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Thesis

The six ways to well-being (6W-WeB): A new measure of valued action that targets the frequency and motivation for six behavioural patterns that promote well-being

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**The Six Ways to Well-Being (6W-WeB): A New Measure of Valued Action That Targets
the Frequency and Motivation for Six Behavioural Patterns That Promote Well-Being**

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STATEMENT OF AUTHORSHIP AND SOURCES

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgment in the main text of the thesis.

All research procedures reported in the thesis received the approval of the relevant Ethics/Safety Committees (where required).

Geetanjali Basarkod

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ABSTRACT

Evidence suggests that the presence of positive emotions and the absence of negative emotions is beneficial. However, recent research shows that direct cognitive attempts to change how we feel can be counterproductive in the long run. Contextual Behavioural Science (CBS) based interventions, such as Acceptance and Commitment Therapy (ACT), limit direct attempts to change emotional states, and focus instead, on activating value-consistent behaviours. However, most measures used by CBS researchers and practitioners still focus on emotional states and reductions in symptomology, which may misfocus the client. Therefore, this thesis seeks to develop a practical, reliable, and valid measure of valued activity that can be used to guide intervention. The Six Ways to Well-Being (6W-WeB) measures the following six behaviours that are theorised to promote well-being: *connecting with others, challenging oneself, giving to others, engaging in physical activity, embracing the moment, and caring for oneself*. In addition, the 6W-WeB assesses the frequency of, and autonomous versus controlled motivation for, each behaviour. Study 1 focuses on the initial validation of the 6W-WeB in a sample of American adults ($N_1 = 1800$, 60.3% female, Age: $M = 40.9$, $SD = 13.21$). Study 2 replicates the factor structure in an independent, Australian adult sample ($N_2 = 855$, 47.3% female, Age: $M = 38.16$, $SD = 13.35$), and extends the research by assessing the barriers and enablers of valued action. Study 3 further replicates the validity of the questionnaire in two adolescent samples ($N_3 = 518$, 100% female, Age: $M = 14.29$, $SD = 1.46$ and $N_4 = 185$, 51.38% female, Age: $M = 19.56$, $SD = 0.72$) and tests the associations of 6W-WeB with personality traits and variables theoretically linked to each of the six behaviour domains. Study 4 combines the previously mentioned samples to maximise statistical power and test the factor structure of the 6W-WeB as well as its measurement invariance across countries, age groups, genders, and levels of psychological distress. Results indicate that the factor structure of the 6W-WeB is best represented by a

bifactor confirmatory factor analysis (bifactor CFA) model, which consists of three global factors, namely *behaviour engagement*, *activity importance*, and *activity pressure*, as well as the six behavioural domain factors. This model showed good fit to the data and the items showed adequate internal consistency in all samples. Further, the findings suggest that the subscales of the 6W-WeB are linked in expected ways to theoretically-relevant measures, and that the 6W-WeB can differentiate between individuals who meet criteria for high psychological distress and those who do not. Finally, participants' qualitative responses provided information about the specific ways through which they engage in the six behaviour domains, and the kinds of barriers that get in the way of valued action. Overall, the results indicate that the 6W-WeB may offer treatment utility for CBS practitioners, as the 6W-WeB is consistent with the core message of CBS – engaging in valued action may enrich and benefit one's life. The new questionnaire, developed and validated in this thesis, can help orient clients towards activating value-consistent behaviour and allow clinicians to gain a deeper understanding of what their clients care about and love doing.

INTRODUCTION

Well-being, which can be defined as the combination of feeling good and functioning effectively (Huppert, 2009), is an important aspect of human life. Among other things, individuals who experience higher levels of well-being are more creative, productive, confident, optimistic, and generous (Ashby, Isen, & Turken, 1999; Forgas, 2002; Fredrickson & Joiner, 2002; Oswald, Proto, & Sgroi, 2015; Sedikides, 1995). However, research over the last few decades has shown that direct attempts to increase positive emotions or to reduce negative emotions, may be counterproductive in the long run (Ciarrochi, Atkins, Hayes, Sahdra, & Parker, 2016; Ford & Mauss, 2014). In this paradoxical effect, attempts to use cognitive strategies to increase happiness can result in lower levels of positive emotions (Schooler, Ariely, & Loewenstein, 2003). Similarly, trying to avoid internal thoughts and experiences, in fact, increases the frequency of the very thoughts we try to keep away from (Koster, Rassin, Crombez, & Näring, 2003; Wegner, Schneider, Carter, & White, 1987). Therefore, *direct* cognitive attempts to change our thoughts and emotions may not be effective in improving well-being.

On the flipside, interventions that aim to *indirectly* increase well-being have shown promise. Acceptance and Commitment Therapy (ACT), for instance, aims to increase an individual's levels of valued-action (engaging in behaviours because they are in line with one's values). Instead of seeking to directly change how one feels, ACT assumes that all feelings are a normal part of the human condition and focuses on increasing engagement in valued activity, even in the face of difficult thoughts and emotions. Engaging in valued activity, in turn, positively impacts well-being (S. C. Hayes, Strosahl, & Wilson, 2011).

The key goals of this thesis are to operationalise and measure valued actions. To fulfil these goals, the research presented in this thesis builds on the extensive review conducted by the New Economic Foundation (NEF). This review showed that five behaviours are thought

to be conducive for well-being: connect, keep learning, be active, give, and take notice (Aked, Marks, Cordon, & Thompson, 2008). These five actions have guided interventions as well as policy changes (Aked, 2011). Recent literature shows that in addition to these five actions, self-care activities, such as sleeping enough and eating healthy food, can also promote well-being and inform behavioural interventions (Ciarrochi, Bailey, & Harris, 2015).

Despite their focus on behavioural change, behaviour-based interventions sometimes still use measures that focus on the reduction of symptomology. When it comes to measures of valued activity, current questionnaires either do not fully capture the specific behaviours through which individuals engage in valued action (the ‘what’ of valued action), or they do not assess the reasons underlying such valued action (the ‘why’ of valued action). Thus, there is currently no valued action measure that assesses both these factors, i.e., the ‘what’ and ‘why’ of valued activity.

The current research aims to fill this gap in the literature, by developing a new measure of valued action, ‘The Six Ways to Well-Being’ (6W-WeB). The 6W-WeB assesses the specific ways in which individuals engage in the following six behaviour domains: *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. It further assesses the extent to which individuals are satisfied with their frequency of behaviour engagement, as well as the extent of their autonomous and controlled motivations for engaging in each behaviour. In short, the 6W-WeB is designed to comprehensively assesses the ‘what’ and ‘why’ of valued action.

In this thesis, I first lay out the current research on well-being, valued action, the behaviours that promote well-being, and the importance of the form of motivation for engaging in these behaviours. Then, through a series of studies, I validate the factor structure of the 6W-WeB and examine its links with theoretically-relevant variables. In Chapter 1 of this thesis, I describe two traditions within the study of well-being, i.e., the hedonic and

eudaimonic traditions. While the hedonic tradition views well-being as simply maximising the proportion of positive to negative feelings (Diener, Suh, Lucas, & Smith, 1999), the proponents of the eudaimonic tradition claim that, in addition to feeling good, well-being also involves maximising one's potential and living in a manner that is true to one's values (Waterman, 1993). I then outline the importance of well-being in terms of its mental and physical health benefits. Lastly, I describe the determinants of well-being and examine the feasibility of these factors as drivers of change.

In Chapter 2, I discuss the problems with direct attempts to change positive and negative internal experiences and the impact such attempts have on well-being and mental health. I introduce Contextual Behavioural Science (CBS) and its focus on increasing valued action to improve well-being. Finally, I review the current measures of valued action, both within and outside the CBS literature.

In Chapter 3, I describe six behaviours that have been shown to promote well-being, namely: *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. The first five of these behaviours overlap with the New Economic Foundation's 'five ways to well-being.' The sixth behaviour of self-care was included after a thorough review of the literature on behaviours associated with greater mental health and well-being.

Chapter 4 highlights individuals' motivation to engage in the six behaviours discussed above. Research shows that simply engaging in these actions in themselves do not guarantee improvements in well-being levels. Self-Determination Theory (SDT) suggests that engaging in autonomously motivated actions promotes well-being, while controlled motivated actions may negatively affect well-being. I detail the SDT perspective on well-being and discuss the research on autonomous and controlled motivation for engaging in each of the six behaviours outlined in Chapter 3.

In Chapter 5, I introduce the Six Ways to Well-Being (6W-WeB), a new measure that is based on the theoretical perspectives and empirical findings discussed in the previous chapters. I describe the methodologies and analytic strategies used to validate the 6W-WeB in subsequent chapters. Chapter 5 also contains the specific research questions of the thesis and a summary of the studies that aim to answer these questions.

Chapters 6, 7, 8, and 9 comprise the empirical studies of the thesis. Chapter 6 presents Study 1, which evaluates the validity of the 6W-WeB questionnaire using a representative American sample. The validation tests include the initial assessment of the factor structure, similarity of measurement across ages and genders, associations with theoretically-relevant variables of flourishing, mental health, experiential avoidance and nonattachment, and the variance explained by the 6W-WeB in these variables. It also examines the differences between participants who meet criteria for high psychological distress and those who do not, in terms of their mean scores on the 6W-WeB. Lastly, Chapter 6 qualitatively explores the typical ways in which participants engage in each of the six behaviour domains through a series of word clouds.

Chapter 7 presents Study 2, a replication and extension of Study 1. The first section of this study seeks to replicate the factor structure, similarity of measurement across gender and age groups, and construct validity of the 6W-WeB in an independent, representative Australian sample. It extends on these analyses by exploring the barriers and enablers to valued action through word clouds that highlight the top barriers experienced by participants for each of the six ways. Further, this study examines the extent to which the six behaviour domains jointly promote valued action.

Chapter 8 describes Study 3, which provides further evidence for the validation of the 6W-WeB in two adolescent samples. Study 3A examines the factor structure, reliability, and criterion validity of the questionnaire in an all-girls adolescent sample. Study 3B further

validates the 6W-WeB in terms of its reliability and extends on the previous studies by examining the associations of the 6W-WeB subscales with personality variables. Personality traits are known to predict well-being (DeNeve & Cooper, 1998; Schmutte & Ryff, 1997), thus sometimes considered benchmarks for evaluating a new measure. Study 3B also examines the links of the 6W-WeB with constructs that are linked to each of the six behaviour domains. For instance, the *engaging in physical activity* domain is tested in relation to a measure of leisure-time exercise. In addition, both studies qualitatively explore the typical ways in which adolescents engage in the six behaviour domains.

Chapter 9 combines the samples from the previous studies to conduct analyses that require larger sample sizes, namely, tests of factor structure and measurement invariance across subgroups of participants from different countries, age groups, genders, and levels of psychological distress. Finally, Chapter 10 synthesises the findings of the empirical studies of this thesis and discusses the implications of the results. The clinical utility of the 6W-WeB is highlighted and future directions for research are considered.

CHAPTER 1

WELL-BEING: WHAT IT IS, HOW IT IS ACHIEVED, AND WHY IT IS IMPORTANT

Over 2,000 years ago, philosophers debated over the meaning and determinants of ‘well-being’. In the 4th century BC, Aristippus held the view that a good life was one with an abundance of pleasure and a lack of suffering, indicating that well-being could be achieved by experiencing maximum pleasure (Lampe, 2014). Aristippus’ ‘hedonic’ well-being equated to happiness (Kahneman, Diener, & Schwarz, 1999). Conversely, Aristotle suggested that hedonism was a vulgar idea, and that a good life is much more than merely experiencing pleasure and happiness (Aristotle, trans. 2002). He postulated that true happiness, or ‘eudaimonia’, is achieved by living a virtuous life and by the actualisation of human potential (Waterman, 1993).

With the emergence of the positive psychology movement in the 1990s, well-being once again became a burgeoning area of interest (M. Seligman & Csikszentmihalyi, 2000). It was now clear that well-being was more than simply the absence of mental ill-health, and that the drivers for well-being were not the same as the drivers for ill-being (for review, see: Huppert, 2009). However, views on the meaning of well-being were still divided into two traditions – hedonism and eudaimonism. As our understanding of well-being influences how we think about parenting, teaching, therapy, research, and government policies for instance, it is important that we have a holistic understanding of well-being by taking into account both hedonic and eudaimonic approaches (Ryan & Deci, 2001).

Current Views of Hedonic and Eudaimonic Well-Being

While the field of new hedonic psychology focuses primarily on the subjective evaluations of our lives (Diener et al., 1999), perspectives within this hedonic tradition vary

greatly. Some views include only the simple pleasures of the body and mind (e.g., happiness and joy) as the core components of well-being, while others include goals and valued outcomes (Diener et al., 1999; Kubovy, 1999; Ryan & Deci, 2001). For instance, Waterman, Schwartz, and Conti (2008) hold the view that hedonic happiness is gained from the accumulation of material objects. A popular view of hedonic well-being, called subjective well-being (SWB), is based on the dichotomy between pleasure and pain. Put simply, hedonic well-being can be said to comprise life satisfaction, the presence of positive mood, and the absence of negative mood (Diener & Lucas, 1999).

Recent eudaimonic perspectives, which align with 20th century intellectual traditions such as humanistic psychology (Robbins, 2008), propose that well-being is not simply happiness or life satisfaction, but rather something that is rooted in human nature and derived from values (Fromm, 1981; Ryan & Deci, 2001). Well-being, according to the eudaimonic philosophical tradition, occurs when individuals live in accordance with their true selves, and their lives are congruent with their values (Waterman, 1993). Eudaimonic perspectives further suggest that even though an individual may achieve a valued outcome, well-being is not guaranteed (Ryan & Deci, 2001). Some outcomes, even though they may provide us with pleasure, may not promote wellness. For instance, while eating sugary foods may be pleasurable, it is not good for our health in the long run. Further, the mere experiencing of happiness does not imply that an individual is psychologically well. Waterman et al. (2008) suggest that someone experiencing eudaimonia will also experience hedonic well-being, but not all hedonic happiness is derived from eudaimonic living. In short, hedonic happiness is neither necessary nor sufficient for experiencing eudaimonia, but eudaimonic well-being may be a sufficient but not necessary condition for hedonic happiness. As opposed to the hedonic tradition where well-being is thought of as an end state, the eudaimonic perspective looks at

well-being as a process of fulfilling one's potentials and being true to oneself (Deci & Ryan, 2006).

A popular framework based on eudaimonia is Ryff's (1989) theory of human flourishing, labelled 'psychological well-being' (PWB). The concept of PWB arose as a reaction to the prevailing hedonistic view in psychological research and was based not only on Aristotle's work but also on the work of humanistic psychologists such as Jung (1933), Maslow (1968), and (Allport, 1961). According to Ryff's model, PWB embodies the actualisation of human potential through six key aspects: autonomy, personal growth, self-acceptance, life-purpose, mastery, and positive relatedness (Ryan & Deci, 2001). The categorisation of well-being into these six domains suggests that Ryff (1989) viewed well-being as psychological functioning rather than attainment of happiness.

A common, but recent view, is that well-being consists of both hedonic and eudaimonic well-being, or subjective and psychological well-being. When examining the different indicators of well-being, research shows that two distinct but related latent factors of well-being emerge: one reflecting hedonic well-being, and the other eudaimonic well-being (Compton, Smith, Cornish, & Qualls, 1996; L. A. King & Napa, 1998; McGregor & Little, 1998). This suggests that the two are empirically related, although conceptually distinct, as argued above. Further, there is substantial statistical covariance between measures of hedonic and eudaimonic well-being (Bauer, McAdams, & Pals, 2008; Waterman et al., 2008). Well-being can, therefore, be seen as a multidimensional concept that amalgamates both hedonic and eudaimonic perspectives and can be defined as the combination of feeling good and functioning effectively (Huppert, 2009). According to Huppert (2009, p. 137), "feeling good" implies positive emotions, as well as other emotions as interest and engagement, while "functioning effectively" involves having a sense of meaning and purpose in one's life and developing one's potential.

The Importance of Well-Being

Well-being and happiness are thought to be important aspects of one's life. A study that surveyed college students in 41 different countries found that, on a 7-scale item that asked individuals to rate the importance of happiness as a goal in life, the average rating was 6.39 (Diener, Sapyta, & Suh, 1998). Diener and Oishi (2006) conducted a cross-cultural survey across 48 countries and found that the average importance rating for happiness was 8.03 on a 9-point scale. In these studies, subjective well-being was found to be more important than having good health, material wealth and a high income, and being physically attractive, successful and intelligent (Diener, 2003; Diener & Oishi, 2006).

The importance of well-being for individuals is not surprising considering its positive implications. According to Fredrickson's (2001) broaden and build theory, experiencing positive emotions or high levels of SWB motivates people to do more, explore one's environment, and approach new goals (Lyubomirsky, King, & Diener, 2005). Further, positive emotions enable individuals to be more helpful to others (Krueger, Hicks, & McGue, 2001), have a broader focus of attention, generate more ideas (Fredrickson & Branigan, 2005), think flexibly and creatively (Ashby et al., 1999; Fredrickson & Joiner, 2002), and be more productive (Oswald et al., 2015). Individuals experiencing high levels of well-being are also more likely to evaluate themselves and others more positively, show greater levels of social engagement, and are more confident, optimistic and generous in the way they interact with others (Forgas, 2002; Sedikides, 1995). Additionally, psychological well-being is associated with better cognitive functioning (Huppert, 2009), successful ageing (Easterlin & Schaeffer, 1999), and fewer reports of treatment for previous or current psychiatric illness (Hamdan-Mansour & Marmash, 2007).

Well-being is also important for physical health. Longitudinal and experimental studies have shown how SWB benefits health and survival. For instance, in a study that

involved ageing nuns who had all written autobiographies in their 20s, the number of positive statements in these diaries were analysed and categorised by the number of positive emotions they included. Results showed that the nuns who were in the lower half of the distribution died on average 9 years sooner than those nuns who were in the top category (Danner, Snowdon, & Friesen, 2001). This study suggests that the presence of positive emotions in their 20s may have positively impacted the longevity of the nuns' lives. Other longitudinal studies have shown that the prevalence of good mood predicts fewer sick days off work five years later (Koivumaa-Honkanen et al., 2004), less likelihood of stroke six years later, and lower risk of cardio-vascular disease ten years later (Lyubomirsky et al., 2005). PWB has been shown to positively impact immunological functioning, neuroendocrine regulation, and reduce cardiovascular risks (Ryff, Singer, & Love, 2004). Further, individuals who live according to their true self and strive for meaning, experience greater PWB, especially in terms of purpose in life and personal growth (Bauer et al., 2008).

Owing to the mental and physical health benefits of well-being, it is important to understand the variables that determine well-being. The factors that have been shown to impact well-being are discussed below.

Drivers of Well-Being

Early research into factors affecting well-being largely considered demographic variables such as age, gender, ethnicity, socio-economic status, marital status, and employment (e.g., W. R. Wilson, 1967). Diener and Biswas-Diener (1999) suggest that avoiding poverty, living in a wealthy country, and focusing on goals other than material wealth are linked with attaining subjective well-being. Wealth has a stronger correlation with happiness in poorer countries than in rich ones (Diener, Diener, & Diener, 1995), suggesting that there may be a positive effect of money on well-being to a certain level, after which the effect is no longer seen (Kahneman & Deaton, 2010). Recent research also shows that

external conditions are often only weakly correlated with well-being. Further, when all demographic variables are taken together, less than 20% of the variance in happiness is accounted for (Campbell, Converse, & Rodgers, 1976). These findings, in combination with the fact that demographic variables are often pre-determined and uncontrollable, suggest that such variables may not be easily modified to impact well-being. Therefore, while a measure assessing demographic status may provide useful information about individuals' levels of well-being, and may inform societal-level policies, it may be of limited value in guiding behavioural interventions for individuals.

Recently, there has been a drive to understand the psychological factors that can lead to well-being, including personality, persistence, and goal striving. Research using both self- and non-self-report questionnaires show that personality traits tend to have much stronger correlations with well-being than do demographic variables (Diener & Lucas, 1999). Evidence shows that people who are more conscientious, extroverted, and agreeable, and less neurotic, are more likely to experience higher levels of positive mental health and flourishing (DeNeve & Cooper, 1998). Further, agreeableness and extraversion are associated with positive relationships (Schmutte & Ryff, 1997), while openness to experience is linked to greater levels of psychological well-being (Keyes, Shmotkin, & Ryff, 2002). Research also shows that the personality factors of extraversion and neuroticism tend to have a stronger and more consistent link with well-being than the factors of openness to experience, conscientiousness, and agreeableness (Diener & Lucas, 1999; Ruini et al., 2003; Vittersø & Nilsen, 2002).

It is important to bear in mind, however, that these associations may be explained, in part, by the way in which these personality traits are defined. On one hand, extraversion and neuroticism consist, within their definition, of experiences of positive and negative mood respectively. This may explain their strong links with well-being. On the other hand,

openness to experience, conscientiousness, and agreeableness have environmental orientations (e.g., interactions with other people are needed to determine whether one is agreeable or not), and may, therefore, have weaker links with subjective well-being (Diener & Lucas, 1999; Seidlitz, 1993).

These factors pose a problem for interventions: to improve positive affect, we would, for instance, need to improve extraversion, but this personality trait already involves the presence of positive affect. Therefore, the starting point of interventions to change personality may be unclear. Further, it is unclear how one would ‘improve’ personality, or if it would be ethically appropriate to do so. The assumption underlying attempts to change personality traits is that some personalities are better than others. For instance, should all introverts be made more extroverted, even if spending time alone may help them feel revitalised? Should those who score highly on neuroticism try to feel less anxious and worried, even if what causes them to be anxious may be a source of value and meaning to them? In fact, research shows that some degree of worrying may predict longevity (Friedman & Martin, 2011). While well-validated measures of personality traits exist, intervening on personality traits to improve well-being may not be practical or ethical.

Research also shows that individuals with relatively stable characteristics may have higher levels of well-being compared to individuals with traits that vary from one day to the next (Roberts & Donahue, 1994). One study demonstrated how individuals who showed greater variability in their self-ratings of a trait (e.g., self-esteem) across different life roles also showed lower levels of well-being, compared to individuals with a stable self-rating of the same trait across roles (Paradise & Kernis, 2002). It is possible that the greatest deviations from traits occur when people do not act in accordance with their true selves, usually when they do not feel authentic in a certain role (Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). For instance, an extroverted individual may be relatively quiet in a new workplace because they

may not yet feel comfortable in that setting. Similar to the issues discussed in the previous paragraph regarding intervening on personality variables, it may not be feasible (or ethical) to increase the stability of individual characteristics in an intervention. Therefore, measures of the day-to-day fluctuations in individual traits, while helpful in profiling the stability of traits, may not be useful in guiding interventions for improving well-being.

Well-being is said to be driven, in part, by genes (DeNeve, 1999). For instance, one study showed that identical twins that are brought up apart have more comparable levels of well-being as compared to those of dizygotic twins reared apart (Tellegen et al., 1988). As identical twins share more DNA than dizygotic twins (about 99% as opposed to 50%) and sets of twins in this study were not subjected to the same environmental conditions, this finding implies that the similarities in well-being levels of identical twins may be, in part, due to genetic factors. Another study showed that there are variations in our genetic makeup that either confer vulnerability to, or protect from, depression (Kendler, Kuhn, Vittum, Prescott, & Riley, 2005). Specifically, this variation occurs in the serotonin transporter (5-HTT) gene – the short allele makes individuals vulnerable to depression, whereas the long allele makes individuals resilient to depression. While there is some evidence to suggest that well-being is partly caused by genetic factors, genes may be difficult to target using behaviour-based interventions. Genetic factors influencing well-being may be measured using twin studies, but due to the difficulty and time involved in changing genes and genetic expression, such measures may not be useful in guiding behavioural interventions.

Environmental influences in our early years have also been shown to affect well-being. For instance, studies find that both maternal and paternal warmth at an early age predict well-being later on in life (Huppert, Abbott, Ploubidis, Richards, & Kuh, 2010; Jorm, Dear, Rodgers, & Christensen, 2003). A large survey of women in their mid-to-late adult years, found that their current levels of PWB were associated with their experiences of

parental warmth and respect during their childhood years (Huppert et al., 2010). This study further showed that the influence of the father's parenting on PWB was greater than that of the mother's. In contrast, a study by Jorm et al. (2003) found that even when the father showed a high level of affection, mental health outcomes later in life were poor if the mother did not show affection. Other research suggests that having a father who is absent, abusive, or authoritarian, is linked with increased mental health risks in adolescence and early adulthood (Amato & Sobolewski, 2001), while having a father who is warm, for instance, is beneficial for a child's well-being level, even after controlling for the effect of the mother's involvement (Flouri & Buchanan, 2003). This suggests that parenting interventions can improve the well-being of children, which have indeed been shown to be effective (Eshel, Daelmans, Mello, & Martines, 2006; Sanders, 2002). However, parenting interventions can only be effective when introduced while the individual in question (i.e., the child) is still under the parent's care. Thus, a questionnaire designed to assess early childhood environmental influences may provide valuable information about an individual's childhood and learning history, but may only be useful in guiding behavioural interventions in limited settings.

Research shows that life events such as gaining or losing employment, and marriage or divorce, can affect well-being (Kalmijn, 2009; Wood & Burchell, 2012). However, these changes in well-being seem to be short-term. For instance, Suh, Diener, and Fujita (1996) found that positive and negative life events affected happiness levels only if these events occurred in the last two months. Bonanno, Wortman, and Nesse (2004) found that even after a major life event, such as death of a loved one, emotions eventually rebounded. In other words, the individual tends to adapt to life events, quite like one adapts to sensory stimuli, suggesting that well-being, or at least subjective well-being, is relatively stable. However, recent research shows that an individual's level of happiness, while relatively stable, can

change to some extent over the course of their life. For example, Fujita and Diener (2005), using longitudinal data over a period of 17 years from a German sample, showed that 24% of respondents changed in their level of happiness from the first five years to the last five years in this study, and 9% of the respondents changed by two standard deviations or more. When put together, these results suggest a possibility of life events impacting well-being in the long run. However, life events, especially early environmental influences or serious illness or death of loved-ones, are often out of individuals' control and can happen unexpectedly, thus are not amenable to interventions.

In conclusion, while there are several variables that may impact an individual's level of well-being, the factors reviewed in this chapter may not be amenable to change through behavioural intervention. The next chapter introduces an alternate approach to improving well-being.

Chapter Summary

There have been two long-standing perspectives about what it means to have a good life and experience well-being. The hedonic perspective holds that the aim of one's life should be to experience happiness and maximise pleasure. More recently, those who prescribe to the hedonic view of well-being, suggest that subjective well-being is the presence of positive emotions, absence of negative emotions, and the experience of high levels of life satisfaction. In contrast, proponents of the eudaimonic perspective suggest that a good life, or having psychological well-being, is more than merely experiencing happiness and involves living life according to one's true value and maximising one's potential. An amalgamation of the hedonic and eudaimonic perspectives results in a multidimensional view of well-being, as the combination of feeling good and functioning effectively.

There are numerous benefits of experiencing subjective and psychological well-being, including engaging in new behaviours, solving problems more efficiently, having greater

social engagement, better immune functioning and better physical health. The research reviewed in this chapter suggests a myriad of factors determine well-being, such as demographic factors, psychological factors, individual differences in personality, stability of traits, genetic influences, early childhood experiences and major life events. Interventionists, however, may have little control over many of these factors. The next chapter focuses on research on behavioural determinants of well-being, which may be more amenable to interventions.

CHAPTER 2

VALUED ACTION AND INTERVENTIONS THAT FOCUS ON ACTIVATING BEHAVIOUR

Chapter 1 consisted of a literature review on well-being. It showed that improving people's well-being would benefit them in numerous ways, such as by increasing their levels of creativity, productivity, and optimism. The determinants of well-being (e.g., personality traits and life events) were discussed, and the conclusion that most of these determinants may not be practical points of change for a behavioural interventionist was drawn. The current chapter discusses the issues with direct attempts to change individuals' well-being and explores why targeting behaviour change may be a feasible approach to improving well-being. This chapter also reviews the current measures used in behavioural interventions.

