

The Consequences of not Acting on Personally and Socially Important Value-Expressive  
Behaviours on Hedonic and Eudaimonic Wellbeing

BY

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### Abstract

Wellbeing is thought to decrease when one's actions do not align with one's values. This study refined a previous experimental method to investigate how perceived failure to live up to expectations of value-expressive behaviours may affect eudaimonic and hedonic wellbeing. One hundred and ninety-nine students considered their own past value-expressive behaviours in a survey designed to induce a discrepancy or "gap" between reported and ideal behaviour. We tested whether the importance of value-expressive behaviours—and whether this importance was based on personal or social ideals—would affect the perception of behavioural discrepancies and wellbeing. Results showed that being asked about more important behaviours predicted a greater perceived behavioural gap and less hedonic wellbeing. Whether this importance was based on personal values or social desirability did not differentially predict perceived behavioural gap or wellbeing, challenging the focus that some therapy models place on personal value expression to improve wellbeing. The perceived behavioural gap did not mediate a relationship between experimental condition and wellbeing, suggesting that other variables may play a role in the relationship between values, behaviour, and wellbeing. Further exploratory tests, limitations, and theoretical implications are discussed.

*Keywords:* values, behaviour, wellbeing, eudaimonic, hedonic

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### The Consequences of not Acting on Personally and Socially Important Value-Expressive Behaviours on Hedonic and Eudaimonic Wellbeing

Experiences of wellbeing are both inherently rewarding and thought to influence other positive experiences such as better academic performance (van Batenburg-Eddes & Jolles, 2013), work performance (Warr & Nielsen, 2018), and longevity (Saunders, Elkins, Christensen, & McGue, 2018). As such, developing strategies to increase wellbeing can have a far-reaching positive impact on individuals and society. Behavioural interventions have long been used to increase wellbeing and reduce psychological distress (Dimidjian, Barrera, Martell, Muñoz, & Lewinsohn, 2011). In some therapy models, behaviours that express personal values are encouraged as a means to increase a sense of purpose and meaning in life (e.g. acceptance and commitment therapy; Hayes, Wilson, & Strosahl, 2012). This study investigates how acting on values (or not doing so) may affect experiences of wellbeing and adds to the literature on values and wellbeing in two major ways by a) distinguishing value-related behaviours in terms of their subjective importance for the person and b) by clarifying effect of the reference of the behavioural importance—with importance being determined either by one's own personal values or what is seen as socially desirable.

Values can be defined as guiding principles in people's lives, and as such they inform behaviours (Bardi & Schwartz, 2003). Behaviours that primarily express a particular value are called value-expressive behaviours; for example, stimulation (excitement, novelty, challenge) is a value that can be enacted through the value-expressive behaviour of watching thrillers (Bardi & Schwartz, 2003). As per their definition, values are often thought to be directly relevant for behaviours; they are supposed to guide actions and behaviour of individuals (Schwartz & Bilsky, 1987, 1990).

One question is how acting in line with one's values might be related to wellbeing. Two major types of wellbeing have been discussed in the literature. A eudaimonic approach to wellbeing emphasises the importance of recognising and acting in accordance with one's "daimon", or "true self" (Waterman, 1990) in the pursuit of living a good life. In contemporary wellbeing research, the core components of eudaimonia include (among other variables) growth, self-actualisation, meaning and purpose in life, caring about and contributing to society, and authenticity (see Huta & Waterman, 2014, for a detailed list of eudaimonia-related elements of wellbeing). Values are core components of personal identity (Hitlin, 2003), and their expression are necessary for the personal expressiveness and pursuit of personal meaning in life. This meaning focus is central to what characterises eudaimonic wellbeing. Therefore, values as meaning-making systems may be most relevant for eudaimonic wellbeing indices.

In contrast, the hedonic approach to wellbeing can be summarised as the presence of positive and absence of negative affective states, and overall satisfaction with one's life (Huta & Waterman, 2014). Positive affect may be a by-product of acting on one's values (e.g. feeling pride or satisfaction with living authentically) and is therefore one way how acting on values may contribute to hedonic wellbeing. In addition, behaviours expressing the value of hedonism (prioritising pleasure and sensuous gratification) would, by definition, promote hedonic wellbeing.

These proposed positive relationships between value-expressive behaviour and types of wellbeing have received some empirical support from correlational and experimental studies. For example, Buchanan and Bardi (2015) analysed the relationship between certain values, the frequency of behaving in ways consistent with those values, and hedonic and eudaimonic wellbeing. The values analysed in their study were agency (consisting of a self-focus orientation,

prioritising self-reliance, self-oriented goals, achievement, and independence) and communion (consisting of an other-focus orientation, emphasising benevolence, interpersonal connections, consideration of others, and social connectedness). Across four studies with student and general population samples from the USA, engaging more frequently in value-expressive behaviours was consistently correlated both with more positive hedonic and eudaimonic wellbeing outcomes. Meanwhile, there was less consistent evidence that values were directly correlated with wellbeing outcomes.

Similarly, Ostermann et al. (2017) analysed how values and their realisation through behaviour may affect hedonic wellbeing for a sample of Germany's general population. When average value importance of Schwartz et al.'s (2012) refined values and average value realisation were both entered into regression equations, only the realisation of values predicted less anxiety and depression, and more satisfaction with life. Overall, these studies offer support for the hypothesised positive relationship between value-expressive behaviours and hedonic wellbeing. Furthermore, as Ostermann et al. suggest, the results raise the question as to whether the behaviour itself is more important for wellbeing compared with the cognitive representation of values that guide that behaviour.

Looking at the relationship between value-expressive behaviour and hedonic and eudaimonic wellbeing from a different angle, Chrystal, Karl, & Fischer (2019) used an experimental design to induce perceived discrepancy between how participants thought they should have acted and how they reported they did act on behaviours expressing Schwartz's (1994) four higher-order values. Perceived behavioural gaps irrespective of the specific values were positively correlated with negative affect and negatively correlated with aspects of positive wellbeing (a combination of hedonic and eudaimonic measures), supporting the general

proposition that not acting in line with values is detrimental to wellbeing. However, the perceived behavioural gap showed no correlation with searching for meaning in life. Conversely, those asked about value-expressive behaviours experienced more searching for meaning in life than did people asked about neutral behaviours, but value condition did not affect negative affect or aspects of positive wellbeing. These results suggest that a perceived gap between one's expectations for one's behaviour and how one acts may be most relevant to experiences of hedonic wellbeing—possibly through mechanisms such as increasing opportunities for rewarding experiences (e.g. behavioural activation; Lewinsohn, 1985). In contrast, value endorsements themselves may be more important for eudaimonic wellbeing (Huta & Waterman, 2014). Extrapolating from these results, it might be possible that the values component of acting on values (or not doing so) may be most relevant to eudaimonic wellbeing, while the action or behavioural component (acting or not acting) may be most relevant for hedonic wellbeing (but see Buchanan & Bardi, 2015 for failure to support this distinction).

The previous studies only examined the specific content of values, but not whether the relevant behaviours and the values that are expressed through those behaviours are actually important for the individual. The personal importance placed on the values being expressed seems certainly important. For example, Buchanan and Bardi (2015) hypothesised that value-expressive behaviours would be most beneficial for wellbeing when the values they express are personally important to an individual. However, they found no evidence for this across their four samples as values and value-expressive behaviours did not interact with each other to increase wellbeing. Similarly, Chrystal et al. (2019) hypothesised that the effect of value condition (i.e. which value-expressive behaviours participants were asked about) would interact with participants' personal values so that people asked about behaviours that expressed values they

found important would experience the greatest perceived behavioural gaps. No such interaction was found, yet the average perceived behavioural gaps were greatest for values found to be important to the sample on average (i.e. self-transcendence and openness to change) and smaller for values found to be less important (i.e. self-enhancement and conservation) for the total sample on average. Together, these studies suggest that perhaps value-expressive behaviours are important for wellbeing for reasons other than that they express a person's values.

One possibility is that value-expressive behaviours are beneficial to wellbeing when they express the values of the surrounding society, that is the values that are deemed consensually important and desirable. Past research in a variety of different contexts has shown that congruence between individual values and societal values can benefit wellbeing (e.g. Sagiv & Schwartz, 2000; Sørtheix, Olakivi, & Helkama, 2013; Sørtheix & Lönnqvist, 2015). It is possible that behaviours that express the important values in a social group may enhance wellbeing through mechanisms such as social reward, enhanced social status, and strengthened social relationships.

We believe that there are two key questions that require more attention. First, it is unclear as to whether any value-expressive behaviours may be beneficial for different types of wellbeing or whether perceptions of behavioural gaps are dependent on the overall importance of the relevant behaviour. In other words, are behaviour effects on wellbeing dependent on their relative importance for either the individual or the larger social group? Second, addressing the source of the importance rating, the findings by Chrystal and colleagues (2019) suggested that acting in line with values may be most beneficial for wellbeing when those behaviours express values in the social environment rather than personal values. Therefore, the source of the perceived importance of behaviour (for the individual vs the social group) need further attention. We use an

experimental design adapted from Chrystal et al. (2019) to investigate how these two factors—the level of subjective importance of value-expressive behaviours and whether this importance is personally or socially based—may influence the relationship between value expressive behaviours and both eudaimonic and hedonic wellbeing.

First, we explicitly measure the subjective importance of different value-expressive behaviours and then participants are asked only about behaviours they find important, neither important nor unimportant, or unimportant. Therefore, we focus on perceived importance of the behaviour instead of the value content based on Schwartz's (1994) theory. In exploratory analysis, we will analyse which value categories are seen as more or less important. Second, we experimentally manipulate the source of behavioural importance by asking participants to judge their ideal behaviour based on either their personal values or what is socially desirable. Going beyond the previous studies, we consider not only the size of the perceived behavioural gaps but also the direction of the gap: positive (thinking more of a behaviour should have been done) and negative (thinking less of a behaviour should have been done). We test all these manipulations in relation to hedonic and eudaimonic wellbeing to cover both approaches to wellbeing.

Summarising our predictions, first, we anticipate that participants will experience greater behavioural gaps when they are asked about behaviours they find either personally or socially important. This is in line with Chrystal et al.'s (2019) finding that perceived behavioural gaps were greatest when asked about behaviours relevant to the most important values for the sample. Furthermore, for the value that was least important to the sample (self-enhancement), the perceived behavioural gap was in a negative direction (indicating that people thought they should have behaved less often in this way). Therefore, we could hypothesise that being asked about

behaviours that are least important for individuals will result in negative perceived behavioural gaps.

H1a: The perceived behavioural gaps should be larger and in a positive direction for people asked about important behaviours relative to less important behaviours.

H1b: The perceived behavioural gaps should be larger and in a negative direction for people asked about unimportant behaviours relative to more important behaviours.

Focusing on the effects on wellbeing, we do expect that that if we manipulate the perceived frequency of engaging in subjectively important behaviours, individuals should report poorer hedonic and eudaimonic wellbeing.

H2: There will be a main effect of importance in that people asked about important value-expressive behaviours (and being subsequently challenged with manipulated frequency information) experience poorer hedonic and eudaimonic wellbeing compared to people asked about behaviours they find less important overall.

The effect of the source of importance is currently unclear. The previous literature seems to imply that personal importance is less relevant compared to socially important value-expressive behaviours. Chrystal et al.'s (2019) results suggest that perceived behavioural gaps were largest when the behaviours asked about were socially important but not when participants reflected on value-expressive behaviours that participants found personally important. Therefore, we hypothesise that if perceived behavioural gaps depend more on the social relevance than personal relevance of behaviours, then:

H3: There will be a main effect of reference condition so that perceived behavioural gaps should be larger and in a positive direction for people asked about socially important behaviours relative to people asked about personally important behaviours.

