*** **	0.007	**0.046*** **	**-0.025*** **	0.007	**0.037*** **	**-0.02***	0.01	-0.012	0.01	**0.052*** **	2.09
Universalism (Tolerance)	-0.013†	0.007	0.011†	0.002	0.008	0	**-0.019***	0.01	0.013	0.01	0.017†	1.981
Achievement	**-0.017***	0.007	**0.02***	0.007	0.008	0.002	**-0.031*** **	0.01	**0.028** **	0.01	**0.046*** **	**9.105** **
Face	-0.001	0.008	0	0.013	0.008	0.008	-0.011	0.01	**0.02***	0.01	0.012	**4.037***
Hedonism	-0.012†	0.007	0.01†	**-0.04*** **	0.007	**0.088*** **	0.001	0.01	**-0.041*** **	0.01	**0.088*** **	**28.407*** **
Power (Dominance)	0.006	0.008	0.002	0.003	0.008	0	0.006	0.01	-0.001	0.01	0.002	0.01
Self-Determination (Thought)	-0.01	0.007	0.007	**0.022** **	0.007	**0.025** **	**-0.031*** **	0.01	**0.042*** **	0.01	**0.069*** **	**22.337*** **
Stimulation	**-0.018** **	0.007	**0.022** **	-0.004	0.007	0.001	**-0.022** **	0.01	0.008	0.01	**0.024***	0.955
Benevolence (Dependability)	**-0.036*** **	0.006	**0.086*** **	**-0.018** **	0.006	**0.024** **	**-0.049*** **	0.01	0.018†	0.01	**0.096*** **	3.566†
Universalism (Concern)	**-0.027*** **	0.006	**0.049*** **	**-0.02** **	0.006	**0.027** **	**-0.024** **	0.01	-0.004	0.01	**0.049*** **	0.276
Security (Societal)	-0.013†	0.007	0.009†	-0.013	0.008	0.008	-0.008	0.01	-0.007	0.01	0.01	0.477
Tradition	**0.023** **	0.007	**0.031** **	**0.026*** **	0.007	**0.037*** **	0.01	0.01	0.019†	0.01	**0.04** **	3.210†
Conformity (Rules)	-0.006	0.008	0.002	0.007	0.008	0.002	-0.017†	0.01	0.018†	0.01	0.011	3.182†
Universalism (Nature)	-0.006	0.007	0.002	-0.01	0.007	0.005	0.002	0.01	-0.012	0.01	0.006	1.118

†p< .10. *p < .05. **p < .01. ***p < .001

Note. Values were weighted by their relevance as described in Study 2a. The final column indicates whether the combined model (adding in measures of avoidance values) constituted a statistically significant improvement over the approach value only model.

In the case of predicting behavioral intentions, six of the 19 positive value models were significantly enhanced by the addition of relatedness-weighted avoidance value measures. Additionally, there were several cases in which the avoidance-value-only models appear to have outperformed the approach-value models, suggesting that avoidance value measures are in some cases individually *better* than positive measures at predicting certain outcomes.

Another set of models was constructed that used the full set of values to predict the outcomes of interest. This was done to test a similar hypothesis as the previous analyses (does adding in considerations of avoidance values improve prediction?) in a more aggregate sense. For both attitudes towards vaccination and vaccination intentions, three regression models were constructed: (a) predicting the outcome using *all* approach values, (b) predicting the outcome using *all* avoidance values, and (c) predicting the outcome using *all* approach *and* avoidance values. Results can be found in Tables 7 (attitudes) and 8 (intentions). Notably, in both cases, the model which included the full set of both approach and avoidance value measures was able to account for more variance than the model including only the set of approach values as predictors. Additionally, there are cases in which avoidance value predictors rose to the level of significance in the combined model, and several cases in which they approached but did not reach significance.

It is worth pointing out that the general scarcity of individual significant predictors in these 19 (or 38) value models is to be expected theoretically, specifically due to the fact that Schwartz' values theory proposes a high degree of correlation

between values adjacent to one another on the circumplex (Schwartz, 1992; Schwartz, 2017). In other words, it is reasonable to expect that since each of these values is highly correlated with a number of others, individual values rising to the level of significance as predictors is likely to be uncommon. Given this, assessing these models through the overall amount of variance they explain is perhaps more diagnostic and appropriate than the significance or even weights of any individual predictors.

Table 7. Comparison of models predicting attitudes towards vaccination using all values

	All-Values Models				Combined Model			
	All Approach Values Model		All Avoidance Values Model		Approach Value		Avoidance Value	
	Approach Values		Avoidance Values					
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Self-Determination (Thought)	0.000	0.009	0.016	0.011	-0.017†	0.010	0.021†	0.011
Self-Direction (Action)	0.007	0.009	0.019†	0.011	0.007	0.009	0.018	0.011
Stimulation	-0.002	0.010	-0.003	0.009	-0.001	0.010	-0.007	0.009
Hedonism	0.003	0.010	**-0.030****	0.010	0.004	0.010	**-0.024***	0.011
Achievement	-0.019†	0.010	0.005	0.011	-0.013	0.011	0.005	0.011
Power (Dominance)	-0.007	0.010	-0.006	0.010	0.000	0.011	-0.006	0.011
Power (Resources)	0.014	0.011	-0.015	0.011	0.021†	0.012	-0.019†	0.011
Face	0.016	0.010	0.016	0.010	0.007	0.011	0.014	0.011
Security (Personal)	**-0.023***	0.011	-0.013	0.009	-0.013	0.012	-0.011	0.010
Security (Societal)	**0.024***	0.010	0.017†	0.009	**0.028***	0.012	0.001	0.011
Tradition	**0.026****	0.010	**0.027****	0.009	0.008	0.011	0.018	0.011
Conformity (Rules)	-0.002	0.010	0.002	0.010	0.002	0.011	-0.009	0.011
Conformity (Interpersonal)	-0.005	0.009	-0.012	0.008	-0.006	0.010	-0.009	0.009
Humility	0.009	0.009	**-0.019***	0.009	0.002	0.009	-0.015	0.010
Universalism (Nature)	-0.002	0.010	-0.003	0.009	0.001	0.012	-0.002	0.012
Universalism (Concern)	-0.002	0.009	-0.007	0.009	0.004	0.010	0.000	0.010
Universalism (Tolerance)	-0.011	0.009	-0.001	0.011	-0.011	0.009	0.014	0.012
Benevolence (Caring)	-0.011	0.011	-0.011	0.010	-0.007	0.011	0.006	0.011
Benevolence (Dependability)	**-0.024***	0.011	0.008	0.009	**-0.033****	0.012	0.020†	0.010
	R^2 = 0.20		R^2 = 0.22		R^2 = 0.30			

† p< .10. *p < .05. **p < .01. ***p < .001

Note. In contrast to most other tables presented in this work, this table depicts only three models, rather than upwards of 19 models that compare approach/avoidance measures across individual values.

Table 8. Comparison of models predicting vaccination intentions using all values

	All-Values Models				Combined Model			
	All Approach Values Model		All Avoidance Values Model					
	Approach Values		Avoidance Values		Approach Values		Avoidance Values	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Self-Determination (Thought)	-0.007	0.010	-0.016	0.012	-0.002	0.010	**-0.025***	0.012
Self-Direction (Action)	0.007	0.009	0.000	0.012	0.011	0.010	0.004	0.013
Stimulation	0.016	0.010	0.008	0.009	0.019†	0.011	0.001	0.010
Hedonism	-0.003	0.010	0.008	0.011	-0.006	0.011	-0.005	0.012
Achievement	0.001	0.010	-0.003	0.012	0.006	0.012	-0.003	0.012
Power (Dominance)	**-0.023***	0.011	-0.005	0.011	**-0.024***	0.011	-0.001	0.012
Power (Resources)	0.003	0.012	0.004	0.012	0.003	0.013	0.006	0.012
Face	-0.003	0.011	-0.010	0.011	-0.002	0.012	-0.001	0.012
Security (Personal)	**0.031***	0.012	0.014	0.010	**0.032***	0.013	0.007	0.010
Security (Societal)	-0.019†	0.010	0.003	0.010	**-0.028***	0.013	0.016	0.012
Tradition	-0.014	0.010	-0.004	0.010	**-0.025***	0.012	0.017	0.012
Conformity (Rules)	0.016	0.010	-0.007	0.010	0.019	0.012	-0.011	0.012
Conformity (Interpersonal)	-0.003	0.010	0.005	0.009	0.001	0.011	0.006	0.009
Humility	0.005	0.010	0.019†	0.011	0.005	0.010	0.018†	0.010
Universalism (Nature)	-0.004	0.010	-0.010	0.010	0.011	0.013	-0.024†	0.013
Universalism (Concern)	0.016	0.010	0.011	0.010	0.012	0.011	-0.003	0.011
Universalism (Tolerance)	0.003	0.010	-0.002	0.012	0.006	0.010	-0.016	0.013
Benevolence (Caring)	0.000	0.011	0.008	0.011	-0.005	0.012	-0.007	0.012
Benevolence (Dependability)	0.016	0.011	0.013	0.010	0.014	0.014	0.005	0.011
	$R^2 = 0.22$		$R^2 = 0.14$		$R^2 = 0.27$			

† p< .10. *p < .05. **p < .01. ***p < .001

Note. In contrast to most other tables presented in this work, this table depicts only three models, rather than upwards of 19 models that compare approach/avoidance measures across individual values.