Problems with Pursuing Positive and Avoiding Negative Mental States

As discussed in Chapter 1, both subjective and psychological well-being are beneficial to individuals. Recent research suggests, however, that direct attempts to pursue positive mental states and avoid negative ones may do more harm than good (Ciarrochi et al., 2016; Ford & Mauss, 2014; Gruber, Mauss, & Tamir, 2011; Schooler et al., 2003). Clinging to positive mood states, for instance, is associated with greater levels of depression, anxiety, loneliness, and suicide rumination (Lamis & Dvorak, 2014; Mauss et al., 2012; Mauss, Tamir, Anderson, & Savino, 2011; Sahdra, Shaver, & Brown, 2010). Conversely, direct attempts to reduce or avoid negative states may have a rebound effect, amplifying the original negative thought or emotion (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Mauss et al., 2012; Schooler et al., 2003).

With regard to positive mood states, experimental studies show that attempts to directly increase happiness may lead to lower levels of happiness (Mauss et al., 2012; Schooler et al., 2003). Schooler et al. (2003) found that when participants were directed to

make themselves feel as happy as possible while listening to mood ambiguous music, they reported feeling less happy as compared to participants who were not given any instructions. Another experimental study showed that, compared to controls, participants who were primed to value happiness showed fewer positive reactions to a happy film clip (Mauss et al., 2011). Further, participants in the experimental condition showed more disappointment at their emotional state than participants in the control condition. A possible explanation for this contradiction is that the goals people work towards often set a benchmark against which they evaluate their achievements (Carver & Scheier, 2012). Therefore, if an individual thinks they should feel happy, they may be disappointed when they do not feel the way they expected to (Gruber et al., 2011).

Experimental studies have also shown how avoiding negative thoughts and emotions may increase the frequency of those internal states and interfere with our functioning (Koster et al., 2003; Wegner et al., 1987). For instance, Wegner et al. (1987) first exposed participants to a 'thought suppression' phase wherein they were told not to think of a white bear. When subsequently told to think about the white bear, these participants reported more frequent thoughts about the white bear compared to participants who were told to think about it from the outset. These results may be explained by the large amount of mental energy individuals use to suppress or distract themselves from negative internal experiences such as self-doubt, distress, or panic. Such attempts to avoid internal experiences have been labelled as experiential avoidance (EA; S. C. Hayes et al., 2011). The more an individual engages in experiential avoidance, the more likely they are to experience panic disorders, depression, anxiety, and eating disorders (Ciarrochi et al., 2016; S. C. Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Kashdan, Barrios, Forsyth, & Steger, 2006). Further, EA has also been linked with lower levels of health and well-being (Sahdra, Ciarrochi, Parker, & Scrucca, 2016).

The above findings suggest that direct attempts to change how we feel may indeed have counterproductive effects on our levels of well-being. However, experiences of negative emotions and mental distress are common. For instance, in 2007, about 45% of Australians reported having suffered from some form of psychological illness at some point in their lives (Australian Bureau of Statistics, 2009). Approximately 25% of Americans meet criteria for psychological disorders at least once in their lives (Kessler, Chiu, Demler, & Walters, 2005), and a lot more people struggle with difficult life events or have trouble functioning well in their daily lives (Levin, Twohig, & Smith, 2015). If direct attempts to improve individuals' levels of well-being are counterproductive, and the factors discussed in Chapter 1 cannot be easily targeted by behavioural interventions, what drivers of change should interventions target?

An Intervention That Focuses on Behaviour to Improve Valued Action

An intervention within positive psychology, called Acceptance and Commitment Therapy (ACT), views suffering as a normal aspect of the human condition. ACT moves the focus of intervention away from changing how people think and feel, to changing how they engage in behaviours that are important to them. ACT, therefore, limits *direct* attempts to increase positive mental states and reduce negative ones, and focuses instead on behaviours aimed to *indirectly* improve well-being. The main aim of ACT is to improve an individual's psychological flexibility by encouraging engagement with meaningful behaviours even when it may be difficult for the individual to do so (S. C. Hayes et al., 2011). Psychological flexibility is targeted through 6 core processes: acceptance, defusion, attention to the present moment, self-as-context, values, and committed action. The first four processes can be said to help individuals recognise and come into contact with what they find most important in their lives (values). These processes also enable individuals to choose to engage in activities that are in accordance with their values, from moment-to-moment (committed action).

Acceptance is an active process of attention and willingness, where one engages with emotions and thoughts to observe the contents of their mind. Defusion is the process of taking a step back from one's internal experiences, in order to notice these thoughts for what they are (i.e., thoughts), and not what they say they are (i.e., the content of these thoughts). The two processes of acceptance and defusion enable individuals to be open and accepting of their private experiences and relate to these internal experiences in a flexible manner. This flexible relating, in turn, helps individuals assess what they find important in life, and focus on engaging in actions consistent with their values (K. G. Wilson & Murrell, 2004).

Present moment awareness implies being psychologically present in the current moment and learning to break through the automatic processes of attentional inflexibility. Self-as-context is the process of observing oneself from a perspective of 'I/here/now'. Together, these two processes help individuals consciously centre their attention to the here-and-now. Being grounded in this present-moment awareness is necessary to be open to experiences and consciously choose valued actions from day-to-day (Trompetter et al., 2013).

In order to increase valued action, ACT, therefore, helps clients relate flexibly with their internal experiences, enables them to spend more time in contact with the present, and encourages them to lead a more meaningful and value-filled life, even when it is difficult to do so (Hayes, Strosahl, & Wilson, 2011). Focusing on creating behaviour change in service of values can positively and practically impact mental health and well-being. ACT has been found to successfully treat a variety of mental health conditions such as anxiety (Eifert & Forsyth, 2005), depression (Zettle, 2007), psychosis (Gaudio & Herbert, 2006), smoking (Gifford et al., 2004), drug addiction (S. C. Hayes et al., 2004), and trichotillomania (Woods, Wetterneck, & Flessner, 2006).

However, behaviour-based interventions may sometimes assess their effectiveness by using measures of internal states (e.g., Bach & Hayes, 2002; Zettle, Rains, & Hayes, 2011).

Such a miss-match between the core message of behaviour-changing interventions like ACT (i.e., engaging in valued action can enrich individuals' lives) and the measures used (i.e., the aim of intervention is to reduce symptomology) can misfocus the client. Measures that assess internal experiences can subtract from the importance of valued action. Therefore, behavioural interventions would benefit from the use of measures that assess valued action. The current measures of valued action are reviewed below.

Measures of Valued Action

To have a holistic understanding of an individual's valued action, both the 'what' and the 'why' are important components to measure. The 'what' refers to the specific behaviours in which individuals engage, such as social relationships and volunteer work. The 'why' refers to the reason for which individuals engage in those behaviours, i.e., whether those behaviours are important to them. The following measures are discussed in terms of their comprehensiveness in measuring both the 'what' and the 'why' of valued action.

Behavioural Activation Measures

Measures such as the Behavioural Activation for Depression Scale (BADSD), are primarily used with individuals with depressive symptoms to help them engage more in valued actions (Kanter, Mulick, Busch, Berlin, & Martell, 2012). The BADSD includes 25 items assessing individuals' levels of activation (e.g., "I am content with the amount and types of things I did"), avoidance (e.g., "I tried not to think about certain things"), work impairment (e.g., "There were certain things I needed to do that I didn't do"), and social impairment (e.g., "I did things to cut myself off from other people"). These items are rated on a scale of 0 (*not at all*) to 6 (*completely*). While questionnaires such as the BADSD provide information about individuals' behavioural patterns and their approach to valued living, they do not measure the specific ways in which individuals engage in valued action (the 'what'

question), nor do they capture the reasons for engaging in these activities (the ‘why’ question).

Personal Values Questionnaire-II

The Personal Values Questionnaire-II (PVQ-II) assesses the extent to which individuals value 9 domains (family, friends, couples’ relationships, work, education, leisure, spirituality, community, and health) (Blackledge & Ciarrochi, 2006; Ciarrochi, Blackledge, & Heaven, 2006). The questionnaire includes an idiographic component where respondents describe what their values are within each domain, and a quantitative component where they rate each domain on nine items. These quantitative items assess importance (“How important is this value to you?”), commitment (“How committed are you to living this value?”), desire to improve (“Right now, would you like to improve your progress on this value?”), value success (“In the last 10 weeks, I have been this successful in living this value”), and reasons for valuing (one question each on external/social, introjected, identified, vital, and fun reasons). All quantitative items are scored on a 5-point Likert scale with varying labels. This questionnaire has been validated in non-clinical as well as clinical samples and has good psychometric properties (Ciarrochi et al., 2006; Ciarrochi, Fisher, & Lane, 2011). The PVQ-II is useful for practitioners to gain an initial understanding of the client’s values and the reasons for these values, rather than being a thorough values assessment. While the PVQ-II assesses values (i.e., the ‘why’ of valued action), it does not assess the specific ways in which individuals act in accordance with these values (i.e., the ‘what’). For example, a person may list “honesty” as their social value, but the measure does not require the participant to specify concrete examples of how they put honesty into play in their everyday lives.

Survey of Guiding Principles

The Survey of Guiding Principles (SGP) provides individuals with 60 different life principles (i.e., values and abstract goals) that are broadly divided into clusters of

universalism (e.g., promoting justice and caring for the weak), relationships (e.g., having genuine and close friends), achievement (e.g., being ambitious and hardworking), sensation seeking (e.g., having an exciting life), physical activity and health (e.g., eating healthy food), spirituality and tradition (e.g., being at one with god), social restraint (e.g., showing respect to parents and elders), security (e.g., maintaining the safety and security of my loved ones), power (e.g., having influence over people), hedonism (e.g., being sexually active), creative self-direction (e.g., being curious, discovering new things), experiential control (e.g., feeling good about myself), career-related principles (e.g., working with my hands), and principles in popularity and courage (e.g., acting with courage) (Ciarrochi & Bailey, 2008). Each of these principles are assessed on four dimensions of values that are targeted by behavioural interventions: value importance (how personally important a principle is to the individual), pressure (the extent to which the individual feels pressured to hold a principle), activity (how many principles they try and put into play), and success (how successful they are at living their principles). Each rating scale is scored on a 9-point Likert scale, resulting in four global scores. The SGP can also be used for a variety of different frames, such as work and relationships. The SGP was originally validated in a university population, with the aim of helping practitioners promote value clarification as well as commitment to valued action for a broad range of actions (Ciarrochi & Bailey, 2008). It has also been converted into a card-sorting task where individuals can sort the life principles into piles according to importance, and then rate the top 15 principles on the activity and success dimensions. The SGP is useful in promoting values clarification and commitment to values, clearly assessing the importance of different values (i.e., answering the ‘why’ question). However, like the PVQ-II, the SGP does not assess the specific behaviours through which individuals put their values into play (i.e., the ‘what’ question).

Valued Living Questionnaire

The Valued Living Questionnaire (VLQ) is a 2-part questionnaire that assesses value importance and value-concordant living in ten life domains: family, marriage, parenting, friendship, work, education, recreation, spirituality, citizenship, and physical self-care (K. G. Wilson & Groom, 2002; K. G. Wilson, Sandoz, Kitchens, & Roberts, 2010). First, the VLQ assesses the importance of each domain, scored on a 10-point Likert scale ranging from 1 (*not at all important*) to 10 (*extremely important*). Second, it assesses the extent to which individuals act in accordance with their values for each of the 10 domains, using another 10-point Likert scale ranging from 1 (*not at all consistent*) to 10 (*extremely consistent*). The valued living composite score is the product of the importance and consistency score for each value domain, averaged across domains. The VLQ has been validated in a non-clinical sample and has shown good internal-consistency, temporal consistency both within and across domains, as well as test-retest reliability (Wilson et al., 2010). While the VLQ assesses the importance placed by individuals on each domain (i.e., the ‘why’ question), and the extent to which they live in accordance with their values, it does not assess the specific behaviours through which individuals put their values into play (i.e., the ‘what’ question). Additionally, some of these domains may not be relevant for everyone (e.g., marriage or parenting), making comparisons of the composite score difficult between individuals.

Valuing Questionnaire

The Valuing Questionnaire (VQ) is a 10-item measure that assesses the extent to which individuals make progress towards (progress subscale), or are obstructed from (obstruction subscale), their values in the past week (Smout, Davies, Burns, & Christie, 2014). Example items include: “I made progress in the areas of my life I care most about” (progress) and “Difficult thoughts, feelings or memories got in the way of what I really wanted to do” (obstruction). Each item is rated on a scale from 0 (*not at all true*) to 6 (*completely true*). The VQ has been validated in clinical as well as non-clinical samples and

has shown good internal consistency, test-retest reliability, convergent validity, and incremental validity (Smout et al., 2014). This questionnaire is beneficial in assessing the extent to which one's life is value-concordant. However, it does not assess the specific behaviours through which an individual's life is value-concordant (the 'what' question), nor does it assess what the individual's values are or how important these values are to them (the 'why' question).

Bull's Eye Values Scale-II

The Bull's Eye Values Scale-II (BEVS-II) measures the extent to which individuals value different life domains, whether they live in accordance with their values, and the barriers that get in the way of individuals leading their ideal lives (Lundgren, Luoma, Dahl, Strosahl, & Melin, 2012). The respondent is presented with two dart-board like scales comprised of 7 concentric rings each. The first dart board assesses the extent to which the individual values the domains of work/education, leisure, relationships, and personal growth/health. The 'bull's eye' or the centre of the dart board is indicative of the greatest level of valuing, while the peripheral ring indicates the lowest level of valuing. The second dart board assesses value concordance; the centre indicates that the individual is living their life as they want to, while the outside ring indicates that their life is far from how they want it to be, in regard to each of the four domains. Then, the individual is required to identify any obstacles that stand between them and living their life as they want to. Each obstacle is rated on a 7-point Likert scale from 1 (*doesn't prevent me at all*) to 7 (*prevents me completely*). Finally, for each domain, the individual reports actions that would be indicative of a value-consistent life. The BEVS-II is brief and easily understood by a broad range of people. It has been validated in clinical and non-clinical samples, is sensitive to clinical intervention, and shows good test-retest reliability, temporal stability, and construct validity (Lundgren et al., 2012). This questionnaire helps guide intervention and monitor client progress in terms of

value importance (the ‘why’ question) and the extent to which obstacles obstruct valued living. It does not, however, assess what specifically an individual does to put their values into play (the ‘what’ question).

Engaged Living Scale

The Engaged Living Scale (ELS) is a process measure of valued action and consists of 16 items measuring two facets of valued action – valued living (10 items) and life fulfillment (6 items) (Trompetter et al., 2013). The facet of valued living measures an individual’s knowledge of their own personal values and the extent to which they engage in action based on these values. The facet of life fulfillment assesses an individual’s evaluation of their life as a consequence of knowing and living according to their values. Each item is rated on a 5-point Likert scale from 1 (*completely disagree*) to 5 (*completely agree*). Example items include “I have values that give my life meaning” (valued living) and “I am satisfied with how I live my life” (life fulfillment). The ELS has shown good internal consistency, construct validity, and incremental validity over measures of acceptance and mindfulness in predicting mental health, in both non-clinical and chronic pain samples (Trompetter et al., 2013). This questionnaire is useful to assess clients’ orientation to valued living and the extent to which it improves their lives. However, it does not measure how clients engage in valued action, i.e., the specific behaviours that promote values (the ‘what question), or the importance of these valued actions (the ‘why’ question).

Chronic Pain Values Inventory

The Chronic Pain Values Inventory (CPVI) is a 10-item scale used with individuals experiencing chronic pain (McCracken & Yang, 2006). The questionnaire assesses value success and the discrepancy between value importance and success in 6 domains: family, intimate relationships, friends, work, health, and growth or learning. Respondents are first asked to rate the importance of each of these domains on a 6-point scale ranging from 0 (*not*

at all important) to 5 (*extremely important*). They are then asked to rate the extent of their success in valued living on a scale from 0 (*not at all successful*) to 6 (*extremely successful*). The individual's success score is the average of the 6 success ratings, while the discrepancy score is the mean difference between each of the 6 importance and success ratings. The discrepancy score helps distinguish between individuals with low success in living in accordance with an important value, and those with low success in living in accordance with a less important value. According to the scale authors, the former group of individuals would suffer more than the latter group. Therefore, the importance score is merely used as a method for weighting the success scores. The CPVI shows good internal consistency and construct validity (McCracken & Yang, 2006). The success subscale has also shown good incremental validity over measures of engagement in pain willingness in predicting disability, depression, and depression-related interference (McCracken & Yang, 2006). The CPVI, therefore, is useful in assessing the extent to which individuals with chronic pain are able to live in accordance with their values. However, it does not assess the specific behaviours through which the individual engages in different value domains (the 'what' question).

It is clear from the above description of these scales that while they provide important information to practitioners, none of them measure both the specific 'what' and the 'why' of valued action. There is a need for a questionnaire that assesses both the 'what' and the 'why' of valued action. Measures used in the personal strivings literature may provide a solid foundation for the creation of such a measure of valued action.

Personal Strivings Assessment

Personal strivings are "the characteristic types of goals that individuals try to achieve through their everyday behaviour" (Emmons, 1986, p. 1058). One measure used in this research area is the Personal Strivings Assessment Packet (PSAP; Emmons, 1986). The PSAP includes an idiographic component in which respondents generate a list of 15 personal

strivings. These personal strivings are objectives that individuals typically try to accomplish or attain. Respondents are provided with examples, such as “trying to seek new and exciting experiences”, and are asked to base their examples on actual instances of their behaviour. The PSAP then has a quantitative component in which respondents rate each striving on a series of dimensions: happiness, unhappiness, value, ambivalence, past attainment, commitment, importance, effort, difficulty, causal attribution, social desirability, clarity, instrumentality, probability of success, confidence, probability if no action, and impact. Lastly, five rating scales assess the reasons (extrinsic, introjected, identified, and intrinsic motives) for each striving.

A questionnaire such as the PSAP not only allows individuals to specify exactly what their goals are (answer to the ‘what’), but it also assesses such things as reasons for each striving and level of importance (answers to the ‘why’). Further, having rating scales based on idiographic responses allows quantitative items to be tied with concrete instances of a construct (e.g., valued action) in the individuals lives, making these quantitative items less abstract. Therefore, an approach that involves both idiographic and quantitative components could form rich and informative data that are useful for both clients and practitioners. Further, a questionnaire with this structure would be useful in assessing constructs related to well-being, as the PSAP has a substantial literature backing its utility in the assessment of personal strivings in relation to well-being (Emmons & McAdams, 1991; L. A. King, Richards, & Stemmerich, 1998; Romero, Villar, Luengo, & Gómez-Fraguela, 2009). For instance, Romero et al. (2009) explored how each of the PSAP rating scales were associated with the well-being constructs of positive affect, negative affect, satisfaction with life, and purpose in life.

The PSAP does have two limitations, however. First, it does not systematically encourage people to evaluate all domains of valued activity. When asked to list personal

strivings without restrictions, people may exclusively focus on some domains, e.g., work, academics, or health. Practitioners may, therefore, benefit from a questionnaire that guides client responses in a way that prompts the client to think about all aspects of their life. Second, the measure focuses on the accomplishment or attainment of objectives and may narrow people's focus to future-oriented rather than present-moment behaviour. For example, people may not list 'socialising with a friend' as a striving, given that it does not help them obtain a future objective, but social relationships are still an important domain of one's life. Questionnaires that focus on what individuals currently do, would enable present-moment assessment.

The new questionnaire developed in this thesis builds on the personal strivings literature and addresses the two concerns laid out above. Specifically, it utilises evidence-based question prompts, based on the "five ways to well-being", to encourage people to reflect on all aspects of their life. It also assesses present-moment behaviours, rather than future-oriented activity, that may determine well-being. These behavioural domains and their links with well-being are reviewed in the next chapter.

Chapter Summary

Direct cognitive attempts to increase positive internal experiences and reduce negative ones have often been shown to do more harm than good for an individual's well-being. Evidence suggests that interventions aimed to increase an individual's engagement in valued action, rather than directly attempting to change how they feel, are useful for treating mental health disorders and improving well-being. To stay consistent with the core message of such interventions (i.e., that valued action can enrich one's life), it is important to use measures that assess values and engagement in valued action. There are several measures that currently assess valued action, but none of them assess both the specific 'what' (i.e., what exactly an individual does to live in accordance with their values) and the 'why' (i.e., why an individual

engages in certain valued behaviours) of valued action. Creating a measure that assesses both these dimensions could prove useful for the comprehensive assessment of valued-action. The behaviour domains that promote well-being (i.e., the ‘what’ of valued action) are reviewed in the next chapter.

CHAPTER 3

THE SIX WAYS TO WELL-BEING

As described in Chapter 2, the goal of behaviour-based interventions, such as ACT, is to encourage individuals to engage in meaningful behaviours across their life domains. The purpose of the questionnaire developed in this thesis, therefore, is to prompt individuals to look at their whole life, not just at particularly salient domains such as work or romantic relationships. Put differently, the aim is to induce people to think of all the ways, or behaviours, that may drive their well-being. These behaviours, or ways to well-being, may not always be discrete things that can be separated from each other, i.e., the same behaviour may involve multiple avenues to well-being. For instance, engaging in physical activity may involve challenge, social connection, and self-care. In order to construct a measure that would comprehensively assess well-being promoting behaviours, and prompt respondents to think of the valued actions across their full lives, I build on work done by the New Economics Foundation (NEF).

In 2008, the NEF, commissioned by the United Kingdom Foresight project on Mental Capital and Wellbeing, published a review of the literature that examined evidence-based behaviours that promote mental health and well-being (Aked et al., 2008). NEF aimed to create a well-being equivalent of the ‘five portions of fruits and vegetables a day’, narrowing down on the following actions: connect, keep learning, give, be active, and take notice. Their review highlighted the importance of the five behaviours in terms of their well-being benefits. In 2011, the NEF developed another report to gain a deeper understanding of how these behaviours were used to improve well-being in the UK (Thompson & Aked, 2011). They stated that, since 2008, the five actions had been utilised in 76 different applications to improve the well-being of individuals and groups/communities. For instance, The Children’s Society collaborated with the NEF to explore the frequency of engagement in the five actions

by 1,500 children aged 10-15 and found that these activities were indeed associated with subjective well-being in this sample (Abdallah, Main, Pople, & Rees, 2014).

The NEF's list of behaviours was intentionally restricted to five actions. However, research suggests that in addition to the behaviours mentioned previously, a sixth behaviour comprised of self-care activities is also important for well-being (Christensen, 2001; Ciarrochi, Bailey, et al., 2015; Haack & Mullington, 2005). This behaviour domain would include actions such as maintaining a healthy diet, getting a good night's sleep, relaxing, brushing teeth regularly, being hygienic, and taking medications when required. The research on all six behaviours and their well-being implications are reviewed below.

Six Behaviour Domains

Connecting With Others

Connecting with others, or having healthy social relationships, is the most consistent predictor of well-being for people of all ages across the world (Berkman, Glass, Brissette, & Seeman, 2000; Chu, Saucier, & Hafner, 2010; Lansford, Antonucci, Akiyama, & Takahashi, 2005; Rowe & Kahn, 1998). Having good social relationships provide us with love, intimacy, reassurance of worth, and support (Ozer & Benet-Martinez, 2006; Rowe & Kahn, 1998; Sarason, Sarason, & Pierce, 1990; Stack & Eshleman, 1998), and can increase our sense of meaning, purpose, and levels of self-control (S. Cohen, 2004; Ross, 2017; Seeman, Singer, Ryff, Love, & Levy-Storms, 2002; Uchino, 2006).

Social relationships can also have long-term consequences. Adults who have more social ties live longer than those who are less socially connected (Umberson & Karas Montez, 2010). This is true even for individuals with a medical condition such as coronary artery disease (Brummett et al., 2001). A meta-analysis of 148 longitudinal studies showed that the survival likelihood for individuals who have strong social relationships, relative to those who do not, increases by 50% (Holt-Lunstad, Smith, & Layton, 2010). Additionally, a

prospective study showed that greater involvement in social relationships was linked to positive health behaviours for a duration of ten years (Berkman & Breslow, 1983).

On the flipside, a lack of social relationships can have negative effects. A primary social network of less than three people predicts mental ill-health in the future, even after controlling for the presence of previous mental health disorders (Brugha et al., 2005). The absence of good quality relationships is associated with depression, anxiety, and loneliness (S. Cohen & Syme, 1985; Rowe & Kahn, 1998). R. Jenkins et al. (2008) stated that the biggest difference between individuals without mental illness and those who died because of psychiatric reasons was social participation. A narrative review of prospective studies stated that individuals with the least social involvement had a greater likelihood of death during the study period, compared to more socially connected individuals (House, Landis, & Umberson, 1988). This finding was true for both men and women and held even after controlling for socioeconomic status, health behaviours (such as exercise and diet), and other mortality-related variables (Berkman & Syme, 1979). Extreme social deprivation has shown to result in psychological and physical harm, and even death (Berkman & Syme, 1979; Umberson & Karas Montez, 2010). In fact, social isolation was used to torture prisoners of war and is still used in prisons around the world, with heavy psychiatric consequences for the inmates (Grassian, 1983).

Challenging Oneself/Learning

The second way to well-being identified by the NEF was “keep learning”. I expanded this to the broader category, challenging oneself, because both learning and challenging oneself, as reviewed below, are linked to well-being. Learning, which often involves challenge, improves social and cognitive development during childhood and is positively associated with self-esteem, self-efficacy, optimism, and life satisfaction in adulthood (Feinstein & Hammond, 2004). Engaging in formal education has a host of benefits. For

instance, individuals with higher qualifications have been shown to enjoy better mental and psychological health than those with less education (Montgomery & Schoon, 1997; Vega-Dienstmaier, Mazzotti, Stucchi-Portocarrero, & Campos, 1998). Further, more qualified individuals have a lower risk of developing mental illness or of suffering from enduring stress (Kubzansky, Kawachi, & Sparrow, 1999).

In terms of learning, the benefits are not only seen during school years, but also during later life stages. Engaged learning during college years is associated with better emotional health and well-being as well as reduced alcohol consumption (Astin, 1993; Sax, Bryant, & Gilmartin, 2002). Education during the adult years is associated with increased self-efficacy, cognitive skills, resilience, health, and well-being (Hammond, 2002, 2003; Schuller, Brassett-Grundy, Green, Hammond, & Preston, 2002). Further, learning in adulthood has also been found to increase positive health behaviours (e.g., exercising and giving up smoking), civic participation, and life-satisfaction (Feinstein & Hammond, 2004). Feinstein and Hammond (2004) showed that participating in three to ten learning courses between the age of 33 and 42, increased the probability of giving up smoking by 7.3%, increased engagement in exercise by 18.5%, and offset the decline in life satisfaction compared to those who did not take any course by 35%.

Lifelong learning, that is, the continued participation in learning through adulthood, has positive effects on the mental health and well-being of older adults. Such learning is associated with increased self-efficacy, social participation, life enjoyment, self-confidence, life satisfaction, coping, and well-being (Dench & Regan, 1999), as well as with fewer depressive symptoms (Kirkwood, Bond, May, McKeith, & Teh, 2008). Lifelong learning has consistently been shown to increase self-efficacy in older adults, even after controlling for family and social background, prior education, and current circumstances (Feinstein & Hammond, 2004; Hammond & Feinstein, 2006). In a qualitative study with 15 adults over the

age of 60, participants reported that courses for activities like sewing and calligraphy helped them to keep their minds active and build friendships (Narushima, 2008). Other qualitative studies show that such courses can increase individuals' levels of self-esteem and mental stimulation (Jamieson, 2007; Withnall, 2009). These findings are complemented by quantitative research that show that engaging in music, arts, and evening classes is associated with higher levels of life satisfaction and quality of life, as well as with lower levels of mental distress (A. Jenkins, 2011).

The benefits of challenging oneself, outside the formal and informal education literature, have been explored through research on flow. Flow, in simple terms, is the state of losing oneself in the act, i.e., being completely absorbed by the current activity an individual is engaging in (Csikszentmihalyi, 1990; Goldberg et al., 2006). It is often characterised, among other things, by a balance between perceived skill and challenge or task difficulty (Engeser & Rheinberg, 2008). If the challenge level of a task is too low or too high for an individual's skill level, the amount of flow experienced by the individual reduces (Csikszentmihalyi, 1990). Therefore, challenging oneself to an optimal level (i.e., a balance between challenge and skill) may bring about an experience of flow. This state of being in flow has been consistently associated with positive affect and happiness (Asakawa, 2004; Rogatko, 2009), as well as with skill development, better task performance, and greater meaning in life (Copperstone, 2004; Csikszentmihalyi, 1990; Mundell, 2001). In an experimental study, Rogatko (2009) showed that participants who engaged in a 'high flow' activity showed greater increases in positive affect as compared to those who engaged in a 'low flow' activity (these activities were determined by the participants' self-reported levels of 'being in the zone' for different activities).