There may be an interaction between the level of importance and source of importance that affects perceived behavioural gaps and wellbeing. While this interaction effect is speculative, based on the patterns in previous research (e.g., Buchanan & Bardi, 2015; Chrystal et al., 2019), we predict that socially important behaviours have a strong effect on both perceived behavioural gap and wellbeing ratings.

H4: The perceived behavioural gaps should be largest and in a positive direction for people asked about socially important value-expressive behaviours compared to people asked about personally important value-expressive behaviours or compared to people asked about less important behaviours, irrespective of the source.

H5: Wellbeing should be lowest for people asked about socially important value-expressive behaviours compared to people asked about personally important value-expressive behaviours or compared to people asked about less important value-expressive behaviours, irrespective of the source.

One of the central questions of our study is whether there are differential effects of not acting on value-expressive behaviours on different types of wellbeing. As discussed above, the perceived behavioural gap of not acting might have more of an impact on hedonic aspects of wellbeing. Therefore, considering the proposition that the behavioural component is most detrimental for hedonic aspects of wellbeing, we make the following hypothesis:

H6: The effect of perceived behavioural gaps on wellbeing should be greater for hedonic measures compared to eudaimonic measures.

Lastly, we test the role that perceiving discrepancy between reported and ideal behaviours may play in the relationship between our experimental conditions and wellbeing. We hypothesised that the manipulations of importance and source of importance (personal vs social

importance) influence both perceived behavioural gap (both positive and negative) and wellbeing (H1a, H1b, H2, H3, H4, H5). We also specified that perceived behavioural gap is correlated with wellbeing (H6). To the extent that behavioural gaps drive the overall wellbeing effect, we should find experimental effects of importance on wellbeing being mediated by perceived behavioural gap. While Chrystal et al. (2019) did not find support for such a mediation model, we more directly differentiate importance and importance source effects that may have obscured the mediation processes in the original study.

H7: The relationship between experimental condition and wellbeing will be mediated by perceived behavioural gap. Specifically, we expect that experimental manipulation effects specified in Hypotheses 2 and 5 will be weakened or disappear when including perceived behavioural gaps in the statistical model.

Finally, addressing the previously noted questions about the relative importance of behavioural vs value components in explaining wellbeing effects, we conduct two types of exploratory analyses. First, we will include the self-rated value scores of the higher-order level values in our statistical models to examine whether self-rated values are predicting any variance over and above the experimental behavioural manipulations and perceived behavioural gaps in wellbeing scores. Second, we will examine the important and non-important behaviours in terms of the value categories by Schwartz et al. (2012). This can provide some indirect evidence into the question whether value content of value-expressive behaviour in itself may have an effect on well-being.

## Method

### Participants

Participants were 212 university students enrolled in a first-year psychology course. There were 10 incomplete responses that were excluded from the analysis. Three participants had completed the survey twice and their second responses were excluded. The final sample consisted of 199 unique participants with complete responses, of which 137 respondents identified as females, 59 as men, one person who described themselves as “nonbinary”, one person who described themselves as “trans-masc[uline] nonbinary”, and one person who chose not to provide their gender. The average age was 19.44 years ( $SD = 3.49$ , min. = 17, max. = 47). Participants could choose multiple ethnicities they identified as and were subsequently coded into the following groups (totals are in parentheses): New Zealand European/Pākehā (135); Asian (2); Māori (24) Pacific Islander (13), Other European (13), American (3), African (3), and people whose ethnicity data was omitted or ambiguous (4). One hundred and fifty-four participants were born in New Zealand, 44 were born elsewhere, and one person did not provide their place of birth.

Participants gave informed consent and participation was done voluntarily to earn course credit. Ethical approval for this study was given by the School of Psychology Human Ethics Committee under delegated authority of Victoria University of Wellington’s Human Ethics Committee.

We conducted an a priori power analysis using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to determine a necessary sample size. Based on a between-subjects ANOVA needed to test the effect of condition on perceived behavioural gap, with an expected  $f$  of .25

based on a medium effect size<sup>1</sup> (Cohen, 1992), an alpha of .05, power of .80, numerator degrees of freedom of 2, and number of groups as 6, the analysis showed that at least 158 participants were needed.

## **Materials**

**Survey.** We created a survey to induce discrepancies between how often participants thought they should have engaged in certain behaviours and how often they reported they did engage in those behaviours (i.e., perceived behavioural gaps). This method was developed by Yousaf and Gobet (2013) and adapted to the study of values in a recently published study (Chrystal, Karl, & Fischer, 2019). As described below, the current study has developed this method further.

The experimental survey consisted of three phases, the first of which required participants to judge a list of 60 behaviours and determine the 10 most and 10 least important of these, as well as 10 that were neither important nor unimportant. The behaviours included in this study were adapted from the Everyday Behaviours Questionnaire (Schwartz & Butenko, 2014), and recent research investigating the link between behaviours and values (Skimina, Cieciuch, Schwartz, Davidov, & Algesheimer, 2019; Coelho, 2018). A list of the behaviours asked about is in Appendix A. The instructions for this phase differed depending on whether participants were in the personal value condition (e.g., “Based on your personal values and how you want to behave, please choose exactly 10 behaviours that are the most important to do.”) or the social norm condition (e.g., “Based on what is socially desirable and how you think others want you to behave, please choose exactly 10 behaviours that are the most important to do.”).

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<sup>1</sup> A medium effect size was chosen in the absence of past research with comparable independent variables.

In the second phase, participants were asked about how often they had engaged in some of the behaviours they had judged in the first phase. Participants were randomly assigned to one of three conditions: being asked about behaviours they judged as most important, least important, or as neither important nor unimportant. For example, someone in the most important condition would have been asked about how often they had engaged in the 10 behaviours they had judged as most important in the first phase. The timeframes for answering the frequency for each behaviour were determined in a pilot study ( $N = 17$ ) in which student participants indicated how often they had done the 60 behaviours recently. The relevant results of this pilot study are depicted in Appendix B. We then manipulated the response scales so that the average frequency for each behaviour in the pilot study was located on the lower end of the scale. This was done to induce a sense that people did not regularly engage in the respective behaviour. We would expect that participants in the current study are likely to answer on the lower end of the scale. Therefore, this was the crucial manipulation to increase the likelihood of experiencing a perceived behavioural gap. For example, if asked “How often did you do puzzles or crosswords in the last week?”, participants responded on the scale *0-10 times, 11-20 times, 21-30 times, 31-40 times, 41-44 times, 45-49 times, 50-54 times, 55-59 times, 60+ times*.

Finally, the perceived behavioural gap—the difference between how participants thought they should have behaved and how they did behave—was measured in the third phase. All participants were asked how much they should have done the behaviours they were asked about in the second phase. This was measured on a 9-point scale from -4, *A lot less often than I did*, to 4, *A lot more often than I did*. The midpoint was 0, *The same amount that I did*. All questions and scales can be found in Appendix C.

**Affect.** Positive and negative affect was measured with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS comprises of 10 items to measure positive affect and 10 to measure negative affect (e.g., “inspired” and “irritable” respectively). Participants indicated to what extent they felt a range of emotions in the present moment from 1, *very slightly or not at all*, to 5, *extremely*. Item scores were averaged for each subscale to create overall scores for positive and negative affect. In addition to the original 20 items of the PANAS, we added 6 items to capture emotions that participants may have felt after completing the survey. These were “frustrated”, “disappointed”, “embarrassed”, “sad”, and “anxious” for the negative scale and “satisfied” for the positive scale. Internal reliability of the positive affect scale was  $\alpha = .87$ ,  $\omega = .90$ , and that of the negative affect was  $\alpha = .94$ ,  $\omega = .95$ . Removing the additional items led to reliability of  $\alpha = .91$ ,  $\omega = .93$  for the positive scale and  $\alpha = .91$ ,  $\omega = .93$  for the negative scale. We used the altered scales for the analyses as they provided a greater range of emotions without compromising the reliability of the original scales.

**Flourishing.** The Flourishing Scale (FS; Diener et al., 2010) was used as a general measure of eudaimonic wellbeing. It includes items measuring positive relationships, feelings of competence, meaning in life, and engagement in daily activities, which have all been conceptualised as being part of eudaimonic wellbeing (Huta & Waterman, 2014). The FS has eight items, such as “My social relationships are supportive and rewarding”, that participants indicate their (dis)agreement with from 1, *strongly disagree*, to 7, *strongly agree*. Scores for flourishing are calculated by averaging the item scores. Internal reliability was  $\alpha = .89$ ,  $\omega = .91$ , indicating good reliability.

**Meaning in life.** We used the Meaning in Life Questionnaire (MLQ; Steger et al., 2006) to measure the presence of meaning in life and searching for meaning in life. The MLQ consists

of 10 items, half of which measure the presence of meaning in life (e.g. “I understand my life’s meaning”) while the other half measures the search for meaning in life (e.g. “I am searching for meaning in life”). The presence of meaning in life is generally associated with other measures of positive wellbeing (Steger, Oishi & Kashdan, 2009), while searching for meaning in life is associated with lower scores on other wellbeing measures (Steger et al., 2009; Cohen & Cairns, 2012). Participants rated these on a seven-point scale from 1, *absolutely untrue*, to 7, *absolutely true*. After reverse coding responses to the negatively phrased item, overall scores for each subscale were created by averaging the scores in each subscale. Internal reliability was  $\alpha = .86$ ,  $\omega = .90$  for presence of meaning in life and  $\alpha = .89$ ,  $\omega = .92$  for searching for meaning in life, indicating good reliability of the scales.

**Values.** We used the Twenty Item Values Inventory (TwIVI; Sandy, Gosling, Schwartz, & Koelkebeck, 2017) to measure participants’ personal values. The TwIVI was chosen for its brevity; its ability to reproduce the overall value hierarchy and correlations with other variables that longer measures produce; and its superior psychometric qualities compared to other measures of similar length (Sandy et al., 2017). The TwIVI contains two items to measure each of 10 basic human values (Schwartz, 1992). Items in the TwIVI describe a hypothetical person and participants indicate how similar this person is to them from 1, *not like me at all*, to 6, *very much like me*. The TwIVI items were changed to be gender neutral, using “they” rather than “s/he”, e.g., “They like to take risks. They are always looking for adventures”. Scores for each of the 10 values were created by averaging the responses of the two items measuring each value, in turn these scores were averaged to form the higher-order value clusters. In line with previous research, conservation scores were calculated by averaging conformity, tradition, and security scores; self-enhancement scores were computed by averaging achievement and power scores;