Chapter 6. Discussion

A primary goal across the studies presented here was to introduce an insight for values research building on several psychological theories - that motives to approach positives and to avoid corresponding negatives can diverge and in many ways might operate independently. Study 1 laid important groundwork for the subsequent studies by supporting two key premises. Firstly, Study 1 demonstrated that a simple reframing of values measures (which, in a vast majority of cases, describe the approach of positive states) as to describe the same general motivational direction but in reference to avoiding a negative state leads individuals to respond differently, in some cases to a strong degree. Furthermore, Study 1 demonstrated that in most cases, these differentially-framed measures were more appropriately modeled as representing two distinct (but correlated) underlying variables as opposed to one. Taken together, these findings suggested that the norm of describing and measuring values in terms of approach motives might not fully capture the range of value-related motivations that might compel an individual to act.

Studies 2a and 2b built upon the observed discrepancies in value measures demonstrated in Study 1 by investigating the extent to which these discrepancies carried implications for predicting (and therefore likely influencing) the actions in which an individual engages. Through constructing predictive models that utilized either

"approach values," "avoidance values," or a combination of the two, it was demonstrated that in most cases, avoidance values outperformed traditionally positive value measures (both in single-predictor models and in combined models) when used to predict behaviors thought of as being avoidance-based. The reverse was also observed, such that approach-oriented value measures better predicted behaviors construed in terms of approaching positive ends.

Study 3 was conducted to extend the findings of Studies 2a and 2b into a context wherein the relevance of various values to the outcome behavior in question was far less clear. In several of the comparisons between models using an approach value and the corresponding avoidance value to predict individuals' intentions to receive a vaccine for COVID-19 (or their attitude towards the behavior), avoidance values served as better standalone predictors and in combined models explained variance above and beyond their approach-framed counterparts.

An additional way in which the present research took novel steps in values research is by introducing a procedure of weighting value importance by its relatedness, a process intended to account for differences in value instantiation across individuals. To the best of my knowledge, this is the first time a procedure like this has been employed, and thus there is much room for revision and improvement in its implementation. Future research might explore including more than a single-item measure of self-reported relatedness, or perhaps might explore a relatedness measure that forgoes self-reports entirely and utilizes some form of response-latency metric. Analyses did in fact reveal that there were a number of cases where value importance alone did not predict a given

outcome, but weighting the value importance by its perceived relatedness to the outcome resulted in significantly improved models. Thus, while not a central focus of this work, I urge future values researchers to incorporate some kind of assessment of value instantiations, whether relatedness ratings or some other measure. Researchers might also consider how to refine measures of instantiation/relatedness/relevance. Failing to include some index of perceived relatedness runs the risk of rendering the value-behavior relation incomprehensible; as argued earlier (and by several other theorists), the importance of a value should affect behavior *only* to the extent that it is subjectively perceived as being relevant or appropriate to apply to one's judgments and decisions in the given context.

The current studies present some challenges for the field of values on multiple levels. The first and most obvious level is that of personal value *measurement.* Given the difficulties some researchers have faced in their attempts to link personal values with behaviors, this work suggests that one potential limiting factor is the way in which these values are framed in their measurement. Take, for instance, the behavior of "avoiding arguments so that others won't be angry with me." In Study 2b (as seen in Table 3), this behavior was not significantly predicted at all using value measures framed in terms of approaching positives, whereas the single predictor of the corresponding weighted avoidance value explained 14% of variance in the behavior (up to almost 30% in models including both main effects and interaction terms: see Appendix F). Bardi and Schwartz (2003) concluded that some values are simply better correlated with their corresponding behaviors than others. However, these results (especially given Study 2a and 2b's use behaviors from that same study) suggest that in many such cases, the lack of

correspondence might have been the result of incompatible value and behavior framing. Thus, any research attempting to further analyze and deconstruct the relations between values and behavior should strongly consider the correspondence between construals of the outcomes of interest and the framing of the measures used. Otherwise, weakened or nonsignificant effects might be observed where they otherwise would have been found.

The present findings might also prompt value theorists to be more explicit in discussions of what exactly personal values *are*. On a conceptual level, is an individual's value of personal safety the extent to which they find approaching the end-state of *safety* to be important? If so, what conceptually is the avoidance of *danger*? Study 1 demonstrated that these perceptions of importance do in many cases operate somewhat independently. If the value of safety is in fact akin to the importance of promoting safety, that might imply that avoidance values are a separate and distinct type of personal value. Alternatively, as hinted by Milton Rokeach's consideration of "oppositive states," it might be the case that a personal value is conceptually comprised of both the approach and avoidance value, in some combinatorial manner. In other words, perhaps the value of *safety* is something more similar to a sum of the importance of *approaching safety* and of *avoiding danger*[4]. These types of distinctions are largely missing from values research and the field would benefit greatly from the clarity gained from addressing them. Ultimately, I suspect that in many cases, given the disjunctions observed between

[4] If this is the case, I argue it is arbitrary to define and label the value in terms of the positive motivation, however it is not clear what a better alternative might be.

approach and avoidance values, it may make sense to conceptualize them as being distinct values. However, the present research alone might not constitute sufficient evidence for this level of reconceptualization. Ultimately, addressing the conceptual ambiguities discussed and acknowledging the distinctions highlighted by the present research should help researchers to paint a fuller and more robust picture of the relationship between personal values and other life outcomes. Given the apparent agreement among researchers and the general public that personal values are an important and central part of human life, it seems clear that research into values and their dynamics ultimately serves to increase our understanding of ourselves and others in ways that could lead to fruitful advances across a number of domains.

References

Atkinson, J. W., & Litwin, G. H. (1960). Achievement motive and test anxiety conceived as motive to approach success and motive to avoid failure. *The journal of abnormal and social psychology*, 60(1), 52.

Bardi, A., & Schwartz, S. H. (2003). Values and behavior: Strength and structure of relations. *Personality and social psychology bulletin*, *29*(10), 1207-1220.

Bardi, A., Lee, J. A., Hofmann-Towfigh, N., & Soutar, G. (2009). The structure of intraindividual value change. *Journal of Personality and Social Psychology*, 97(5), 913-929. doi:10.1037/a0016617

Borg, I., Bardi, A., & Schwartz, S. H. (2017). Does the value circle exist within persons or only across persons?. *Journal of Personality*, 85(2), 151-162.

Blankenship, K. L., Wegener, D. T., & Murray, R. A. (2012). Circumventing resistance: Using values to indirectly change attitudes. *Journal of Personality and Social Psychology*, 103(4), 606.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319-333.

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, 78(1), 98.

Downey, G., & Feldman, S. I. (1996). Implications of rejection sensitivity for intimate relationships. *Journal of personality and social psychology*, 70(6), 1327.

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of personality and social psychology*, 72(1), 218.

Evans, L., Maio, G. R., Corner, A., Hodgetts, C. J., Ahmed, S., & Hahn, U. (2013). Self-interest and pro-environmental behaviour. *Nature Climate Change*, *3*(2), 122-125.

Eyal, T., Sagristano, M. D., Trope, Y., Liberman, N., & Chaiken, S. (2009). When values matter: Expressing values in behavioral intentions for the near vs. distant future. *Journal of experimental social psychology*, *45*(1), 35-43.

Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of personality and Social Psychology*, *73*(1), 31.

Fishbein, M. (1963). An investigation of the relationships between beliefs about an object and the attitude toward that object. *Human relations*, 16(3), 233-239.

Gray, J. A. (1981). A critique of Eysenck's theory of personality. In *A model for personality* (pp. 246-276). Springer, Berlin, Heidelberg.

Gray, J. A. (1982). The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system. *Behavioral and brain sciences*, *5*(3), 469-484.

Hanel, P. H., Vione, K. C., Hahn, U., & Maio, G. R. (2017). Value instantiations: the missing link between values and behavior?. In *Values and behavior* (pp. 175-190). Springer, Cham.

Hanel, P. H., Maio, G. R., Soares, A. K., Vione, K. C., de Holanda Coelho, G. L., Gouveia, V. V., ... & Manstead, A. S. (2018). Cross-cultural differences and similarities in human value instantiation. *Frontiers in psychology*, *9*, 849.