Giving to Others

Giving to others, or engaging in helping behaviour, has not only been shown to benefit the receiver (Ainsworth, Blehar, Waters, & Wall, 2015; H. F. Harlow, 1958; Ornish, 1998), but also the giver (Weinstein & Ryan, 2010). Individuals engaging in giving behaviours have been shown to have higher levels of happiness (Krueger et al., 2001), well-being (Lyubomirsky et al., 2005; Silverstein, Chen, & Heller, 1996), positive affect (Cialdini & Kenrick, 1976), life satisfaction (R. E. Harlow & Cantor, 1996), mental health (Schwartz, Meisenhelder, Ma, & Reed, 2003), morale, and self-esteem (Midlarsky & Kahana, 1994). Giving is also linked to lower levels of hopelessness (M. J. Miller, Denton, & Tobacyk, 1986) and depressive symptoms (Crandall, 1975).

Empirical research shows that volunteers are less likely to be depressed (D. Brown, Gary, Greene, & Milburn, 1992; Rietschlin, 1998) and have higher levels of happiness (Ellison, 1991), life-satisfaction (Wheeler, Gorey, & Greenblatt, 1998), and self-esteem (Gecas & Burke, 1995; Newman, Vasudev, & Onawola, 1986), compared to non-volunteers. Further, people feel happier and more satisfied after philanthropic activities as compared to activities that are considered ‘fun’ (M. Seligman, 2002). One study showed that participating in community service predicted life satisfaction even after controlling for health, social support, and baseline levels of life satisfaction (R. E. Harlow & Cantor, 1996). Another study found that individuals who committed one act of kindness each week for six weeks had higher levels of well-being, compared to individuals in the control condition who did not engage in helping behaviours (Lyubomirsky, Tkach, & Sheldon, 2004). Consistent with these findings, a world-wide survey by Oishi, Diener, and Lucas (2007) showed that volunteering was positively correlated with happiness.

Giving to others may frequently involve financial sacrifice or prosocial spending (W. Liu & Aaker, 2008). Several studies have found financial generosity to lead to increased

levels of emotional and psychological well-being, even after controlling for income (Andreoni, 1989; E. W. Dunn, Aknin, & Norton, 2008; Harbaugh, 1998). Research shows this link to be causal and cross-cultural. An experimental study showed that students randomly assigned to spend money on others were happier at the end of the day, compared to individuals who were instructed to spend money on themselves (E.W. Dunn et al., 2008). Aknin et al. (2013) found that prosocial spending, such as donating to charities or buying coffee for an acquaintance, promoted happiness and life satisfaction in individuals across different cultures (Canada, Uganda, South Africa, and India). These increases in happiness levels remained even when the giver did not know who the receivers were (implying that increased social interaction did not account for this finding) and nobody knew about the giver's generosity (indicating that the finding could not be explained by positive judgements by others).

Giving to others can also be exhibited through providing social support to others or being compassionate and altruistic. Not only is providing social support associated with increased psychological well-being and reduced depression, but it is also linked with experiencing fewer health problems, longer-term survival among individuals with AIDS, lower blood pressure, reduced cortisol levels, higher oxytocin levels, and lower risk of mortality in older adults and chronically ill patients (Aknin et al., 2013; S. Brown, Konrath, Seng, & Smith, 2011; W. M. Brown, Consedine, & Magai, 2005; Field, Hernandez-Reif, Quintino, Schanberg, & Kuhn, 1998; Ironson et al., 2002; McClellan, Stanwyck, & Anson, 1993; Smith, Loving, Crockett, & Campbell, 2009). Being compassionate, even in stressful jobs, has been associated with greater job satisfaction and lower burnout due to stress (Burtson & Stichler, 2010; Dyrbye et al., 2010), while having an altruistic personality as an adolescent has shown to predict better mental health outcomes during adulthood (Wink & Dillon, 2002).

Engaging in Physical Activity

Being active, or engaging in physical activity, has consistently been linked to reduced mental ill-health and improved well-being (Biddle & Asare, 2011; Biddle & Ekkekakis, 2005). Physical activity reduces depression and anxiety symptoms across all age groups, and prevents new ones from emerging (Azar, Ball, Salmon, & Cleland, 2008; Biddle & Ekkekakis, 2005; A. L. Dunn, Trivedi, Kampert, Clark, & Chambliss, 2002; Kirkwood et al., 2008). It is also associated with improved mental health (D. R. Brown, 1988; Martinsen, 1994), life satisfaction, happiness (Morgan & Bath, 1998), perceived self-efficacy (Kirkwood et al., 2008), mood, and creativity (Steinberg et al., 1997). These improvements in mood are seen even after a single bout of physical activity of as little as 10 minutes (Abdallah, Steuer, Marks, & Page, 2008; Acevedo & Ekkekakis, 2006; Steinberg et al., 1997). Further, individuals tend to have higher levels of life satisfaction on days they exercise compared to days they do not exercise on (Maher et al., 2013). Engaging in exercise is also associated with a host of physical health benefits such as improved immunity (Garber et al., 2011), reduced risk of mortality (Caspersen, Christenson, & Pollard, 1986; Kujala, Kaprio, Sarna, & Koskenvuo, 1998), cardiovascular and metabolic improvements (US Dept of Health and Human Services, 1991), and weight loss (Garber et al., 2011).

In childhood and adolescence, engaging in regular physical activity is related with better cognitive development (Goswami, 2008) and improved well-being (McMahon et al., 2017), even after controlling for gender, class, and health status (Steptoe & Butler, 1996). In terms of cognitive benefits, physical activity has been associated with better cognitive performance, learning, classroom behaviour, and academic achievement (Biddle & Asare, 2011; Maeda & Murata, 2004). Research shows that, during physical activity, an increased amount of blood flows to brain areas that stimulate learning (Hillman, Castelli, & Buck, 2005). In terms of well-being, randomised controlled trials and longitudinal studies have

found that children and adolescents engaging in exercise show reduced depression and anxiety, greater resilience to developing symptoms of mental illness (Larun, Nordheim, Ekeland, Hagen, & Heian, 2006; McPhie & Rawana, 2015), and increased self-esteem (Biddle & Asare, 2011), while those engaging in sedentary behaviours are likely to exhibit anxiety disorders (Teychenne, Costigan, & Parker, 2015). Participation in sports, especially team sports, is associated with lower levels of depression, anxiety, and suicide ideation and higher levels of happiness and well-being (Babiss & Gangwisch, 2009; Jewett et al., 2014; McMahon et al., 2017; Zhou, Heim, & O'brien, 2015).

In adulthood, little to no leisure-time activity is associated with an increased chance of developing depressive symptoms (Farmer et al., 1988). Active adults report fewer anxiety symptoms compared to inactive adults (Taylor, 2003). For individuals hospitalised with diagnosed depression, a 9-week-long intervention of vigorous aerobic training was associated with significant reductions in self-reported depression (Martinsen, Medhus, & Sandvik, 1985). In addition, research suggests that adults with the severe depression show the greatest mental health benefits from such physical activity interventions (Craft & Landers, 1998). Studies further suggest that increasing physical activity in adults might be as effective for reducing symptoms of minor depression as psychotherapy interventions (Greist et al., 1979). Moderate-intensity physical activity has been found to be the best at treating mental health symptoms, as it is not too demanding and may improve adherence to protocol (Cramer, Nieman, & Lee, 1991; Glenister, 1996; Moses, Steptoe, Mathews, & Edwards, 1989).

Physical activity is also beneficial in older adulthood. In such samples, increased physical activity is used as a treatment for depression (Sjösten & Kivelä, 2006). Exercise also improves cognitive functioning (Angevaren, Aufdemkampe, Verhaar, Aleman, & Vanhees, 2008), physical functioning (Windle et al., 2008), well-being (Windle, Hughes, Linck, Russell, & Woods, 2010), happiness, and life satisfaction in such populations (McAuley et

al., 2000), while the lack of physical activity predicts increased mortality (Fried et al., 1998). An experimental study showed that older adults who were in the exercise conditions (high intensity exercise, high intensity exercise at home, or low intensity at home exercise) showed reductions in stress, depression, and anxiety as compared to an assessment control group (A. C. King, Taylor, & Haskell, 1993). This study implies that regardless of the type of physical activity people engage in, engaging in exercise is beneficial for mental health.

Embracing the Moment

Taking notice, or embracing the moment, was defined by the NEF as an increased awareness of, and engagement with, one's surroundings. The closest proxy to this construct in the psychological literature is mindfulness, which may be defined as "bringing one's complete attention to the present experience on a moment-to-moment basis" (Marlatt & Kristeller, 1999, p. 68), in a way that is accepting, non-judgemental, and allowing of all experiences (K. W. Brown & Ryan, 2003; L. Hayes & Ciarrochi, 2015). Mindfulness is associated with greater stress reactivity, physical well-being (Davidson et al., 2003), psychological well-being, life satisfaction, vitality, self-esteem, optimism, pleasant affect (K. W. Brown & Ryan, 2003), emotional and behavioural regulation, heightened self-knowledge (K. W. Brown & Ryan, 2003), and empathy (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008). Eight to twelve weeks of training to be aware of sensations and thoughts, can increase an individual's level of well-being for several years (Huppert, 2009). Higher levels of trait mindfulness has also been linked with lower levels of rumination (Raes & Williams, 2010), depression, and social anxiety (K. W. Brown & Ryan, 2003), fewer emotional regulation difficulties (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), less frequent automatic thoughts (Frewen, Evans, Maraj, Dozois, & Partridge, 2008), and lower levels of experiential avoidance (Baer, Smith, & Allen, 2004).

Experimental studies have shown that even a brief mindfulness instruction can increase subjective well-being in the short-term (Keng, Smoski, & Robins, 2011). For instance, instructions to practice mindfulness were shown to be more effective in reducing negative mood states following a negative mood induction, compared to instructions to ruminate or receiving no instructions at all. This result was found in healthy university students (Broderick, 2005), as well as in previously (Singer & Dobson, 2007) and currently depressed individuals (Huffziger & Kuehner, 2009). In an experiment with university students, participants were randomly assigned to either a focused breathing condition, an unfocused attention group, or a worry group (Arch & Craske, 2006). Before and after their respective instructions, participants viewed affect-valanced pictures and rated their emotional reactions to these pictures. The focused breathing group showed consistent positive emotions to neutral slides, while participants from the other two groups showed decreases in their levels of positive affect from slides shown before instruction to those shown after. The focused breathing participants also reported lower negative affect, as compared to the worry group when viewing negatively valanced slides post-instruction. Further, participants in the focused breathing group viewed a greater number of optional negative slides than participants in the unfocused attention group, indicating a greater willingness to endure negatively-valanced situations.

Mindfulness has been incorporated into several interventions such as Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2003) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Teasdale, Williams, & Gemar, 2002), with studies showing positive mental health and well-being effects for both these therapies. Mindfulness has shown to mediate the relationship between both MBSR and MBCT and well-being outcomes (Gu, Strauss, Bond, & Cavanagh, 2015; Kuyken et al., 2010; Shahrar, Britton, Sbarra, Figueredo, & Bootzin, 2010), indicating that mindfulness does indeed impact well-being. MBSR is an 8-

week long group-based intervention originally formulated to treat individuals with chronic pain. It involves mindfulness meditation to enable individuals to be accepting and non-judgemental of their internal and external experiences, to be less reactive to these experiences, and to be able to recognise and break free from their habitual and maladaptive thought and behaviour patterns (Keng et al., 2011). MBSR has been shown to be effective for increasing levels of mindfulness (Anderson, Lau, Segal, & Bishop, 2007), well-being (Baer, 2003; Bishop, 2002; K. W. Brown & Ryan, 2003; Keng et al., 2011), life satisfaction, quality of life (Grossman et al., 2010), positive affect (Anderson et al., 2007), empathy (Shapiro, Schwartz, & Bonner, 1998), and self-compassion (Shapiro, Astin, Bishop, & Cordova, 2005) in both clinical and community samples. It has also been shown to reduce levels of distress (Baer, 2003; Bishop, 2002), perceived stress, post-traumatic avoidance symptoms (Bränström, Kvillemo, Brandberg, & Moskowitz, 2010), depression, anxiety (Grossman, Niemann, Schmidt, & Walach, 2004), anger, rumination (Anderson et al., 2007), self-consciousness, and neuroticism (K. W. Brown & Ryan, 2003).

MBCT is another group-based intervention which runs for 8 weeks and was originally designed to prevent relapses in remitted depression (Segal et al., 2002). MBCT combines mindfulness training with cognitive therapy and aims to loosen the link between negative automatic thought patterns and their psychological effects on the individual. It enables recognition of thoughts as simply mental events rather than facts, which in turn helps individuals increase their awareness of negative internal events and change their relationship with these thoughts (Keng et al., 2011). MBCT has indeed been successful in reducing relapse rates of individuals with depression, especially for individuals who have had more than three relapses (Godfrin & Van Heeringen, 2010; Ma & Teasdale, 2004). This intervention has also been shown to improve quality of life for individuals with depression (Godfrin & van Heeringen, 2010), increase the time between depression relapses (Bondolfi et

al., 2010), and help treat bipolar disorder (J. Williams et al., 2008) and social phobia (Piet, Hougaard, Hecksher, & Rosenberg, 2010).

Caring for Oneself

Caring for oneself includes activities that are intended to directly promote one's health and well-being. Self-care behaviours, such as engaging in health-care activities like getting good quality sleep and eating in moderation, are important for both physical and mental health (Ciarrochi et al., 2015; Christensen, 2001; Haack & Mullington, 2005). Conversely, the lack of such activity is associated with lower levels of happiness and life satisfaction (Easterlin, 2003; Mehnert, Krauss, Nadler, & Boyd, 1990). Evidence suggests that self-care activities influence well-being in adolescence, adulthood, and older adulthood, as well as in both ill and healthy individuals (Dungan, Brown, & Ramsey, 1996; Hartweg, 1993; X. Liu & Zhou, 2002; Zauszniewski, 1996). For instance, in a study with 181 chronically ill individuals from age 26 to 88, Connelly (1993) showed that both general (behaviours that promote health and prevent illness) and medication self-care activities were positively correlated with well-being. Further, Dungan et al. (1996) showed that a health management intervention aimed at increasing self-care behaviours for health maintenance could improve well-being levels of elder men and women. Another study looked at the link between both self-care agency (the want to engage in self-care behaviours) and self-care behaviours (engagement in self-care activities) and well-being (Hartweg, 1993). The results indicated that both agency and behaviour were linked with well-being, but that self-care agency predicted well-being through self-care behaviours. Thus, actually engaging in such behaviours may provide individuals with well-being benefits, rather than merely wanting to do so.

In terms of diet and nutrition, eating well is associated with better mental health and well-being outcomes such as lower levels of depression and antisocial behaviour, and better

cognitive functioning and mood (Gesch, Hammond, Hampson, Eves, & Crowder, 2002; Hakkarainen et al., 2004; Letenneur, Proust-Lima, Le Gouge, Dartigues, & Barberger-Gateau, 2007; Rogers, 2001). Specifically, consumption of omega-3 fatty acids are associated with reduced symptoms of bipolar personality disorder (Stoll, Locke, Marangell, & Severus, 1999) and vitamin D supplements in winter improve mood (Lansdowne & Provost, 1998). Conversely, eating poorly, or not getting adequate amounts of certain foods, is associated with worse mental health. For instance, a higher intake of omega-6 fatty acid is associated with depression and anxiety (Hakkarainen et al., 2004), while a low amount of folic acid in one's diet seems to increase depressive symptoms (Tolmunen et al., 2003).

Sleep is positively associated with mood regulation (Dinges et al., 1997), pain modulation (Kundermann, Sernal, Huber, Krieg, & Lautenbacher, 2004), optimism (National Sleep Foundation, 2002), motivation (Totterdell, Reynolds, Parkinson, & Briner, 1994), quality of life, and well-being (Jean-Louis, Kripke, & Ancoli-Israel, 2000). However, it is the quality of sleep more than the duration that matters for well-being (Pilcher, Ginter, & Sadowsky, 1997). Poor quality sleep has been associated with anxiety and depression amongst adolescents in USA, New Zealand, Italy, China, and France (Bailly, Bailly-Lambin, Querleu, Beuscart, & Collinet, 2004; X. Liu & Zhou, 2002; Manni et al., 1997; Marks & Monroe, 1976). A longitudinal study over 34 years found that sleep disturbances, such as insomnia during school years, predicted the development of depression in adulthood (Chang, Ford, Mead, Cooper-Patrick, & Klag, 1997). Other longitudinal studies have found that the relationship between sleep disturbance and poor mental health was bidirectional, perhaps causing a vicious cycle where the presence of one perpetuated the occurrence of the other and vice versa (Kaneita, Uchiyama, Yoshiike, & Ohida, 2008; Morphy, Dunn, Lewis, Boardman, & Croft, 2007).

Chapter Summary

Research shows that there are six behaviour domains that are important for well-being: *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. In this chapter, the link between each of the six behaviours and well-being was demonstrated through a review of correlational, experimental, and longitudinal studies. The next chapter discusses the implications of the motivation for engaging in each of the six behaviour domains.

CHAPTER 4

MOTIVATION THROUGH A SELF-DETERMINATION THEORY LENS

Chapter 3 emphasised the six behaviour domains that promote well-being, namely: *connecting with others, challenging oneself, giving to others, engaging in physical activity, embracing the moment, and caring for oneself*. However, the reasons for engaging in these six behaviours also have important consequences for well-being. The current chapter will focus on these consequences.

Self-determination theory (SDT; Ryan & Deci, 2017) suggests that the ability of an action to promote well-being depends on the form of one's motivation. SDT differentiates between autonomous and controlled reasons for engaging in activities. Autonomous motivation involves engaging in activities that are personally meaningful and inherently enjoyable. This form of motivation reflects a sense of agency and volition, that is, the decision to engage in the action emanates from within the individual (Deci & Ryan, 2008; Nix, Ryan, Manly, & Deci, 1999). Autonomously motivated actions are typically consistent with the individual's values and are integrated within their sense of self (Deci & Ryan, 2008). Research shows that autonomously motivated actions are associated with greater levels of subjective vitality and improvements in mental health (Deci & Ryan, 2000, 2008). For instance, in a 14-day long diary study, Sheldon, Ryan, and Reis (1996) found that trait levels of autonomy were positively associated with subjective vitality across a two-week period. Daily changes in autonomy were also related to changes in vitality, indicating that autonomous motivation is linked to positive well-being outcomes. Such changes in vitality and well-being are said to occur because autonomously motivated actions are usually accompanied by greater interest in the activity and more frequent positive experiences (Ryan

& Connell, 1989). In terms of behaviour change, individuals are more likely to persist with actions that are autonomously motivated (Deci & Ryan, 2008).

Controlled motivation is characterised by a sense of felt pressure or coercion to engage in activity. While autonomous motivation often involves an approach or movement towards something (e.g., something pleasurable, interesting, or important), controlled motivation often involves avoidance or getting away from something (e.g., the feeling of guilt or pressure; L. Hayes & Ciarrochi, 2015). Pressure can be inflicted by oneself (e.g., from guilt, approval motivation, avoidance of shame, or contingent self-esteem) or by other individuals (e.g., contingencies of reward or punishment; Deci & Ryan, 2008). Engaging in an activity because of controlled motivation is accompanied by pressure to think, feel, or behave in certain ways, that are not self-endorsed. Research shows that engaging in controlled behaviours is often accompanied by intrapersonal conflict (Sheldon & Houser-Marko, 2001) and tend to deplete the individual's energy levels (Moller, Deci, & Ryan, 2006). Further, they do not promote mental health and may, in fact, cause the individual's mental health to deteriorate (Deci & Ryan, 2008). For instance, even though studies show personal strivings correlate positively with well-being, Sheldon and Kasser (1995) found that more controlled personal strivings were associated with lower levels of subjective vitality, implying that it is not simply the goal striving that has an impact on well-being, but the motivation behind the striving is also important. In the same vein, engaging in behaviours because of controlled reasons has been associated with neuroticism (Elliot & Sheldon, 1998; Veage, Ciarrochi, & Heaven, 2011), Machiavellianism (McHoskey, 1999), depressive symptoms (Rouse, Ntoumanis, Duda, Jolly, & Williams, 2011), and reduced subjective vitality (Edmunds, Ntoumanis, & Duda, 2007). In terms of affecting behaviour change, controlled behaviours are less likely to be persisted with, compared to autonomously motivated behaviours (Deci & Ryan, 2008; Kasser, Koestner, & Lekes, 2002).

In this thesis, I refer to behaviours as “valued” to the extent that they are engaged in for autonomous and not controlled reasons. It is important to note that autonomy and control may not be exclusively opposed to each other; behaviours can often be under multiple source of control (Ratelle, Guay, Vallerand, Larose, & Senécal, 2007). For example, people often engage in exercise because physical activity is important to them, but they may also exercise to avoid the sense of guilt associated with not exercising. The following section briefly discusses evidence for the impact of motivation type on each of the six behaviour domains introduced in Chapter 3.

Autonomous vs. Controlled Reasons for Engaging in Activity

Connecting With Others

Autonomous motivation for engaging in relationships is associated with higher levels of love, affection, and happiness (Blais, Sabourin, Boucher, & Vallerand, 1990; Patrick, Knee, Canevello, & Lonsbary, 2007; Rempel, Holmes, & Zanna, 1985; C. Seligman, Fazio, & Zanna, 1980). Autonomous engagement in romantic relationships is not only associated with greater relationship well-being, but also with greater individual well-being (Patrick et al., 2007). On the flipside, social interactions that are negative and involve control in the form of neglect, abuse, disputes, and the violation of trust, respect and reciprocity, are linked with reduced well-being (Finch, Okun, Pool, & Ruehlman, 1999; Oxman, Berkman, Kasl, Freeman, & Barrett, 1992). This may be explained by the reduced levels of autonomy felt by individuals in controlling relationships (Ryan & Deci, 2017). While such relationships may still be important to individuals, they often also involve feeling controlled by the other individual (Felson & Outlaw, 2007).

The literature on approach and avoidance motivation also underlines the impact of motivation to engage in social relationships. Approach motivation is positively linked to autonomous engagement in behaviours, while avoidance motivation undermines autonomous

motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Evidence suggests that social approach motives are linked with lower levels of loneliness, while social avoidance motives are associated with lower levels of well-being (Nikitin, Burgermeister, & Freund, 2012). For instance, Elliot, Gable, and Mapes (2006) showed that friendship approach goals positively predicted relationship satisfaction and subjective well-being, and negatively predicted loneliness. Conversely, friendship avoidance goals negatively predicted relationship satisfaction, subjective well-being, and positively predicted symptoms of physical illness.

Challenging Oneself/Learning

Autonomously engaging in challenging activities can increase enjoyment and vitality (Deci & Ryan, 1985), and lead to a state of flow, wherein the individual is completely engaged in an activity (Csikszentmihalyi, 1990). Intrinsically motivated individuals are more likely to challenge themselves (Abuhamdeh & Csikszentmihalyi, 2012), learn, extend their creative abilities (Ryan & Deci, 2000b), put in more effort, and persist with tasks (Wigfield & Eccles, 1992). Such individuals not only show higher levels of happiness and well-being (Bryce & Haworth, 2002; Csikszentmihalyi, 1990), but also better achievement-related outcomes such as greater engagement in school (Skinner, Zimmer-Gembeck, Connell, Eccles, & Wellborn, 1998), better text recall (Ryan, Connell, & Plant, 1990; Schiefele & Krapp, 1996), and better grades (Burton, Lydon, D'alessandro, & Koestner, 2006). Further, research shows that having the opportunity to participate in active learning reduces stress compared to when individuals have no choice (Whitman, Spendlove, & Clark, 1986). This may be the case as giving students a choice provides them with a sense of control over their education, thereby reducing academic stress and stress-related mental health problems (Swaner, 2007).

A study in a sample of older adults found that the link between learning and subjective well-being was strongest for informal learning, weaker for formal learning, and nonsignificant for vocational learning (A. Jenkins & Mostafa, 2015). This may, in part, be

due to the motivation for engaging in such learning. Informal learning is usually chosen because the activity is personally enjoyable, while vocational training is often undertaken as part of a job and may only be beneficial for well-being when it results in more satisfying work or in a promotion (A. Jenkins, 2011; A. Jenkins & Mostafa, 2015).

Giving to Others

A common way in which people give to others is through volunteering. While volunteering activities are engaged in mostly for autonomous reasons, evidence suggests that there may be a curvilinear link between time spent volunteering and well-being (Windsor, Anstey, & Rodgers, 2008). Moderate levels of volunteering have a positive impact on well-being, while the positive impact on mental health reduces for extremely high levels of volunteering (Windsor et al., 2008). This may be explained by the stress associated with excessive giving or giving because of controlled reasons. For instance, when giving is part of the job for doctors and nurses, it can make individuals feel emotionally taxed or 'burnt-out' (Maslach & Jackson, 1982), therefore, reducing their levels of mental health and well-being.

The literature on caregiving is rich in examples of how engaging in controlled motivated behaviours does not lead to well-being and may, in fact, increase mental ill-health. The very nature of caregiving is such that it is usually non-voluntary (e.g., when a spouse or a child falls ill) and involves considerable cost to the self (Konrath & Brown, 2013). Providing care for a sick spouse can be draining for an individual, which in turn may negatively affect their health behaviours, immunity, physical and psychiatric morbidity, and even increase their risk of mortality (Christakis & Allison, 2006; Schulz & Sherwood, 2008). In a study using ecological momentary assessment, an important distinction was drawn between caregiving for a spouse when one wanted to, as compared to when one had to do so (Poulin et al., 2010). Participants in this study experienced greater levels of positive affect when they helped their spouses more and had the choice to do so. Conversely, greater levels of care provided during

‘on call’ hours were associated with lower positive affect (Poulin et al., 2010). Another study found that the more hours of care and caregiving tasks an individual had to engage in, the more susceptible to physical and psychological problems they were (Pinquart & Sörensen, 2007). The findings from these studies suggest that giving to others, especially in the form of caring for them, is associated with positive mental health benefits when done autonomously and for a certain period, after which such activities may link with negative well-being outcomes.

Engaging in Physical Activity

Leisure-time physical activity, i.e., physical activity undertaken during one’s free time, is positively associated with subjective well-being (Cerin, Leslie, Sugiyama, & Owen, 2009; Jurakić, Pedišić, & Greblo, 2010) and negatively associated with mental health disorders such as depression (Kull, Ainsaar, Kiive, & Raudsepp, 2012; Pickett, Yardley, & Kendrick, 2012). A meta-analysis of 66 empirical studies found consistent evidence for a positive association between more autonomous types of motivation and exercise; individuals who were more autonomously motivated were more likely to engage in physical activity for longer (Teixeira, Carraça, Markland, Silva, & Ryan, 2012). Greater exercise adherence, in turn, has consistently been linked with better mental health outcomes (Biddle & Asare, 2011; Biddle & Ekkekakis, 2005). Research also shows that autonomously motivated physical activity is positively associated with physical self-worth, body-image satisfaction, quality of life, and subjective well-being, while it is negatively linked with anxiety (Briki, 2016; Gillison, Standage, & Skevington, 2006; Gillison, Standage, & Skevington, 2011; Sebire, Standage, & Vansteenkiste, 2009).

Engaging in non-autonomous physical activity, such as household tasks that are viewed as obligatory, is associated with increased depression and reduced well-being (Asztalos et al., 2009; Kim, Shin, Nam, Choi, & Kim, 2008; Kull et al., 2012; Pickett et al.,

2012) as well as with lower body image satisfaction, and physical self-worth (Edmunds, Ntoumanis, & Duda, 2006; Gillison et al., 2011; Thøgersen-Ntoumani & Ntoumanis, 2006). A study by Vieira et al. (2010) found that controlled motivation to participate in obesity treatment predicted lower levels of quality of life and self-esteem. In a sample of American adults who exercised regularly, exercising for autonomous reasons was linked with greater subjective well-being, while doing so because of controlled reasons was linked with lower levels of subjective well-being (Briki, 2016). The findings from this study imply that even long-term exercise adherence may not be beneficial for mental health outcomes when done because of controlled reasons.