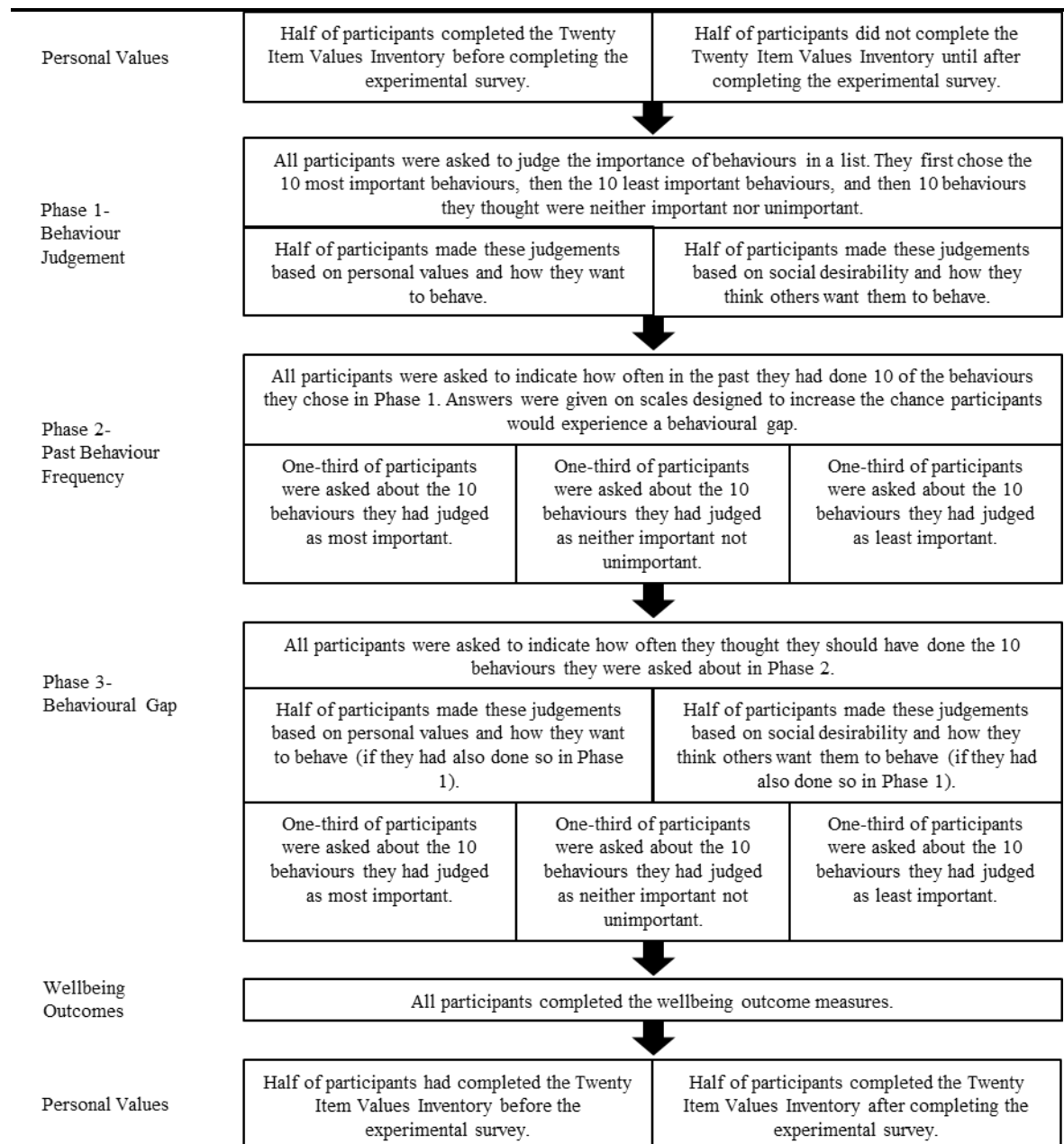
self-transcendence scores by averaging benevolence and universalism scores; and openness to change scores by averaging self-direction, stimulation, and hedonism scores. The internal reliability for four higher-order value types were  $\alpha = .66$ ,  $\omega = .74$  for conservation;  $\alpha = .71$ ,  $\omega = .84$  for self-enhancement;  $\alpha = .79$ ,  $\omega = .84$  for self-transcendence; and  $\alpha = .79$ ,  $\omega = .89$  for openness to change.

### **Procedure**

The survey was administrated online through the survey programme Qualtrics, and participants completed the survey in their own time with their own internet-enabled devices. All participants were first presented with an information sheet, consented to participation, and then provided demographic information. Next, half of the sample was randomly assigned to complete the TwIVI before starting the experimental survey and the remaining half completed towards the end to counterbalance any effects that considering personal values might have on subsequent answers about behaviour, or any effects the manipulation may have on the ratings of personal values.

In the next phase, participants were asked to select the 10 behaviours from a list of 60 that they judged as the most important to do, then to select the 10 behaviours they thought were the least important, and finally to select 10 behaviours they thought were neither important nor unimportant (i.e. behaviours they thought were of neutral importance). In this phase, half of participants were randomly assigned to either the personal values reference or social norm reference conditions. Next, participants indicated how often they had done certain behaviours they had selected in phase 1. In this phase, participants were randomly assigned to being asked about either the most important, least important, or neutral behaviours. Lastly, participants indicated how often they thought they should have done the behaviours asked about in phase 2.

Then, participants responded to the different measures of wellbeing. After this, half of the participants filled out the TwIVI. Figure 1 depicts the experimental procedure.



*Figure 1.* Flow chart depicting the tasks in the survey, and the differences and similarities between conditions.

### Dimension Reduction of Wellbeing Variables

Pearson's correlations were calculated to examine the relationships between each wellbeing measure (see Table 1).

Table 1.

*Pearson's correlations between wellbeing outcome measures.*

Measure	1	2	3	4	5
1. Presence of meaning in life	—				
2. Searching for meaning in life	-.03	—			
3. Negative affect	-.32***	.16*	—		
4. Positive affect	.35***	.09	.10	—	
5. Flourishing	.54***	.01	-.39***	.35***	—

*Note.* \* $p \leq .05$ ,  $p^{***} \leq 0.001$ .

We conducted a confirmatory factor analysis to test whether the wellbeing measures loaded onto two factors—eudaimonic and hedonic wellbeing—as expected. However, the CFA model did not converge as there were only two variables for the proposed hedonic factor (positive and negative affect). Therefore, we performed a principle components analysis (PCA) with two factors specified to better understand how the scales used in our study may cluster together. The results of this PCA are summarised in Table 2. Parallel analysis suggested retaining two factors with Eigenvalues of 1.79 and 1.14. Flourishing, presence of meaning in life, and positive affect loaded primarily onto Component 1, while searching for meaning in life, and negative affect loaded primarily onto Component 2. Component 1 appears to encompass measures of positive wellbeing while Component 2 encompasses measures of negative wellbeing rather than the hedonic and eudaimonic distinction we expected. However, given positive affect

loaded relatively highly onto Component 2, we chose to retain Component 1 as a measure of positive eudaimonic wellbeing and Component 2 as a measure of positive hedonic wellbeing (composed of only positive affect). We excluded searching for meaning in life and negative affect from the analyses requiring aggregated wellbeing measures to reduce the overall number of tests needed (and therefore Type I error).

Table 2.

*Results of a principal components analysis with two components, including standardised loadings for each wellbeing outcome, Eigenvalues, and proportion of variance explained.*

	Component 1	Component 2
Flourishing	<b>.84</b>	-.10
Searching for meaning in life	.04	<b>.67</b>
Presence of meaning in life	<b>.82</b>	-.08
Negative affect	<b>-.46</b>	<b>.70</b>
Positive affect	<b>.62</b>	<b>.54</b>
Eigenvalues	1.79	1.13
Proportion of explained variance	.61	.39

*Note.* Loadings greater than .40 are bolded.

## Planned Analyses

**Testing H1a, H1b, H3, and H4: The effect of condition on perceived behavioural gap.** To test whether the experimental conditions differentially affect reports of perceived behavioural gap, we will conduct a multiple regression with perceived behavioural gap regressed onto the interaction between behaviour importance condition and the judgement reference condition. The predictors will be dummy-coded so that the most important, neither important nor unimportant, and unimportant levels are coded as 1, 0, and -1 respectively. Social judgement reference will be coded as 1 and personal judgement reference will be coded as 0.

**Testing H2 and H5: The effect of condition on wellbeing measures.** To see if there is an effect of condition on wellbeing measures, we will conduct multiple regressions with hedonic

and eudaimonic wellbeing outcomes regressed onto the interaction between behaviour importance condition and the judgement reference condition. The predictors will be dummy-coded as described above.

**Testing H6: The effect of perceived behavioural gap on wellbeing.** To test whether the perceived behavioural gap has differential effects on eudaimonic and hedonic wellbeing, we will run a regression with both standardised hedonic and eudaimonic wellbeing measures regressed onto the perceived behavioural gap and type of wellbeing with a random factor will be assigned to each participant so that the wellbeing outcomes are treated as within-subject variables. In case the direction of the perceived behavioural gap (positive and negative) affects this relationship, we will also run a regression with the quadratic perceived behavioural gap term to assess if a curvilinear model fits the data better than a linear model. These tests will show if the effect of perceived behavioural gap on wellbeing is greatest for hedonic compared to eudaimonic measures (as predicted), and if the effect of the perceived behavioural gap on wellbeing is better modelled by a linear or curvilinear regression. If a curvilinear model is shown to be more suitable, it would show that wellbeing depends on both the distance of the gap from 0 and the negative or positive direction of the gap.

**Testing H7: Perceived behavioural gap mediating the relationship between condition and wellbeing.** To test if the perceived behavioural gap mediates the relationship between the independent variables (importance and judgement reference) and wellbeing, we will use pathway analysis models in which 1) perceived behavioural gap is regressed onto the interaction between importance and judgement reference, 2) hedonic and eudaimonic wellbeing outcomes are regressed onto the interaction between importance and judgement reference and 3) each wellbeing measure is regressed onto the perceived behavioural gap and the interaction between

importance and judgement reference. Total, direct, and indirect effects will be calculated to see if perceived behavioural gap mediates the relationship between the condition variables and wellbeing measures. Figure 2 depicts the proposed relationships to be tested.

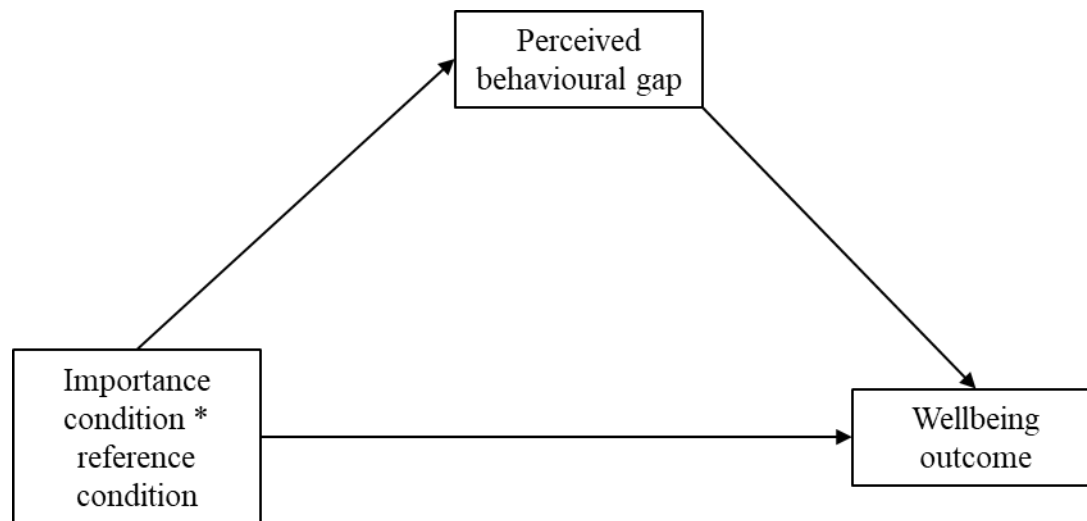


Figure 2. Depiction of the proposed relationships between variables.

### Statistical Analysis Software

All analyses will be completed in R version 3.6.2 (R Core Team, 2019) using RStudio version 1.2.5033 (RStudio Team, 2019). The packages used will be lavaan version 0.6-5 (Rosseel, 2012), car version 2.1-6 (Fox & Weisberg, 2019), lsr version 0.5 (Navarro, 2015), emmeans version 1.4.3.01 (Lenth, 2019), sjPlot version 2.8.1 (Lüdtke, 2019), paran version 1.5.2 (Dinno, 2018), jtools version 2.0.1 (Long, 2019), and psych version 1.8.12 (Revelle, 2018) packages.

## Results

### Summary of Personal Values

Average scores for each of the four higher-order values measured by the TwIVI were calculated to better understand our sample characteristics. Additionally, we looked at the average

TwIVI scores for those who completed the TwIVI before the manipulation (the “before” group) and those who completed it afterwards (the “after” group). T-tests were done to see whether value scores differed between the before and after groups. Conservation scores were not different between these two groups,  $t(192.24) = 1.54, p = .12$ . However, people in the after group reported less self-enhancement ( $M = 3.41, SD = .81$ ) than did those in the before group ( $M = 3.67, SD = .85$ ),  $t(196.9) = 2.23, p = .02$ . The same was true for self-transcendence scores in the after group ( $M = 4.78, SD = .87$ ) compared to the before group ( $M = 5.09, SD = .77$ ),  $t(192.27) = 2.65, p = .008$ . Following the same pattern, openness to change scores were lower for the after group ( $M = 4.40, SD = .76$ ) compared to those in the before group ( $M = 4.71, SD = .80$ ),  $t(196.89) = 2.83, p = .005$ . Means and standard deviations of values for the total sample and the two timing groups are presented in Table 3.