Hertel, G., & Kerr, N. L. (2001). Priming in-group favoritism: The impact of normative scripts in the minimal group paradigm. *Journal of Experimental Social Psychology*, *37*(4), 316-324.

Higgins, E. T. (1997). Beyond pleasure and pain. *American psychologist*, *52*(12), 1280.

Kaplan, K. J. (1972). On the ambivalence-indifference problem in attitude theory and measurement: A suggested modification of the semantic differential technique. *Psychological bulletin*, *77*(5), 361.

Kristiansen, C. M., & Hotte, A. M. (1996). Morality and the self: Implications for the when and how of value-attitude-behavior relations. In *The psychology of values: The Ontario symposium* (Vol. 8, pp. 77-105). Ontario: Lawrence Erlbaum Associates, Inc..

Maio, G. R., Olson, J. M., Allen, L., & Bernard, M. M. (2001). Addressing discrepancies between values and behavior: The motivating effect of reasons. *Journal of Experimental Social Psychology*, *37*(2), 104-117.

Maio, G. R., Hahn, U., Frost, J., & Cheung, W. (2009). Applying the value of equality unequally: Effects of value instantiations that vary in typicality. *Journal of Personality and Social Psychology, 97*(4), 598-614. doi:10.1037/a0016683

Maio, G. R., Pakizeh, A., Cheung, W., & Rees, K. J. (2009). Changing, priming, and

acting on values: Effects via motivational relations in a circular model. *Journal of Personality and Social Psychology*, 97(4), 699-715. doi:10.1037/a0016420

McClelland, D. C. (1987). *Human motivation*. CUP Archive.

Roccas, S., Sagiv, L., Oppenheim, S., Elster, A., & Gal, A. (2014). Integrating content and structure aspects of the self: Traits, values, and self-improvement. *Journal of personality*, *82*(2), 144-157.

Rokeach, M., & Cochrane, R. (1972). Self-Confrontation and Confrontation With Another as Determinants of Long-Term Value Change 1. *Journal of Applied Social Psychology*, *2*(4), 283-292.

Rokeach, M., & McLellan, D. D. (1972). Feedback of Information About the Values and Attitudes of Self and Others as Determinants of Long-Term Cognitive and Behavioral Change 1. *Journal of Applied Social Psychology*, *2*(3), 236-251.

Rokeach, M. (1973). *The nature of human values*. Free press.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In *Advances in experimental social psychology* (Vol. 25, pp. 1-65). Academic Press.

Schwartz, S. H. (2017). The refined theory of basic values. In *Values and behavior* (pp. 51-72). Springer, Cham.

Skimina, E., Cieciuch, J., Schwartz, S. H., Davidov, E., & Algesheimer, R. (2018). Testing the circular structure and importance hierarchy of value states in real-time behaviors. *Journal of Research in Personality*, *74*, 42-49.

Steinmetz, H., Isidor, R., & Baeuerle, N. (2012, April). Testing the circular

structure of human values: A meta-analytical structural equation modelling approach. In *Survey Research Methods* (Vol. 6, No. 1, pp. 61-75).

Tansel, A., Dalgic, B., & Guven, A. (2014). Wage Inequality and Wage Mobility in Turkey. *SSRN Electronic Journal*. doi:10.2139/ssrn.2519502

Appendix A: PVQ-RR, PVQ-RR-A, and PVQ-RR-P

Note. Unless otherwise specified, all statements begin with, "It is important to [him/her]..." Items are color-coded green or red depending on whether they appeared in the PVQ-RR-P or -A, respectively.

	Original PVQ-RR Item	**Reworded Item**
Self-Direction (Thought)	… to form [his/her] views independently.	… to avoid having [his/her] views formed by others.
	… to develop [his/her] own opinions.	… to avoid having [his/her] opinions developed by others.
	… to figure things out for [himself/herself].	… to avoid being told how to think about things.
Self-Direction (Action)	… to make [his/her] own decisions about [his/her] life.	… to avoid having others make decisions about [his/her] life.
	… to plan [his/her] activities independently.	… to avoid having others plan [his/her] activities.
	… to be free to choose what [he/she] does by [himself/herself].	… to avoid having others control what [he/she] does.
Stimulation	… always to look for different things to do.	… to avoid always doing the same things.
	… to take risks that make life exciting.	… to avoid letting life become dull by shying away from risks.
	… to have all sorts of new experiences.	… to avoid being closed to new experiences.
Hedonism	… to have a good time.	… to avoid having a bad time.
	… to enjoy life's pleasures.	… to avoid life's miseries.
	… to take advantage of every opportunity to have fun.	… not to miss opportunities to have fun.
Achievement	… to have ambitions in life.	… to avoid lacking ambitions in life.

	… to be very successful.	… to avoid being a failure.
	… that people recognize what [he/she] achieves.	… that people don't ignore [his/her] achievements.
Power (Dominance)	… that people do what [he/she] says they should.	… that people do not ignore what [he/she] says they should do.
	… to have the power to make people do what [he/she] wants.	… to avoid being powerless over what other people do.
	… to be the one who tells others what to do.	… to avoid being the one who is told what to do.
Power (Resources)	… to have the power that money can bring.	… to avoid the powerlessness of poverty.
	… to be wealthy.	… to avoid being poor.
	… to own expensive things that show [his/her] wealth.	… to avoid appearing poor.
Face	… that no one should ever shame [him/her].	… that others praise [him/her].
	… to protect [his/her] public image.	… to avoid having [his/her] public image be damaged.
	… never to be humiliated.	… to always be respected.
Security (Personal)	It is very important to [him/her] to avoid disease or illness.	It is very important to [him/her] to promote [his/her] health.
	… to be personally safe and secure.	… to avoid personal danger and risks.
	… to avoid anything dangerous.	… to remain safe.
Security (Societal)	… that [his/her] country is secure and stable.	… to avoid having an insecure or unstable country.
	… to have a strong government that can defend its citizens.	… to avoid having a weak government that can't defend its citizens.
	… that [his/her] country protect itself against all threats.	… to avoid having a country that cannot protect itself against threats.
Tradition	… to maintain traditional values and ways of thinking.	… to avoid violating traditional values and ways of thinking.
	… to follow [his/her] family's customs or the customs of a religion.	… to avoid violating [his/her] family's customs or the customs of a religion.

	… to honor the traditional practices of [his/her] culture.	… to avoid disrespecting the traditional practices of [his/her] culture.
Conformity (Rules)	… never to violate rules and regulations.	… to always follow rules and regulations.
	… to follow rules even when no-one is watching.	… to avoid breaking rules, even when no-one is watching.
	… to obey all the laws.	… to avoid breaking any laws.
Conformity (Interpersonal)	… to avoid upsetting other people.	… to please other people.
	… never to annoy anyone.	… to be pleasant to everyone.
	… never to make other people angry.	… to always make other people happy.
Humility	… never to think [he/she] deserves more than other people.	… to receive no more than others in life.
	… to be humble.	… not to be arrogant.
	… to be satisfied with what [he/she] has and not ask for more.	… to avoid being dissatisfied with what [he/she] has and wanting more.
Universalism (Nature)	… to care for nature.	… to avoid exploiting nature.
	… to take part in activities to defend nature.	… to avoid taking part in activities that harm nature.
	… to protect the natural environment from destruction or pollution.	… to avoid contributing to the destruction and pollution of the natural environment.
Universalism (Concern)	… that the weak and vulnerable in society be protected.	… to avoid exploiting the weak and vulnerable in society.
	… that every person in the world have equal opportunities in life.	… that no people in the world are given less opportunities than others.
	… that everyone be treated justly, even people that [he/she] doesn't know.	… that nobody be treated unjustly, even people [he/she] doesn't know.
Universalism (Tolerance)	… to be tolerant toward all kinds of people and groups.	… to avoid being intolerant toward other kinds of people and groups.
	… to listen to and understand people who are different from [him/her].	… not to ignore and be uninformed about people who are different from [him/her].
	… to accept people even when [he/she] disagrees with them.	… to avoid rejecting people that [he/she] disagrees with.
Benevolence (Caring)	… to take care of people [he/she] is close to.	… to avoid neglecting those [he/she] is close to.
	… to help the people dear to [him/her].	… to avoid hurting the people dear to [him/her].

	… to concern [himself/herself] with every need of [his/her] dear ones.	… to avoid ignoring the needs of [his/her] dear ones.
Benevolence (Dependability)	… that people [he/she] knows have full confidence in [him/her].	… that people [he/she] knows do not lack any confidence in [him/her].
	… to be a dependable and trustworthy friend.	… to avoid being an unreliable or untrustworthy friend.
	… that all [his/her] friends and family can rely on [him/her] completely.	… that no friends or family believe that [he/she] is unreliable.