Embracing the Moment

There is a dearth of research that examines the impact of motivation on embracing the moment or its closest proxy, mindfulness. However, I would speculate that mindfulness practice is often done because it is personally important to the individual. From the little research that has been conducted in this area, findings suggest that intrinsic types of motivation link positively with mindfulness and external types of motivation to link negatively with mindfulness (Donald et al., 2019). Further, the more extreme the type of motivation, the stronger the correlation with mindfulness (Ruffault, Bernier, Juge, & Fournier, 2016). Specifically, motivation types that are on the far ends of the continuum such as external regulation (negative link), and intrinsic regulation (positive link) have stronger correlations with mindfulness, while motivation types in the middle of the continuum such as introjected (negative or no link) and identified regulation (positive link) have weaker correlations with mindfulness (Ruffault et al., 2016).

Autonomy and mindfulness jointly enable individuals to choose and commit to valued action from moment to moment. Autonomously motivated individuals have shown enhanced emotional awareness and an improved ability to freely choose how they regulate behaviours

(Ryan & Deci, 2000a). Mindfulness enhances self-awareness and contact with the present moment, enabling individuals to choose behaviours that may have previously been habitual or automatic (Baer, 2009). Further, research shows that autonomy partially mediates the relationship between mindfulness and well-being as well as the link between mindfulness and psychological distress (Parto & Besharat, 2011; Ryan & Deci, 2000a).

Caring for Oneself

Autonomously motivated self-care behaviours are better maintained as they are enjoyable and ingrained into an individual's sense of self (Ryan, Lynch, Vansteenkiste, & Deci, 2010; Teixeira, Patrick, & Mata, 2011). For instance, women who are autonomously motivated to regulate their eating behaviours have a healthier diet, are better at maintaining weight, and are less affected by sociocultural pressures of an ideal body image (Pelletier & Dion, 2007; G. C. Williams, Grow, Freedman, Ryan, & Deci, 1996). Conversely, individuals who regulate their eating because of controlled reasons have a higher presence of eating pathology (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004).

Field studies have shown how autonomous motivation positively affects long-term medication and treatment adherence (G. C. Williams, Rodin, Ryan, Grolnick, & Deci, 1998). Autonomous motivation has been linked with better treatment outcomes for individuals with substance abuse issues (Zeldman, Ryan, & Fiscella, 2004), tobacco dependence (G. C. Williams et al., 2006), and low dental hygiene (Halvari & Halvari, 2006). A study examining the effectiveness of a clinical intervention for obesity in children found that intrinsic rather than extrinsic motivation to participate in intervention, predicted weight loss and weight maintenance (Vansteenkiste, Simons, Braet, Bachman, & Deci, 2005). These studies indicate that autonomy can be helpful for initiating and maintaining healthy life-style changes and other self-care activities (Palmeira et al., 2009; Ryan, Patrick, Deci, & Williams, 2008; Teixeira et al., 2011).

Chapter Summary

In this chapter, I outlined the SDT approach to motivation and drew links to the six ways to well-being. SDT posits that engaging in activity because of autonomous reasons (i.e., because the activity is personally meaningful and enjoyable), is associated with better mental health and well-being outcomes. On the flipside, engaging in action because of controlled reasons (i.e., out of a sense of pressure from external or internal sources) is linked with worse mental health outcomes. A summary of the research on the impact of autonomous and controlled motivation on engaging in each of the six behavioural domains was provided. The next chapter introduces the Six Ways to Well-Being (6W-WeB), a measure based on the evidence for the six behaviours that promote well-being and the motivation for action. It also describes the methodologies and analytic strategies used to validate the 6W-WeB in this thesis.

CHAPTER 5

OVERVIEW OF STUDIES AND METHODOLOGIES

Chapters 1 to 4 provided an overview of the literature on well-being, valued action, the current measures of valued action, the behaviours that promote well-being, and the importance of the form of motivation. These chapters have shown that (i) the pursuit of positive internal experiences or the avoidance of negative internal experiences can disadvantage an individual's mental health and well-being in the long-run; (ii) in order to improve the human condition, interventions may focus on increasing engagement in valued behaviours rather than aiming to directly change how individuals feel; (iii) there are a handful of measures of valued action, but none that assess both the 'what' and the 'why' of valued action (i.e., the specific ways in which individuals engage in valued action and why they do so); (iv) engagement in six behaviour domains can promote well-being; and (v) it is the autonomous engagement in these behaviour domains rather than engagement because of controlled reasons, that could enrich an individual's life and improve their well-being.

The overarching aim of this PhD, therefore, is to develop a questionnaire that comprehensively assesses both the 'what' and the 'why' of valued action within the six behaviour domains of *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. Such a questionnaire would enable clinicians to comprehensively evaluate their clients' valued action. Importantly, the focus of this thesis is not on improving the predictive power of the current valued activity questionnaires, as they are well-validated process measures. Rather, the aim is to develop a measure that can guide behaviour-based intervention.

This thesis seeks to validate the new questionnaire in cross-sectional data from four independent samples – a large representative sample from America (Study 1), another large

representative sample from Australia (Study 2), a third sample of adolescents from a private girls' school in Sydney, Australia (Study 3A), and lastly, a small sample of Australian adolescents from the Australian Character Study (Study 3B). A fourth study (Study 4) combines these samples to run further validation tests. Together, these studies examine the questionnaire's factor structure, similarity across gender and age groups, internal consistency, and criterion validity with well-being, mental health, experiential avoidance, nonattachment, personality, and variables closely related to each of the six behaviour domains. Further, a description of the most frequently reported idiographic responses for each behaviour is provided through a series of word clouds, and the barriers and enablers associated with engaging in valued action are explored. The current chapter presents an overview of the 6W-WeB questionnaire and its items, discusses the methodologies and analytic strategies used to validate the questionnaire, and reports on the research questions and aims of each study.

The Six Ways to Well-Being (6W-WeB)

The new questionnaire was named 'The Six Ways to Well-Being' (or the 6W-WeB for short), as the six behaviours previously reported, when combined with autonomous reasons for engaging in them, can be thought of as 'ways' to well-being. As mentioned in Chapter 2, the 6W-WeB questionnaire is closely based on the measures used in the personal strivings literature; the 6W-WeB consists of an idiographic component as well as quantitative rating scales. The complete 6W-WeB questionnaire is presented in Appendix A.

The 6W-WeB assesses both 'what' individuals do to engage in each of the six behaviour domains previously mentioned, as well as 'why' individuals engage in each behaviour (i.e., because of autonomous or controlled motivation). The questionnaire first instructs respondents to think of how they engage in the six behaviours and stresses that their examples should be instances of behaviours they actually and typically engage in, not those in which they wish to engage. This was done to make sure that participants' responses were

present-moment focused rather than future-oriented. Then, the questionnaire is divided into six parts – one for each of the six behaviour domains. Within each section, respondents are provided with a description of that behaviour domain as well as some examples of what their reported actions may look like. In the idiographic component of the questionnaire, participants are required to report two examples of how they typically engage in that domain, while in the quantitative component, respondents are instructed to rate each of their examples on three Likert-type scales.

The first quantitative rating scale assesses the individual's satisfaction with the frequency with which they engage in a particular behaviour. This scale was chosen over the absolute frequency of behaviour engagement, as frequency can vary vastly between behaviours as well as between people. For instance, an individual may be satisfied with engaging in challenging activities once a week, while they may want to connect with others every day. Further, an individual may think that exercising three times a week is enough for them, while someone else may not be satisfied unless they exercise every day. Therefore, I used the satisfaction with frequency scale, rather than a scale assessing absolute frequency, as the former would be comparable across behaviours and participants.

The second and third quantitative rating scales were based on self-determination theory (SDT) and its perspective on motivation. The second scale assesses the extent to which an individual engages in a particular behaviour because they find it personally meaningful and enjoyable, while the third assesses the extent to which an individual engages in a behaviour because they feel pressured to do so, either externally (e.g., from another person) or internally (e.g., from a sense of guilt). Previous research shows that autonomy and control are two related but distinct variables that require separate items for assessment (Duineveld, Parker, Basarkod, Ciarrochi, Ryan, & Salmela-Aro, 2019). In other words, an individual may engage

in a certain activity for both autonomous and controlled reasons. For instance, while people may find exercise enjoyable, they may do so to avoid the guilt associated with missing out on physical activity (Mullan, Markland, & Ingledew, 1997).

A seventh ‘other’ section was also added to the questionnaire, in case respondents felt that their valued actions were not fully captured by the six behaviour domains. Within this section, individuals were requested to report one typical way in which they engage in a behaviour not captured by the previous six domains, and then rate this example on the same satisfaction with frequency of engagement, autonomous motivation, and controlled motivation scales described above.

The complete 6W-WeB questionnaire has a Flesch-Kincaid Grade Level index (Kincaid, Fishburne, Rogers, & Chissom, 1975) of 6.1, indicating that it can be understood by a 6th grade student (according to the American school system). This index is based on the average word length (number of syllables per word) and sentence length (number of words per sentence) of a passage.

Data Handling and Analyses

Data Pre-Processing

All datasets were cleaned using the following three criteria: (i) data from individuals who did not report all qualitative responses for the 6W-WeB were deleted from the dataset as without this anchoring qualitative response, the quantitative responses that follow the idiographic component would not be meaningful; (ii) data from individuals who reported nonsense responses for the qualitative items, such as a set of random letters, were also removed for the same reason as in point (i); and (iii) data from individuals who reported the same responses for all quantitative items within a questionnaire (each questionnaire was

presented on a separate page) were removed as their responses would be of poor quality and may imply that they did not properly read and respond to the questions.

Missing Data

For the samples in Study 1, 2, and 3A, the quantitative items on the 6W-WeB were required-responses, implying that individuals who completed the questionnaire (i.e., did not exit the survey window until they responded to all questions) did not have any missing response data. In Study 1, some questionnaires were only answered by a proportion of participants to reduce burden due to length (see Study 1 for details). Pair-wise deletion was used for analyses in this study. The data in Study 3B contained missingness, but as the proportion of missingness was quite low (1.96%), pair-wise deletion was used.

Factor Structure Assessment

The lavaan package (Rosseel, 2012) in R was used to assess the factor structure of the 6W-WeB. Specifically, confirmatory factor analyses (CFA) were conducted to test a number of theory-driven models that would inform the number and nature of latent factors of the 6W-WeB. A latent factor is an underlying construct that manifests itself through participants' responses on a set of observed items. These observed, or manifest items, are said to be correlated because they share the same underlying cause, which is captured by that latent factor. Each factor accounts for two things: (1) the shared or common variance across the items that load on to that factor, and (2) the unique variance that is specific only to an item, which includes the item's random error.

CFAs are utilised when there is strong empirical or theoretical foundation to guide the specification of a model. The factor model in a CFA is constructed by prespecifying the number of latent factors and the pattern with which observed items load onto these latent factors. A CFA is evaluated by the extent to which it adequately represents what occurs in the data. To test the fit of all models in this thesis, the following thresholds of fit indices were

used, in keeping with commonly accepted criteria for adequate model fit : (i) Tucker-Lewis Index (TLI) $\geq .90$; (ii) comparative fit index (CFI) $\geq .90$; and (iii) root mean square error of approximation (RMSEA) $\leq .06$ (Bentler, 1990; Hu & Bentler, 1999; Kenny, Kaniskan, & McCoach, 2014).

In this thesis, CFAs were preferred over the data-driven approach of exploratory factor analyses (EFAs), as I had strong theoretical reasons for all the models tested (these models are described in Chapter 6, p. 77). CFAs also exhibit another benefit over EFAs; EFAs assume that the measurement error of items is random. In other words, an EFA assumes that the relationship between two items that load on to a factor is due to the influence the latent factor has on those two items, i.e., that the shared variance of two or more items is not accounted for by another underlying variable. In a CFA, this shared variance can be modelled. For instance, all items of a questionnaire can be specified to load onto one latent factor, while a subset of these items can also be specified to load onto another latent factor. CFAs can also provide support for the convergent or discriminant validity of items. If a model with two factors fits the data better than a model with one factor, it implies that the items are caused by two different underlying causes (discriminant validity), and that the items loading on the same factor are caused by the same underlying construct (convergent validity).

All CFA models analysed in this thesis utilised robust maximum likelihood (MLR) estimation methods. This was done as the items on the 6W-WeB were all rated on a 6-point Likert scale and the MLR estimation method is often used in the case of continuous data with non-normal distribution (Li, 2016). Further, MLR estimation offers the advantages of asymptotic consistency (i.e., the estimator converges to its true value with an increase in sample size), asymptotic normality (i.e., the distribution approaches a normal curve as sample size increases), and efficiency (i.e., the result has small standard errors; Li, 2016). In other

words, using MLR estimation improves the accuracy of the results obtained from a CFA model.

The CFA models I tested also included bifactor CFAs. A bifactor model assumes that general or global commonalities exist across items of a questionnaire and that, additionally, there are multiple specific factors that exert unique influence on a subset of items of the questionnaire. The influence of these specific factors is over and above what is already accounted for by the global factor/s. Therefore, in bifactor models, each item (or observed variable) of the questionnaire loads on to two different latent variables – one global factor, and one specific domain factor. Further, the global and domain factors are orthogonal (i.e., unrelated) to each other. Bifactor models are advantageous over other approaches as they enable simultaneous examination of each factor's contribution to an outcome variable, while taking the other factors into account. They also enable the identification of specific factors that do not remain unique contributors after the global factors are taken into account. Bifactor models have been widely used in intelligence questionnaires, and more recently, in personality research to evaluate multifaceted constructs. Research shows bifactor models to be well-suited for such evaluation (Chen, West, & Sousa, 2006).

Similarity Across Groups

Correlations. To test whether the 6W-WeB questionnaire performed similarly in different subgroups of gender (female vs. male) and age (young vs. old), I conducted correlations between each of the subscales of the 6W-WeB using scale scores and calculated the absolute mean difference of the correlations between the subgroups. If the absolute mean difference between two subgroups is small, it would imply that the two groups are responding to the questionnaire in similar ways.

Measurement invariance. To check whether the 6W-WeB model would perform well across gender and age groups, as well as across participants from different countries and

levels of psychological distress, I tested the final model's invariance across these subgroups using multigroup confirmatory analysis models (MGCFAs). Measurement invariance assesses whether the scale measures the same construct across all groups, i.e., whether the items mean the same thing to members of different subgroups (Cheung & Rensvold, 2002). If a model is invariant across subgroups, the fit indices will not change as more restraints are added to the model. In other words, the fit indices for a given model will not be worse (i.e., $\Delta CFI \leq .01$) than the fit indices for the model with one fewer constraint (Cheung & Rensvold, 2002). I assessed five levels of invariance: (i) a configural invariance model which tests the same underlying measurement structure in both groups, but all parameters are free to vary across the groups; (ii) a metric invariance model that holds factor loadings constant across groups; (iii) a scalar invariance model that holds both factor loadings and intercepts constant across groups; (iv) a residual invariance model that hold factor loadings, intercepts, and residuals equal across groups; and (v) a means invariance model that hold factor loadings, intercepts, residuals and means equal across groups.

Substantively, measurement invariance at these different levels would indicate, respectively, that the two subgroups being compared (e.g., females and males) (i) associate the same subset of manifest items with the same latent constructs; (ii) attribute the same meaning to the latent constructs; (iii) have the same scores on the manifest items if their scores on the latent constructs are the same; (iv) have equivalent residual errors in the model; and (v) have the same mean levels for each latent construct (Cheung & Rensvold, 2002; Van de Schoot, Lugtig, & Hox, 2012). It should be noted that the residuals and means invariance models (together often called strict invariance) are said to be a highly constrained models that are rarely achieved in practice (Bialosiewicz, Murphy, & Berry, 2013). Thus, at a minimum, a questionnaire should meet scalar invariance to be able to compare two groups on the construct measured (Van de Schoot et al., 2012).

I conducted these MGCFAs in Study 4, where I combined all four samples used in this thesis. In confirmatory factor analyses, increasing the sample size used to conduct analyses increases the statistical accuracy of the covariance and variance estimates, which in turn reduces the error of estimation (Jackson, Gillaspay Jr, & Purc-Stephenson, 2009). Therefore, combining the four samples helps maximise the available information, allowing for the examination of the measurement invariance of the 6W-WeB model.

Correlations With Theoretically-Relevant Variables

Zero-order correlations were assessed using Pearson's coefficient. Scale scores (i.e., averages of scale/subscale items) were used to conduct these analyses and missing data were deleted pair-wise. In the interest of completing reporting, I include correlations using the 6W-WeB model's factor scores in Supplementary Materials S1. It should be noted that correlations using factor scores and scale scores are usually comparable, although correlations using scale scores tend to be larger than those using factor scores. This is because factor scores take into account only the unique variance accounted for by that subscale, while scale scores take into account all the variance accounted for by the items within the subscale. More information about the interpretation of factor score correlations can be found in Supplementary Materials S1.

Regressions

To assess the amount of variance that the 6W-WeB model explains in the constructs of flourishing and psychological distress, regressions were conducted using structural equation models (SEMs) wherein both the measurement structure as well as the paths were estimated. SEMs are second-generation multivariate approaches that account for measurement error as they use latent variables rather than manifest variables. Further, all variables are analysed simultaneously rather than in a step-wise fashion, which is beneficial as human behaviour is complex and cannot be properly explained by independent and

isolated relationships between constructs (Alavifar, Karimmalayer, & Anuar, 2012; Fornell, 1985). SEMs expand on the explanatory ability of hierarchical regressions and do so with a single comprehensive model (Hair, Black, Babin, Anderson, & Tatham, 1998). Therefore, SEMs are superior to step-wise and hierarchical regression models and were used in this thesis.

Known-Groups Validity

As the 6W-WeB is intended for use in clinical settings, I tested whether the measure can discriminate between people who meet criteria for high psychological distress and those who do not. Specifically, I identified groups of individuals with high psychological distress using the cut-off of 11/12 on the General Health Questionnaire – 12 (GHQ; Goldberg, 1992), when scored on a Likert scale from 0 to 3. Higher scores on this questionnaire are indicative of poorer mental health (see p. 76 for more details). The 11/12 cut-off has previously been used in research as it has shown a good balance between sensitivity and specificity for identifying individuals experiencing poor mental health (Donath, 2001).

The GHQ-12 has previously been used to determine the presence of psychological distress (Baksheev, Robinson, Cosgrave, Baker, & Yung, 2011; Gureje & Obikoya, 1990; Sheppard, Deane, & Ciarrochi, 2018). It has also been validated against the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-IV-Test Revision (SCID-IV; First, Spitzer, Gibbon, Williams, & Janet, 1997), indicating that it can identify cases of individuals who meet criteria for psychological distress. Therefore, the GHQ-12 was used in Studies 1 and 2 to compare individuals who meet criteria for psychological distress with those who do not, in terms of their scores on the 6W-WeB.

Word-Frequency Tabulation

To examine idiographic responses, a series of frequency word clouds were constructed using the following R packages: tidytext (Silge & Robinson, 2016), tm (Feinerer

& Hornik, 2017), wordcloud (Fellows, 2015), SnowballC (Bouchet-Valat, 2013), and wesanderson (Ram & Wickham, 2015). For each behaviour domain, all responses on both examples for each behaviour domain were converted into a text document that was then pre-processed to remove capital letters, punctuation, and numbers. Stop words (words such as ‘a’, ‘the’, ‘or’) were removed using the “smart” lexicon in the tidytext package (Silge & Robinson, 2016). Words that did not provide meaningful information about valued action (these are listed in Supplementary Materials S2) were also removed. The remaining words were then reduced to their stems, i.e., words representing different forms of the same word were reduced to their core. For instance, the words ‘behave’, ‘behaviour’, ‘behaviours’, and ‘behaving’ were reduced to ‘behav’. These stems were then manually converted into a complete word (some stems were not proper words, e.g., ‘behav’ instead of ‘behave’). If a participant repeated the same word within the same example, that instance of the word was counted only once towards the total frequency count of that word. Therefore, the final frequency score for each word represented the number of examples in which that word was reported. To make sure that each example in a word cloud was reported by at least two participants in each sample, a minimum word frequency of three was allowed (the word was either reported by two participants, with one person reporting the same word in both their examples for a particular domain, or by three different people). Finally, a maximum of 100 of the most frequently reported words were reported in each word cloud. The larger a word in a word cloud, the more frequently it was reported, and words occurring at similar frequencies are represented by the same colour.

Research Questions

Each study of this thesis aims to provide evidence for the validity of the 6W-WeB questionnaire. While the specific research questions and hypotheses for each study are

presented within the chapter dedicated to that study, the following are the overarching questions that the studies presented in this thesis aim to answer:

Research Question 1

What factor structure of the 6W-WeB would best fit the data? For example, does a model that assumes six distinct ways to well-being fit the data adequately? Or is there serious misfit in the assumption of six factors, which would happen if, for instance, the challenging oneself and physical activity indicators substantially cross-loaded? Thus, an important part of Research Question 1 is not only establishing fit, but also examining the sources of misfit. If the six ways are reducible to fewer ways, then a briefer scale might be preferable.

Research Question 2

How will the subscales of the 6W-WeB relate to theoretically relevant variables? For instance, will the six behaviours link positively to mental health indices as is suggested by past research (Aked et al., 2008; Ciarrochi, Bailey, et al., 2015)? If not, perhaps these behaviours may not be ‘ways’ to well-being. Further, how does each domain link to a theoretically similar construct? If there is no association between the domains and these similar constructs, perhaps the 6W-WeB is not measuring what it intends to measure.

Research Question 3

Will individuals who meet criteria for high psychological distress respond to the 6W-WeB differently compared to those who do not meet these criteria? For example, would individuals who meet criteria engage less in valued action in the six behaviour domains? If individuals who meet criteria for high psychological distress engage in valued action to the same extent as those who do not meet criteria, perhaps valued action may not be an important indicator of mental health.

Research Question 4

What kinds of behaviours are individuals engaging in within each of the six behaviour domains? Certain activities may help individuals engage in multiple avenues of well-being. However, if there is substantial overlap between the kinds of activities that participants engage in across the six behaviours, then maybe these six domains are not distinct. If the six domains are indeed different, the kinds of behaviours reported for each behaviour should mostly be different.

Research Question 5

Lastly, what factors prevent or promote engagement with valued actions? If valued action is indeed an important indicator of well-being, it is important to explore the kinds of barriers people experience when attempting to engage in each of the six behaviours. Such information about barriers to valued activity would help practitioners guide intervention.

Overview of Studies

In Study 1 of this thesis, I test the factor structure of the 6W-WeB questionnaire using data from a representative American sample (**Research Question 1**), assess how each subscale of the 6W-WeB relates to theoretically relevant measures of flourishing, psychological distress, experiential avoidance, and nonattachment (**Research Question 2**), test how the patterns of subscale scores differ between groups of individuals with high and low psychological distress (**Research Question 3**), and examine the typical ways in which individuals engage in the 6 behaviour domains (**Research Question 4**). In Study 2, I sought to replicate the results from Study 1 in an independent sample from Australia (**Research Questions 1-4**), and also assess the barriers and enablers of valued action (**Research Questions 5**). In Study 3, I first sought to replicate the factor structure and construct validity of the 6W-WeB in two adolescent samples (**Research Questions 1 and 2**), examine the typical ways in which individuals engage in the 6 ways (**Research Question 4**), and test how the 6W-WeB relates to measures of mental health, personality, and constructs closely related

to each of the 6 behavioural domains (**Research Question 2**). Finally, in Study 4, I combine all samples to further test the factor structure of the 6W-WeB and its measurement invariance (**Research Question 1**).

Chapter Summary

In summary, this chapter provides an overview of the Six Ways to Well-Being (6W-WeB) questionnaire, explains how the datasets were cleaned, describes the techniques for dealing with missing data, and the analytical strategies used to assess factor structure, correlations, regressions, known-groups validity, and idiographic responses. Lastly, it introduces the research questions that the four studies of this thesis aim to answer. The next four chapters describe each of the studies of the thesis in detail and provide the studies' specific research questions, hypotheses, methodologies, results, and discussion of findings.

CHAPTER 6

STUDY 1: INITIAL VALIDATION OF THE SIX WAYS TO WELL-BEING

Chapter 6 presents the first study of this thesis. The primary aim of Study 1 is to provide an initial validation of the Six Ways to Well-Being (6W-WeB) questionnaire. Specifically, the factor structure of 6W-WeB is established and tested across subgroups, the construct validity of the questionnaire is assessed in relation to theoretically relevant variables (i.e., flourishing, psychological distress, experiential avoidance, and nonattachment), the known groups validity of the questionnaire is tested in terms of psychological distress, and the typical ways in which participants engage in the six domains of valued activity are explored.

Research Questions and Hypotheses

The specific research questions of the current study, as well as the rationale and hypotheses for each of these questions, are presented below:

Research Question 1

What factor structure of the 6W-WeB would best fit the data in a general population American sample?

Evidence reviewed previously in this thesis suggests that there are six important behaviour domains, namely *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself* (Aked et al., 2008; Ciarrochi, Bailey, et al., 2015). The level of engagement in these behaviours (i.e., greater or lesser engagement in valued action) and the type of motivation (i.e., autonomous versus controlled) for engaging in these behaviours, are both consequential for well-being (Deci & Ryan, 2000; S. C. Hayes et al., 2011). It logically follows that if the 6W-WeB assesses both these aspects of valued action (the specific behaviour as well as the reason for

engaging in that behaviour), the factor structure of the measure may be best represented by two sets of latent constructs. The first set of latent factors would account for the six different behaviour domains, while the second set of latent factors would account for individuals' motivation for behaviour engagement.

Consistent with this argument, past research suggests that there are individual differences in the extent to which people feel autonomy (or importance) and control (or pressure) across all activity domains in their life (Ryan & Deci, 2017, Ciarrochi & Bailey, 2008). For example, some people tend to feel high levels of pressure and low levels of importance across all domains. Others tend to value many things and experience little pressure, regardless of whether they focus on *connecting with others*, *challenging oneself*, or *giving to others*. Despite such global tendencies, people can distinguish between the different ways to well-being, placing more importance on some domains compared to others (K. G. Wilson et al., 2010). For example, one could have high autonomous engagement in *connecting with others*, but not in *challenging oneself* or *giving to others*. Putting these logical and empirical arguments together, I hypothesise the following factor structure for the 6W-WeB:

Hypothesis 1

A bifactor model that captures three global factors, namely *behaviour engagement*, *activity importance*, and *activity pressure*, as well as six specific domain factors of behaviour (*connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*) will fit the data well. Additionally, this bifactor model will fit the data better than a model that assumes only three global factors or one that assumes only six specific factors.

Research Question 2

Will the questionnaire perform similarly across subgroups of gender and age?

In Chapters 3 and 4, the evidence for the six behaviour domains and for the motivation to engage in these behaviours was presented through studies that comprised of diverse samples (e.g., Feinstein & Hammond, 2004; A. Jenkins & Mostafa, 2015; Steptoe & Butler, 1996; Wink & Dillon, 2002). These samples included both male and female participants, as well as participants from different age groups. Therefore, the arguments provided for Research Question 1 also hold true for Research Question 2.

Hypothesis 2

The 6W-WeB, as represented by the bifactor model, will perform similarly across subgroups of gender and age.

Research Question 3

How will the subscales of the 6W-WeB relate to criterion variables of well-being, mental health, experiential avoidance, and nonattachment (rationale for including these variables is provided below)?

Based on the theoretical rationales that (i) the more one engages in valued action, the more likely one is to have higher levels of well-being (K. G. Wilson et al., 2010); (ii) autonomously motivated behaviours promote well-being (Sheldon & Kasser, 1995); (iii) controlled motivated behaviours reduce well-being (Ryan & Deci, 2017); and (iv) there are six behavioural domains assumed to promote well-being (Aked, 2008; Ciarrochi et al., 2015), I hypothesise the following:

Hypothesis 3a

The global factors of *behaviour engagement* and *activity importance* will be positively correlated with flourishing and negatively correlated with psychological distress. The global factor of *activity pressure* will be negatively related with flourishing and positively linked with psychological distress. All six domain factors will be positively correlated with flourishing and negatively correlated with psychological distress.

Experiential avoidance and experiential attachment (i.e., the inverse of nonattachment) are relevant constructs to the field of Contextual Behavioural Science. Experiential avoidance measures how individuals interact with valued behaviour in the face of emotional distress (Sahdra, Ciarrochi, Parker, & Scrucca, 2016), and experiential attachment measures the extent to which individuals cling to and seek out positive states (Sahdra et al., 2010). Engaging in valued action in the face of emotional distress, and being able to let go of positive states and events, would enable individuals to increase their autonomous engagement in valued action.