Table 3.

*Means and standard deviations of each TwIVI higher-order value for the total sample and the two TwIVI timing groups.*

	Total sample ( $N = 199$ )		TwIVI before manipulation ( $N = 101$ )		TwIVI after manipulation ( $N = 98$ )	
	M	SD	M	SD	M	SD
Openness to Change	4.55	.79	4.71	.80	4.40	.76
Self-Enhancement	3.54	.84	3.67	.85	3.41	.81
Self-Transcendence	4.94	.83	5.09	.77	4.78	.87
Conservation	3.28	.93	3.38	.87	3.18	.98

### Summary of Outcome Measures

Average scores of each wellbeing measure were calculated to better understand our sample characteristics. T-tests showed that both hedonic and eudaimonic wellbeing were not different for the two TwIVI timing groups;  $t(196.38) = -.71, p = .48$  for hedonic wellbeing and

$t(192.78) = .83, p = .41$  for eudaimonic wellbeing. The results for the total sample are reported in Table 4.

Table 4.

*Means and standard deviations of wellbeing outcomes for the total sample.*

Wellbeing outcomes	<i>M</i>	<i>SD</i>
Flourishing Scale	5.00	1.05
PANAS (Positive)	2.52	.74
PANAS (Negative)	2.24	.90
MILQ- Searching for Meaning	4.75	1.29
MILQ- Presence of Meaning	4.02	.86
Eudaimonic wellbeing	4.66	1.01
Hedonic wellbeing	2.52	.74

### Summary of Perceived Behavioural Gaps

The perceived behavioural gaps for the total sample and each experimental condition were calculated to better understand the nature of the perceived behavioural gaps. A t-test showed that behavioural gaps were not different for the TwIVI before and after groups. The results for each condition and the total sample are reported in Table 5.

Table 5.

*Average perceived behavioural gap scores for each condition and across all conditions*

	Reference Condition								
	Social			Personal			Both social and personal		
Importance condition	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Most important	1.04	.80	35	1.29	.99	33	1.16	.89	68
Neither important nor unimportant	.75	.65	34	.79	.80	29	.77	.72	63
Least important	.21	1.20	30	.12	.98	38	.16	1.05	68
All importance conditions	.69	.93	99	.70	1.05	100	.70	.90	199

**Hypotheses 1a, 1b, H3, and H4: The effect of condition on perceived behavioural gap.**

These hypotheses concerned the effect that the different conditions may have on the perceived behavioural gap and as such, were tested in the same analysis. Specifically, we tested these hypotheses with a linear regression model with the perceived behavioural gap regressed onto the interaction between judgement reference condition (personal and social, coded as 0 and 1 respectively) and importance condition (most important, neither important nor unimportant, and least important, coded as 1, 0, and -1 respectively). A significant regression was found,  $F(3, 195) = 14.62, p < .001, R^2 = .18, R^2_{\text{Adjusted}} = .17$ . These results indicate that the experimental conditions explain 17% of the variance in perceived behavioural gap. The results from this regression are presented in Table 6.

Table 6.

*The main and interaction effects of importance condition and reference condition on perceived behavioural gap.*

	Estimate	Standard error	T value	P value
(Intercept)	.73	.09	8.07	< .001***
Importance	.59	.11	5.50	< .001***
Reference	-.06	.13	-.47	.64
Importance * reference	-.17	.16	-1.13	.26

For H1a, we predicted that perceived behavioural gaps would be larger and in a positive direction, (i.e. participants felt they should have done more of the behaviours) for people asked about more important behaviours relative to less important behaviours. There was a main effect of importance level so that being asked about more important behaviours was associated with greater behavioural gaps than being asked about less important behaviours,  $B = .59, p < .001$ . Therefore, H1a was supported.

For H1b, we predicted that the perceived behavioural gaps should be larger and in a negative direction (i.e. participants felt they should have done less of the behaviours) for people asked about unimportant behaviours relative to more important behaviours. T-test comparisons between those in the least important condition ( $M = .16$ ,  $SD = 1.05$ ) and most important condition ( $M = 1.16$ ,  $SD = .89$ ) showed that perceived behavioural gaps were significantly smaller for the least important group  $t(130.63) = 6.02$ ,  $p < .001$ . Perceived behavioural gaps for the least important condition were also significantly smaller than those for the neither important nor unimportant group ( $M = .77$ ,  $SD = .72$ );  $t(118.72) = 3.94$ ,  $p < .001$ . While the direction of the gap was positive, i.e. people in the least important condition felt they should have done more behaviours, they did to a significantly lesser degree than the other two importance conditions. Therefore, H1b is partially supported.

In H3, we predicted a main effect of reference condition so that perceived behavioural gaps are larger and in a positive direction for people asked about socially relevant behaviours relative to people asked about personally relevant behaviours. This hypothesis was not supported as the regression test of the reference condition effect on perceived behavioural gap was not significant,  $B = -.06$ ,  $p = .64$ .

H4 predicted an interaction between the conditions so that the perceived behavioural gaps would be largest and in a positive direction for people asked about socially important value-expressive behaviours compared to people asked about personally important value-expressive behaviours, or compared to people asked about less important behaviours, irrespective of the source. The regression model showed that there was no interaction between importance and reference conditions to predict perceived behavioural gap,  $B = -.17$ ,  $p = .26$ .

### Hypotheses 2 and 5: The effect of condition on wellbeing

These hypotheses concerned the effect that different conditions may have on measures of hedonic and eudaimonic wellbeing. To test both hypotheses, we ran linear regressions with eudaimonic and hedonic wellbeing regressed onto the interaction between importance conditions and reference conditions. The levels of these factors were coded as for the previous regression. The regression model predicting hedonic wellbeing was significant,  $F(3, 195) = 3.28, p = .02, R^2 = .05, R^2_{\text{Adjusted}} = .03$ . The regression model predicting eudaimonic wellbeing was not significant,  $F(3, 195) = 1.59, p = .22, R^2 = .02, R^2_{\text{Adjusted}} = .007$ . These results indicate that the experimental conditions explain 3% of the variance in hedonic wellbeing but do not explain any variance in the eudaimonic outcome. The results of the significant hedonic regression are presented in Table 7.

Table 7.  
*The main and interaction effects of importance condition and reference condition on hedonic wellbeing*

	Estimate	Standard error	T value	P value
(Intercept)	2.49	.07	34.33	< .001***
Importance	-.25	.09	-2.91	.004**
Reference	.05	.10	.52	.60
Importance * reference	.15	.12	1.21	.23

For H2, we predicted that there would be a main effect of importance so that people asked about important value-expressive behaviours (and being subsequently challenged with manipulated frequency information) experience poorer hedonic and eudaimonic wellbeing compared to people asked about behaviours they find less important overall. Because the regression for eudaimonia was not significant, the hypothesis about eudaimonic wellbeing was not supported. The hedonic regression results, however, showed that being asked about more

important behaviours predicted significantly less hedonic wellbeing than did being asked about less important behaviours,  $B = -.25, p = .04$ . This supported out hypothesis about hedonic wellbeing. Therefore, H2 was partially supported.

For H5, we predicted that wellbeing would be lowest for people asked about socially important value-expressive behaviours compared to people asked about personally important value-expressive behaviours or compared to people asked about less important value-expressive behaviours, irrespective of the source. Again, the non-significant eudaimonic regression does not support this hypothesis as the conditions were not found to predict eudaimonic wellbeing. The interaction effect of conditions on hedonic wellbeing was not significant,  $B = .15, p = .23$ . Therefore, H5 was not supported.

#### **H6: Testing the effect of perceived behavioural gap on each type of wellbeing**

We predicted that there would be a greater effect of perceived behavioural gap on hedonic wellbeing compared to eudaimonic wellbeing. To test this, we applied a mixed effects regression model with the type of wellbeing (hedonic or eudaimonic) and the perceived behavioural gap predicting standardised wellbeing scores. A random factor was assigned to each participant so that hedonic and eudaimonic wellbeing scores were treated as within-subject variables.

The results of this regression did not show that any of the predictors or their interactions with one another predicted wellbeing. Particularly relevant to H6, there was no evidence of an interaction between the perceived behavioural gap and type of wellbeing,  $B = .02, t(197) = .22, p = .82$ . Therefore, H6 was not supported.

#### **Hypothesis 7: Behavioural gap mediating relationship between condition and wellbeing**

We predicted that the relationship between experimental condition and wellbeing would be mediated by perceived behavioural gap. This was tested with two path models with

eudaimonic and hedonic wellbeing as the predicted variables for each test. The interaction between reference conditions and importance conditions was the predictor variable and perceived behavioural gap was the mediator variable. Indirect effects were calculated for each of 1000 bootstrapped samples.

Both path models revealed the only significant path to be that of condition predicting perceived behavioural gap. The results of these tests are depicted in Figure 3. H7 was not supported as no statistical support for mediation was found.

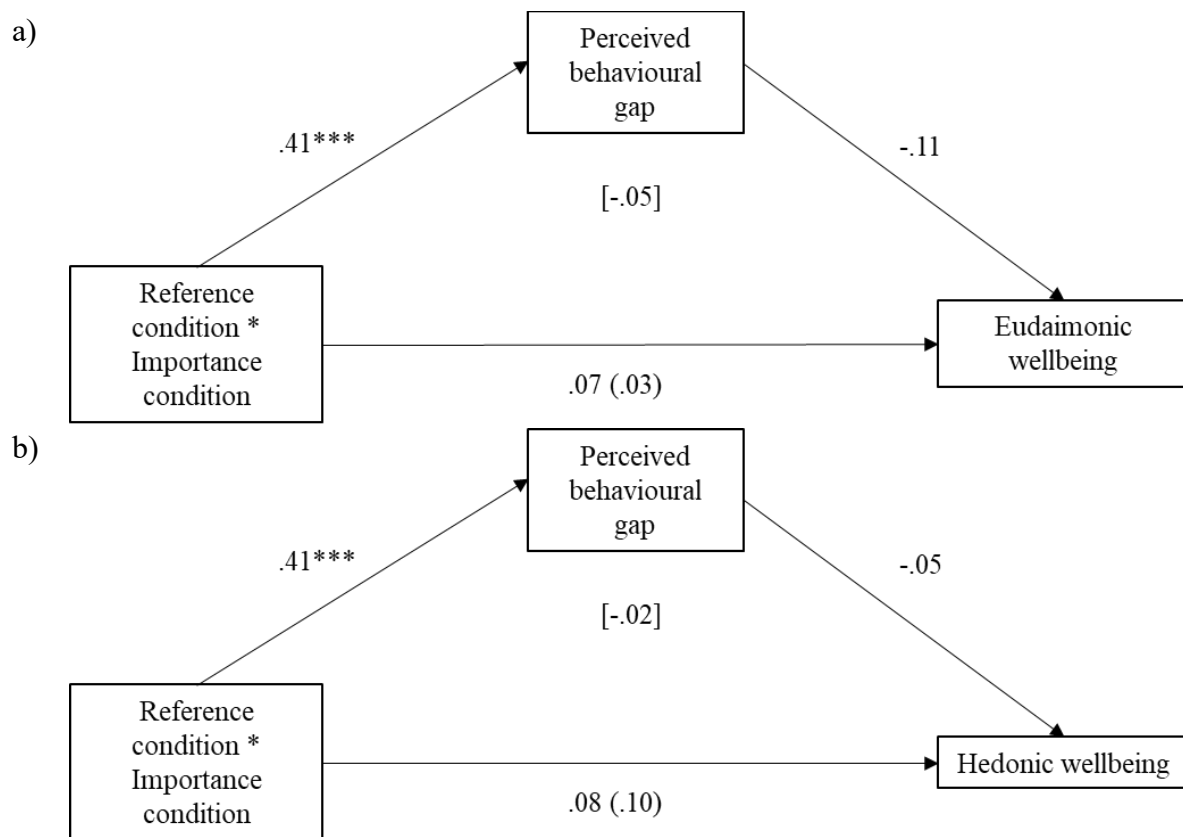


Figure 3. Results of path model analysis for condition and perceived behavioural gap predicting a) eudaimonic wellbeing and b) hedonic wellbeing.