Appendix B: Behavioral measures employed in studies 2a and 2b

(From Bardi & Schwartz, 2003)

Label	Behavior	Prediction
Interpersonal Conformity #1	Avoided arguments so that others wouldn't be angry with me.	Negative (PVQ-RR-A)
Interpersonal Conformity #2	Said please and thank you.	Positive (PVQ-RR-P)
Interpersonal Conformity #3	Avoided confrontations with people I don't like.	Negative (PVQ-RR-A)
Interpersonal Conformity #4	Refrained from questioning a negative grade [in Study 2a, negative feedback] even if I thought it was unfair.	Negative (PVQ-RR-A)
Interpersonal Conformity #5	Opened doors for other people.	Positive (PVQ-RR-P)
Interpersonal Conformity #6	Listened to my elders respectfully.	Positive (PVQ-RR-P)
Personal Security #1	Chose a healthy food over other alternatives.	Positive (PVQ-RR-P)
Personal Security #2	Avoided dangerous places and neighborhoods.	Negative (PVQ-RR-A)
Personal Security #3	Gone out of my way to avoid catching COVID-19 from others.	Negative (PVQ-RR-A)
Personal Security #4	Avoided spending more money than I could really afford.	Negative (PVQ-RR-A)
Personal Security #5	Checked who was at my door before opening it.	Negative (PVQ-RR-A)
Personal Security #6	Took time out of the day to exercise.	Positive (PVQ-RR-P)

Note. Participants were asked to "... please indicate how frequently you have performed the listed behaviors in the past year *relative to the opportunities you have had to perform them.* In other words, please only indicate how frequently you have done these behaviors *when you were faced with the appropriate opportunity*.

Appendix C: BIS/BAS Scale

(Carver & White, 1994)

The following is copied from:

https://local.psy.miami.edu/people/faculty/ccarver/availbale-self-report-instruments/bisbas-scales/

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

1 = very true for me
2 = somewhat true for me
3 = somewhat false for me
4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.
11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.

14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.
21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

Items other than 2 and 22 are reverse-scored.
BAS Drive: 3, 9, 12, 21
BAS Fun Seeking: 5, 10, 15, 20
BAS Reward Responsiveness: 4, 7, 14, 18, 23
BIS: 2, 8, 13, 16, 19, 22, 24
Items 1, 6, 11, 17, are fillers.

Appendix D: Short value descriptions used for relatedness measures

(Adapted from Schwartz, 2017)

	Positive Framing	**Negative Framing**
Self-direction (thought)	Having the freedom to cultivate one's own ideas and opinions	Avoiding having one's ideas and opinions controlled by others
Self-direction (action)	Having the freedom to determine one's own actions	Avoiding having one's own actions controlled by others
Stimulation	Experiencing excitement, novelty, and change	Preventing boredom and stagnation
Hedonism	Experiencing pleasure and sensuous gratification	Preventing pain and suffering
Achievement	Experiencing achievement and success	Avoiding failure
Power (dominance)	Having influence on other people	Avoiding being powerless over others
Power (resources)	Having money and other important resources	Avoiding poverty and lack of other importance resources
Face	Maintaining one's public image	Avoiding humiliation
Security (personal)	Promoting safety in one's immediate environment	Preventing danger in one's immediate environment
Security (societal)	Promoting safety and stability in the wider society	Preventing danger and instability in the wider society

Tradition	Maintaining and preserving cultural, family, or religious traditions	Avoiding violating cultural, family, or religious traditions
Conformity (rules)	Compliance with rules, laws, and formal obligations	Avoiding breaking rules, laws, and formal obligations
Conformity (interpersonal)	Pleasing and helping others.	Avoidance of upsetting other people
Humility	Recognizing one's insignificance in the larger scheme of things	Avoiding being arrogant
Universalism (nature)	Preservation of the natural environment	Preventing destruction of the natural environment
Universalism (concern)	Commitment to equality, justice, and protection for all people	Preventing inequality, injustice, and harm for all people
Universalism (tolerance)	Acceptance and understanding of those who are different from oneself	Avoiding intolerance of those who are different from oneself
Benevolence (caring)	Devotion to the well-being of members of your community	Preventing the suffering of members of your community
Benevolence (dependability)	Being a reliable and trustworthy member of your community	Avoiding being an unreliable or untrustworthy member of your community

Appendix E: Study 2a models with separated main effects and interaction terms

Single-Value Models

		Approach Value Model							Avoidance Value Model						
		B_{value}	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	R^2	$B_{anti\text{-}value}$	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	R^2
Interpers. Conformit	Behavior 1 (-)	**0.389*** **	0.071	0.063	0.07	-0.028	0.063	**0.171*** **	**0.514*** **	0.062	**0.136***	0.063	-0.104†	0.056	**0.315*** **
	Behavior 2 (+)	0.097	0.075	**0.194***	0.076	-0.035	0.084	**0.054***	0.078	0.077	0.002	0.076	0	0.073	0.006
	Behavior 3 (-)	**0.165***	0.076	0.111	0.076	-0.12	0.075	**0.064****	**0.32*** **	0.071	0.057	0.072	-0.073	0.063	**0.125*** **
	Behavior 4 (-)	0.07	0.076	0.07	0.076	-0.026	0.069	0.013	**0.247*** **	0.072	**0.158***	0.072	-0.012	0.066	**0.093*** **
	Behavior 5 (+)	**0.181***	0.074	0.082	0.08	-0.086	0.068	**0.062****	0.12	0.077	**0.181***	0.077	0.049	0.076	**0.061***
	Behavior 6 (+)	**0.296*** **	0.069	**0.265*** **	0.074	-0.037	0.062	**0.214*** **	**0.326*** **	0.072	-0.042	0.072	-0.03	0.067	**0.104*** **
Personal Security	Behavior 1 (+)	**0.188***	0.074	0.141†	0.074	0.02	0.067	**0.063****	0.124†	0.073	**0.164***	0.073	0.03	0.071	**0.045***
	Behavior 2 (-)	**0.352*** **	0.07	0.036	0.072	-0.052	0.08	**0.13*** **	**0.341*** **	0.07	**0.263*** **	0.071	0.039	0.06	**0.22*** **
	Behavior 3 (-)	**0.253*** **	0.07	**0.169***	0.07	**-0.192****	0.071	**0.141*** **	**0.215****	0.074	**0.197***	0.076	-0.075	0.055	**0.15*** **
	Behavior 4 (-)	0.13†	0.075	0.065	0.075	0.08	0.076	0.029	**0.234****	0.073	0.047	0.073	-0.035	0.081	**0.057***
	Behavior 5 (-)	**0.224****	0.073	0.1	0.073	0.011	0.079	**0.064****	**0.167***	0.073	**0.288*** **	0.076	0.002	0.062	**0.136*** **
	Behavior 6 (+)	**0.212****	0.075	0.1	0.078	0.064	0.061	**0.059***	0.035	0.075	0.04	0.075	-0.073	0.076	0.007

Combined Models

		Approach Value						Avoidance Value						R^2	Improved Fit? (F)
		B_{value}	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	$B_{anti\text{-}value}$	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE		
Interpers. Conformity	Behavior 1 (-)	0.007	0.095	0.034	0.065	-0.021	0.059	**0.5*** **	0.094	**0.136***	0.064	-0.097†	0.057	**0.317*** **	**12.41*** **
	Behavior 2 (+)	0.112	0.111	**0.2***	0.078	-0.032	0.086	-0.027	0.113	0.035	0.076	0.002	0.072	0.055	**2.999***
	Behavior 3 (-)	-0.118	0.106	0.071	0.074	-0.096	0.074	**0.38*** **	0.106	0.051	0.072	-0.066	0.064	**0.14*** **	**5.166****
	Behavior 4 (-)	**-0.224***	0.107	0.009	0.074	-0.019	0.067	**0.408*** **	0.109	**0.143***	0.073	-0.023	0.067	**0.116****	**6.748*** **
	Behavior 5 (+)	**0.217***	0.107	0.12	0.08	-0.071	0.067	-0.082	0.112	**0.205****	0.077	0.052	0.075	**0.108****	**3.107***
	Behavior 6 (+)	**0.269****	0.101	**0.263*** **	0.075	-0.034	0.064	0.039	0.104	-0.023	0.069	-0.008	0.064	**0.215*** **	**8.19*** **
Personal Security	Behavior 1 (+)	**0.279***	0.12	0.129†	0.075	0.031	0.068	-0.122	0.12	0.136†	0.074	0.03	0.072	**0.088***	**2.755***
	Behavior 2 (-)	0.086	0.113	0.01	0.069	-0.021	0.077	**0.268***	0.117	**0.257*** **	0.072	0.028	0.063	**0.222*** **	**6.934*** **
	Behavior 3 (-)	0.09	0.118	0.12	0.075	-0.13	0.08	0.165	0.123	0.109	0.085	-0.056	0.06	**0.176*** **	2.465†
	Behavior 4 (-)	-0.141	0.12	0.035	0.077	0.115	0.077	**0.348****	0.121	0.043	0.075	-0.06	0.083	**0.075***	2.947
	Behavior 5 (-)	0.04	0.12	0.035	0.073	0.07	0.08	0.132	0.12	**0.279*** **	0.079	-0.014	0.064	**0.142*** **	**5.302****
	Behavior 6 (+)	**0.554*** **	0.119	0.105	0.077	0.113†	0.062	**-0.413*** **	0.117	0.054	0.072	-0.082	0.075	**0.129*** **	**8.162*** **