Hypothesis 3b

The global factors of *behaviour engagement* and *activity importance* will be negatively correlated with experiential avoidance and positively correlated with nonattachment, while the global factor of *activity pressure* will be positively correlated with experiential avoidance and negatively linked with nonattachment. All six domain factors will be negatively correlated with experiential avoidance and positively correlated with nonattachment.

Research Question 4

Will the patterns of responding to the 6W-WeB be different for groups of individuals who meet criteria for high psychological distress and those who do not?

Evidence suggests that individuals who have greater levels of engagement in each of the six behaviour domains, and do so because of autonomous rather than controlled reasons, tend to experience lower levels of psychological distress (Aked et al., 2008; Ciarrochi, Bailey, et al., 2015; Deci & Ryan, 2000). On the flipside, individuals who have lower levels of engagement in each of the six behaviour domains, lower levels of autonomous motivation, and higher levels of controlled motivation, tend to have a greater risk of experiencing mental

health difficulties (Aked et al., 2008; Ciarrochi, Bailey, et al., 2015; Deci & Ryan, 2000).

Based on these reasons, I hypothesise that:

Hypothesis 4

Participants who meet criteria for high psychological distress will show lower levels of *behaviour engagement*, *activity importance*, and higher levels of *activity pressure*, while participants who do not meet criteria will show the opposite pattern. Individuals who meet criteria for psychological distress will also have lower mean scores on the six behavioural domains.

Research Question 5

Will the typical ways in which participants engage in valued actions be different for each of the six domains?

While evidence suggests that there are six important domains of valued action (Aked et al., 2008; Ciarrochi, Bailey, et al., 2015), prior research has not explored the specific ways in which individuals engage in these domains. Although this research question is exploratory, I would expect the following:

Hypothesis 5

The idiographic responses within each of the six ways will not substantially overlap across domains. While there may be some similarities (e.g., exercise could be reported for both *engaging in physical activity* and *caring for oneself*), the most frequently reported words for each domain will be unique.

Methods

Participants and Design

The sample consisted of 1,800 participants from the general population in America, whose data were purchased from Survey Monkey, a professional survey company (information about their recruitment channels can be found here:

https://help.surveymonkey.com/articles/en_US/kb/SurveyMonkey-Audience). The participants had a wide age range of 18 to 65 years ($M = 40.9$, $SD = 13.21$) and 60.3% of them were female. Regarding ethnicity, 66.9% were Caucasians, 10.2% were African American, 10.2% were Hispanic, and 12.8% were from other ethnicities. With respect to annual household income in American dollars, 18.6% of the participants reported earning less than \$20,000, 26.6% between \$20,001-\$40,000, 19.4% between \$40,001-\$60,000, 14% between \$60,001-\$80,000, 10.2% between \$80,001-\$100,000, 11.1% more than \$100,000, and 0.2% other. With regard to education, 24.2% of the participants had an education up to high school, 58% up to a college diploma level, and 17.8% up to a graduate degree. Participants who consented to participating in the survey on the first page, proceeded to answer a 30-minute-long questionnaire. They were instructed to complete the survey in one sitting and in a quiet place free from distractions. For completion, the survey company offered participants a choice to either donate \$0.50 to a charity of their preference or enter a sweepstake to win \$100. Ethics approval for this study was provided by the Australian Catholic University Human Research Ethics Committee (Appendix C1).

Measures

All participants completed the Six Ways to Well-Being questionnaire (described in Chapter 5). To reduce participant burden, I utilised a planned missing data design (e.g., Ciarrochi, Sahdra, Marshall, Parker, & Horwath, 2014), whereby the data were collected in two parts. In the first part, some of the participants answered mental health and CBS-related measures, while the others answered questions on body image. In the second part, all participants answered questions on psychological distress, nonattachment, and body image. Therefore, out of the 1800 participants, 500 answered the flourishing and experiential avoidance questionnaires, and 1262 answered the psychological distress and nonattachment questionnaires. The data related to body image measures are not relevant to this thesis and are

part of a separate study reported elsewhere (Basarkod, Sahdra, & Ciarrochi, 2018). Please note that the alpha reliability estimates included in the measure descriptions in each study of the thesis are specific to the sample used in that study.

Ways to well-being. The Six Ways to Well-Being (6W-WeB) was designed to measure satisfaction with frequency, autonomous motivation, and controlled motivation for engaging in six behaviour domains that promote well-being. A detailed description of this questionnaire is provided in Chapter 5 (p. 56). Briefly, participants were asked to report two typical ways in which they engaged in each of the following domains: *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. For each example, participants rated the extent to which they were satisfied with the frequency of engagement in that activity, felt that engaging in the behaviour was personally important or meaningful to them, and felt pressured to engage in that behaviour. All items were rated on a Likert type scale from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). The questionnaire had 12 qualitative items and 36 quantitative items with the addition of an optional section where participants could report an example of an activity they felt did not fall under the previous six categories. As this category was optional, only a proportion of participants completed it (about 30%), so the quantitative analyses did not include these items. However, the idiographic responses reported in this category are examined using word clouds in every study. The order in which the six behaviour domains were presented was randomised, but the optional category was always presented last.

Flourishing. I used a 12-item measure to assess flourishing (Keyes, 2006) with three items measuring emotional flourishing (e.g., “In the past month, how often have you felt happy?”; $\alpha = .86$), four items measuring psychological flourishing (e.g., “In the past month, how often did you feel good at managing the responsibilities of your daily life?”; $\alpha = .82$), and five items measuring social flourishing (e.g., “In the past month, how often did you feel

that you had something important to contribute to society?"; $\alpha = .87$). All items were to be rated on a Likert type scale from 0 (*Never*) to 5 (*Every Day*), and higher scores on each subscale were reflective of greater levels of flourishing in that domain.

Psychological distress. I used the General Health Questionnaire-12 (GHQ-12) to measure psychological distress (Goldberg, 1992). Each of the 12 items were rated on a 4-point scale (0 to 3), with varying labels such as '*not at all*' to '*much more than usual*'. Example items include: "Have you recently lost much sleep over worry" and "Have you recently been thinking of yourself as a worthless person". Higher scores indicate greater psychological distress ($\alpha = .91$). GHQ-12 has been used in prior research to identify individuals with mental health disorders as classified by the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (e.g., Cornelius, Groothoff, van der Klink, & Brouwer, 2013). I used the cut-off point of 11/12 to identify groups of individuals with high psychological distress. This cut-off point has been used with both clinical (e.g., Martin & Newell, 2005) and non-clinical samples (e.g., Lundin, Hallgren, Theobald, Hellgren, & Torgén, 2016), and shows a good degree of both specificity and sensitivity in identifying individuals with psychological distress (Donath, 2001).

Experiential avoidance. A 30-item short form of the Multidimensional Experiential Avoidance Questionnaire (MEAQ-30) was used to measure experiential avoidance (Sahdra, Ciarrochi, Parker, & Scrucca, 2016). The measure consists of 5 items for each of the six subscales of avoidance: behavioural avoidance (e.g., "I avoid situations if there is a chance that I'll feel nervous"; $\alpha = .82$); distress aversion (e.g., "I'd do anything to feel less stressed"; $\alpha = .82$); distraction and suppression (e.g., "When a negative thought comes up, I immediately try to think of something else"; $\alpha = .84$); repression/denial (e.g., "I feel disconnected from my emotions"; $\alpha = .82$); procrastination (e.g., "I won't do something until I absolutely have to"; $\alpha = .79$); and distress endurance (e.g., "When working on something

important, I won't quit even if thing get difficult"; $\alpha = .84$). Each item was rated on a Likert-type scale from 1 (*Disagree Strongly*) to 6 (*Agree Strongly*). Higher scores on each of the subscales are indicative of higher levels of that avoidance style, except for the subscale of distress endurance (as it assesses approach rather than avoidance).

Nonattachment. I used the Nonattachment Scale – 7 (NAS-7), a short form of the 30-item Nonattachment Scale (Sahdra et al., 2010), to measure nonattachment (Elphinstone, Sahdra, & Ciarrochi, 2015; Sahdra, Ciarrochi, Parker, Marshall, & Heaven, 2015). Example items include: “I can enjoy pleasant experiences without needing them to last forever”, and “I can let go of regrets and feelings of dissatisfaction about the past”. Each item is rated on a Likert type scale from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). Higher scores are indicative of greater nonattachment ($\alpha = .87$).

Results

Factor Structure and Reliability

I tested three different CFA models to ascertain the factor structure of the 6W-WeB. The first model that was tested (CFA₁) had only three global factors of satisfaction with frequency (or *behaviour engagement*), autonomous motivation (or *activity importance*), and controlled motivation (or *activity pressure*) for engaging in behaviours. All satisfaction with frequency items across the six behaviours were loaded onto the first factor, all items measuring autonomy were loaded onto the second factor, and all items assessing controlled motivation were loaded onto the third factor. Additionally, all three global factors were allowed to correlate with each other. This model did not provide a good fit to the data, as can be seen in Table 1.

The second model that was tested (CFA₂) had only six domain factors – one for each of the six behaviours of *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. For each domain factor, all the items for satisfaction with frequency, autonomous motivation, and

controlled motivation within that domain, were loaded onto that factor. For instance, the items measuring satisfaction with frequency, importance, and pressure for the connecting with others idiographic responses, were loaded on the *connecting with others* factor. All six domain factors were allowed to correlate with each other. As seen in Table 1, the fit indices for CFA₂ were unsatisfactory.

Next, I tested a bifactor CFA model (CFA₃) that consisted of the three global factors from CFA₁ as well as the six domain factors from CFA₂. As described in Chapter 5, in a bifactor model, each manifest item loads onto two orthogonal, latent factors. Thus, each of the 36 quantitative 6W-WeB items were loaded onto one global factor and one domain factor. For instance, the item assessing satisfaction with frequency of engaging in connecting with others, was loaded onto both the *behaviour engagement* factor as well as the *connecting with others* factor. The global factors were allowed to correlate with each other, the domain factors were allowed to correlate with each other, but the correlations between global factors and domain factors were constrained to zero, i.e., the global and domain factors were orthogonal. This bifactor model showed close to adequate fit, improving on the fit of CFA₁ and CFA₂.

Sources of misspecification. Next, I examined the modification indices to determine if there were any important sources of misfit in the bifactor model (CFA₃). I was particularly interested in the possibility that items could load across domains (e.g., physical activity and challenging oneself), which, if true, would be contrary to the model's assumption that the six domains are distinct. The top 20 largest modification indices are presented in Table 2.

These modification indices suggested that some of the misspecification lay in the residual covariances between the first and second pressure items within a behaviour domain. These residual covariances emerged for five out of the six behavioural domains. This may imply that pressure is pervasive across items within a domain, e.g., pressure felt for one instance of *embracing the moment*, is also felt for a second instance of *embracing the*

moment. The residual covariances between the first and second pressure items for each of the six behaviours were added into the bifactor model as there has been prior evidence for the pervasiveness of felt pressure within life domains (Ciarrochi & Bailey, 2008).

The modification indices also suggested that some misspecification lay in the residual covariances between the frequency and importance items within each behaviour domain. This may be possible because the satisfaction with frequency items may pull for a positive response from the participants, as the rating scale includes the positively valenced word ‘satisfied’. However, there was no strong underlying theory to include the covariances between these items, over and above the correlation of their latent factors, so these modification indices were not added to the bifactor model.

Lastly, the modification indices further suggested that some misspecification lay in the residual covariances between the importance and pressure items within each domain. Again, these residual covariances were not added into the bifactor model as there is strong evidence suggesting that while autonomy and control are related, they are two distinct constructs (Duineveld et al., 2019). Therefore, the inclusion of their residual covariances was not warranted.

Importantly, the top modification indices did not suggest misspecification of the behaviour domains, i.e., none of the behavioural domains cross-loaded, suggesting six distinct behavioural domains. The adjusted bifactor CFA model (CFA₄), which included the residual covariances between the two pressure items within each domain, showed good fit to the data. Therefore, the CFA₄ model was used for all further analyses. This model is visually represented in Figure 1.

Table 1

Fit Indices of Confirmatory Factor Analysis (CFA) Models Testing the Factor Structure of the Six Ways to Well-Being in Study 1.

Model	χ^2	<i>df</i>	CFI	TLI	RMSEA [90% CI]
CFA ₁ : Global factors only	6436.41	591	.76	.74	.074 [.073 .075]
CFA ₂ : Domain factors only	13343.74	579	.47	.43	.111 [.109 .112]
CFA ₃ : Bifactor model	2741.77	540	.91	.89	.048 [.046 .049]
CFA ₄ : Adjusted bifactor model	2344.01	534	.93	.91	.043 [.042 .045]

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval.

Table 2

Top 20 Modification Indices From the 6W-WeB Bifactor Model (CFA₃) in Study 1.

Item ₁	Operation	Item ₂	Scaled modification index
Emb1Pres	~~	Emb2Pres	157.60
Care2Freq	~~	Care2Imp	125.94
Care2Imp	~~	Care2Pres	103.71
Chal2Freq	~~	Chal2Imp	99.39
Con2Imp	~~	Con2Pres	90.94
Care1Pres	~~	Care2Pres	82.67
Phys1Pres	~~	Phys2Pres	78.52
Emb2Freq	~~	Emb1Imp	73.80
Chal2Imp	~~	Chal2Pres	71.49
Give2Imp	~~	Give2Pres	70.90
Con1Pres	~~	Con2Pres	67.32
Con1Imp	~~	Con2Pres	64.94
Phys2Imp	~~	Phys2Pres	64.40
Give1Imp	~~	Give2Pres	63.82
Phys2Freq	~~	Phys2Imp	62.43
Give1Pres	~~	Give2Pres	61.69
Con2Freq	~~	Con2Imp	60.66
Phys1Freq	~~	Phys1Imp	57.76
Give1Imp	~~	Give1Pres	54.45
Give1Freq	~~	Give1Imp	54.34

Note. The ‘~~’ operation indicates a residual covariance between Item₁ and Item₂.

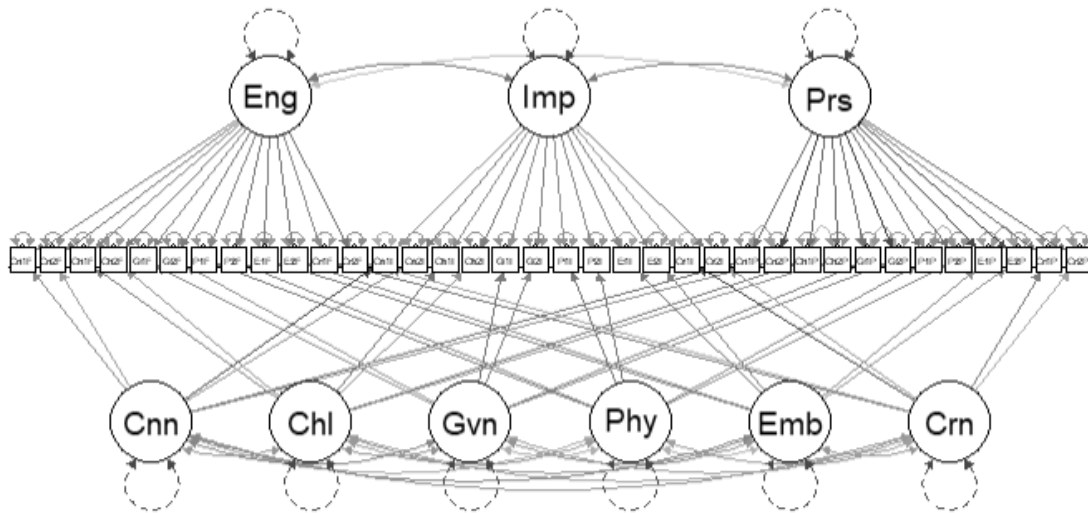


Figure 1. Bifactor model (CFA₄) of the Six Ways to Well-Being

Note. Eng = behaviour engagement; Imp = activity importance; Prs = activity pressure; Cnn = connecting with others; Chl = challenging oneself; Gvn = giving to others; Phy = engaging in physical activity; Emb = embracing the moment; Crn = caring for oneself

Reliability. The alpha reliability estimates of the 9 subscales of the 6W-WeB are presented in Table 3. The alpha reliability estimates were calculated taking into account all items within a subscale (i.e., these reliability estimates ignored the bifactor structure in that they fully account for the variance in the items that load onto a latent factor. The estimates do not partial out the item variance accounted for by the other latent factor those items load onto). All subscales showed adequate internal consistency.

Table 3

Alpha Reliability Estimates for Each Subscale of the Six Ways to Well-Being in Study 1.

	α
Behaviour engagement	.90
Activity importance	.88
Activity pressure	.94
Connecting with others	.77
Challenging oneself	.76
Giving to others	.75
Engaging in physical activity	.76
Embracing the moment	.77
Caring for oneself	.76

Similarity Across Groups

As mentioned in Chapter 5, I wanted to ascertain whether all participants respond to the items of the 6W-WeB similarly. To do this, I first calculate the correlations between each of the subscales of the 6W-WeB using scale scores, for each subgroup. Then, the mean absolute difference of correlations between male ($N = 715$) and female participants ($N = 1085$), and between young ($N = 963$) and old participants ($N = 837$) were determined. The continuous variable of age was split into two subgroups of equal age ranges – the first group included participants from 18-41.5 years of age and the second group included participants from 41.5-65 years of age. The mean absolute difference between males and females for the 6W-WeB inter-correlations was .07, while the mean absolute difference between the young and old participant subgroups was .04. The correlation matrices for each of these groups is presented in Supplementary Material S3 (Table S 6 and Table S 7). As these mean absolute difference values were small, it can be said that the gender subgroups, as well as the age subgroups, responded to the 6W-WeB in similar ways.

In order to test the measurement invariance of the bifactor model across these subgroups, I also conducted multiple group CFAs. However, owing to the complicated nature of the bifactor model and the number of parameters needed to be estimated in this two-group bifactor CFA (i.e., 408 parameters), the sample sizes of each of these subgroups did not confer adequate statistical power to run these analyses. Therefore, I combined all samples from all studies before testing measurement invariance. Details about these analyses are presented in Chapter 5 (p. 61) and their results are presented in Chapter 9 (p. 194).

Correlations With Theoretically-Relevant Variables

I conducted zero-order correlations using the scale scores of the 6W-WeB measure and the criterion variables. These results are presented in Table 4. The correlation coefficients were interpreted wherein .10, .30, and .50 indicate small, medium, and large effect sizes respectively (J. Cohen, 1992; Gignac & Szodorai, 2016). With respect to flourishing and psychological distress, *behaviour engagement* had medium positive correlations with all three flourishing subscales and a medium negative correlation with psychological distress. These correlations indicate that individuals with high levels of perceived satisfaction with their engagement in valued action, also had higher levels of flourishing and lower levels of psychological distress. *Activity importance* had medium positive correlations with the emotional and psychological flourishing subscales, a small positive correlation with the social flourishing subscale, and a small negative correlation with psychological distress. This implies that individuals who placed greater importance on their behaviours tended to display higher levels of flourishing and lower levels of psychological distress. *Activity pressure* had small negative correlations with emotional and psychological flourishing, and a medium positive correlation with psychological distress. This indicated that individuals who engage in actions because of controlled reasons tend to show lower levels of emotional and psychological flourishing and greater levels of psychological distress. Lastly, the six behaviours had small to medium positive correlations with the flourishing subscales and small to medium negative correlations with psychological distress. These correlations indicate that engagement in each of the six behaviour domains is associated with better well-being and a lower risk of experiencing psychological distress.

With regard to the experiential avoidance subscales, *behaviour engagement* had a small positive correlation with distraction and suppression, a small negative correlation with procrastination, and a medium positive correlation with distress endurance. These

correlations indicate that individuals who tend to be satisfied with their level of engagement in valued action may also tend to distract themselves from difficult internal experiences, tend not to procrastinate, and be more likely to endure distress in the service of their values.

Activity importance had the same pattern of correlations with the addition of a small negative correlation with repression/denial. These correlations indicate that individuals who place higher importance on their behaviours may also tend to distract themselves, procrastinate less, endure more distress in service of their values, and be more in touch with their emotions.

Activity pressure had medium positive correlations with behavioural avoidance, repression/denial, and procrastination, a small positive correlation with distress aversion, and a small negative correlation with distress endurance. This pattern of correlations may signify that individuals who engage in behaviours because of pressured reasons may be more likely to avoid engaging in meaningful activity, repress negative internal experiences, procrastinate more, and avoid distress instead of enduring it in the service of their values. The six behaviours had small negative correlations with behavioural avoidance and distress aversion, small to medium negative correlations with repression/denial and procrastination, small positive correlations with distraction and suppression (except for *engaging in physical activity* and *caring for oneself*), and medium positive correlations with distress endurance. This may indicate that individuals who engage in the six behaviour domains may be less likely to avoid distressing thoughts and instead endure this distress to engage in valued action, and be less likely to repress, deny, or suppress their negative experiences and procrastinate.

Behaviour engagement had a medium positive correlation, *activity importance* had a large positive correlation, *activity pressure* had a small negative correlation, and the six behaviours had medium positive correlations with nonattachment. This pattern of correlations suggests that individuals who do not cling to positive experiences may have greater levels of

engagement in the six behaviours and do so because of autonomous rather than controlled reasons. Further, such individuals may also be satisfied with the extent to which they engage in each of the six behavioural domains.

Table 4

Zero-Order Correlations Between the 6W-WeB Subscales (Using Scale Scores, i.e., Averages of Subscales) and Theoretically Relevant Variables in Study 1.

	Global subscales			Domain subscales					
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.40***	.33***	-.11*	.28***	.29***	.26***	.31***	.24***	.24***
Psych F	.44***	.34***	-.14**	.31***	.31***	.28***	.35***	.25***	.28***
Soc F	.42***	.22***	.07	.15***	.22***	.12**	.25***	.10*	.14**
GHQ-12	-.31***	-.27***	.30***	-.33***	-.32***	-.28***	-.35***	-.28***	-.35***
BehAvd	-.01	-.08	.31***	-.15***	-.17***	-.17***	-.15**	-.20***	-.18***
DisAver	.03	-.05	.28***	-.11*	-.12**	-.09*	-.09*	-.18***	-.19***
DstSup	.22***	.15***	.00	.13**	.19***	.13**	.07	.11*	.07
RepDen	-.02	-.17***	.49***	-.33***	-.20***	-.27***	-.22***	-.35***	-.31***
Procst	-.23***	-.23***	.38***	-.33***	-.35***	-.29***	-.31***	-.29***	-.31***
DisEndr	.40***	.39***	-.24***	.38***	.41***	.32***	.32***	.37***	.31***
NAS-7	.43***	.50***	-.24***	.44***	.42***	.42***	.33***	.37***	.40***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12, Multidimensional Experiential Avoidance Subscale – 30 subscales: BehAvd = behavioural avoidance; DisAver = distress aversion; DstSup = distraction and suppression; RepDen = repression/denial; Procst = procrastination subscale; DisEndr = distress endurance, NAS-7 = Nonattachment Scale – 7.

6W-WeB subscales: Eng = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself

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

Regressions

Structural equation models. To examine the amount of variance that the overall Six Ways to Well-Being measurement model explained in indices of mental health and well-being, I conducted structural equation models (SEMs). These SEMs were used instead of manifest variable-based methods, such as step-wise hierarchical regressions, because SEMs adjust for the measurement error in the path analyses and allow for all paths to be estimated simultaneously (Alavifar et al., 2012; Fornell, 1985). In these SEMs, the following things were specified: (i) the 6W-WeB bifactor model; (ii) the measurement model for a theoretically-relevant variable; and (iii) the regression wherein the nine 6W-WeB factors predict the mental health criterion variable. The fit indices of these models as well as the variance explained by the 6W-WeB in each of the variables are presented in Table 5. All models showed adequate fit. The Six Ways to Well-Being explained 23% to 29% of the variance in flourishing and 23% of the variance in psychological distress. The standardised path estimates for each subscale of the 6W-WeB in these models, can be found in the Supplementary Material S4, Table S 10.

Table 5

Summary of Goodness of Fit for Models From Structural Equation Models Testing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables, and the Variance Explained by the 6W-WeB in the Criterion Variables, in Study 1.

	χ^2	<i>df</i>	CFI	TLI	RMSEA [90% CI]	R^2
Flourishing						
Emotional	1958.35	633	.91	.90	.045 [.043 .047]	.23
Psychological	2021.18	671	.91	.90	.044 [.042 .046]	.29
Social	2102.27	710	.91	.90	.043 [.042 .045]	.22
Psychological Distress	3701.66	1011	.92	.91	.038 [.037 .040]	.23

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; Flourishing = Keyes' flourishing measure; Psychological Distress = General Health Questionnaire-12

Multiple regressions. The SEMs are useful in examining the total variance explained by the 6W-WeB bifactor model in the mental health variables. However, the contribution of each of the 6W-WeB factors in a bifactor model, in terms of the standardised path estimates, can be complicated to decipher. This is because, in a bifactor model, the global factors and the domain factors are derived from the same manifest items. For instance, the non-significance of *connecting with others* in predicting variance in social flourishing, does not mean that social relationships are not an important indicator of flourishing in the social domain. Rather, it may indicate that the effect of *connecting with others* on social flourishing is already fully represented by the global factors. Therefore, it may be easier to assess the unique contribution of each of the six behaviour domains, in explaining variance in the criterion variables, using scale scores.

I conducted multiple regressions to assess the variance explained by the domain factors in the mental health criterion variables. The scale scores of the six domains that were used in correlational analyses were also used in these regressions. The results of these regressions are represented in Table 6. *Challenging oneself* and *engaging in physical activity* were significant predictors of all flourishing subscales, while *connecting with others*, *challenging oneself*, *engaging in physical activity*, and *caring for oneself* were significant predictors of psychological distress.

Table 6

Standardised Regression Coefficients and Variance Explained (Adjusted R²) From Multiple Regressions Showing the Unique Variance Explained by the Scale Scores of the 6 Domain Factors of the 6W-WeB in Criterion Variables, in Study 1.

	β	t	SE	R^2
Emotional flourishing				.11
Connecting with others	.09	1.32	.07	
Challenging oneself	.12	1.98*	.06	
Giving to others	.04	0.59	.06	
Engaging in physical activity	.17	3.11**	.05	
Embracing the moment	.00	-0.06	.07	
Caring for oneself	.01	0.17	.06	
Psychological flourishing				.14
Connecting with others	.10	1.62	.06	
Challenging oneself	.12	2.01*	.06	
Giving to others	.04	0.64	.06	
Engaging in physical activity	.20	3.79***	.05	
Embracing the moment	-.05	-0.75	.06	
Caring for oneself	.05	0.76	.06	
Social flourishing				.07
Connecting with others	.04	0.53	.07	
Challenging oneself	.16	2.73**	.06	
Giving to others	-.04	-0.58	.07	
Engaging in physical activity	.20	3.63***	.06	
Embracing the moment	-.11	-1.70.	.07	
Caring for oneself	.01	0.11	.06	

*Note: . $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.*

Table 6 (continued)

Standardised Regression Coefficients and Variance Explained (Adjusted R²) From Multiple Regressions Showing the Unique Variance Explained by the Scale Scores of the 6 Domain Factors of the 6W-WeB in Criterion Variables, in Study 1.

	β	t	SE	R^2
Psychological distress				.17
Connecting with others	-.13	-3.26**	.04	
Challenging oneself	-.09	-2.59**	.04	
Giving to others	.01	0.32	.04	
Engaging in physical activity	-.16	-4.81***	.03	
Embracing the moment	.04	1.01	.04	
Caring for oneself	-.16	-4.35***	.04	

*Note: . $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.*

Known-Groups Validity

To test whether individuals who meet criteria for psychological distress and those who do not would respond differently to the 6W-WeB, I divided the sample into two subgroups based on their scores on the GHQ-12. As mentioned in Chapter 5 (p. 64), the GHQ-12 has been used to determine the presence of psychological distress, where scores above a certain threshold are indicative of individuals likely to meet criteria for a DSM-V diagnosis (Baksheev et al., 2001; Gureje & Obikoya, 1990; Sheppard et al., 2017). In this thesis, a cut-off score of 11/12 was used due to its balance between specificity and sensitivity (Donath, 2001). Therefore, individuals with a score of 11 or below were compared with those who had a score of 12 and over, on their standardised scale scores (i.e., z-scored averages of all items in each subscale) of *behaviour engagement*, *activity importance*, and *activity pressure*. The results from these comparisons are represented visually in Figure 2 through bar plots with 95% confidence intervals. Groups of individuals meeting criteria for high psychological distress tended to have lower mean scores on *behaviour engagement* and *activity importance*, and higher mean scores on *activity pressure*, compared to individuals who did not meet criteria. This suggests that individuals who have lower levels of satisfaction with their behaviour engagement and engage in activity because of autonomous rather than controlled reasons, were also likely to experience high levels of psychological distress.