Note. Total effects appear in parentheses; indirect effects appear in square brackets.  $p^{***} < .001$

**Exploratory Analysis: The quadratic effect of perceived behavioural gap on wellbeing**

The linear regression in H6's analysis showed that wellbeing was not predicted by the perceived behavioural gap, the type of wellbeing, or the interaction between these variables. However, so far, we have looked only at the overall perceived behavioural gap, which consists of both size (distance from 0) and direction (positive or negative—i.e., whether one feels they should have done more or less of the behaviours). Considering these two separate components of the gap may help reveal any effect they both may have on wellbeing. To include both the perceived behavioural gap size and direction, we ran a similar regression to that done to test H6 but with the quadratic term of the perceived behavioural gap as a predictor. The quadratic model fit the data significantly better than did the linear model,  $X^2(2, N = 199) = 10.13, p = .006$ . The results of the quadratic equation are presented in Table 8.

Table 8.

*Quadratic regression equations with perceived behavioural gap predicting wellbeing outcomes.*

Outcome	Predictor	<i>B</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Wellbeing	(Intercept)	.00	.07	337.19	.00	1
	Gap	-2.04	1.4	337.19	-1.46	.15
	Gap <sup>2</sup>	4.04	1.4	337.19	2.88	.004**
	Wellbeing type	.00	.08	196	.00	1.00
	Gap * wellbeing type	.35	1.53	196	.23	0.82
	Gap <sup>2</sup> * wellbeing type	-4.14	1.53	196	-2.71	.007**
Hedonic wellbeing	(Intercept)	.00	0.07	2, 196	.00	1.00
	Gap	-1.2	1.00	2, 196	-1.20	.23
	Gap <sup>2</sup>	-0.07	1.00	2, 196	-.07	.94
Eudaimonic wellbeing	(Intercept)	.00	.07	2, 196	.00	1.00
	Gap	-1.44	.98	2, 196	-1.47	.14
	Gap <sup>2</sup>	2.85	.98	2, 196	2.92	.004**

This regression showed an interaction between the quadratic perceived behavioural gap term and type of wellbeing where hedonic wellbeing was lower than eudaimonic wellbeing at the lower and upper ends of the perceived behavioural gap scale,  $B = -4.14$ ,  $p = .007$ . This pattern is depicted in Figure 4.

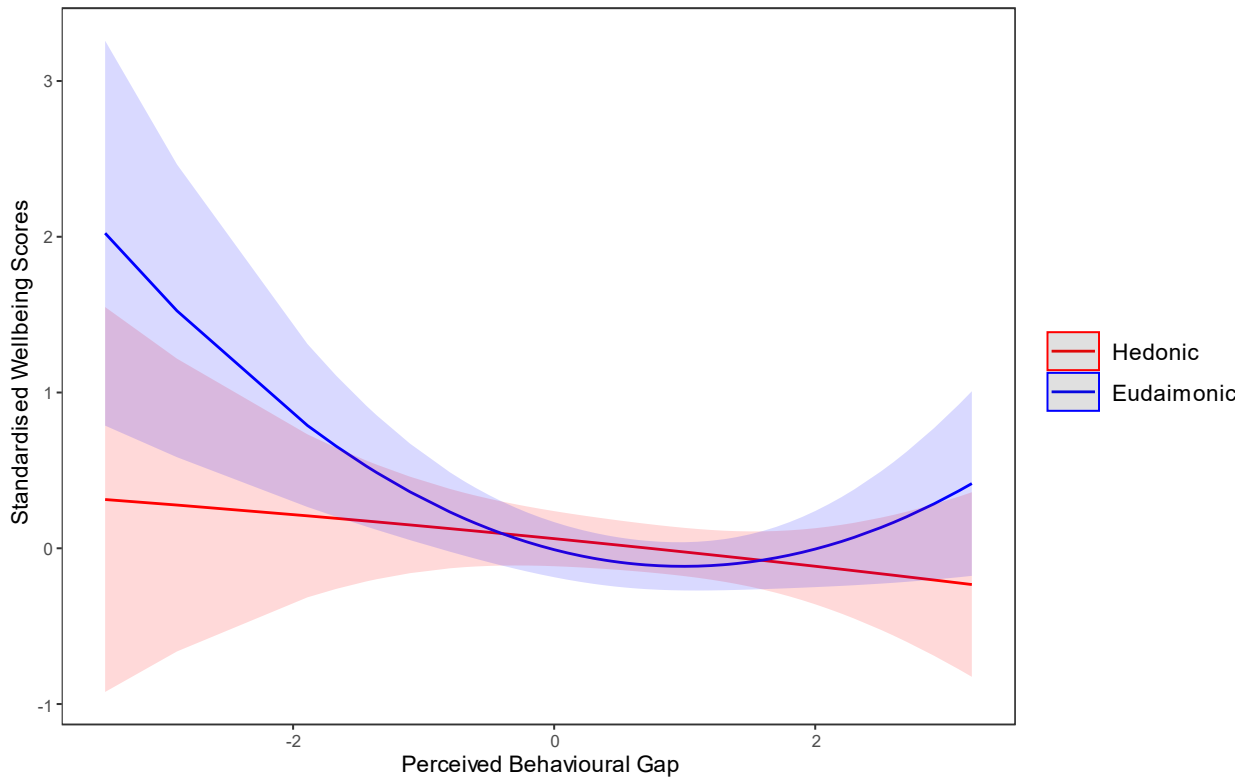


Figure 4. Graph depicting curvilinear relationship between perceived behavioural gap and standardised scores of different types of wellbeing.

Given the differences in this model between the two types of wellbeing, we ran separate regressions for each wellbeing outcome predicted by the quadratic perceived behavioural gap term. For hedonic wellbeing, the regression was non-significant,  $F(2, 196) = .72$ ,  $p = .49$ ,  $R^2 = .007$ ,  $R^2_{\text{Adjusted}} = -.003$ . This indicates that the regression model including the quadratic perceived behavioural gap term did not predict hedonic wellbeing.

For eudaimonic wellbeing, the regression was significant,  $F(2, 196) = 5.34$ ,  $p = .006$ ,  $R^2 = .05$ ,  $R^2_{\text{Adjusted}} = .04$ . There was a significant effect of the quadratic perceived behavioural gap

term on wellbeing so that being on the upper and lower ends of the perceived behavioural gap scale predicted greater eudaimonic wellbeing than being around the middle of the scale,  $B = 2.85, p = .004$ .

### **Exploratory Analysis: The effect of personal values on wellbeing**

To examine whether self-rated value scores of Schwartz's four higher-order values predicted any additional variance over the experimental manipulations and perceived behavioural gaps in wellbeing scores, we included the value scores in equations predicting eudaimonic and hedonic wellbeing. Both wellbeing measures were separately regressed onto the interactions between the reference conditions and importance conditions, perceived behavioural gap, and with the scores for each higher-order value added as predictive factors.

The regression without the values scores predicting eudaimonic wellbeing was non-significant,  $F(3, 195) = .85, p = .50, R^2 = .01, R^2_{\text{Adjusted}} = -.002$ . However, when the values scores were included in the equation it was significant,  $F(7, 191) = 4.05, p < .001, R^2 = .13, R^2_{\text{Adjusted}} = .10$ . Higher openness to change scores were associated with greater eudaimonic wellbeing,  $B = .30, p = .01$ , as were conservation scores  $B = .21, p = .01$ .

When the timing of the TwIVI (before or after completing the experimental manipulation, coded as 0 and 1 respectively) was included in the regression as a moderator, the regression was again significant,  $F(12, 186) = 3.00, p = .001, R^2 = .16, R^2_{\text{Adjusted}} = .11$ . With timing included, openness to change and conservation no longer predicted eudaimonic wellbeing. However, there were interactions between timing and openness to change ( $B = .53, p = .02$ ), and timing and self-transcendence ( $B = -.45, p = .03$ ) so that being in the after group and being higher in openness to change was associated with greater eudaimonic wellbeing, while being in the after group and being higher in self-transcendence was associated with less eudaimonic wellbeing. To better

understand the effect of TwIVI timing on eudaimonic wellbeing, the previous regression was conducted separately for the before and after groups. The regression for those in the before group was non-significant, showing that eudaimonic wellbeing was not predicted by perceived behavioural gap, condition, or values when the TwIVI was completed before the manipulation,  $F(7, 93) = 2.04, p = .06, R^2 = .13, R^2_{\text{Adjusted}} = .07$ . However, the regression for those who completed the TwIVI after the manipulation and wellbeing measures was significant,  $F(7, 90) = 3.58, p = .002, R^2 = .22, R^2_{\text{Adjusted}} = .16$ . Here it was evident that greater openness to change was associated with greater eudaimonic wellbeing ( $B = .58, p < .001$ ), as was conservation ( $B = .23, p = .01$ ). The results of these regressions are presented in Table 9.

Table 9.

*Regressions with the interaction of the reference and importance conditions, perceived behavioural gap, and values predicting eudaimonic wellbeing.*

Step	Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> <sub>Adjusted</sub>	<i>F</i>	<i>p</i>
1	Condition	.04	.15	.25	.80	.01	-.002	.85	.50
	Gap	-.11	.08	-1.45	.15				
	Condition * gap	.05	.12	.40	.69				
2	Condition	.06	.15	.41	.68	.13	.10	4.05	<.001***
	Gap	-.12	.07	-1.66	.10				
	TwIVI OTC	.30	.11	2.65	.01**				
	TwIVI SE	.11	.09	1.14	.26				
	TwIVI ST	.00	.10	.002	.10				
	TwIVI Con	.21	.08	2.74	.01**				
	Condition * gap	.09	.12	.73	.46				
3	Condition	.04	.15	.28	.78	.16	.11	3.00	<.001***
	Gap	-.13	.07	-1.79	.07				
	Timing	.71	1.12	.63	.53				
	TwIVI OTC	.04	.16	.24	.81				
	TwIVI SE	.25	.13	1.95	.05				
	TwIVI ST	.25	.16	1.64	.10				
	TwIVI Con	.17	.12	1.38	.17				
	Condition * gap	.09	.12	.75	.45				
	Timing * TwIVI								
	OTC	.52	.23	2.29	.02**				
	Timing * TwIVI SE	-.31	.19	-1.64	.10				
	Timing * TwIVI ST	-.45	.20	-2.2	.03**				
	Timing * TwIVI Con	.07	.16	.42	.68				
4—TwIVI before group (N = 101)						.13	.07	2.04	.06

	Condition	.23	.25	.92	.36				
	Gap	-.13	.1	-1.31	.19				
	TwIVI OTC	.04	.18	.25	.80				
	TwIVI SE	.25	.14	1.73	.09				
	TwIVI ST	.25	.17	1.46	.15				
	TwIVI Con	.19	.14	1.41	.16				
	Condition * gap	.07	.21	.32	.75				
5—TwIVI after group (N = 98)						.22	.16	3.58	.002**
	Condition	-.12	.18	-.66	.51				
	Gap	-.11	.10	-1.08	.28				
	TwIVI OTC	.58	.15	4.00	<.001***				
	TwIVI SE	-.05	.12	-.46	.64				
	TwIVI ST	-.21	.12	-1.83	.07				
	TwIVI Con	.23	.09	2.53	.01**				
	Condition * gap	.09	.14	.66	.51				

*Note.* OTC = openness to change; SE = self-enhancement; ST = self-transcendence; CON = conservation.