†p< .10. *p < .05. **p < .01. ***p < .001

Appendix F: Study 2b models with separated main effects and interaction terms

Single-Value Models

		Approach Value Models							Avoidance Value Models						
		B_{value}	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	R^2	$B_{anti\text{-}value}$	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	R^2
Behavior	Behavior 1 (-)	**0.248***	0.103	-0.079	0.106	0.065	0.097	0.071†	**0.522*****	0.089	-0.015	0.092	**0.152***	0.073	**0.296*****
	Behavior 2 (+)	0.092	0.107	0.132	0.107	0.026	0.108	0.032	0.086	0.109	0.146	0.112	0.035	0.102	0.035
	Behavior 3 (-)	**0.24***	0.102	0.074	0.103	-0.128	0.103	0.083†	**0.328****	0.103	0.087	0.11	0.089	0.087	**0.124****
	Behavior 4 (-)	0.121	0.106	0.03	0.106	-0.071	0.096	0.019	**0.347*****	0.099	0.049	0.099	-0.099	0.088	**0.148****
	Behavior 5 (+)	0.166	0.117	-0.064	0.132	-0.001	0.14	0.023	0.121	0.106	-0.079	0.105	0.058	0.091	0.023
	Behavior 6 (+)	0.156	0.1	0.178†	0.1	**0.268****	0.094	**0.148****	0.175	0.111	0.079	0.111	-0.061	0.094	0.057
Attitudes	Behavior 1 (-)	0.129	0.105	0.051	0.108	0.114	0.099	0.035	0.196†	0.101	-0.033	0.104	**-0.177***	0.083	**0.093***
	Behavior 2 (+)	0.08	0.105	0.16	0.105	**-0.21***	0.105	0.077†	-0.034	0.109	0.195†	0.112	0.011	0.102	0.035
	Behavior 3 (-)	0.026	0.104	-0.138	0.104	0.191†	0.105	0.051	0.158	0.102	**0.228***	0.109	**0.287****	0.086	**0.141****
	Behavior 4 (-)	-0.103	0.103	0.129	0.102	**0.22***	0.093	0.084†	0.092	0.106	0.082	0.106	-0.073	0.094	0.024
	Behavior 5 (+)	0.016	0.116	0.064	0.131	-0.176	0.139	0.038	-0.003	0.107	-0.013	0.107	-0.001	0.092	0
	Behavior 6 (+)	0.004	0.104	**0.277****	0.104	0.024	0.098	0.079†	-0.006	0.113	-0.11	0.113	-0.01	0.097	0.012

Combined Models

		Approach Value						Avoidance Value							
		B_{value}	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	$B_{anti\text{-}value}$	SE	$B_{relatedness}$	SE	$B_{interaction}$	SE	R^2	Improved Fit? (F)
Behavior	Behavior 1 (-)	-0.032	0.114	0.007	0.106	-0.036	0.093	**0.541*****	0.108	-0.013	0.11	**0.163***	0.078	**0.297*****	**9.155*****
	Behavior 2 (+)	0.027	0.13	0.132	0.117	0.024	0.11	0.089	0.131	0.111	0.117	0.049	0.107	0.054	0.564
	Behavior 3 (-)	0.104	0.117	0.136	0.108	-0.134	0.103	**0.279***	0.117	0.062	0.111	0.145	0.094	**0.16***	2.604†
	Behavior 4 (-)	-0.098	0.119	-0.005	0.106	-0.006	0.093	**0.398****	0.119	0.051	0.107	-0.095	0.09	**0.155***	**4.576****
	Behavior 5 (+)	0.155	0.141	-0.063	0.142	0.016	0.145	0.045	0.127	-0.09	0.109	0.065	0.095	0.038	0.454
	Behavior 6 (+)	0.086	0.118	0.189†	0.105	**0.249***	0.096	0.114	0.123	0.017	0.11	-0.079	0.091	**0.17***	**3.84***
Attitudes	Behavior 1 (-)	0.071	0.126	0.045	0.118	0.169	0.104	0.154	0.12	-0.049	0.123	**-0.22***	0.087	0.132†	**3.146***
	Behavior 2 (+)	0.101	0.126	0.122	0.114	**-0.223***	0.108	-0.08	0.128	0.172	0.114	0.06	0.104	0.103	2.144
	Behavior 3 (-)	-0.112	0.116	-0.059	0.107	0.181†	0.102	0.221†	0.116	**0.256***	0.11	**0.248****	0.093	**0.181****	**4.509****
	Behavior 4 (-)	-0.236†	0.12	0.117	0.107	**0.265****	0.094	**0.239***	0.12	0.011	0.107	-0.097	0.09	**0.142***	1.916
	Behavior 5 (+)	0.022	0.141	0.069	0.141	-0.175	0.145	-0.016	0.127	-0.003	0.109	-0.021	0.095	0.039	1.133
	Behavior 6 (+)	0.057	0.122	**0.324****	0.108	0.032	0.098	-0.019	0.126	-0.209†	0.113	-0.036	0.093	0.119†	**3.418***

†p< .10. *p < .05. **p < .01. ***p < .001

Appendix G: Study 3 models predicting vaccination intentions with separated main effects and interaction terms

Single-Value Models

	Approach Value Model							Avoidance Value Model						
	Value Importance		Relatedness		Interaction		R^2	Value Importance		Relatedness		Interaction		R^2
	Estimate	SE	Estimate	SE	Estimate	SE		Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	0.137	0.221	**0.632***	0.318	-0.048	0.057	**0.115*****	0.082	0.228	0.576†	0.3	-0.033	0.053	**0.125*****
Security (Personal)	0.163	0.267	0.616†	0.316	-0.036	0.06	**0.171*****	0.242	0.181	**0.619****	0.208	-0.059	0.039	**0.1*****
Humility	**0.283***	0.128	**0.555***	0.257	-0.077†	0.04	0.023†	0.072	0.135	0.327	0.309	-0.019	0.045	**0.038****
Self-Direction (Action)	-0.04	0.164	0.094	0.306	0.018	0.045	**0.047****	-0.203	0.134	-0.41	0.27	0.063	0.041	0.008
Power (Resources)	-0.018	0.117	0.212	0.216	-0.026	0.038	0.014	0.018	0.122	0.131	0.263	-0.008	0.04	0.007
Conformity (Interpersonal)	-0.166	0.225	-0.172	0.316	0.059	0.054	**0.042****	0.153	0.166	0.352†	0.209	-0.024	0.036	**0.055*****
Universalism (Tolerance)	-0.026	0.164	-0.421	0.379	0.069	0.051	**0.043****	-0.056	0.138	-0.21	0.327	0.041	0.05	0.007
Achievement	0.136	0.154	0.344	0.385	-0.029	0.051	0.023†	0.01	0.145	-0.07	0.362	0.014	0.053	0.003
Face	-0.036	0.171	-0.318	0.294	0.051	0.05	0.02	-0.029	0.131	-0.036	0.273	0.006	0.044	0
Hedonism	-0.084	0.143	-0.137	0.346	0.037	0.044	**0.026***	-0.323	0.236	0.074	0.273	0.06	0.053	**0.131*****
Power (Dominance)	0.072	0.146	0.146	0.186	-0.035	0.034	0.009	**-0.332***	0.128	-0.309	0.265	0.07	0.043	**0.037***
Self-Determination (Thought)	-0.196	0.158	-0.287	0.336	0.064	0.047	**0.032***	-0.057	0.138	-0.146	0.319	0.017	0.047	0.002
Stimulation	-0.304†	0.158	-0.406	0.341	0.09†	0.046	**0.073*****	-0.197	0.129	-0.284	0.288	0.057	0.041	0.019
Benevolence (Dependability)	-0.425†	0.216	-0.318	0.349	**0.11***	0.054	**0.149*****	0.138	0.191	0.567	0.351	-0.038	0.05	**0.089*****
Universalism (Concern)	0.031	0.163	0.391	0.279	-0.006	0.043	**0.126*****	0.133	0.148	0.298	0.302	-0.016	0.042	**0.048****
Security (Societal)	-0.029	0.25	**0.473***	0.226	-0.019	0.047	**0.138*****	-0.199	0.194	0.208	0.22	0.024	0.039	**0.123*****
Tradition	-0.189	0.126	-0.211	0.191	0.029	0.032	0.015	-0.149	0.122	-0.122	0.198	0.025	0.034	0.007
Conformity (Rules)	0.135	0.157	0.325	0.202	-0.023	0.035	**0.041****	-0.097	0.131	-0.047	0.227	0.014	0.037	0.004
Universalism (Nature)	-0.047	0.116	-0.281	0.258	0.053	0.039	0.019	0.042	0.114	-0.193	0.254	0.03	0.039	0.016