The two groups were also compared on their scores on the six behaviour domains. As seen from Figure 3, individuals who met criteria for high psychological distress had lower mean scores on each of the six behaviours compared to individuals who did not meet criteria. These results indicate that lower levels of autonomous engagement in each of the six behaviours is associated with a greater likelihood of meeting case criteria. Taken together, these results suggest that the 6W-WeB seems to be distinguishing between individuals who experience psychological distress and those who do not.

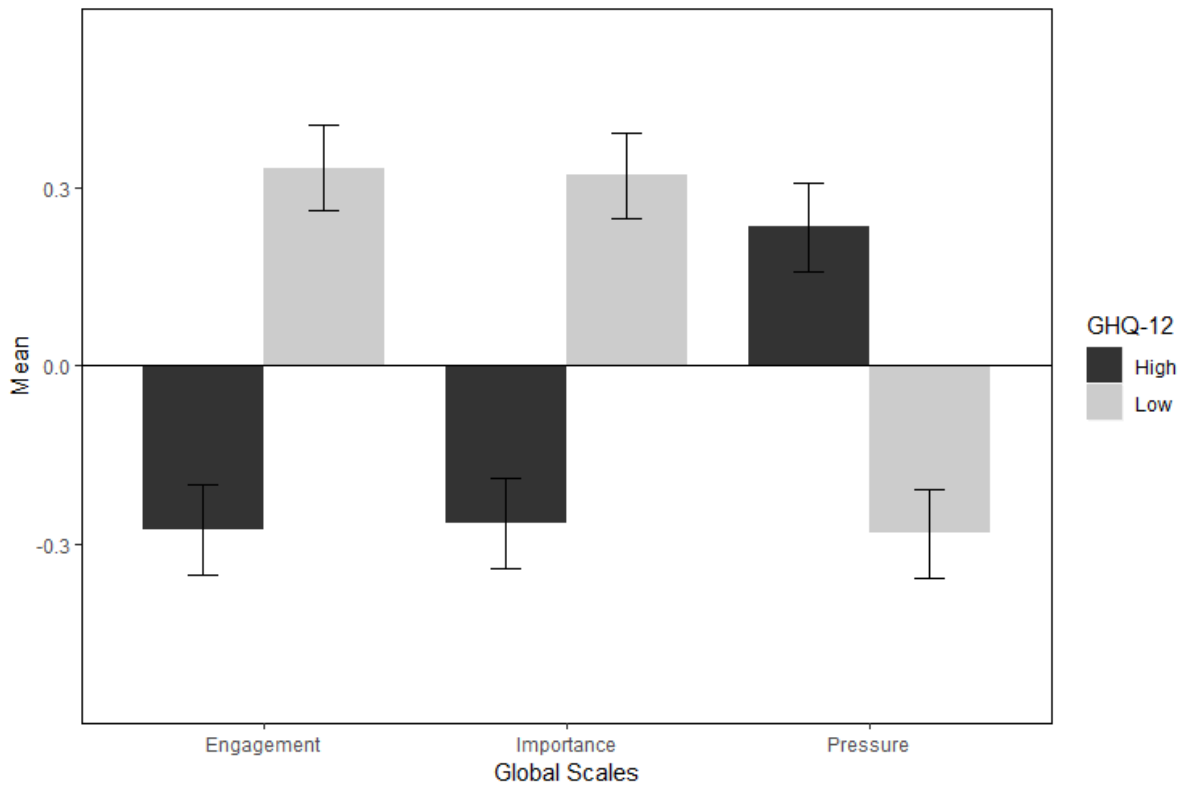


Figure 2. Bar plots comparing mean scores of participant subgroups (using standardised scale scores) who met criteria for high psychological distress ('High' GHQ-12 score) with scores of those who did not ('Low' GHQ-12 score), on the global scales of the 6W-WeB in Study 1.

Note. The error bars represent 95% confidence intervals.

Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

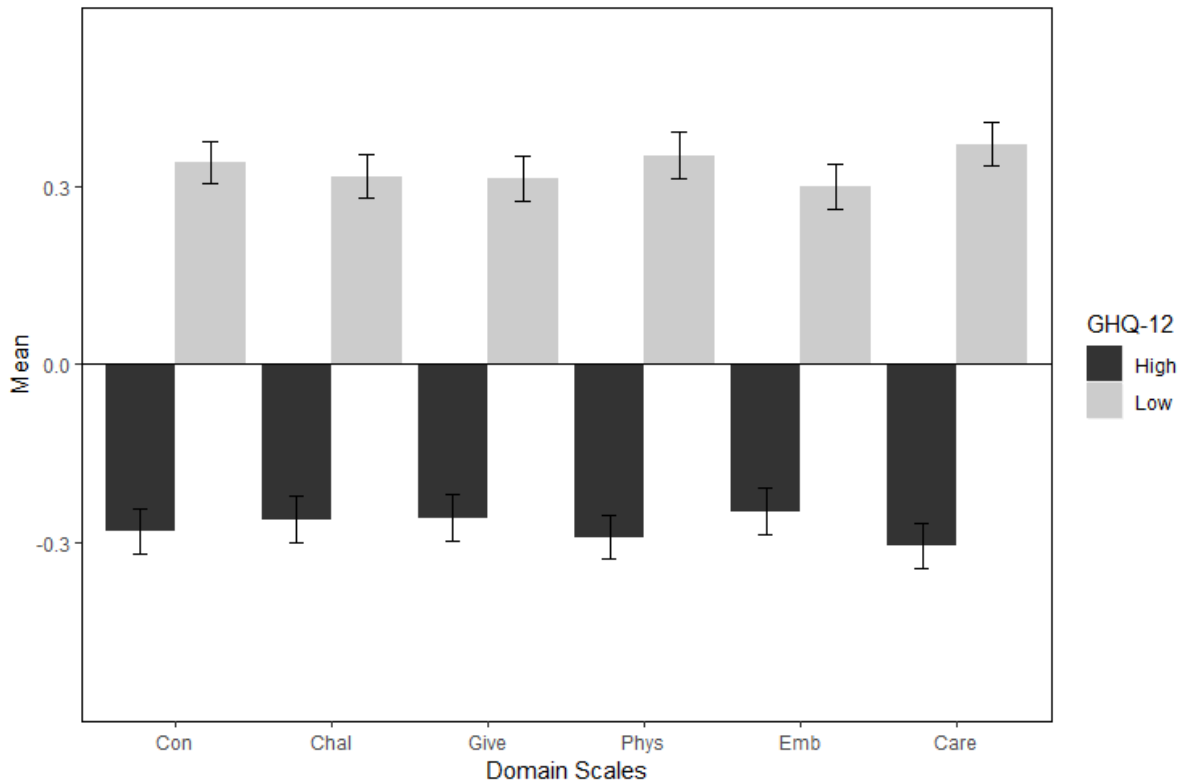


Figure 3. Bar plots comparing mean scores of participant subgroups (using standardised scale scores) who met criteria for high psychological distress ('High' GHQ-12 score) with scores of those who did not ('Low' GHQ-12 score), on the domain subscales of the 6W-WeB in Study 1.

Note. The error bars represent 95% confidence intervals.

Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

Word-Frequency Tabulation

To examine the typical ways in which participants engaged in each of the six behavioural domains, a series of frequency word clouds were constructed following the procedure described in Chapter 5 (p. 64). Other than the stop words previously mentioned in Chapter 5, any words that contained the stem for a particular behaviour were removed. For instance, the word ‘connect’ was removed for *connecting with others*, the words ‘embrace’ and ‘moment’ were removed for *embracing the moment*, and so on. These word clouds are presented in Figures 4 to 9. Each of these word clouds show the top 100 most frequent words reported by participants. From these word clouds, it is apparent that individuals engaged in the six behaviours in generally different ways, i.e., the majority of words reported did not overlap between domains. For *connecting with others*, individuals frequently engaged in interactions with their friends, and seemed to do so over Facebook or by using phones. Individuals engaged in *challenging oneself* behaviours through learning, cooking, reading, or working. Participants seemed to engage in *giving to others* by donating, volunteering, or helping a friend. A majority of participants were *engaging in physical activity* through walking, while some did so by going to the gym, running, or playing. For *embracing the moment*, participants reported that they enjoy, pay attention to, or watch something. Participants engaged in *caring for oneself* activities by eating well, sleeping well, and being healthy.

A word cloud was also constructed for the ‘other’ behaviour category, presented in Figure 10. This word cloud contains less than 100 words, as fewer than 100 words appeared in at least three examples. Participants often reported behaviours already captured by the six behaviour domains, such as ‘care’, ‘family’, ‘give’, ‘read’, and ‘connect’. This supported the 6W-WeB model of six important behaviour domains. However, to explore the behaviours that were not captured by the six ways, I deleted all words that reflected key aspects of the six

behavioural domains. The remaining words are presented in Figure 11. These words were at most reported by 12 participants out of the 1,800 survey respondents, suggesting that the inclusion of behaviour categories specific to any of these examples, such as spirituality, was not warranted. However, the 'other' category enables clinicians to explore the entire spectrum of their clients' valued activities, and was, therefore, retained in the 6W-WeB questionnaire.



Figure 6. The top 100 most frequent words recorded for the two ‘giving to others’ examples in Study 1.



Figure 7. The top 100 most frequent words recorded for the two ‘engaging in physical activity’ examples in Study 1.

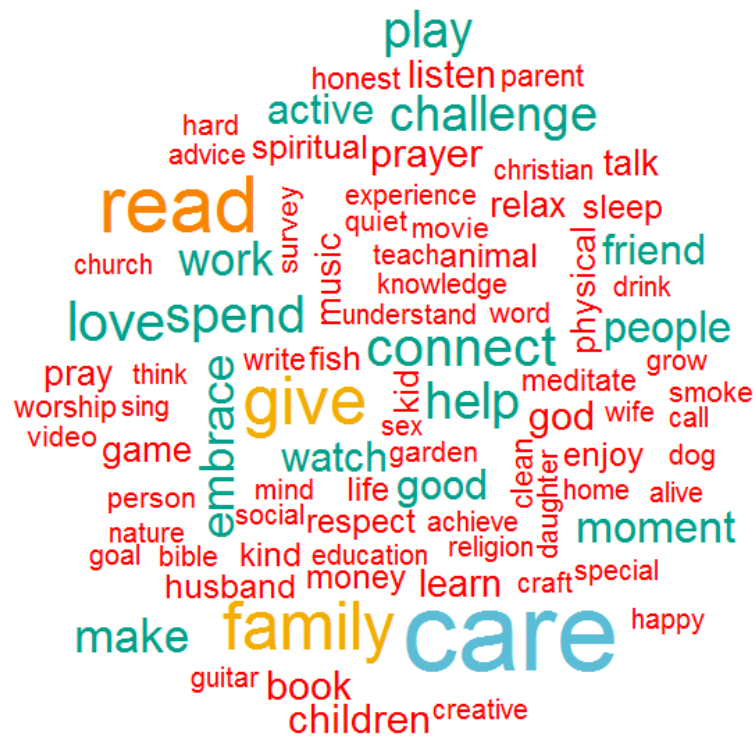


Figure 10. The most frequent words recorded for the ‘other’ example in Study 1.



Figure 11. The most frequent words recorded for the ‘other’ example in Study 1, if not captured by the six behavioural domains.

Discussion

Study 1 was the first validation study for the Six Ways to Well-Being (6W-WeB). First, the results showed that a bifactor model, with the addition of residual covariances between the first and second pressure items within each behaviour domain, fit the data well. The alpha reliability estimates of the 6W-WeB subscales were acceptable. These findings confirm Hypothesis 1, in that the 6W-WeB was best represented by a bifactor model and that this bifactor model performed better than a model with only three global factors or one with only six domain factors. Second, subgroups of males and females, as well as subgroups of young and old participants, responded to the 6W-WeB items similarly. The absolute mean difference between each of the subgroup dyads was negligible, confirming Hypothesis 2. Third, the subscales of the 6W-WeB linked in largely expected ways with theoretically-relevant criterion variables of flourishing, psychological distress, experiential avoidance, and nonattachment. Further, the 6W-WeB explained 23-29% of the variance in the mental health criterion variables, and the domain of *physical activity* was the most consistent predictor of flourishing and psychological distress. Overall, these findings support Hypotheses 3a and 3b. Fourth, findings supported Hypothesis 4, as individuals who met criteria for high psychological distress had lower mean scores on *behaviour engagement*, *activity importance*, and each of the six behaviour domains, and higher mean scores on *activity pressure*. Individuals who did not meet criteria for high psychological distress showed the opposite pattern of 6W-WeB scores. Lastly, the most frequent words reported for each behaviour indicated that the content captured by each of the six domains was distinct, and that the six behaviour domains encapsulated the vast majority of individuals' valued action. These findings support Hypothesis 5.

Overall, the findings from Study 1 show that the 6W-WeB, as measured by a bifactor model, performed as expected. However, it is important to assess the reproducibility of the results from this study. The next chapter presents Study 2, wherein the analyses conducted in Study 1 are replicated in an independent sample. Study 2 also extends on these analyses by assessing the barriers to, and enablers of, valued action.

CHAPTER 7

STUDY 2: REPLICATION AND EXTENSION OF THE 6W-WeB IN AN AUSTRALIAN SAMPLE

Study 1 described the initial validation of the Six Ways to Well-Being in terms of its factor structure, similarity across groups, construct validity, known-groups validity, and word frequency tabulation. When validating new questionnaires, strong conclusions about its reliability and validity cannot be drawn using a single sample. It is, therefore, important to replicate findings in multiple samples to increase confidence in the questionnaire. Study 2 seeks to replicate the analyses conducted in Study 1, to further validate the 6W-WeB in an independent, general population Australian sample. Study 2 further seeks to go beyond the analyses conducted in Study 1, to explore the barriers and enablers that individuals experience when engaging with valued action. As discussed in Chapter 2 (p. 21), questionnaires such as the Bull's Eye Values Scale – II (Lundgren et al., 2012) measure barriers to valued action, but do not do so in addition to a comprehensive assessment of the 'what' and 'why' of valued action. Through an extension of the 6W-WeB questionnaire, I seek to measure factors that prevent and promote engagement in valued action. The aim of Study 2, therefore, is to replicate and extend on the findings of Study 1. The following are my specific research questions and hypotheses for Study 2.

Research Questions and Hypotheses

Research Question 1

Will a bifactor model for the 6W-WeB fit the data well in a second, independent, sample?

Hypothesis 1

Following from the results in Study 1, a bifactor model that captures three global factors of *behaviour engagement*, *activity importance*, and *activity pressure*, as well as six

specific domain factors of *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*, will fit the data well.

Research Question 2

Will the questionnaire perform similarly across subgroups of gender and age?

Hypothesis 2

As found in Study 1, the 6W-WeB as represented by the bifactor model, will perform similarly across subgroups of gender and age.

Research Question 3

How will the subscales of the 6W-WeB relate to criterion variables of well-being and mental health?

Hypothesis 3

Consistent with findings from Study 1, the global factors of *behaviour engagement* and *activity importance* will be positively correlated with flourishing and negatively correlated with psychological distress, while the global factor of *activity pressure* will be negatively correlated with flourishing and positively linked with psychological distress. All six domain factors will be positively correlated with flourishing and negatively correlated with psychological distress.

Research Question 4

Will participants who meet criteria for high psychological distress respond differently to the 6W-WeB, as compared to those who do not meet criteria?

Hypothesis 4

Participants who meet criteria for high psychological distress will show lower levels of *behaviour engagement*, *activity importance*, and higher levels of *activity pressure*,

compared to participants who do not meet criteria. Individuals who meet criteria will also have lower mean scores on the six behavioural domains, as was the case in Study 1.

Research Question 5

Will the typical ways in which participants engage in each of the six behaviours be unique?

Hypothesis 5

As seen in Study 1, the idiographic responses within each of the six ways to well-being will not substantially overlap across the six ways. While some similarities between domains are again expected, the most frequently reported words for each domain will be unique.

The next two research questions are exploratory:

Research Question 6

What are the barriers to engaging in valued action?

Hypothesis 6

Some barriers to valued action would be common across behaviour domains (e.g., physical disability may hinder people in *engaging in physical activity* and *caring for oneself*), while some barriers would be specific to a domain (e.g., social anxiety may get in the way of *connecting with others* but not *challenging oneself*).

Research Question 7

How do each of the six behaviour domains help or hinder engagement in the other behaviour domains?

Hypothesis 7

Physical activity and *giving to others* may help individuals *connect with others* as the two domains often involve social interactions (e.g., team sports, exercise classes, volunteer

work, or caregiving). *Giving to others* may hinder engagement in *self-care* activities, and vice versa, as these behaviour domains both involve caring for someone (either for others or for yourself) and may conflict with each other.

Methods

Participants and Design

Data from 855 respondents from the general population of Australia were purchased from Qualtrics, a professional survey company (information about their recruitment process can be found here:

<https://success.qualtrics.com/rs/qualtrics/images/ESOMAR%2028%202014.pdf>). These

participants had the same age range as the previous sample, i.e., 18-65 ($M = 38.16$, $SD = 13.35$), 47.3% were female and 0.4% reported their gender as 'other'. 74% of the sample

were Caucasian, 15.9% were Asian (including South Asians), 2.7% were Indigenous

Australians or New Zealanders, and 7.4% were from other ethnicities. With respect to annual

household income in Australian dollars, 8.9% of the participants reported earning less than

\$20,000, 17% between \$20,001-\$40,000, 18.9% between \$40,001-\$60,000, 17.5% between

\$60,001-\$80,000, 14.4% between \$80,001-\$100,000, and 23.3% more than \$100,000.

Regarding education, 33.1% of the participants had an education up to high school, 32.3% up

to a college diploma level, and 34.6% up to a graduate degree. The survey company

determines the incentives for participants based on various factors (such as length of survey

and target acquisition difficulty) and incentives may include cash, gift cards, or entries into

sweepstakes. As in the survey from Study 1, the first page of this survey acted as a consent

form. The survey took approximately 20 minutes to complete. Ethics approval for this study

was provided by the Australian Catholic University HREC (Appendix C1).

Measures

Six Ways to Well-Being. As in Study 1, participants answered the Six Ways to Well-Being questionnaire. Again, the order in which the domains were presented was randomised and the ‘other’ category items were presented last.

Barriers and enablers. Participants were given an extended version of the 6W-WeB questionnaire that asked about barriers to, and enablers of, valued action. To assess the barriers to valued action, individuals were asked to report examples of obstacles to engaging in each of the six ways. Each example was to be rated on its frequency of occurrence and the extent to which it could be overcome. Participants were then asked to select the behaviour domains that obstructed valued action in each of the other domains. For instance, to assess barriers to *connecting with others*, participants were asked to select the other behaviour domains (i.e., *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*) that got in the way of them *connecting with others*. They were also asked to select the behaviours that helped them *connect with others*, from the same list. A greater emphasis was placed on barriers than enablers, as it would be clinically useful to work through clients’ difficulties first, before addressing the enablers of valued action. If the clients’ difficulties are hard to overcome, focusing on enablers of valued action without solving their difficulties first may not provide much help to the clients. The barriers and enablers extension to the 6W-WeB is presented in Appendix B.

Flourishing and psychological distress. Participants also completed the flourishing (emotional flourishing $\alpha = .91$; psychological flourishing $\alpha = .84$; social flourishing $\alpha = .89$) and psychological distress ($\alpha = .92$) questionnaires introduced in Study 1. (The MEAQ-30 and NAS-7 were replaced with the barriers and enablers extension, to avoid increasing participant burden.)

Results (Part I - Replication)

The following section describes the results for the replication section of Study 2.

Factor Structure and Reliability

I tested the bifactor CFA model (CFA₃ in Study 1) to examine whether this factor structure of the 6W-WeB replicated in a separate, independent sample. This model showed close to adequate fit: $\chi^2(540) = 1633.88$, $p < .001$, CFI = .91, TLI = .89, RMSEA = .049, 90% CI [.046 .051].

Sources of misspecification. As was done in Study 1, the modification indices of the bifactor CFA model were examined. The top 20 modification indices are presented in Table 7. Similar to the modification indices from Study 1, cross-loadings between the six behavioural domains were not indicated as sources of misspecification. This suggests that these behaviours are, in fact, best represented by six distinct domains. Instead, the misspecifications in the bifactor model were: (i) the residual covariances between the first and second pressure items within each domain, (ii) the residual covariances between the frequency and importance items within each domain, and (iii) the residual covariances between the importance and pressure items within each domain. For the reasons laid out in Chapter 6, only the residual covariances between pressure items within each domain were added to the bifactor model. This adjusted bifactor CFA model (CFA₄ in Study 1) showed good fit in the Australian sample, confirming the factor structure of the 6W-WeB: $\chi^2(534) = 1399.92$, $p < .001$, CFI = .93, TLI = .91, RMSEA = .044, 90% CI [.041 .046]. I used this bifactor model (CFA₄) for all further analyses in Study 2.

Table 7

Top 20 Modification Indices From the 6W-WeB Bifactor Model (CFA₃) in Study 2.

Item ₁	Operation	Item ₂	Scaled modification index
Emb1Pres	~~	Emb2Pres	65.654
Give2Freq	~~	Give2Imp	63.925
Phys2Freq	~~	Phys2Imp	63.309
Chal1Pres	~~	Chal2Pres	59.152
Phys1Freq	~~	Phys1Imp	55.582
Give1Pres	~~	Give2Pres	52.795
Emb1Freq	~~	Emb1Imp	47.276
Phys1Pres	~~	Phys2Pres	41.066
Care1Freq	~~	Care1Imp	39.682
Care2Freq	~~	Care2Imp	38.706
Emb1Freq	~~	Emb2Imp	38.649
Care1Freq	~~	Care2Imp	37.284
Phys2Imp	~~	Phys2Pres	36.191
Phys1Freq	~~	Phys2Imp	34.627
Con2Freq	~~	Con2Imp	32.285
Emb2Freq	~~	Emb1Imp	31.479
Give2Imp	~~	Give1Pres	31.133
Give2Freq	~~	Give1Imp	28.571
Give1Imp	~~	Give1Pres	28.539
Give1Freq	~~	Give1Imp	28.346

Note. The ‘~~’ operation indicates a residual covariance between Item₁ and Item₂.

Reliability. The alpha reliability estimates for the three global and six domain scales of the Six Ways to Well-Being are reported in Table 8. As was done in Study 1, the alpha reliability estimates were calculated for the scale scores of each factor. All subscales of the 6W-WeB showed adequate internal reliability.

Table 8

Alpha Reliability Estimates for Each Subscale of the Six Ways to Well-Being in Study 2.

	α
Behaviour engagement	.90
Activity importance	.89
Activity pressure	.94
Connecting with others	.77
Challenging oneself	.76
Giving to others	.80
Engaging in physical activity	.74
Embracing the moment	.77
Caring for oneself	.75

Similarity Across Groups

To examine the similarity of the 6W-WeB across groups, the same procedure used in Study 1 was utilised with the present Australian sample. Participants were split by gender into a male subgroup (N = 448) and a female (N = 404) subgroup, and by age into a subgroup between 18-41.5 years of age (N = 532) and another subgroup between 41.5-65 years of age (N = 323). The mean absolute difference between males and females for the 6W-WeB inter-correlations was .08, while the mean absolute difference between the young and old subgroups was .06. The correlation matrices for each of these groups is presented in Supplementary Material S3 (Table S 8 and Table S 9). As the mean absolute difference values were small, it can be said that the gender subgroups, as well as the age subgroups, responded to the 6W-WeB in similar ways.

Correlations With Theoretically-Relevant Variables

I conducted zero-order correlations using the scale scores of the 6W-WeB measure and the flourishing and psychological distress measures. These results are presented in Table 9. Showing similar patterns of correlations as in Study 1, *behaviour engagement* had medium positive correlations with all three flourishing subscales and a medium negative correlation with psychological distress. This indicates that individuals who are more satisfied with their engagement in valued actions showed higher levels of flourishing and lower levels of psychological distress. *Activity importance* had medium positive correlations with the emotional and psychological flourishing, a small positive correlation with social flourishing, and a small negative correlation with psychological distress. This may imply that individuals who placed greater importance on their behaviours tend to have higher levels of flourishing and lower levels of psychological distress. *Activity pressure* had small negative correlations with emotional and psychological flourishing, and a small positive correlation with psychological distress. As was the case with the American participants, these correlations could indicate that individuals who engage in action because of felt pressure to do so, tend to show lower levels of emotional and psychological flourishing and greater levels of psychological distress. All six behaviour domains had small to medium positive correlations with the three flourishing subscales, and small to medium negative correlations with psychological distress. These correlations indicate that greater levels of engagement in each of the six behaviour domains is associated with higher levels of well-being.

Table 9

Zero-Order Correlations Between the 6W-WeB Subscales (Using Scale Scores, i.e., Averages of Subscales) and Theoretically Relevant Variables in Study 2.

	Global subscales			Domain subscales					
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.41***	.34***	-.12***	.30***	.30***	.26***	.32***	.24***	.28***
Psych F	.46***	.39***	-.17***	.37***	.35***	.32***	.35***	.30***	.32***
Soc F	.38***	.27***	.05	.20***	.20***	.16***	.27***	.09**	.17***
GHQ-12	-.38***	-.27***	.20***	-.28***	-.33***	-.25***	-.31***	-.26***	-.31***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12.

6W-WeB subscales: Eng = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself

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

Regressions

Structural equation models. I conducted regressions using structural equation models (SEMs), to examine the amount of variance that the overall Six Ways to Well-Being measurement model explains in indices of well-being. The fit indices of these models, as well as the overall variance explained by the Six Ways to Well-Being in each of the variables, are presented in Table 10. All models showed adequate fit. The Six Ways to Well-Being explained 23% to 32% of the variance in flourishing and 21% of the variance in psychological distress. To see the standardised path estimates for each subscale of the 6W-WeB in these models, please see Supplementary Materials S4 (Table S 11).

Table 10

Summary of Goodness of Fit for Models From Structural Equation Models Testing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables, and the Variance Explained by the 6W-WeB in the Criterion Variables, in Study 2.

	χ^2	<i>df</i>	CFI	TLI	RMSEA [90% CI]	<i>R</i> ²
Flourishing						
Emotional	1547.51	633	.93	.92	.041 [.039 .043]	.23
Psychological	1586.92	671	.93	.92	.040 [.038 .042]	.32
Social	1776.31	710	.93	.92	.042 [.040 .044]	.24
Psychological Distress	2414.47	1011	.92	.91	.040 [.038 .042]	.21

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; Flourishing = Keyes' flourishing measure; Psychological Distress = General Health Questionnaire – 12

Multiple regressions. As was done in Chapter 6, I conducted multiple regressions to assess the variance explained by each of the six domain factors in the mental health criterion variables. These regressions used standardised scale scores for the 6W-WeB subscales, as well as for the criterion variables. The results of these regressions are represented in Table 11. *Connecting with others*, *challenging oneself* and *engaging in physical activity* were significant predictors of all flourishing subscales. These three domains, as well as the domain of *embracing the moment*, were significant predictors of social flourishing. Lastly, *challenging oneself*, *engaging in physical activity*, and *caring for oneself* were significant predictors of psychological distress, in that higher engagement in these behaviours predicted lower levels of psychological distress.

Table 11

Standardised Regression Coefficients and Variance Explained (Adjusted R²) From Multiple Regressions Showing the Unique Variance Explained by the Scale Scores of the 6 Domain Factors of the 6W-WeB in Mental Health Variables, in Study 2.

	β	t	SE	R^2
Emotional flourishing				.13
Connecting with others	.14	3.05**	.05	
Challenging oneself	.13	2.97**	.05	
Giving to others	.00	-0.08	.05	
Engaging in physical activity	.17	3.89***	.04	
Embracing the moment	-.05	-1.02	.05	
Caring for oneself	.04	0.86	.05	
Psychological flourishing				.18
Connecting with others	.19	4.08***	.05	
Challenging oneself	.13	3.03**	.04	
Giving to others	.03	0.69	.05	
Engaging in physical activity	.16	3.73***	.04	
Embracing the moment	-.02	-0.33	.05	
Caring for oneself	.02	0.49	.05	
Social flourishing				.09
Connecting with others	.12	2.56*	.05	
Challenging oneself	.11	2.37*	.05	
Giving to others	.00	-0.08	.05	
Engaging in physical activity	.23	5.16***	.04	
Embracing the moment	-.17	-3.41***	.05	
Caring for oneself	.00	0.06	.05	

Note: . $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 11 (continued)

Standardised Regression Coefficients and Variance Explained (Adjusted R²) From Multiple Regressions Showing the Unique Variance Explained by the Scale Scores of the 6 Domain Factors of the 6W-WeB in Mental Health Variables, in Study 2.