The regression predicting hedonic wellbeing without the value scores was not significant,  $F(3, 195) = 1.66, p = .18, R^2 = .02, R^2_{\text{Adjusted}} = .01$ . When including the values scores, the overall regression was significant,  $F(7, 191) = 2.73, p = .01, R^2 = .09, R^2_{\text{Adjusted}} = .06$ . Higher self-transcendence scores were associated with less hedonic wellbeing,  $B = -.16, p = .03$ . However, this pattern did not remain when the timing of the TwIVI was included as a moderating factor, and the overall regression was not significant anymore:  $F(12, 186) = 1.65, p = .08, R^2 = .10, R^2_{\text{Adjusted}} = .04$ . In line with this overall pattern, the separate regressions for each timing condition were both non-significant—  $F(7, 93) = 1.70, p = .12, R^2 = .1, R^2_{\text{Adjusted}} = .05$  for the before TwIVI condition and  $F(7, 90) = 1.28, p = .27, R^2 = .09, R^2_{\text{Adjusted}} = .02$  for those in the after TwIVI condition. The results of these regressions are shown in Table 10.

Table 10.

*Regressions with the interaction of the reference and importance conditions, perceived behavioural gap, and values predicting hedonic wellbeing.*

Step	Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> <sub>Adjusted</sub>	<i>F</i>	<i>p</i>
1						.02	.01	1.66	.18
	Condition	.03	.11	.26	.80				
	Gap	-.07	.05	-1.24	.21				
	Condition * gap	-.15	.09	-1.69	.09				
2						.09	.06	2.73	.01**
	Condition	.02	.11	.18	.86				
	Gap	-.08	.05	-1.5	.13				
	TwIVI OTC	.10	.08	1.23	.22				
	TwIVI SE	.13	.07	1.91	.06				
	TwIVI ST	-.16	.07	-2.13	.03**				
	TwIVI Con	.08	.06	1.31	.19				
	Condition * gap	-.13	.09	-1.48	.14				
3						.10	.04	1.65	.08
	Condition	.03	.11	.29	.78				
	Gap	-.08	.05	-1.39	.17				
	Timing	-.09	.85	-.10	.92				
	TwIVI OTC	.12	.12	1.00	.32				
	TwIVI SE	.13	.10	1.35	.18				
	TwIVI ST	-.17	.12	-1.43	.15				
	TwIVI Con	.07	.09	.79	.43				
	Condition * gap	-.14	.09	-1.51	.13				
	Timing * TwIVI OTC	-.02	.17	-.09	.93				
	Timing * TwIVI SE	.01	.14	.09	.93				
	Timing * TwIVI ST	.03	.15	.21	.84				
	Timing * TwIVI Con	.02	.12	.15	.88				
4—TwIVI before group (N = 101)						.11	.05	1.70	.12
	Condition	.14	.18	.81	.42				
	Gap	-.13	.07	-1.75	.08				

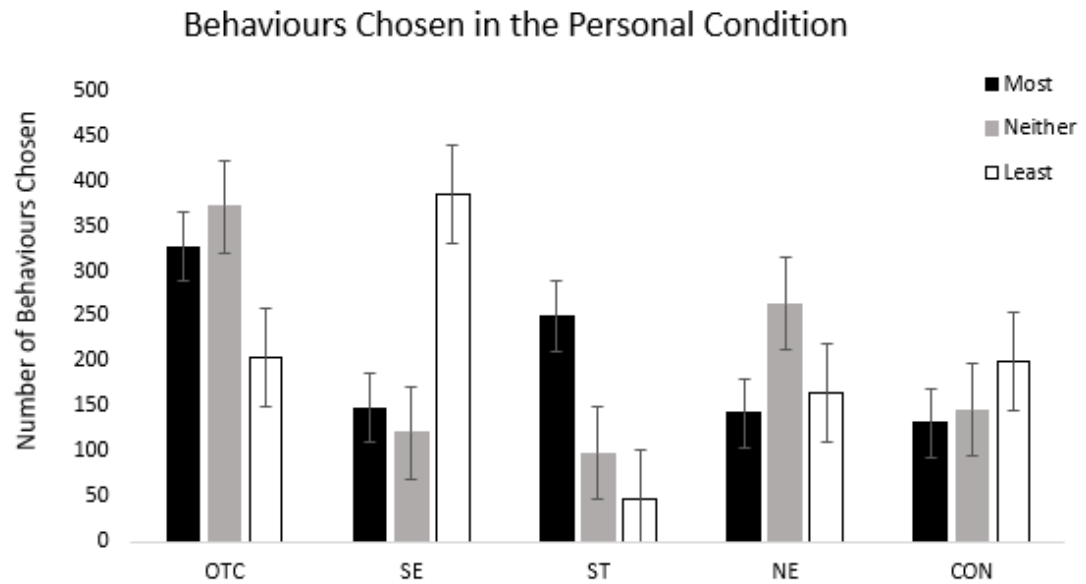
	TwIVI OTC	.11	.13	.88	.38				
	TwIVI SE	.14	.10	1.32	.19				
	TwIVI ST	-.16	.12	-1.33	.19				
	TwIVI Con	.08	.10	.86	.39				
	Condition * gap	-.19	.15	-1.3	.20				
5—TwIVI after group (N = 98)						.09	.02	1.28	.27
	Condition	-.08	.15	-.55	.58				
	Gap	.01	.08	.08	.94				
	TwIVI OTC	.12	.12	.99	.33				
	TwIVI SE	.14	.10	1.43	.16				
	TwIVI ST	-.14	.10	-1.47	.14				
	TwIVI Con	.09	.08	1.13	.26				
	Condition * gap	-.11	.12	-.9	.37				

*Note.* OTC = openness to change; SE = self-enhancement; ST = self-transcendence; CON = conservation.

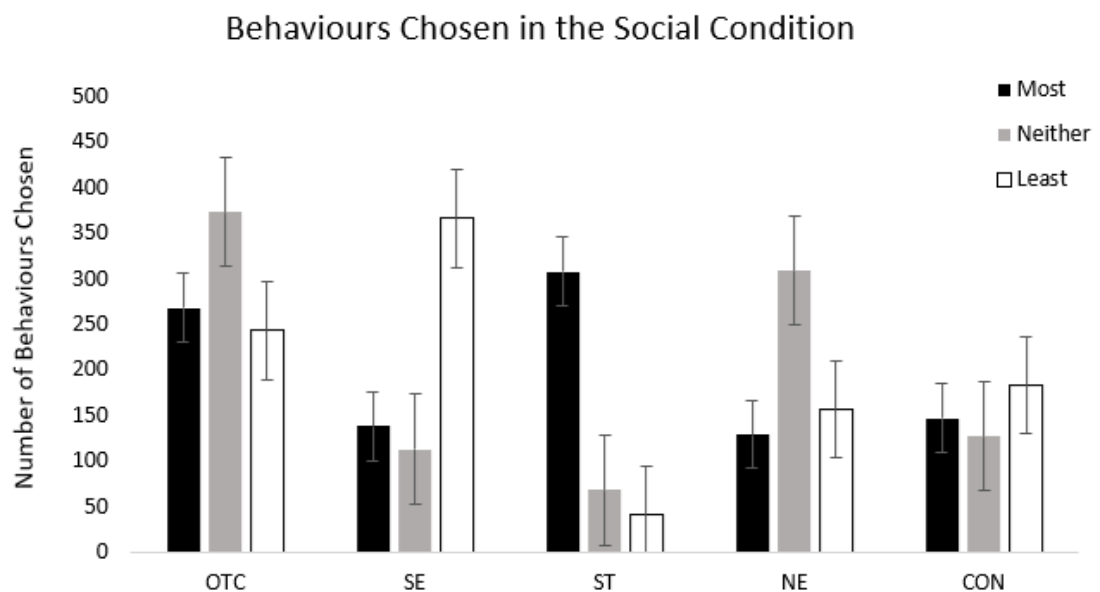
**Exploratory Analysis: Content of behaviour and their ratings**

We examined the behaviours participants sorted as most, least, and neither important nor unimportant in terms of which values they expressed (or did not, in the case of the neutral behaviours). Of the 60 behaviour items, 28% expressed openness to change, 20% were intended to be neutral, 18% expressed self-enhancement, 17% expressed self-transcendence, and 17% expressed conservation. Therefore, we would expect similar percentages for each value in each condition if behaviours were equally likely to be chosen as one another. Chi-squared tests of the actual number of chosen behaviours in each value category for each importance condition in each reference condition, and for the total sample, compared to the expected number were conducted. All chi-squared tests showed significant differences between the actual and expected number of behaviours chosen for each category. The number of chosen behaviours in each reference condition, for each level of importance, are represented in Figures 5a and 5b. The percentages of value-expressive behaviours chosen in each judgement reference condition for each level of importance are represented in Figure 6.

a)

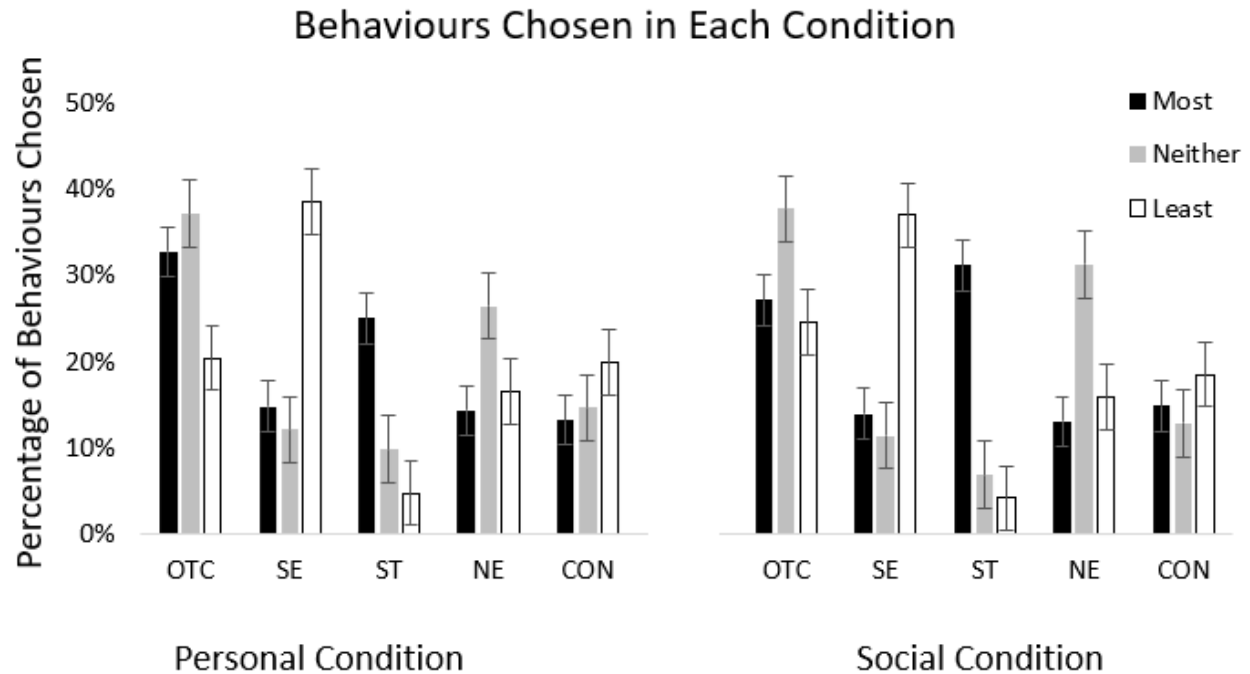


b)



*Figure 5.* Number and standard errors of value-expressive behaviours chosen for each level of importance in the a) personal reference condition and b) social reference condition.