Combined Models

	Approach Value						Avoidance Value							Avoidance Values Improve Model? (F)
	Value Importance		Relatedness		Interaction		Value Importance		Relatedness		Interaction		R^2	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE		
Benevolence (Caring)	-0.052	0.28	0.291	0.393	-0.011	0.068	0.054	0.29	0.403	0.38	-0.021	0.064	**0.158*****	**5.007****
Security (Personal)	0.044	0.286	0.403	0.343	-0.007	0.064	0.171	0.187	0.328	0.22	-0.045	0.04	**0.18*****	1.063
Humility	**0.285***	0.135	0.477†	0.257	-0.075†	0.04	-0.014	0.146	0.208	0.313	-0.004	0.045	**0.053***	**3.141***
Self-Direction (Action)	0.012	0.169	0.207	0.32	0.009	0.048	-0.229†	0.136	-0.457†	0.277	0.052	0.042	**0.07****	2.379†
Power (Resources)	-0.076	0.134	0.123	0.241	-0.018	0.04	0.066	0.136	0.076	0.285	-0.001	0.042	0.019	0.533
Conformity (Interpersonal)	-0.285	0.247	-0.384	0.345	0.084	0.059	0.224	0.184	**0.461***	0.228	-0.053	0.04	**0.07****	**3.011***
Universalism (Tolerance)	0.063	0.179	-0.355	0.401	0.058	0.054	-0.164	0.149	-0.164	0.339	0.029	0.051	**0.05***	0.699
Achievement	0.17	0.179	0.494	0.43	-0.043	0.057	-0.075	0.167	-0.271	0.399	0.028	0.058	0.028	0.492
Face	0.029	0.184	-0.34	0.317	0.056	0.053	-0.083	0.141	0.118	0.291	-0.018	0.046	0.032	1.205
Hedonism	-0.025	0.146	-0.04	0.329	0.016	0.042	-0.296	0.247	0.105	0.275	0.05	0.053	**0.139*****	**12.912*****
Power (Dominance)	0.142	0.15	0.146	0.191	-0.041	0.035	**-0.327***	0.136	-0.319	0.277	0.075†	0.044	**0.046***	**3.726***
Self-Determination (Thought)	-0.203	0.165	-0.262	0.353	0.074	0.049	-0.057	0.144	-0.121	0.328	-0.008	0.048	**0.056****	2.558†
Stimulation	-0.199	0.174	-0.337	0.352	0.081†	0.048	-0.205	0.146	-0.271	0.29	0.037	0.042	**0.08*****	0.750
Benevolence (Dependability)	**-0.726****	0.257	-0.851†	0.397	**0.192****	0.063	**0.515***	0.222	**1.097****	0.385	**-0.154****	0.057	**0.173*****	**2.896***
Universalism (Concern)	-0.024	0.197	0.346	0.32	0	0.049	0.083	0.176	0.098	0.334	-0.012	0.047	**0.127*****	0.139
Security (Societal)	0.134	0.284	0.482†	0.268	-0.043	0.054	-0.34	0.225	-0.163	0.261	0.064	0.045	**0.169*****	**3.685***
Tradition	-0.211	0.162	-0.276	0.24	0.03	0.039	0.001	0.156	0.057	0.245	0.007	0.04	0.02	0.533
Conformity (Rules)	**0.405***	0.191	**0.492***	0.219	-0.039	0.038	**-0.417***	0.164	-0.426†	0.244	0.054	0.04	**0.077*****	**3.831***
Universalism (Nature)	-0.104	0.162	-0.161	0.337	0.045	0.048	0.08	0.16	-0.146	0.328	0.008	0.048	0.027	0.802

†p< .10. *p < .05. **p < .01. ***p < .001

Appendix H: Study 3 models predicting attitudes towards vaccination with separated main effects and interaction terms

Single-Value Models

	Approach Value Model							Avoidance Value Model						
	Value Importance		Relatedness		Interaction		R^2	Value Importance		Relatedness		Interaction		R^2
	Estimate	SE	Estimate	SE	Estimate	SE		Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	-0.248	0.207	**-0.638***	0.3	0.062	0.054	**0.096***	0.029	0.215	-0.323	0.285	0.001	0.05	**0.096***
Security (Personal)	0.134	0.249	-0.126	0.298	-0.036	0.056	**0.102***	-0.154	0.17	**-0.441***	0.2	0.035	0.037	**0.069***
Humility	**-0.267***	0.125	-0.408	0.253	0.073†	0.04	0.015	**-0.347****	0.123	**-0.66***	0.285	**0.084***	0.041	**0.034****
Self-Direction (Action)	-0.168	0.162	-0.308	0.303	0.037	0.045	0.009	-0.002	0.127	0.229	0.256	-0.009	0.039	**0.03***
Power (Resources)	0.119	0.112	-0.033	0.208	0.013	0.036	**0.026***	0.139	0.115	0.223	0.249	-0.041	0.038	0.006
Conformity (Interpersonal)	-0.024	0.201	0.087	0.282	-0.035	0.048	**0.05*****	-0.098	0.157	-0.159	0.198	0.001	0.034	**0.039****
Universalism (Tolerance)	-0.178	0.144	-0.09	0.339	0.005	0.046	**0.029***	-0.18	0.13	-0.012	0.307	0.013	0.047	**0.027***
Achievement	**0.39****	0.14	**1.144****	0.35	**-0.166*****	0.047	**0.051*****	0.106	0.134	0.412	0.341	-0.051	0.05	0.008
Face	-0.028	0.159	0.208	0.276	-0.024	0.047	0.013	-0.064	0.125	-0.044	0.262	0.023	0.042	0.01
Hedonism	-0.035	0.128	0.081	0.316	-0.02	0.041	0.014	0.017	0.208	-0.26	0.239	-0.013	0.047	**0.114*****
Power (Dominance)	-0.089	0.139	-0.162	0.173	0.033	0.032	0.005	0.184	0.126	0.154	0.261	-0.031	0.042	0.012
Self-Determination (Thought)	-0.054	0.153	0.071	0.328	-0.014	0.046	0.012	0.086	0.129	0.253	0.3	-0.014	0.044	**0.028***
Stimulation	0.102	0.15	0.225	0.325	-0.049	0.045	0.023†	0.041	0.124	0.2	0.276	-0.031	0.04	0.004
Benevolence (Dependability)	-0.077	0.191	-0.313	0.316	0.004	0.049	**0.095*****	0.106	0.18	0.067	0.332	-0.033	0.048	**0.027***
Universalism (Concern)	-0.202	0.158	-0.252	0.278	0.016	0.042	**0.054*****	-0.201	0.14	-0.115	0.288	0.006	0.04	**0.043****
Security (Societal)	0.138	0.227	-0.36†	0.208	0.007	0.043	**0.126*****	0.223	0.19	-0.155	0.218	-0.016	0.039	**0.084*****
Tradition	0.046	0.117	-0.045	0.183	0.024	0.031	**0.033***	0.084	0.112	0.075	0.188	0.01	0.032	**0.039****
Conformity (Rules)	-0.115	0.152	-0.234	0.199	0.03	0.034	0.007	0.056	0.127	0.101	0.221	-0.01	0.037	0.003
Universalism (Nature)	0.062	0.112	**0.6***	0.249	**-0.085***	0.038	**0.038****	-0.094	0.11	0.228	0.244	-0.033	0.037	**0.033***