	β	t	SE	R^2
Psychological distress				.17
Connecting with others	-.09	-1.81.	.05	
Challenging oneself	-.18	-3.87***	.05	
Giving to others	.03	0.68	.05	
Engaging in physical activity	-.13	-2.90**	.04	
Embracing the moment	.01	0.24	.05	
Caring for oneself	-.10	-2.09*	.05	

*Note: . $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.*

Known-Groups Validity

I compared individuals who met criteria for high psychological distress with those who did not meet criteria, based on their scores on the GHQ-12. Figure 12 and Figure 13 visually represent the results of these comparisons through bar plots with 95% confidence intervals. These figures show a similar pattern to the results in Study 1. Individuals who met criteria for high psychological distress had lower mean scores on *behaviour engagement* and *activity importance*, and higher mean scores on *activity pressure*, compared to those who did not meet criteria. Further, individuals who met criteria also had lower mean scores on each of the six behaviours. When taken together with the results from Study 1, these results show that the 6W-WeB may be able to differentiate between individuals experiencing psychological distress and those who do not.

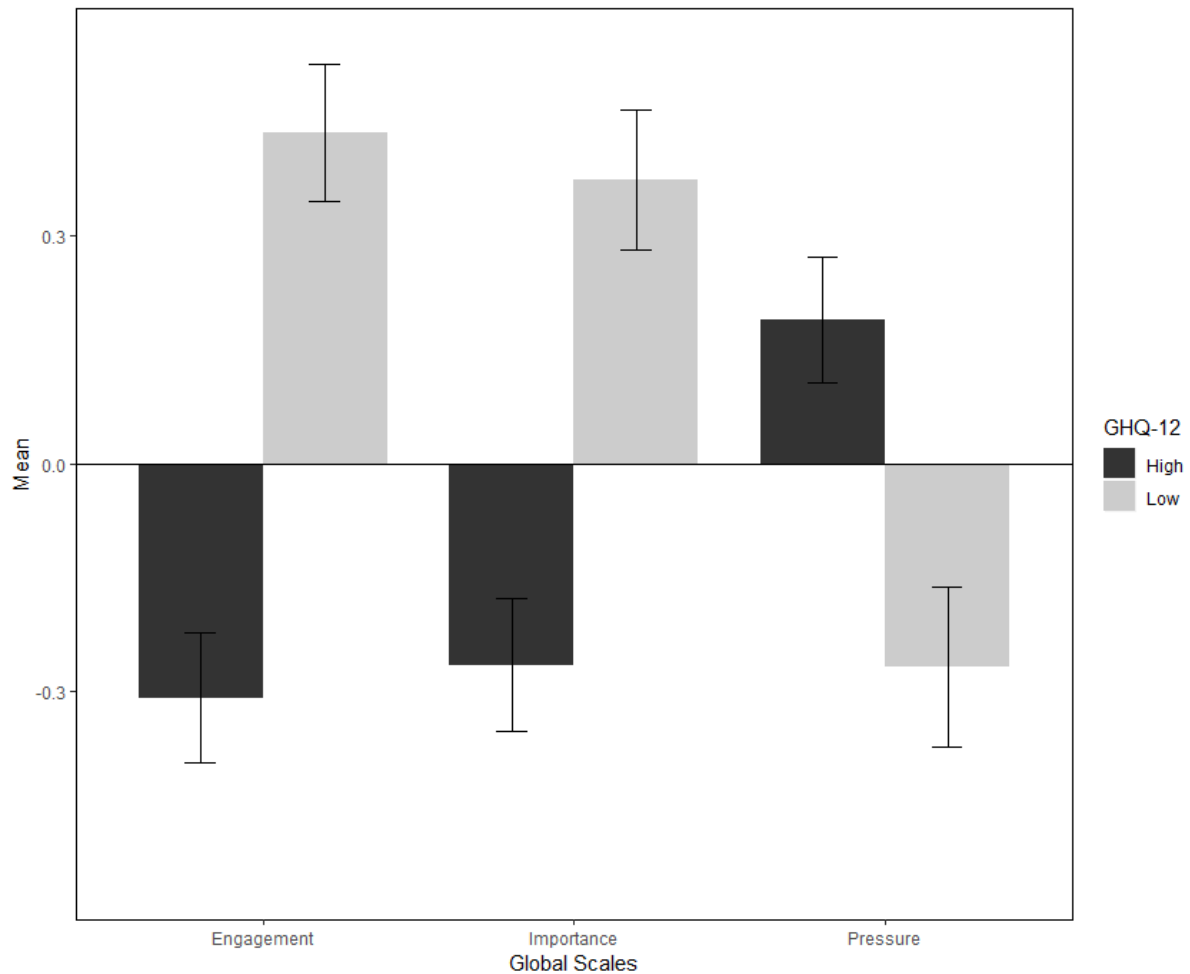


Figure 12. Bar plots comparing mean scores of participant subgroups (using standardised scale scores) who met criteria for high psychological distress ('High' GHQ-12 score) with scores of those who did not ('Low' GHQ-12 score), on the global scales of the 6W-WeB in Study 2.

Note. The error bars represent 95% confidence intervals.

Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

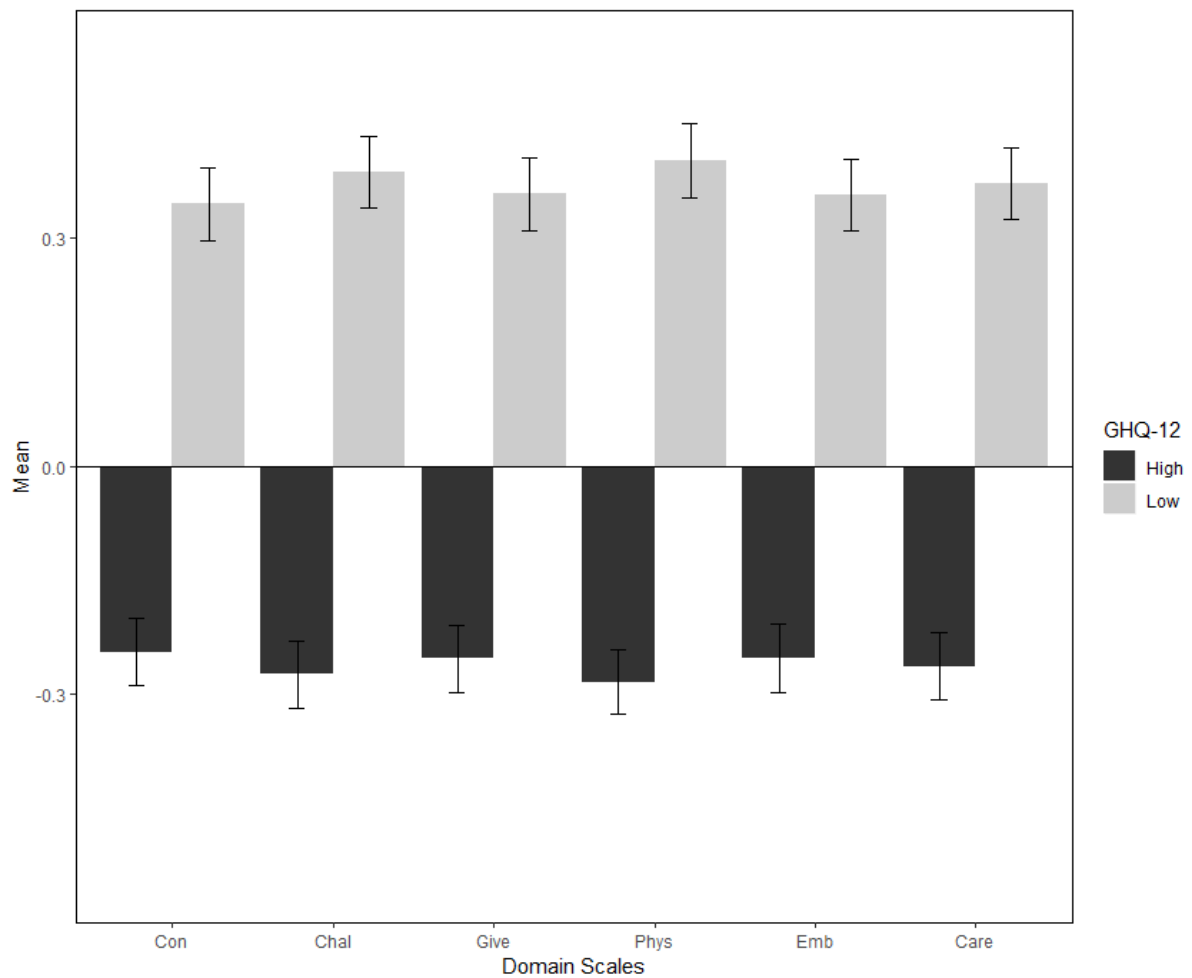


Figure 13. Bar plots comparing mean scores of participant subgroups (using standardised scale scores) who met criteria for high psychological distress ('High' GHQ-12 score) with scores of those who did not ('Low' GHQ-12 score), on the domain subscales of the 6W-WeB in Study 2.

Note. The error bars represent 95% confidence intervals.

Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

Word-Frequency Tabulation

To examine the common ways in which participants engaged in the six behaviour domains, a series of frequency word clouds were constructed using the same methodology employed in Study 1. These word clouds are presented in Figures 14 to 19. As observed from these word clouds, the majority of behaviours reported by participants did not overlap between domains, indicating that the six behaviour categories may indeed be distinct.

The behaviours reported by participants within each behaviour in this study, while similar to those reported in Study 1, seemed more diverse. For *connecting with others*, individuals frequently engaged in interactions with their friends and family and did so through conversations, social media, by using phones, and over Facebook. Individuals engaged in *challenging oneself* behaviours through learning, cooking, and working. Participants seemed to engage in *giving to others* by donating, volunteering, helping others, and giving money to charities. A majority of participants were *engaging in physical activity* through walking, going to the gym, running, and playing. For *embracing the moment*, participants reported that they enjoy the moment, watch something, and pay attention. Participants engaged in *caring for oneself* activities by eating well, sleeping well, maintaining a healthy diet, and relaxing.

I also constructed a word cloud for the 'other' category, presented in Figure 20. For this category, participants most frequently reported words such as 'care', 'connect', 'challenge', 'play', 'friend', 'active', and 'game'. As these words were already captured by the six behavioural domains, this overlap lent support to the 6W-WeB model. In order to explore the behaviours that were not captured by the six ways, I deleted all words that reflected key aspects of the six behavioural domains. The remaining words are presented in Figure 21. The word shown in this word cloud were at most reported by 8 participants out of

the 855 survey respondents, suggesting that the inclusion of behaviour categories based on these examples (such as spirituality or relationships with animals), was not warranted.

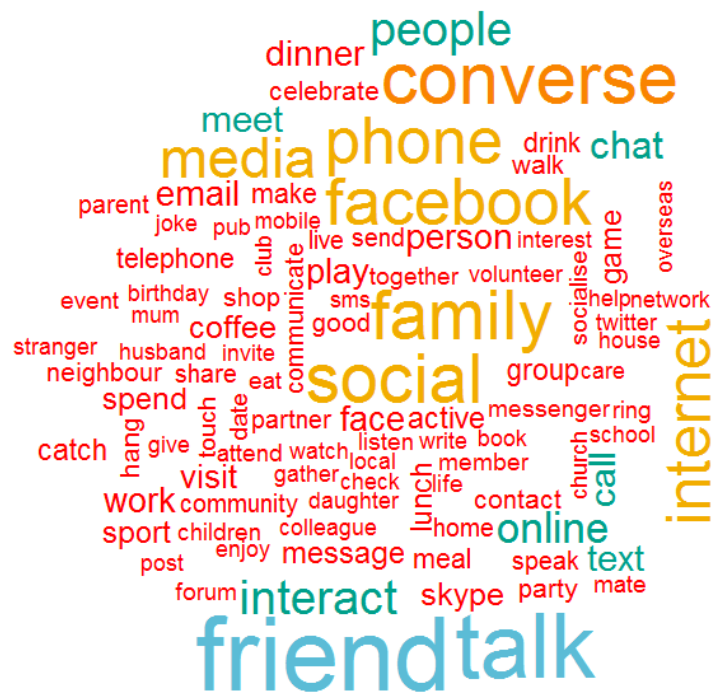


Figure 14. The top 100 most frequent words recorded for the two ‘connecting with others’ examples in Study 2.

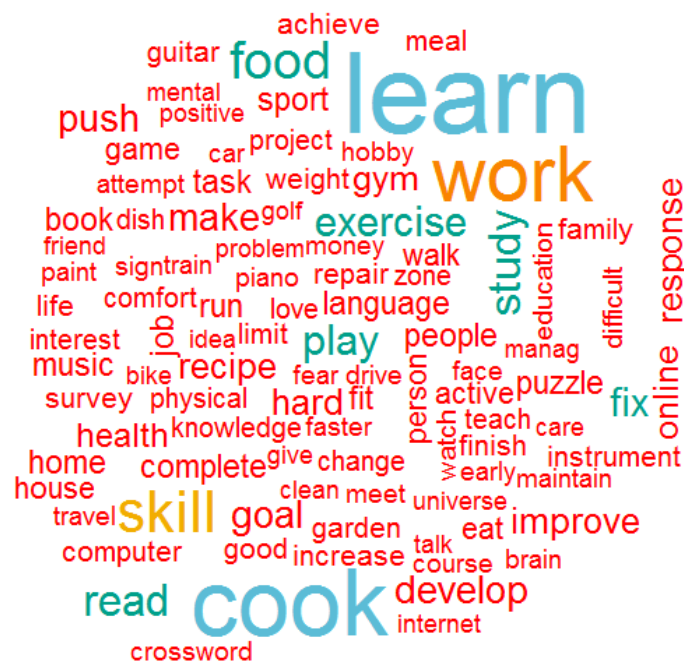


Figure 15. The top 100 most frequent words recorded for the two ‘challenging oneself’ examples in Study 2.



Figure 18. The top 100 most frequent words recorded for the two 'embracing the moment' examples in Study 2

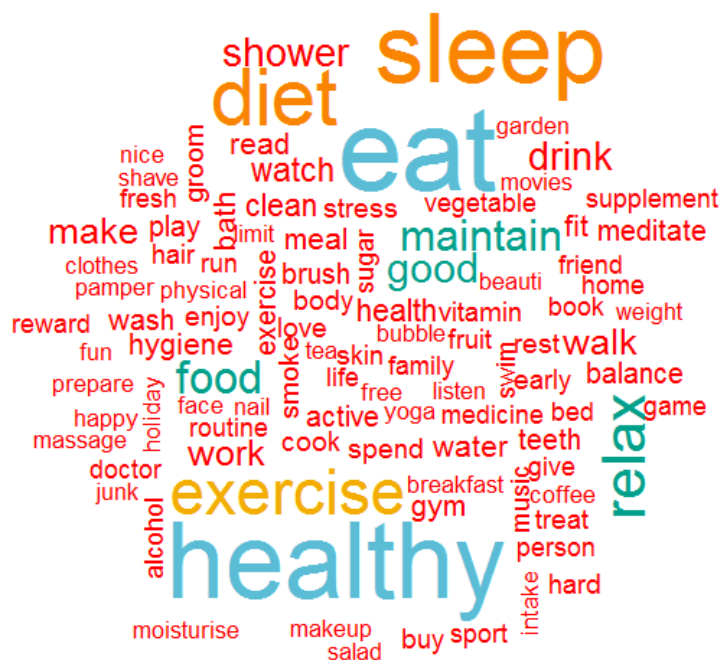


Figure 19. The top 100 most frequent words recorded for the two 'caring for oneself' examples in Study 2.



Figure 20. The most frequent words recorded for the ‘Other’ example in Study 2.



Figure 21. The most frequent words recorded for the ‘Other’ example in Study 2, if not captured by the six behavioural domains.

Part II – Extension

The following section describes the results for the extension part of Study 2.

Description of Barriers

In order to explore the barriers to valued action, I constructed another set of word clouds. In addition to the stop words and stem words deleted from previous word clouds, words that were not informative about barriers to valued action were removed. This list of words is presented in Supplementary Materials S2. The word clouds for barriers to valued action contain less than 100 words, as fewer than 100 words were reported in at least three examples.

Figures 22-27 represent the most frequently mentioned barriers for each of the six ways. Interestingly, the barrier reported the most for all six behaviours was ‘time’, suggesting that individuals may not perceive that they have enough time to engage in activities that are important to them. Other barriers include: anxiety, shyness, and being busy for *connecting with others*; a lack of motivation and confidence for *challenging oneself*; a lack of money for *giving to others*; laziness, a lack of motivation, injury, and health for *engaging in physical activity*; distraction, depression, stress, and worry for *embracing the moment*; and a lack of money for *caring for oneself*. These word clouds show that while the barrier of ‘time’ was reported for all domains, participants reported barriers that were specific to each domain as well.



Figure 22. The top most frequently reported barriers to 'connecting with others'.

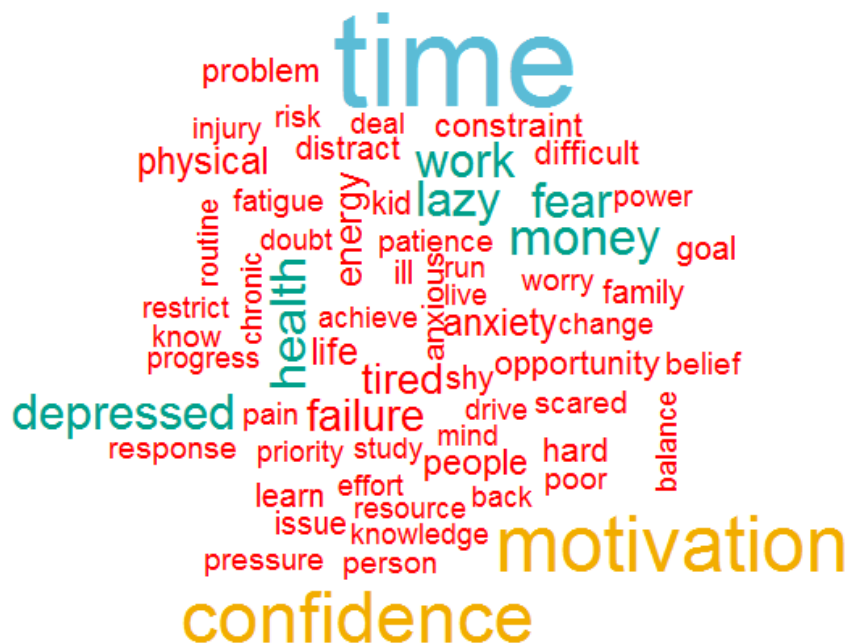


Figure 23. The top most frequently reported barriers to 'challenging oneself'.



Figure 24. The top most frequently reported barriers to 'giving to others'.



Figure 25. The top most frequently reported barriers to 'engaging in physical activity'.

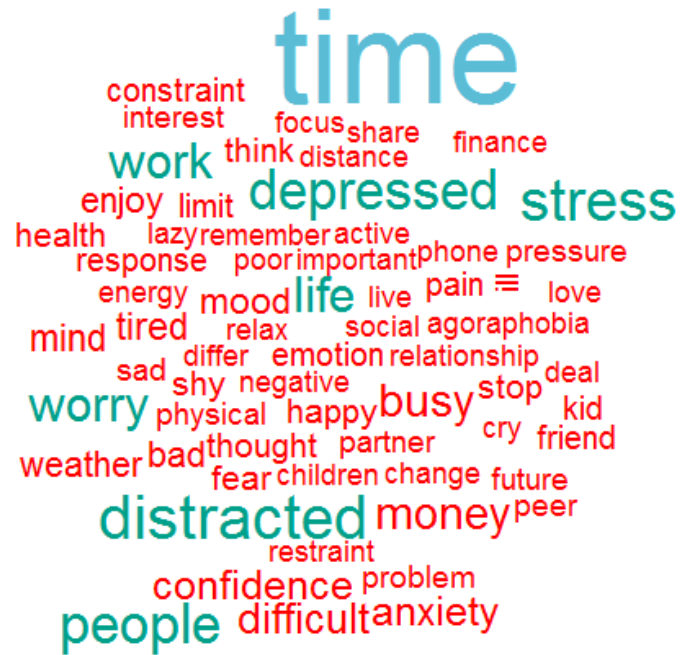


Figure 26. The top most frequently reported barriers to 'embracing the moment'.



Figure 27. The top most frequently reported barriers to 'caring for oneself'.

Ratings of Barriers

As can be seen from Table 12, the ratings for items assessing the frequency of barrier occurrence were similar across all behaviours, although *engaging in physical activity* had a slightly higher mean rating while *embracing the moment* had a slightly lower mean rating. This suggests that participants may encounter more persistent barriers to *engaging in physical activity* while the barriers to *embracing the moment* occur less often. Similarly, all behaviours had comparable ratings for the items assessing ability to overcome barriers, although *embracing the moment* and *caring for oneself* had higher mean ratings and *engaging in physical activity* had a lower mean rating. This may indicate that participants feel more able to overcome the barriers encountered when attempting to engage in activities associated with *embracing the moment* and *caring for oneself*, while they may feel less able to overcome barriers associated with *engaging in physical activity*.

Table 12

Means and Standard Deviations for the Frequency of Barrier Occurrence and the Ability to Overcome Barrier, for Each of the Six Domain Behaviours in Study 2.

Frequency of barrier occurrence	mean	<i>sd</i>	Ability to overcome barrier	mean	<i>sd</i>
Connecting with others	3.14	1.40	Connecting with others	2.85	1.12
Challenging oneself	3.13	1.40	Challenging oneself	2.90	1.11
Giving to others	3.08	1.43	Giving to others	2.86	1.16
Engaging in physical activity	3.19	1.34	Engaging in physical activity	2.79	1.14
Embracing the moment	3.00	1.44	Embracing the moment	2.95	1.16
Caring for oneself	3.05	1.39	Caring for oneself	2.95	1.17

Note. Items for ‘frequency of barrier occurrence’ were rated on a Likert scale from 1 (*never*) to 5 (*always*), while the items for ‘ability to overcome barrier’ were rated on a Likert scale from 1 (*not at all able to overcome*) to 5 (*completely able to overcome*).

Correlations

To assess the correlations of items associated with barriers to valued action with the criterion variables, two sets of scale scores were created. For the '*frequency of barrier occurrence*' scale, the average of all six items assessing the frequency with which barriers occurred was calculated. For the '*ability to overcome barriers*' scale, I calculated the average of items assessing the extent to which an individual felt able to overcome barriers. These two scale scores had a medium negative correlation, $r(700) = -.46, p < .001$. Further, I compared these two scores to the three global scales of the 6W-WeB (using their scale scores) and to the criterion variables of flourishing and mental health. These correlations are presented in Table 13.

Frequency of barrier occurrence had a medium negative correlation with *behaviour engagement*, a small negative correlation with *activity importance*, and a small positive correlation with *activity pressure*. These correlations may indicate that individuals who experience more frequent barriers to engagement in valued action also had lower levels of satisfaction with engagement in the six behaviours, placed less importance on the six behaviours, and felt more pressure to engage in the six behaviours. *Ability to overcome barriers* had medium positive correlations with *behaviour engagement* and *activity importance*, and a small negative correlation with *activity pressure*. This pattern of correlations indicates that individuals with a greater perceived ability to overcome their barriers to valued action, had greater satisfaction with engagement in the six behaviours, placed more importance on valued action, and felt less pressure to engage in the six behaviours.

With regard to mental health, *frequency of barrier occurrence* had medium negative correlations with the three flourishing subscales and a medium positive correlation with

psychological distress, indicating that individuals who experience barriers to engagement in valued action more often had lower levels of emotional, psychological, and social flourishing and higher levels of psychological distress. *Ability to overcome barriers* had medium positive correlations with the three flourishing subscales and a medium negative correlation with psychological distress, implying that individuals who have a greater felt ability to overcome their barriers to valued action, had higher levels of emotional, psychological, and social flourishing and lower levels of psychological distress.

Table 13

Correlations Between 'Frequency of Barrier Occurrence' and 'Ability to Overcome Barrier' Scores With the Scale Scores of the Three 6W-WeB Global Scales and Mental Health Variables, In Study 2.

	Frequency of barrier occurrence	Ability to overcome barriers
6W-WeB		
Behaviour engagement	-.31***	.37***
Activity importance	-.21***	.30***
Activity pressure	.18***	-.14**
Flourishing		
Emotional	-.32***	.48***
Psychological	-.30***	.44***
Social	-.30***	.45***
Psychological distress	.39***	-.46***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

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

Groups of Barriers

Figure 28 shows the behaviour domains that act as barriers to engagement in each of the other behaviour domains. This graph comprises of 6 facets – one each for the six behaviours. Each facet represents the frequency with which the behaviour domains get in the way of engaging in a particular behaviour. For instance, the first facet represents *connecting with others*. Here, the bars represent the frequency with which participants reported that the other five behaviours – namely *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself* – get in the way of them engaging in the domain of *connecting with others*. Participants were allowed to choose as many of these behaviours as they wanted.

From this graph, it is apparent that *caring for oneself* was reported most often as a barrier to *connecting with others*, while *giving to others* was reported the least often. *Connecting with others*, *giving to others*, and *caring for oneself* all seemed to get in the way of participants engaging in activities associated with *challenging oneself*, while *embracing the moment* got in the way the least for engaging in this domain. *Caring for oneself* most frequently got in the way of *giving to others*, while *challenging oneself* and *embracing the moment* were rated as barriers for this domain the least often. For *engaging in physical activity*, *challenging oneself* was the most frequently rated barrier, while *embracing the moment* seemed to get in the way the least. An almost equal number of participants reported each behaviour as barriers to engaging in *embracing the moment*. Lastly, *challenging oneself* was rated most often as a barrier to *caring for oneself*, while *engaging in physical activity* was rated as a barrier for this domain the least.

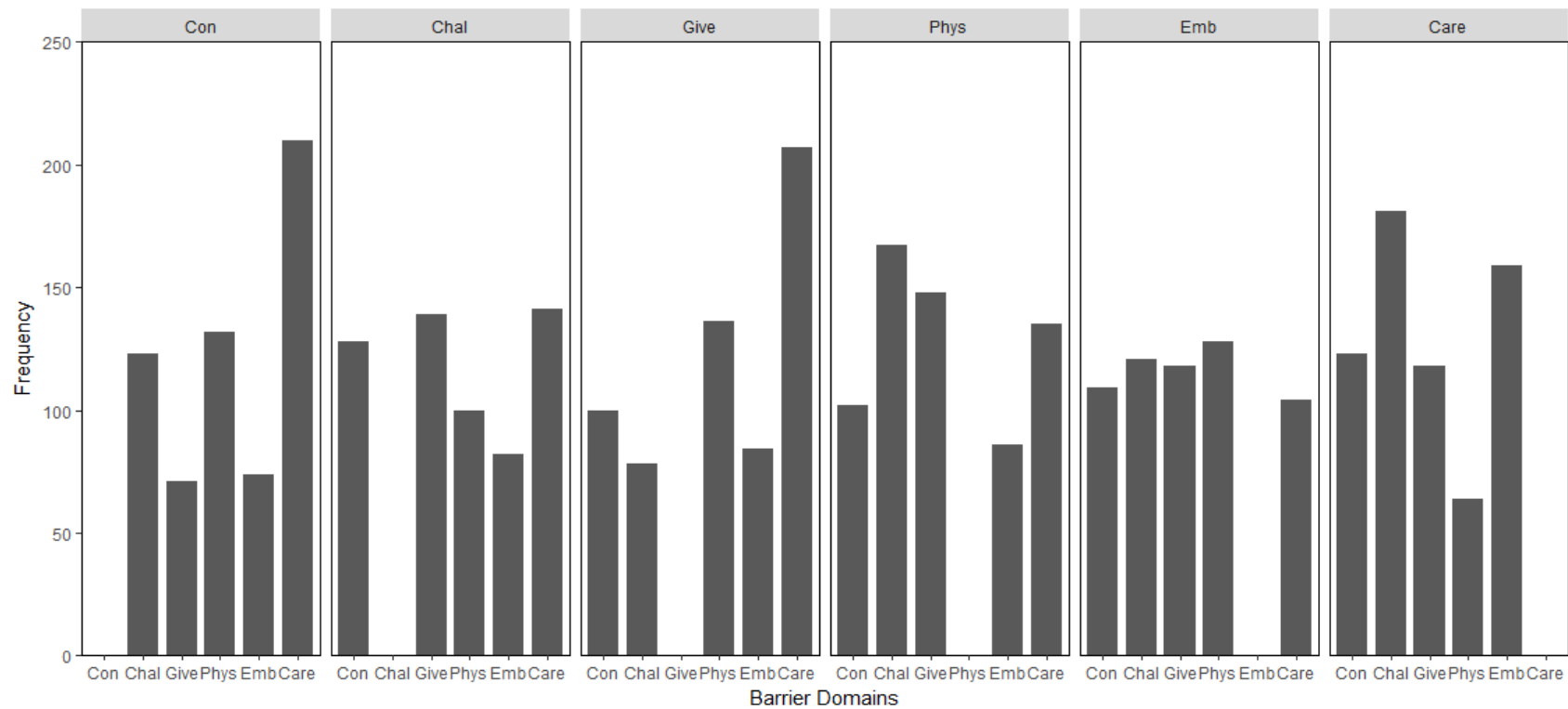


Figure 28. Histograms showing the frequency with which individuals reported the six behaviours acting as barriers to engagement in each other. Each facet shows how many individuals reported the other 5 behaviours getting in the way of their engagement in the behaviour (labelled at the top of that facet).