*Note.* OTC = openness to change; SE = self enhancement; ST = self-transcendence; NE = neutral; CON = conservation.



*Figure 6.* Percentages and standard errors of value-expressive behaviours chosen for each importance level for each judgement reference condition.

*Note.* OTC = openness to change; SE = self enhancement; ST = self-transcendence; NE = neutral; CON = conservation.

For both the social and personal judgement reference conditions, self-transcendence items made up the smallest percentage of the items chosen to be neither important nor unimportant (6.87% for the social condition, 9.80% for the personal condition) and least important (4.14% for the social condition, 4.70% for the personal condition). Furthermore, openness to change made up the greatest percentage of items chosen to be neither important nor unimportant (37.68% for the social condition, 37.10% for the personal condition) and self-enhancement behaviours made up the greatest percentage of items chosen to be least important (36.97% for the social condition, 38.50% for the personal condition).

The two reference conditions differed in the items chosen to be most important. In the personal reference condition, openness to change behaviours were most likely to be chosen as

most important (32.70%), while in the social reference condition, self-transcendence values were most likely to be chosen as most important (31.11%). Additionally, in the personal reference condition, conservation items were least likely to be chosen as most important (13.20%), while neutral behaviours were the least likely to be chosen as most important in the social reference condition (13.03%).

### **Discussion**

One of the core questions this study aimed to address was whether participants' wellbeing and perceptions of discrepancies between past and ideal value-expressive behaviours would differ based on how subjectively important the behaviours in question were to participants. Our results showed that the subjective importance of behaviours did indeed affect the perceived behavioural gaps and hedonic wellbeing as expected. Considering one's past behaviours in a context that highlights failures to live up to expectations led to a greater sense that one should have done more of those behaviours and less positive affect when the behaviours were judged as more important. These results show that this experimental method is more effective at inducing perceived behavioural gaps and affecting wellbeing when the behaviours asked about are important to the participant. The importance of the behaviours was not accounted for in a previous study which asked participants about behaviours expressing one of four higher-order values with the assumption participants would find the behaviours more important than neutral behaviours (Chrystal, et al., 2019). By explicitly measuring the importance of the behaviours and comparing three importance conditions (most important, least important, and neither important nor unimportant), we were able to compare the effects of being asked about value-expressive behaviours in relation to their actual importance to participants rather than assumed importance. More broadly, these results suggest that not acting on values has the most detriment to wellbeing

when the behaviours expressing those values are deemed to be important. This highlights the benefits of clarifying the importance behaviours have to an individual while developing interventions to improve their wellbeing (e.g. behavioural activation, Lewinsohn, 1985).

Eudaimonic wellbeing was not predicted by behaviour importance, however. This could have been because the measures used for eudaimonic aspects of wellbeing did not provide a timeframe for participants' responses whereas the hedonic measure instructed participants to respond based on how they felt in the present moment. Therefore, the eudaimonic responses may have reflected more general, long-term experiences of eudaimonic wellbeing that were less susceptible to change by the brief manipulation.

What remains to be seen is whether perceived behavioural gaps and/or wellbeing are differentially affected based on whether the participants' judgement of importance was based on their own personal values or what they thought was socially desirable. The emphasis placed on an individual's personal values and eudaimonic wellbeing in ACT (Hayes et al., 2012) for example, suggests that behaving incongruently with personally important values should have a greater negative effect on eudaimonic wellbeing than behaving incongruently with the expectations of others. Conversely, previous studies have found no interaction effect of personal values and value-expressive behaviours on wellbeing (Buchanan & Bardi, 2015; Chrystal et al., 2019). Our results showed that neither perceived behavioural gaps nor any type of wellbeing was predicted by judgement reference condition. This could suggest that acting incongruently with any important behaviour has negative impacts on wellbeing regardless of the source of that importance, which would bring into question whether the emphasis on personal values in therapy models is justified. However, the exploratory analysis showed that the behaviours chosen for each importance level in the personal condition did not appear to differ greatly from those chosen

in the social condition. This is perhaps not surprising as personal values are shaped by the wider social group in addition to individual factors (Schermer, Feather, Zhu, & Martin, 2008). It is possible that the two conditions were too similar to differentially affect perceived behavioural gap or wellbeing. There may be little benefit in including personal vs social conditions to influence perceived behavioural gap or wellbeing, although an interesting avenue for future research may be to look solely at individuals whose personal values are vastly different to their social reference group's. As there was no clear difference between these groups, it may be worth acting on socially—not just personally—important values to improve wellbeing (e.g. through improved social relationships, Sorthaix & Lönnqvist, 2015). This may be especially relevant for people in cultures that emphasise social harmony and whose relationships depend on committing to socially rather than personally important behaviours. In a therapy context, our results serve as a reminder to clinicians to consider not only the individual but also the individual's social context when clarifying values and making behavioural activation treatment plans.

In a previous study, perceived behavioural gap was shown to correspond with more negative affect and less positive wellbeing, but did not have a relationship with searching for meaning in life (Chrystal et al., 2019). To see if this pattern replicated, we tested the effect perceived behavioural gaps would have on dependent measures chosen for their relevance to hedonic or eudaimonic wellbeing and expected a greater impact of perceived behavioural gap on hedonic wellbeing. However, our results showed no relationship between perceived behavioural gap or any type of wellbeing.

In exploratory analyses, we tested whether the relationship between perceived behavioural gap and wellbeing may be better modelled by a quadratic model. This was proposed because theoretically, wellbeing should be highest when the perceived behavioural gap is close to

the midpoint of 0 (indicating one believed they had acted as they should have). Being further from 0 in either a negative or positive directions should be associated with lower wellbeing because the perceived behavioural gap is larger (-4 at the lowest, indicating a belief one should have done a lot less, and 4 at the highest, indicating a belief one should have done a lot more). Therefore, an inverted U shape with perceived behavioural gap on the x axis and wellbeing scores on the y axis would seem most appropriate for these data. A linear model would not capture this proposed relationship as -4 is the smallest possible value and is treated differently to 4 despite these values being the same distance from 0. Testing whether a curvilinear fit was more appropriate for the data was an improvement on previous studies using similar methods (Chrystal et al., 2019; Yousaf & Gobet, 2013). No such curvilinear relationship was found between perceived behavioural gap and hedonic wellbeing. While the curvilinear relationship was significant for eudaimonic wellbeing, the nature of this relationship was unexpected; scores on each extreme of the perceived behavioural gap scale (indicating that one believed they should have done a lot less or more of the behaviours) were associated with greater eudaimonic wellbeing. That is, the relationship was depicted by a U shape. It is unlikely that feeling as though one did not live up to their own or others' expectations would cause an increase in meaning in life or flourishing. Therefore, these results may instead show that people with greater eudaimonic wellbeing—including having fulfilling social relationships and a clearer sense of what makes their lives meaningful—may have a clearer idea of how they believe they should act and therefore are more likely to indicate stronger opinions on how they should have acted. Including the wellbeing measures before and after the manipulation could help determine the causal relationship between eudaimonic wellbeing and perceived behavioural gap.

The experiment was thought to work by inducing a belief that one did not live up to expectations which was then thought to influence wellbeing. In other words, the experimental condition was thought to influence wellbeing through the perceived behavioural gap. However, our mediation model testing this relationship did not reveal a significant mediation. These results suggest that the experimental method did not work as planned. However, the fact that the importance condition predicted greater perceived behavioural gap and less hedonic wellbeing suggests that something about the manipulation can and does impact participants' experiences as we predicted. This shows some potential for this method to be tested with other mediating or dependent outcomes, such as self-esteem or intentions for future behaviours. Identifying other relevant variables in future studies could highlight the importance of addressing these variables in the pursuit of wellbeing.

Some unexpected relationships between variables were discovered in the exploratory analyses. First, of the four higher-order values measured by the TwIVI, only conservation scores did not differ significantly by whether the TwIVI was completed before or after the manipulation and wellbeing measures. For self-transcendence, self-enhancement, and openness to change values, average scores were lower in the after group compared to the before group. This may be explained by a need to reduce feelings of dissonance caused by the manipulation. Social psychologists have extensively studied the experience of tension that results from behaving in ways inconsistent with one's beliefs of how one should act. Festinger (1957) proposed that people are motivated to reduce this dissonance by changing their attitudes or behaviour. Without an opportunity to change their behaviours following our experiment, participants may have reduced the extent they endorsed values as a way to minimise the behaviours' importance and therefore the dissonance associated with not acting on these behaviours as they thought they

should have. Interestingly, Yousaf & Gobet's (2013) religious hypocrisy experiments, whose method we adapted to the study of values, found that participants in a condition designed to induce dissonance indicated stronger religious beliefs following the manipulation than did people in a control condition. In other words, participants appeared to use self-affirmation to reduce their feelings of dissonance (see McGrath [2017] for a brief overview of self-affirmation). Why our participants appear to have used the value measure as a way to downplay the importance of the values (and therefore possibly their inadequacy in expressing them) rather than to endorse them to a greater extent following the experiment in order to reaffirm their beliefs and identity is unclear, but both methods are thought to reduce dissonance (McGrath, 2017). Alternating the sequence of the values and hedonic wellbeing measures between participants would make it possible to test whether hedonic wellbeing (including negative feelings associated with dissonance) is greater for people who first complete the values measure and show evidence that endorsing values to a lesser extent following the experiment serves to reduce dissonance.

Other exploratory results showed that when analysing the effect of perceived behavioural gap, experimental condition, values, and TwIVI timing on eudaimonic wellbeing simultaneously, openness to change and conservation predicted significantly greater eudaimonic wellbeing in the TwIVI "after" group but not the "before" group. Therefore, in our experiment, openness to change and conservation were not associated with eudaimonic wellbeing until after the manipulation when they were positively associated with eudaimonic wellbeing. The reasons for this pattern are unclear. Meanwhile, self-transcendence predicted less hedonic wellbeing regardless of TwIVI timing in a similar analysis. It has been proposed that self-transcendence may contribute negatively to wellbeing through worry and concern about the needs of others (Schwartz & Sortheix, 2018), which may explain why being high in self-transcendence was

associated with poorer hedonic wellbeing in this exploratory test. Further experiments are needed to see if these patterns replicate and indicate robust effects of values on different types of wellbeing in the context of this experimental method.

There are some limitations to the study that may be addressed in future studies. First, it is possible that our expected effect size was overestimated and that the effects we hypothesised—if they do indeed exist—are smaller and therefore require a larger sample size to become significant. Using a smaller effect size to estimate the required sample size may be more appropriate for future studies testing the effects proposed in this study. Second, the direction of the relationship between perceived behavioural gap, eudaimonic wellbeing, and values measured after the manipulation may be different to what we expected they would be and this could be accounted for in future analyses. Third, our sample of psychology students, mostly in their late teens and mostly female, limits the generalisability of some of our findings. People who choose to study psychology may have a different value profile to people who study other topics (e.g. Sagiv & Schwartz, 2000) or the general population. Furthermore, evidence suggests that value priorities differ with age and gender (Gouveia, Vione, Milfont, & Fischer, 2015). Having a representative sample would improve the ability to generalise our findings to a wider population. Last, this method looks only at one instance of perceived discrepancy between past and ideal behaviours. The external validity of the manipulation's effects on eudaimonic wellbeing may be limited as, in real life, people may experience consistent failures to behave how they would like to which may affect their sense of meaning in life and flourishing in a way that this method is unsuited to reproduce.