Combined Models

	Approach Value						Avoidance Value							
	Value Importance		Relatedness		Interaction		Value Importance		Relatedness		Interaction		R^2	Avoidance Values Improve Model? (F)
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE		
Benevolence (Caring)	-0.332	0.268	-0.643†	0.377	0.081	0.066	0.302	0.278	0.121	0.364	-0.055	0.062	**0.121*****	**3.14***
Security (Personal)	0.244	0.263	0.078	0.323	-0.062	0.06	-0.152	0.176	-0.311	0.216	0.04	0.039	**0.11*****	1.068
Humility	-0.149	0.131	-0.3	0.253	0.06	0.04	**-0.338***	0.132	**-0.644***	0.288	0.078†	0.042	**0.047***	**3.582***
Self-Direction (Action)	-0.153	0.166	-0.456	0.314	0.042	0.047	0.045	0.131	0.358	0.267	-0.017	0.041	**0.059****	**5.741*****
Power (Resources)	0.174	0.128	0.035	0.233	0.013	0.039	0.015	0.128	0.147	0.271	-0.041	0.04	**0.043***	2.044
Conformity (Interpersonal)	0.008	0.226	0.182	0.317	-0.043	0.055	-0.047	0.176	-0.197	0.22	0.015	0.039	**0.06****	1.210
Universalism (Tolerance)	-0.148	0.152	-0.195	0.357	0.011	0.048	-0.094	0.139	0.084	0.322	0.006	0.049	**0.045***	1.831
Achievement	**0.387***	0.163	**1.065****	0.39	**-0.17****	0.052	-0.024	0.153	-0.018	0.37	0.028	0.054	**0.072*****	2.491†
Face	-0.042	0.173	0.199	0.299	-0.031	0.05	-0.018	0.137	-0.127	0.281	0.035	0.045	0.023	1.137
Hedonism	0.062	0.137	0.129	0.307	-0.017	0.04	-0.015	0.225	-0.286	0.246	-0.008	0.049	**0.115*****	**12.451*****
Power (Dominance)	-0.155	0.146	-0.191	0.183	0.038	0.033	0.216	0.135	0.229	0.276	-0.042	0.044	0.016	1.216
Self-Determination (Thought)	-0.086	0.157	0.031	0.338	-0.03	0.047	0.181	0.136	0.239	0.311	0.003	0.046	**0.077*****	**7.772*****
Stimulation	0.078	0.164	0.156	0.337	-0.043	0.046	0.069	0.141	0.208	0.285	-0.021	0.041	0.027	0.499
Benevolence (Dependability)	-0.133	0.231	-0.336	0.371	-0.003	0.059	0.156	0.211	0.177	0.375	-0.012	0.056	**0.106*****	1.417
Universalism (Concern)	-0.141	0.191	-0.281	0.32	0.021	0.049	-0.081	0.173	0.077	0.332	-0.01	0.046	**0.06****	0.719
Security (Societal)	-0.018	0.261	-0.396	0.247	0.023	0.05	0.298	0.22	0.165	0.254	-0.043	0.044	**0.137*****	1.391
Tradition	-0.042	0.154	-0.201	0.229	0.036	0.037	0.089	0.148	0.186	0.234	-0.01	0.038	**0.045***	1.270
Conformity (Rules)	-0.199	0.189	-0.356	0.22	0.036	0.038	0.179	0.165	0.341	0.246	-0.035	0.04	0.022	1.697
Universalism (Nature)	0.265†	0.155	**0.851****	0.323	**-0.112***	0.047	-0.247	0.153	-0.282	0.315	0.029	0.045	**0.055****	1.927

†p< .10. *p < .05. **p < .01. ***p < .001

Appendix I: Comparison of models predicting vaccination intentions in Study 3 including political orientation and norms as controls

Approach Value Model

	Approach Value		Political Orientation		Norms		R^2
	Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	0.005	0.007	-0.236***	0.05	0.451***	0.057	0.295***
Security (Personal)	0.018*	0.007	-0.215***	0.05	0.416***	0.055	0.309***
Humility	0.001	0.007	-0.24***	0.05	0.465***	0.052	0.294***
Self-Direction (Action)	0.009	0.006	-0.24***	0.05	0.445***	0.054	0.299***
Power (Resources)	0	0.008	-0.24***	0.05	0.466***	0.052	0.294***
Conformity (Interpersonal)	-0.004	0.007	-0.243***	0.05	0.479***	0.056	0.295***
Universalism (Tolerance)	0	0.006	-0.24***	0.05	0.466***	0.053	0.294***
Achievement	0	0.006	-0.24***	0.05	0.466***	0.053	0.294***
Face	-0.004	0.007	-0.24***	0.05	0.474***	0.053	0.295***
Hedonism	0.005	0.006	-0.237***	0.05	0.458***	0.053	0.295***
Power (Dominance)	-0.016*	0.007	-0.229***	0.05	0.48***	0.052	0.307***
Self-Determination (Thought)	0.003	0.006	-0.238***	0.05	0.461***	0.053	0.294***
Stimulation	0.006	0.006	-0.229***	0.051	0.453***	0.053	0.296***
Benevolence (Dependability)	0.013†	0.007	-0.221***	0.051	0.422***	0.057	0.302***
Universalism (Concern)	0.014*	0.006	-0.21***	0.051	0.43***	0.054	0.305***
Security (Societal)	0.003	0.007	-0.242***	0.05	0.459***	0.054	0.294***
Tradition	-0.01	0.007	-0.223***	0.051	0.475***	0.052	0.299***
Conformity (Rules)	0.007	0.007	-0.243***	0.05	0.452***	0.054	0.296***
Universalism (Nature)	0.004	0.007	-0.234***	0.05	0.464***	0.052	0.295***

Avoidance Value Model

	Avoidance Value		Political Orientation		Norms		R^2
	Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	0.003	0.007	-0.236***	0.051	0.455***	0.056	0.295***
Security (Personal)	0.009	0.007	-0.23***	0.05	0.451***	0.053	0.298***
Humility	0.009	0.007	-0.231***	0.05	0.456***	0.052	0.298***
Self-Direction (Action)	-0.008	0.007	-0.241***	0.05	0.473***	0.052	0.297***
Power (Resources)	-0.001	0.007	-0.24***	0.05	0.467***	0.052	0.294***
Conformity (Interpersonal)	0.006	0.006	-0.235***	0.05	0.453***	0.053	0.296***
Universalism (Tolerance)	-0.008	0.007	-0.251***	0.051	0.473***	0.052	0.297***
Achievement	-0.005	0.007	-0.241***	0.05	0.472***	0.052	0.295***
Face	-0.003	0.007	-0.239***	0.05	0.468***	0.052	0.294***
Hedonism	0.01	0.007	-0.23***	0.05	0.444***	0.054	0.299***
Power (Dominance)	-0.009	0.007	-0.243***	0.05	0.478***	0.052	0.298***
Self-Determination (Thought)	-0.01	0.007	-0.242***	0.05	0.472***	0.052	0.3***
Stimulation	0.003	0.007	-0.238***	0.05	0.464***	0.052	0.295***
Benevolence (Dependability)	0.005	0.006	-0.234***	0.05	0.452***	0.055	0.295***
Universalism (Concern)	0.003	0.006	-0.231***	0.053	0.462***	0.052	0.295***
Security (Societal)	0.008	0.007	-0.24***	0.05	0.449***	0.054	0.297***
Tradition	-0.006	0.007	-0.233***	0.05	0.474***	0.052	0.296***
Conformity (Rules)	-0.003	0.007	-0.239***	0.05	0.469***	0.052	0.294***
Universalism (Nature)	-0.004	0.007	-0.246***	0.051	0.467***	0.052	0.295***

Combined Models

	Approach Value		Avoidance Value		Political Orientation		Norms		R^2	Avoidance Values Improve Model? (F)
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE		
Benevolence (Caring)	0.004	0.009	0.001	0.009	-0.236***	0.051	0.449***	0.058	0.295***	0.181
Security (Personal)	0.018*	0.008	0	0.008	-0.216***	0.05	0.416***	0.055	0.309***	4.741*
Humility	-0.002	0.007	0.01	0.007	-0.23***	0.05	0.457***	0.052	0.299***	0.077
Self-Direction (Action)	0.015*	0.007	-0.016*	0.008	-0.242***	0.049	0.441***	0.053	0.308***	4.885*
Power (Resources)	0.001	0.009	-0.001	0.008	-0.241***	0.051	0.467***	0.052	0.294***	0.014
Conformity (Interpersonal)	-0.011	0.008	0.012	0.008	-0.24***	0.05	0.476***	0.056	0.301***	1.905
Universalism (Tolerance)	0.004	0.007	-0.01	0.008	-0.251***	0.051	0.467***	0.053	0.297***	0.283
Achievement	0.004	0.007	-0.008	0.008	-0.239***	0.05	0.465***	0.053	0.296***	0.338
Face	-0.004	0.008	-0.001	0.009	-0.239***	0.05	0.473***	0.053	0.295***	0.227
Hedonism	0.003	0.006	0.009	0.007	-0.229***	0.05	0.441***	0.054	0.299***	0.18
Power (Dominance)	-0.015†	0.008	-0.001	0.008	-0.23***	0.05	0.481***	0.052	0.307***	3.736†
Self-Determination (Thought)	0.012	0.007	-0.018*	0.008	-0.237***	0.05	0.451***	0.053	0.306***	2.637
Stimulation	0.006	0.007	0	0.008	-0.229***	0.051	0.453***	0.053	0.296***	0.791
Benevolence (Dependability)	0.017†	0.009	-0.006	0.009	-0.222***	0.051	0.426***	0.057	0.303***	3.372†
Universalism (Concern)	0.019*	0.008	-0.008	0.008	-0.223***	0.053	0.43***	0.054	0.308***	5.608*
Security (Societal)	-0.003	0.009	0.009	0.009	-0.238***	0.05	0.452***	0.055	0.297***	0.095
Tradition	-0.01	0.009	0.001	0.009	-0.223***	0.051	0.475***	0.052	0.299***	1.191
Conformity (Rules)	0.015	0.009	-0.012	0.009	-0.242***	0.05	0.444***	0.054	0.3***	2.537
Universalism (Nature)	0.016	0.01	-0.016	0.01	-0.245***	0.051	0.463***	0.052	0.301***	2.582