This study highlights the similarities between acting on personal values and social desirability for wellbeing outcomes, challenging the position of some therapy models that

prioritise acting on personal values for wellbeing. We have also developed the method for the study of values, behaviours, and wellbeing by showing that the best way to induce a belief that one should have done more or less of behaviours is to ensure that those behaviours are important to the individual or their social group. Further, the study suggests that this method is most appropriate for the study of feelings in the moment after inducing a perceived behavioural gap rather than eudaimonic wellbeing which may be less susceptible to change from a brief manipulation. Our results raise questions about the mechanisms through which not acting on values may work to influence wellbeing, as it may not be through the perceived behavioural gap as predicted. Instead, perhaps reflecting on one's failures to live up to expectations of past value-expressive behaviours affects other variables (e.g., self-esteem; intentions for future behaviours) that then affect wellbeing. Identifying these variables could help explain how this method works to affect wellbeing and what variables we can focus on changing in order to improve wellbeing.

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## Appendix A

### List of Behaviours Participants Rated the Importance of in the First Phase of the Survey

1. Help out a friend or colleague at work or school
2. Fulfil my obligations to those who depend on me (e.g. do my share of cleaning in my shared flat, look after a younger family member)
3. Attend university lectures and tutorials
4. Watch TV or TV programmes online (except the news)
5. Mention to other people how valuable some of my possessions are \
6. Talk with a family member on the phone or internet
7. Plan my activities for the next day
8. Talk with a partner or friend on the phone or internet
9. Read about topics (science, arts, philosophy, etc.) that are not related to my school or profession
10. Choose not to buy something because it might harm the environment
11. Develop my own opinion on a topic in the news by studying what is written about it
12. Choose to watch educational TV programmes (science, history, technology, arts, etc.)
13. Read a book
14. Show respect to my classmates (e.g., by listening attentively during tutorials, holding the door open for others going into a lecture)
15. Indulge myself by buying things that I don't really need
16. Do something that provides sensual pleasure (e.g., bubble bath, massage)
17. Work hard to get something or achieve a goal (e.g., exercise to get fitter; work for money)
18. Have a drink with friends
19. Insist that others do what I want
20. Shop online
21. Eat in a restaurant
22. Act independently without waiting to hear what other people are doing
23. Look for exciting activities to break up my routine
24. Take a rich person I heard about as an example of what I want to be
25. Do something my way even if someone might disapprove

26. Do puzzles or crosswords
27. Try something completely new
28. Do my best to understand the views of a person with whom I disagree strongly
29. Pressure others to go along with my preferences and opinions
30. Not rest until I achieve my goals (e.g. not go to sleep until I have studied as much as I had planned to)
31. Worry about my reputation
32. Try to understand the worldview of people whose beliefs about religion differ to mine
33. Prepare for dates
34. Visit an art exhibition
35. Support a cause that helps the weaker members of society
36. Buy luxury brands of clothing so that other people would notice
37. Participate in contests (e.g. raffles, radio competitions)
38. Manipulate others to get what I wanted
39. Participate in active games like pool or bowling (not board games, card games, or video games)
40. Get good grades on an exam, test, or assignment
41. Go to the beach
42. Participate in an activity aimed at preserving the environment (forests, parks, beaches, public gardens, roads, etc.)
43. Study or work late into the night before an exam or project due date even though I am already well prepared
44. Go hiking
45. Meet a family member in a public space
46. Buy presents
47. Change a habit to have less impact on the environment
48. Go sightseeing
49. Learn a new skill
50. Provide food for homeless people in the community
51. Collect food, clothing, or other things for needy families
52. Check the expiration date on products before buying or using them.

- 53. Wait for the green light before crossing the street, even when no cars are coming
- 54. Keep my opinion to myself rather than disagree openly with others
- 55. Avoid arguments so that others won't be angry with me
- 56. Practice my cultural traditions (e.g., eat or avoid particular foods)
- 57. Play down my achievements or talent
- 58. Attend regular daily or weekly religious/spiritual services
- 59. Visit family I don't live with
- 60. Feel embarrassed when others praise me

## Appendix B

### Tables Depicting Results of Pilot Study

Table B1

*Average frequency, standard deviations, minimum, maximum, and number of responses in the pilot study when asked “Approximately how many times did you do the following behaviours in the last week?”*

Behaviour item	<i>M</i>	<i>SD</i>	Min.	Max.	<i>N</i>
Helped out a friend or colleague at work or school	4	2.11	2	10	17
Fulfilled my obligations to those who depend on me (e.g. did my share of cleaning in my shared flat, looked after a younger family member)	6	2.54	2	10	17
Attended university lectures and tutorials	3	3.35	0	12	15
Watched TV or TV programmes online (except the news)	4	3.23	0	10	17
Mentioned to others how valuable some of my possessions are	0	.70	0	2	17
Talked with a family member on the phone or internet	4	2.32	0	7	17
Planned my activities for the next day	5	2.21	0	10	17
Talked with a partner or friend on the phone or internet	8	6.17	2	25	17
Read about topics (science, arts, philosophy, etc.) that are not related to my school or profession	4	2.05	1	7	17
Avoided buying items that might harm the environment <sup>a</sup>	4	4.91	0	20	16
Developed my own opinion on a topic in the news by studying what was written about it	1	1.29	0	5	17
Chose to watch educational TV programmes (science, history, technology, arts, etc.)	2	1.68	0	5	17
Read a book	2	2.25	0	7	17
Showed respect to my classmates (e.g., by listening attentively during tutorials, holding the door open for others going into a lecture)	4	2.72	0	10	16
Indulged myself by buying things that I didn't really need	2	2.09	0	7	17
Did something that provided sensual pleasure (e.g., bubble bath, massage)	1	1.87	0	7	17
Slept in late even if I hadn't gone to bed late the night before <sup>b</sup>	1	1.84	0	7	17
Avoided arguments so that others wouldn't be angry with me.	1	1.00	0	2	5
Waited for the green light before crossing the street, even when no cars were coming.	4	4.06	0	10	5

*Note.* <sup>a</sup> This item was subsequently changed to “Chose not to buy something because it might harm the environment” to make it easier for participants to think of single occasions this took place.

<sup>b</sup> This item was removed from the final survey as one cannot exceed the maximum frequency (7) of sleeping in late in a week.

Table B2

*Average frequency, standard deviations, minimum, maximum, and number of responses in the pilot study when asked “Approximately how many times did you do the following behaviours in the last month?”*

Behaviour item	<i>M</i>	<i>SD</i>	Min.	Max.	<i>N</i>
Worked hard to get something or achieve a goal (e.g., exercised to get fitter; worked for money)	12	10.29	0	30	15
Had a drink with friends	6	8.80	0	28	15
Insisted that others do what I want	2	1.66	0	5	15
Shopped online	2	2.38	0	8	15
Ate in a restaurant	4	2.85	0	12	15
Acted independently without waiting to hear what other people were doing	8	7.60	0	30	14
Looked for exciting activities to break up my routine	4	7.53	0	30	14
Took a rich person I heard about as an example of what I want to be	0	1.03	0	4	15
Did something my way even if someone might disapprove	3	2.71	0	10	14
Did puzzles or crosswords	4	7.94	0	30	15
Tried something completely new	3	7.47	0	30	15
Did my best to understand the views of a person with whom I disagreed strongly	3	2.42	1	10	15
Pressured others to go along with my preferences and opinions	1	1.41	0	4	15
Didn't rest until I achieved my goals (e.g. did not go to sleep until I had studied as much as I had planned to)	2	3.07	0	10	15
Worried about my reputation	3	5.08	0	20	15
Tried to understand the worldview of people whose beliefs about religion differ to mine	5	7.61	0	30	14
Prepared for a date	1	1.81	0	5	15
Kept my opinion to myself rather than disagree openly with others.	3	2.16	0	5	4
Played down my achievements or talent.	4	5.20	1	10	3
Felt embarrassed when others praised me.	4	4.35	0	10	4
Checked the expiration date on products before buying or using them	1	1.15	0	2	4
Practiced my cultural traditions (e.g., eat or avoid particular foods).	3	5.00	0	10	4
Attended regular daily or weekly religious/spiritual services.	1	1.41	0	3	4

Table B3

*Average frequency, standard deviations, minimum, maximum, and number of responses in the pilot study when asked “Approximately how many times did you do the following behaviours in the last three months?”*

Behaviour item	<i>M</i>	<i>SD</i>	Min.	Max.	<i>N</i>
Visited an art exhibition	1	1.64	0	6	15
Supported a cause that helps the weaker members of society	9	22.78	0	90	15
Bought luxury brands of clothing so that other people would notice	0	.80	0	3	15
Participated in contests (e.g. raffles, radio competitions)	1	1.31	0	4	15
Manipulated others to get what I wanted	1	1.40	0	5	15
Participated in active games like pool or bowling (not board games, card games, or video games)	2	1.73	0	5	15
Got good grades on an exam, test, or assignment	1	.78	0	2	13
Went to the beach	4	5.25	0	20	15
Participated in an activity aimed at preserving the environment (forests, parks, beaches, public gardens, roads, etc.)	2	1.77	0	5	15
Studied or worked late into the night before an exam or project due date even though I was already well prepared	2	2.78	0	10	14
Went hiking	3	5.26	0	20	15
Met a family member in a public space	4	3.72	0	10	15
Bought presents	3	2.69	0	10	15
Changed a habit to have less impact on the environment	2	2.48	0	10	15
Went sightseeing	2	2.85	0	8	15
Learned a new skill	1	1.10	0	4	15
Provided food for homeless people in the community	0	.90	0	3	15
Collected food, clothing, or other things for needy families	0	.59	0	2	15
Visited family I don't live with	1	.96	0	2	4

### Questions and Scales for Second Phase of Experimental Survey

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

[illegible][illegible][illegible][illegible]

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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[illegible][illegible][illegible]

How often did you study or work late into the night before an exam or project due date even though you were already well prepared in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you go to the beach in the last three months?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you manipulate others to get what you wanted in the last three months?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you keep your opinion to yourself rather than disagree openly with others in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you support a cause that helps the weaker members of society in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you wait for the green light before crossing the street, even when no cars are coming in the last week?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you not rest until you achieved your goals (e.g. did not go to sleep until you had studied as much as you had planned to) in the last month?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you check the expiration date on products before buying or using them in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you worry about your reputation in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you collect food, clothing, or other things for needy families in the last three months?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you provide food for homeless people in the community in the last three months?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you change a habit to have less impact on the environment in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you buy presents in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you meet a family member in a public place in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you go sightseeing in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you learn a new skill in the last three months?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you try to understand the worldview of people whose beliefs about religion differ to yours in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you prepare for a date in the last month?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you visit an art exhibition in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you attend university lectures and tutorials in the last week?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you buy luxury brands of clothing so that other people would notice in the last three months?

0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11-12 times	13-14 times	15+ times
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How often did you participate in contests (e.g. raffles, radio competitions) in the last three months?

[illegible]

How often did you shop online in the last month?

[illegible]

How often did you participate in active games like pool or bowling (not board games, card games, or video games) in the last three months?

[illegible]

How often did you get good grades on an exam, test, or assignment in the last three months?

[illegible]

How often did you participate in an activity aimed at preserving the environment (forests, parks, beaches, public gardens, roads, etc.) in the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you pressure others to go along with your preferences and opinions in the last month?

[illegible]

How often did you read a book in the last week?

[illegible]

How often did you do something that provided sensual pleasure (e.g., bubble bath, massage) in the last week?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you work hard to get something or achieve a goal (e.g., exercise to get fitter; work for money) in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you insist that others do what you want in the last month?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you feel embarrassed when others praised you in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you visit family you don't live within the last three months?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you attend regular daily or weekly religious/spiritual services in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you help out a friend or colleague at work or school in the last week?

0-3 times	4-7 times	8-11 times	12-15 times	16-18 times	19-20 times	21-22 times	23-24 times	25+ times
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How often did you play down your achievements or talents in the last month?

0-10 times	11-20 times	21-30 times	31-40 times	41-44 times	45-49 times	50-54 times	55-59 times	60+ times
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How often did you practice your cultural traditions (e.g., eat or avoid particular foods) in the last month?

[illegible]

How often did you avoid arguments so that others wouldn't be angry with you in the last week?

[illegible]