†p< .10. *p < .05. **p < .01. ***p < .001

Appendix J: Comparison of models predicting attitudes towards vaccination in Study 3 including political orientation and norms as controls

Approach Value Models

	Approach Value		Political Orientation		Norms		R^2
	Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	-0.008	0.01	**0.324*** **	0.05	**-0.292*** **	0.056	**0.26*** **
Security (Personal)	-0.008	0.01	**0.318*** **	0.05	**-0.295*** **	0.054	**0.26*** **
Humility	0.012†	0.01	**0.327*** **	0.05	**-0.336*** **	0.05	**0.264*** **
Self-Direction (Action)	0.006	0.01	**0.33*** **	0.05	**-0.337*** **	0.052	**0.259*** **
Power (Resources)	**0.02** **	0.01	**0.319*** **	0.05	**-0.338*** **	0.049	**0.273*** **
Conformity (Interpersonal)	0	0.01	**0.33*** **	0.05	**-0.321*** **	0.054	**0.257*** **
Universalism (Tolerance)	0.005	0.01	**0.332*** **	0.05	**-0.332*** **	0.051	**0.258*** **
Achievement	0	0.01	**0.33*** **	0.05	**-0.321*** **	0.051	**0.257*** **
Face	**0.015***	0.01	**0.331*** **	0.05	**-0.35*** **	0.051	**0.268*** **
Hedonism	0.003	0.01	**0.332*** **	0.05	**-0.326*** **	0.05	**0.257*** **
Power (Dominance)	0.009	0.01	**0.324*** **	0.05	**-0.331*** **	0.05	**0.261*** **
Self-Determination (Thought)	0.005	0.01	**0.332*** **	0.05	**-0.331*** **	0.051	**0.258*** **
Stimulation	0.005	0.01	**0.338*** **	0.05	**-0.332*** **	0.051	**0.259*** **
Benevolence (Dependability)	-0.008	0.01	**0.318*** **	0.05	**-0.292*** **	0.055	**0.26*** **
Universalism (Concern)	0.002	0.01	**0.334*** **	0.05	**-0.326*** **	0.052	**0.257*** **
Security (Societal)	0.003	0.01	**0.328*** **	0.05	**-0.33*** **	0.053	**0.258*** **
Tradition	**0.019** **	0.01	**0.294*** **	0.05	**-0.344*** **	0.049	**0.277*** **
Conformity (Rules)	0.012†	0.01	**0.327*** **	0.05	**-0.35*** **	0.052	**0.264*** **
Universalism (Nature)	0.008	0.01	**0.339*** **	0.05	**-0.327*** **	0.049	**0.26*** **

Avoidance Value Models

	Avoidance Value		Political Orientation		Norms		R^2
	Estimate	SE	Estimate	SE	Estimate	SE	
Benevolence (Caring)	-0.003	0.01	**0.326*** **	0.05	**-0.312*** **	0.054	**0.257*** **
Security (Personal)	-0.006	0.01	**0.324*** **	0.05	**-0.309*** **	0.051	**0.259*** **
Humility	0.002	0.01	**0.331*** **	0.05	**-0.323*** **	0.05	**0.257*** **
Self-Direction (Action)	**0.026*** **	0.01	**0.331*** **	0.05	**-0.345*** **	0.048	**0.293*** **
Power (Resources)	0.006	0.01	**0.331*** **	0.05	**-0.328*** **	0.05	**0.259*** **
Conformity (Interpersonal)	-0.005	0.01	**0.325*** **	0.05	**-0.31*** **	0.051	**0.258*** **
Universalism (Tolerance)	**0.022** **	0.01	**0.359*** **	0.05	**-0.343*** **	0.049	**0.28*** **
Achievement	**0.017** **	0.01	**0.333*** **	0.05	**-0.342*** **	0.049	**0.272*** **
Face	**0.019** **	0.01	**0.329*** **	0.05	**-0.335*** **	0.049	**0.273*** **
Hedonism	**-0.017***	0.01	**0.311*** **	0.05	**-0.279*** **	0.052	**0.27*** **
Power (Dominance)	**0.016***	0.01	**0.336*** **	0.05	**-0.343*** **	0.05	**0.27*** **
Self-Determination (Thought)	**0.026*** **	0.01	**0.331*** **	0.05	**-0.335*** **	0.048	**0.293*** **
Stimulation	0.007	0.01	**0.334*** **	0.05	**-0.328*** **	0.05	**0.26*** **
Benevolence (Dependability)	0.01	0.01	**0.344*** **	0.05	**-0.355*** **	0.053	**0.263*** **
Universalism (Concern)	0.008	0.01	**0.353*** **	0.05	**-0.333*** **	0.05	**0.26*** **
Security (Societal)	0.006	0.01	**0.33*** **	0.05	**-0.336*** **	0.052	**0.259*** **
Tradition	**0.027*** **	0.01	**0.298*** **	0.05	**-0.353*** **	0.049	**0.295*** **
Conformity (Rules)	0.013†	0.01	**0.327*** **	0.05	**-0.334*** **	0.049	**0.265*** **
Universalism (Nature)	0.004	0.01	**0.336*** **	0.05	**-0.323*** **	0.049	**0.258*** **

Combined Models

	Approach Value		Avoidance Value		Political Orientation		Norms		R^2	Avoidance Values Improve Model? (F)
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE		
Benevolence (Caring)	-0.01	0.01	0.003	0.01	**0.327*** **	0.05	**-0.295*** **	0.057	**0.26*** **	1.173
Security (Personal)	-0.007	0.01	-0.002	0.01	**0.317*** **	0.05	**-0.295*** **	0.054	**0.26*** **	0.75
Humility	0.013†	0.01	-0.003	0.01	**0.325*** **	0.049	**-0.333*** **	0.05	**0.265*** **	3.448†
Self-Direction (Action)	-0.007	0.01	**0.03*** **	0.01	**0.331*** **	0.047	**-0.33*** **	0.051	**0.295*** **	1.001
Power (Resources)	**0.024** **	0.01	-0.007	0.01	**0.314*** **	0.049	**-0.334*** **	0.049	**0.274*** **	**7.032** **
Conformity (Interpersonal)	0.004	0.01	-0.007	0.01	**0.327*** **	0.049	**-0.318*** **	0.054	**0.259*** **	0.219
Universalism (Tolerance)	-0.006	0.01	**0.025** **	0.01	**0.36*** **	0.049	**-0.333*** **	0.051	**0.281*** **	0.654
Achievement	-0.013†	0.01	**0.026** **	0.01	**0.327*** **	0.048	**-0.32*** **	0.051	**0.28*** **	3.348†
Face	0.007	0.01	0.015†	0.01	**0.33*** **	0.048	**-0.346*** **	0.05	**0.275*** **	0.848
Hedonism	0.007	0.01	**-0.019** **	0.01	**0.314*** **	0.049	**-0.285*** **	0.052	**0.273*** **	1.431
Power (Dominance)	0.002	0.01	0.015†	0.01	**0.334*** **	0.049	**-0.343*** **	0.05	**0.27*** **	0.043
Self-Determination (Thought)	-0.013†	0.01	**0.035*** **	0.01	**0.325*** **	0.047	**-0.312*** **	0.05	**0.301*** **	3.558†
Stimulation	0.002	0.01	0.006	0.01	**0.337*** **	0.05	**-0.332*** **	0.051	**0.26*** **	0.098
Benevolence (Dependability)	**-0.028** **	0.01	**0.028** **	0.01	**0.328*** **	0.049	**-0.312*** **	0.054	**0.284*** **	**9.623** **
Universalism (Concern)	-0.004	0.01	0.01	0.01	**0.351*** **	0.052	**-0.326*** **	0.052	**0.261*** **	0.246
Security (Societal)	-0.001	0.01	0.007	0.01	**0.33*** **	0.049	**-0.335*** **	0.053	**0.259*** **	0.01
Tradition	0.001	0.01	**0.026** **	0.01	**0.297*** **	0.049	**-0.354*** **	0.049	**0.295*** **	0.017
Conformity (Rules)	0.006	0.01	0.01	0.01	**0.326*** **	0.048	**-0.344*** **	0.052	**0.266*** **	0.382
Universalism (Nature)	0.011	0.01	-0.004	0.01	**0.336*** **	0.05	**-0.328*** **	0.05	**0.261*** **	1.231

†p< .10. *p < .05. **p < .01. ***p < .001