Note. Con = connecting with others; Chal = challenging oneself, Give = giving to others, Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

Groups of Enablers

Similar to the barrier groupings, Figure 29 shows the behaviour domains that enable engagement in each of the other behaviours. This graph also comprises of 6 facets – one for each of the six behaviours. Each facet represents the frequency with which behaviour domains help participants engage in that behaviour. For instance, the first facet represents *connecting with others* and the bars represent the frequency with which participants reported that the other five behaviours – namely *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself* – help them engage in the domain of *connecting with others*. Again, participants were allowed to select as many behaviours as they wanted.

From this graph, it is apparent that *giving to others* was reported most often by participants as a domain that helps them in *connecting with others*, while *caring for oneself* was reported the least often. *Engaging in physical activity* was most frequently reported as helping participants engage in *challenging oneself*, while *giving to others* was reported the least. *Connecting with others* seemed to help *giving to others* the most, while *engaging in physical activity* seemed to help *giving to others* the least. For *engaging in physical activity*, *connecting with others* was reported the most often as a behaviour that helps, while *challenging oneself* was reported the least frequently. For *embracing the moment*, *engaging in physical activity* was reported as being helpful the most often, while *giving to others* was reported the least often. Lastly, *giving to others* was reported most often as helping engagement in *caring for oneself*, while *challenging oneself* was reported the least often.

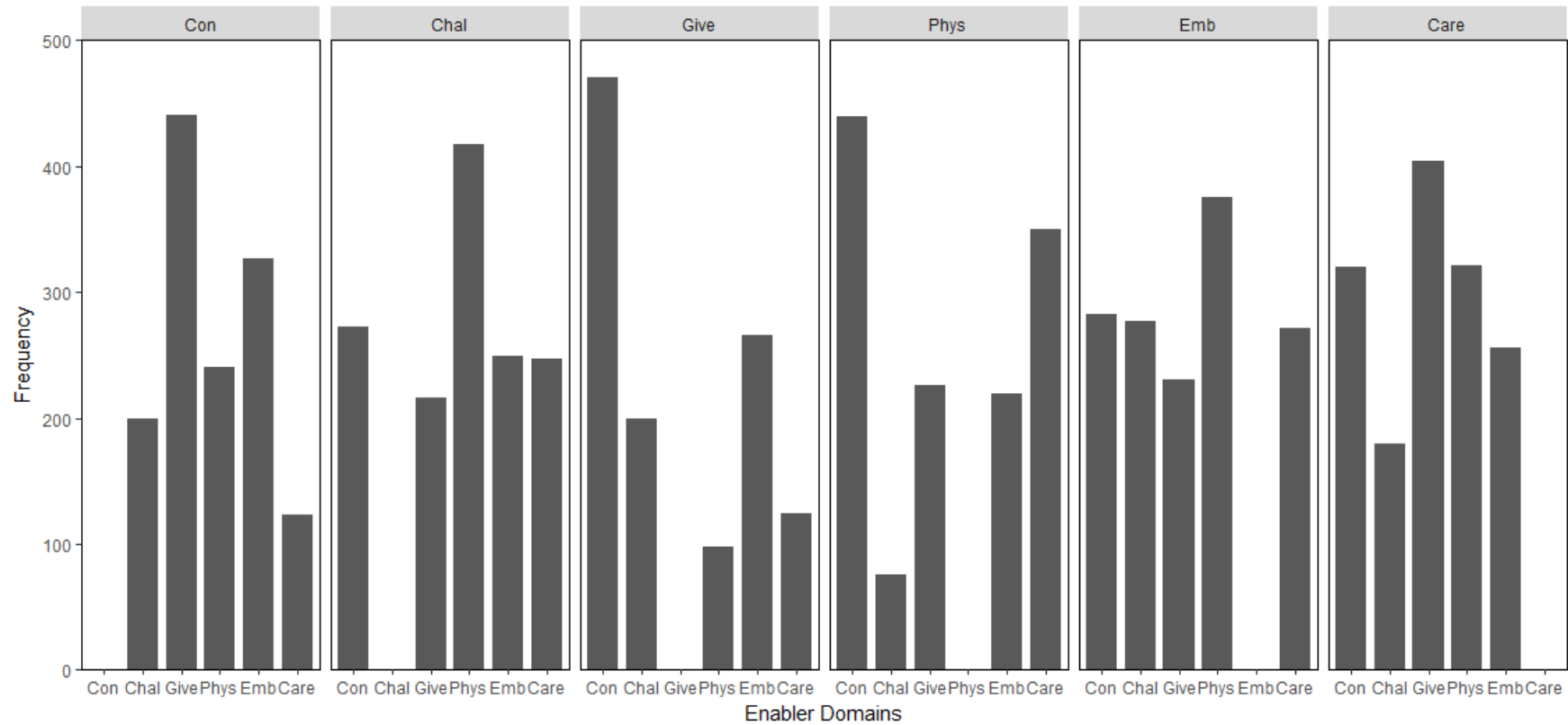


Figure 29. Histograms showing the frequency with which individuals reported the six behaviours enabling engagement in each other. Each facet shows how many individuals reported the other 5 behaviours enabling their engagement in the behaviour (labelled at the top of that facet).

Note. Con = connecting with others; Chal = challenging oneself, Give = giving to others, Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

Discussion

Study 2 presented a replication of, and an extension to, the analyses presented in Study 1. With regard to the replication section of this study, first, the results showed that a bifactor CFA model with the addition of the same residual covariances used in Study 1, showed a good fit to the data in an independent sample. The alpha reliability estimates of the 6W-WeB were again acceptable. Altogether, the findings of this study confirmed Hypothesis 1. Second, participants from both male and female subgroups, and both young and old subgroups, responded to the 6W-WeB in similar ways. Hypothesis 2 was confirmed, as the absolute mean difference between each of the subgroup dyads was negligible. Third, the pattern of correlations of the 6W-WeB subscales with flourishing and psychological distress largely confirmed Hypothesis 3. The 6W-WeB also explained 21%-32% of the variance in mental health variables, and the domain of *physical activity* was again the most consistent predictor of flourishing and mental health. Fourth, Hypothesis 4 was largely confirmed, as individuals who met criteria for high psychological distress had lower mean scores on *behaviour engagement*, *activity importance*, and higher mean scores on *activity pressure*, compared to individuals who did not meet criteria. Further, individuals who met criteria also showed lower mean scores for all behaviour domains. These findings suggest that the 6W-WeB may be able to differentiate between individuals who experience high psychological distress and those who do not. Finally, the most frequent words reported for each behaviour indicated that the content captured by each of the six domains was distinct, and that the six behaviour domains captured the vast majority of individuals' valued action. These findings support Hypothesis 5.

Study 2 expanded on the results from Study 1, by exploring the barriers to, and enablers of, valued action. This section of the study was largely exploratory. 'Time' was consistently reported as a barrier to valued action for all six behaviour domains, indicating

that individuals' may perceive the lack of time to be an obstacle to valued action in general, regardless of the domain. Further, specific obstacles were also reported for each behaviour. Together, these two findings support Hypothesis 6. In terms of the ways in which each domain helped or hindered engagement in the other domains of activity, *caring for oneself* emerged as the most frequent barrier to *giving to others* and *connecting with others*. This may indicate that individuals perceive self-care activities as selfish, perhaps because such activities may require people to take time out of their schedules for themselves. However, *giving to others* was reported as helping one engage in *caring for oneself* activities perhaps indicating that engaging in helpful behaviours may make people feel better themselves. *Connecting with others* emerged as an enabler to valued action in the domains of *giving to others* and *engaging in physical activity*. While meaningful, these findings were contrary to those mentioned in Hypothesis 7, an exploratory hypothesis.

Overall, Study 2 showed that the 6W-WeB may be a valid and reliable measure of valued action and explored the factors that promote and prevent engagement in valued action. However, Studies 1 and 2 focused largely on adult samples. To enable the use of the 6W-WeB with a broad range of individuals, it is important to validate the measure in samples with different demographic characteristics. The next chapter presents Study 3, a validation study with two adolescent samples.

CHAPTER 8

STUDY 3: REPLICATION AND EXTENSION OF THE 6W-WeB IN ADOLESCENTS

Chapters 6 and 7 explored the factor structure, reliability, and validity of the Six Ways to Well-Being (6W-WeB) questionnaire in American and Australian samples. The two studies showed that the bifactor structure of the 6W-WeB fits the data well in both samples. Further, the subscales of the 6W-WeB link in expected ways to theoretically-relevant criterion variables and explain a substantial proportion of variance in these measures. Study 2 also explored the barriers and enablers associated with engaging in the six domains of valued action. Both the above samples, however, consisted of adults, so the results presented so far do not speak to how younger individuals might respond to the 6W-WeB.

Some of the past literature discussed in Chapters 3 and 4 in this thesis, regarding the importance of the six domains of valued action, as well as the implications of the type of motivation to engage in these behaviours, employed samples of adolescents and young adults (e.g., Bailly et al., 2004; McMahon et al., 2017; McPhie & Rawana, 2015; Vansteenkiste et al., 2005; Wink & Dillon, 2002). Further, as mentioned in Chapter 5, the 6W-WeB can be understood by 6th grade students as it has a Flesch-Kincaid Grade Level index of 6.1. It is therefore expected that the 6W-WeB would perform in similar ways in samples with young people, to what was seen in Studies 1 and 2. The aim of the studies presented in the current chapter is to test the validity of the 6W-WeB in adolescent samples. The current chapter presents the validation of the 6W-WeB in two adolescent samples – first in a sample of adolescent females from a private school in Australia, and then in a sample of adolescents from the general Australian population.

STUDY 3A: FACTOR STRUCTURE AND CONSTRUCT VALIDITY IN AN ADOLESCENT SAMPLE.

In Study 3A, I examine the factor structure and construct validity of the 6W-WeB and explore the typical ways in which Australian adolescents engage in each of the six ways to well-being. The following are my research questions and hypotheses specific to Study 3A.

Research Questions and Hypotheses

Research Question 1

Would the bifactor structure of the 6W-WeB fit the data well in an independent, adolescent sample?

Hypothesis 1

As seen in Studies 1 and 2, a bifactor model that captures three global factors of *behaviour engagement*, *activity importance*, and *activity pressure*, as well as six specific domain factors of *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*, will fit the data well in an adolescent sample.

Research Question 2

How will the subscales of the 6W-WeB relate to the three flourishing domains?

Hypothesis 2

Consistent with findings from Studies 1 and 2, I expect the global factors of *behaviour engagement* and *activity importance* to be positively correlated with flourishing, while the global factor of *activity pressure* will be negatively related with flourishing. All six domain factors will be positively correlated with flourishing.

Research Question 3

Will the typical ways in which participants engage in each of the six behaviours be different?

Hypothesis 3

Following on from the findings in Studies 1 and 2, the idiographic responses within each of the six ways will not substantially overlap across domains. While some similarities between domains are expected, the most frequently reported words for each domain will be unique.

Methods

Participants and Design

Data were gathered from a convenience sample consisting of 518 respondents from an all-girls private school in Sydney, Australia. These adolescents were in grades 7-11, with an age range of 12-17 ($M = 14.29$, $SD = 1.46$). Parents of all participants were given an information sheet as well as a consent sheet. All participants were given an information sheet, and the first page of the survey acted as the consent form. The survey took approximately 30 minutes to complete. Ethics approval for this study was provided by the Australian Catholic University HREC (Appendix C2).

Measures

All participants completed the Six Ways to Well-Being questionnaire as well as the flourishing questionnaire (emotional flourishing $\alpha = .87$; psychological flourishing $\alpha = .79$; social flourishing $\alpha = .84$). As the sample used in this study was a convenience sample, I could not include the GHQ-12 because of the battery length restrictions set by the school.

Results

Factor Structure and Reliability

Factor structure and modification indices. I tested the bifactor CFA model of the 6W-WeB, which showed close to adequate fit: $\chi^2(540) = 1134.58, p < .001, CFI = .90, TLI = .88, RMSEA = .046, 90\% CI [.043 .049]$. I then examined the modification indices from this bifactor model, which are presented in Table 14. Similar to the modification indices observed in Studies 1 and 2, cross-loadings between the six behavioural domains were not indicated as sources of misspecification. This suggests that these behaviours may, in fact, be best represented by six distinct domains. The misspecifications observed were as follows: (i) the residual covariances between the first and second pressure items within each domain; (ii) the residual covariances between the frequency and importance items within each domain; (iii) the residual covariances between the importance and pressure items within each domain, and; (iv) the item assessing pressure felt for engaging in the second physical activity example should load on the *activity importance* factor. However, as (iv) occurred only for one item of the 6W-WeB, it was not enough reason to include this modification index to the bifactor model. Further, for the reasons laid out in Chapter 6, only the residual covariances between pressure items within each domain were added to the bifactor model. This adjusted bifactor CFA model again showed adequate fit: $\chi^2(534) = 1034.44, p < .001, CFI = .91, TLI = .90, RMSEA = .043, 90\% CI [.039 .046]$. Therefore, I used this bifactor CFA model (CFA₄) for all further analyses in Study 3A.

Table 14

Top 20 Modification Indices From the 6W-WeB Bifactor Model (CFA₃) in Study 3A.

Item ₁ /Factor ₁	Operation	Item ₂	Scaled modification index
Emb1Pres	~~	Emb2Pres	63.49
Chal2Freq	~~	Chal2Imp	48.29
Give1Imp	~~	Give2Pres	44.81
Give2Imp	~~	Give2Pres	44.79
Give2Imp	~~	Give1Pres	28.87
Chal2Imp	~~	Chal2Pres	27.98
Emb1Freq	~~	Emb1Imp	27.73
Chal2Imp	~~	Chal1Pres	23.54
Care2Freq	~~	Care2Imp	23.01
Phys2Imp	~~	Phys2Pres	21.86
Chal1Imp	~~	Chal2Pres	21.28
Give1Freq	~~	Give2Imp	20.98
Care2Imp	~~	Care2Pres	19.26
Chal1Imp	~~	Chal1Pres	19.18
Emb1Imp	~~	Emb2Pres	18.59
Con2Imp	~~	Con1Pres	17.94
Phys1Pres	~~	Phys2Pres	17.83
Give1Imp	~~	Give1Pres	15.81
Chal2Freq	~~	Chal1Pres	15.13
Importance	=~	Phys2Pres	14.97

Note. The ‘~~’ operation indicates a residual covariance between Item₁ and Item₂, while the ‘=~’ operation indicates that Item₂ should load onto Factor₁.

Reliability. The alpha reliability estimates for the subscales of the Six Ways to Well-Being are reported in Table 15. As was done in Studies 1 and 2, the alpha reliability estimates were calculated using the scale scores of each factor. All subscales again showed adequate internal consistency.

Table 15

Alpha Reliability Estimates for Each Subscale of the Six Ways to Well-Being in Study 3A.

	α
Behaviour engagement	.85
Activity importance	.86
Activity pressure	.91
Connecting with others	.82
Challenging oneself	.79
Giving to others	.79
Engaging in physical activity	.75
Embracing the moment	.81
Caring for oneself	.73

Correlations With Theoretically-Relevant Variables

As in Studies 1 and 2, I conducted zero-order correlations using the scale scores of the 6W-WeB measure and the flourishing questionnaire. These results are presented in Table 16. *Behaviour engagement* and *activity importance* had medium positive correlations with all three flourishing subscales, suggesting that the more an individual is satisfied with their engagement in valued action, and the more they engage in behaviours because of autonomous reasons, the higher their levels of emotional, psychological, and social flourishing. *Activity pressure* had small negative correlations with all three flourishing subscales indicating that engaging in behaviours because of controlled reasons tends to be accompanied by lower levels of flourishing. The six behaviour domains had small to medium positive correlations with all three flourishing subscales, implying that greater engagement in each of the six behaviours was associated with greater well-being.

Table 16

Zero-Order Correlations Between the Scale Scores of the 6W-WeB Subscales and of Theoretically Relevant Variables in Study 3A.

	Global subscales			Domain subscales					
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.41***	.33***	-.25***	.32***	.32***	.27***	.35***	.26***	.30***
Psych F	.43***	.34***	-.24***	.34***	.35***	.28***	.36***	.23***	.27***
Soc F	.41***	.33***	-.22***	.33***	.31***	.27***	.34***	.21***	.29***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself

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

Regressions

Structural equation models. I conducted regressions using structural equation models (SEMs), to examine the total amount of variance that the overall Six Ways to Well-Being bifactor model explained in the flourishing measure. These models were conducted and analysed in the same way as was done with the regression models in Studies 1 and 2. The fit indices of these models and the variance explained by the 6W-WeB in each of the criterion variables are presented in Table 17. All models showed adequate fit. The Six Ways to Well-Being explained 23% to 32% of the variance in the flourishing domains. To see the standardised path estimates for each subscale of the 6W-WeB in these models, please see Supplementary Material S4, Table S 12.

Table 17

Summary of Goodness of Fit for Models From Structural Equation Models Testing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables, and the Variance Explained by the 6W-WeB in the Criterion Variables, in Study 3A.

	χ^2	<i>df</i>	CFI	TLI	RMSEA [90% CI]	R^2
Flourishing						
Emotional	1175.29	633	.92	.91	.041 [.038 .044]	.24
Psychological	1212.64	671	.92	.91	.039 [.036 .043]	.30
Social	1285.37	710	.92	.91	.040 [.037 .043]	.23

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; Flourishing = Keyes' flourishing measure

Multiple regressions. As was done in the previous studies, I conducted multiple regressions, using scale scores of the 6W-WeB behaviour domains, to assess the variance explained by each of the six domains in the mental health criterion variables. The results of these regressions are represented in Table 18. *Challenging oneself* and *engaging in physical activity* were significant predictors of all flourishing subscales, while *connecting with others*, in addition to *challenging oneself* and *engaging in physical activity*, also significantly predicted social flourishing.

Table 18

Standardised Regression Coefficients and Variance Explained (Adjusted R²) From Multiple Regressions Showing the Unique Variance Explained by the Scale Scores of the 6 Domain Factors of the 6W-WeB in Mental Health Variables, in Study 3A.

	β	t	SE	R^2
Emotional flourishing				.15
Connecting with others	.11	1.88.	.06	
Challenging oneself	.14	2.62**	.05	
Giving to others	-.01	-0.18	.06	
Engaging in physical activity	.17	2.94**	.06	
Embracing the moment	.00	-0.05	.06	
Caring for oneself	.08	1.43	.06	
Psychological flourishing				.17
Connecting with others	.18	3.14**	.06	
Challenging oneself	.18	3.49***	.05	
Giving to others	.00	0.06	.06	
Engaging in physical activity	.18	3.07**	.06	
Embracing the moment	-.07	-1.19	.05	
Caring for oneself	.01	0.10	.05	
Social flourishing				.15
Connecting with others	.17	2.95**	.06	
Challenging oneself	.13	2.52*	.05	
Giving to others	.01	0.18	.06	
Engaging in physical activity	.17	2.84**	.06	
Embracing the moment	-.08	-1.41	.06	
Caring for oneself	.06	1.08	.06	

*Note: . $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.*

Word-Frequency Tabulation

Frequency word clouds were constructed to represent the most common ways in which the participants reported engaging in each of the six behaviour domains (Figures 30 to 35). As was the case in Studies 1 and 2, it was again noticed that individuals engaged in the six behaviours in generally different ways, i.e., the majority of words reported for each behaviour domain did not overlap with those reported in other domains.

From these figures, it is again apparent that individuals engaged in the six behaviours in a wide variety of ways. In terms of the top examples for each behaviour domain, individuals frequently reported engaging in conversations and talking with their friends at school for *connecting with others*. Individuals engaged in *challenging oneself* behaviours through learning, developing skills, and working hard. Participants were *giving to others* through helping their friends and other people, giving donations to charities, volunteering, and being kind. Unlike in the previous samples where a majority of participants seem to be *engaging in physical activity* through walking, individuals in this sample seemed to also play sport, play netball, go to the gym, dance, and run. Participants reported that they were *embracing the moment* by enjoying, paying attention, appreciating, and noticing. Lastly, participants engaged in *caring for oneself* activities by being healthy, getting enough sleep, and eating well.

A word cloud was also constructed for the ‘other’ behaviour category, presented in Figure 36. This word cloud contains less than 100 words, as fewer than 100 words appeared in at least three examples. Participants often reported behaviours already captured by the six behaviour domains, such as ‘care’, ‘family’, ‘active’, ‘physical’, and ‘challenge’. This provided support for the comprehensiveness of the six behaviour domains of the 6W-WeB. As was done in the previous studies, I then deleted all words that reflected key aspects of the

six behavioural domains to explore any other behaviours that individuals may engage in. The remaining words are presented in Figure 37. These words were at most reported by 10 participants out of the 518 respondents. Further, most words represented feeling states (e.g., 'happy' and 'positive') rather than behaviours. Therefore, the six behaviours appeared to capture the vast majority of the participants' valued action.



Figure 36. The most frequent words recorded for the 'other' example in Study 3A.



Figure 37. The most frequent words recorded for the 'other' example in Study 3A, if not captured by the six behavioural domains.

Discussion

The main aim of Study 3A was to replicate the factor structure and construct validity of the 6W-WeB in an adolescent, female sample. First, the bifactor structure of the 6W-WeB, in addition to the same residual covariances used in Studies 1 and 2, showed a good fit to the data. The alpha reliability estimates of the 6W-WeB were again acceptable. Therefore, Hypothesis 1 was confirmed. Second, all the 6W-WeB subscales were associated with the flourishing subscales in expected ways. The 6W-WeB also explained 23% to 30% of the variance in the flourishing subscales, while *challenging oneself* and *engaging in physical activity* were the most consistent predictors of mental health. These findings, therefore, confirmed Hypothesis 2. Lastly, the most frequent words reported for each behaviour indicated that the content captured by each of the six domains was distinct, and that the six behaviour domains captured the vast majority of individuals' valued action. These findings support Hypothesis 3. The next study, Study 3B, presents another validation study of the 6W-WeB, in an independent adolescent sample.

STUDY 3B: CONSTRUCT VALIDITY IN A SMALL ADOLESCENT SAMPLE

Study 3A showed that the 6W-WeB performed well in an adolescent sample. However, this was a convenience sample comprised entirely of females. Thus, to further examine the validity of the 6W-WeB in younger populations, data from the Australian Character Study were used. This dataset consisted of responses from adolescents of both genders, from the general Australian population. Study 3B presents the validation of the 6W-WeB using this sample, with a focus on the assessment of construct validity. Like the previous studies, the construct validity of the 6W-WeB in this sample was examined in relation to flourishing and psychological distress measures. The big five personality variables (i.e., openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) were also measured in this sample. Personality is one of the largest established areas of psychological research and personality traits are shown to predict many important life outcomes such as personal values (Roccas, Sagiv, Schwartz, & Knafo, 2002), well-being (Schmutte & Ryff, 1997), and flourishing (DeNeve & Cooper, 1998). Thus, the assessment of personality is sometimes considered to be the benchmark for evaluating a new measure. The construct validity of each of the six domains of the 6W-WeB was further assessed in relation to constructs that were closely related to each domain. For instance, a measure of loneliness was used to assess the construct validity of the *connecting with others* domain. The following are my research questions and hypotheses specific to Study 3B:

Research Questions and Hypotheses

Research Question 1

Will the subscales of the 6W-WeB show adequate reliability?

Hypothesis 1

As seen in previous studies reported in this thesis, the subscales of the 6W-WeB will show adequate reliability.

Research Question 2

How will the subscales of the 6W-WeB relate to criterion variables of flourishing and psychological distress?

Hypothesis 2

In line with findings from Studies 1, 2, and 3A, the global factors of *behaviour engagement* and *activity importance* will be positively correlated with flourishing and negatively correlated with psychological distress, while the global factor of *activity pressure* will be negatively related with flourishing and positively related to psychological distress. All six domain factors will be positively correlated with flourishing and negatively correlated with psychological distress.

Research Question 3

How will the subscales of the 6W-WeB relate to personality variables?

Hypothesis 3

The global factors of *behaviour engagement* and *activity importance* will be positively correlated with personality variables of openness to experience, conscientiousness, extraversion, agreeableness, and negatively correlated with neuroticism. The opposite pattern of correlations between *activity pressure* and personality variables will be seen. In terms of the domain factors, the six behaviours will have positive correlations with openness to experience, conscientiousness, extraversion, and agreeableness, and negative correlations with neuroticism.

Research Question 4

How are the six domains of the 6W-WeB associated with constructs closely related to each of the six domains?

Hypothesis 4

The proxy measure for each of the six behaviour domains (presented in the ‘Measures’ section) will be correlated with that behaviour domain. For instance, loneliness will have a negative correlation with *connecting with others*, while leisure time physical activity will have a positive correlation with *engaging in physical activity*.

Research Question 5

Will the typical ways in which participants engage in valued actions be different for each of the six domains?

Hypothesis 5

As was the case in Studies 1, 2, and 3A, the idiographic responses for each of the six ways will not substantially overlap across domains. While some similarities are expected, the most frequently reported words for each domain will be unique.

Methods

Participants and Design

Secondary data from 185 adolescents from the Australian Character Study (ACS) 2016 wave were used for this study. Participants in this sample had an age range of 15 – 21 ($M = 19.58$, $SD = 0.72$) and 61.62% of them were female. At the time of assessment, most participants in this sample had recently started university degrees. Ethics approval for the Australian Character Study was received from the Australian Catholic University HREC (2014-342N) and the University of Wollongong HREC (HE10/158).

Measures

Data on the following measures were used for this study:

Six Ways to Well-Being. All participants completed the Six Ways to Well-Being (6W-WeB) questionnaire. In addition to the three rating scales of satisfaction with frequency, autonomy and control, participants also answered a question assessing whether they wanted

to engage less, the same, or more, in each of the behaviours they engaged in. This question (i.e., ‘I want to do this’) was rated on a 5-point Likert scale with the following options: 1 (*much less*), 2 (*slightly less*), 3 (*as much as I am currently doing it*), 4 (*slightly more*), and 5 (*much more*). This rating scale helped explore whether individuals’ satisfaction with frequency of engagement in valued action was associated with a want to change the levels of engagement in valued action. The average of all these items across the six behaviour domains was treated as the *desire to change* scale score, and higher scores were reflective of a desire to increase engagement in valued action.

Flourishing and psychological distress. Participants completed the flourishing (emotional flourishing $\alpha = .89$; psychological flourishing $\alpha = .81$; social flourishing $\alpha = .86$) and psychological distress ($\alpha = .89$) questionnaires described in Study 1.

Personality. Individuals’ personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism, were assessed via the Big Five Inventory – Short (BFI-S; Hahn, Gottschling, & Spinath, 2012). This measure consists of 15 items (3 measuring each trait) with the stem ‘I see myself as someone who...’. Items include, “Has an active imagination” (openness; $\alpha = .77$), “Does a thorough job” (conscientiousness; $\alpha = .60$), “Is outgoing, sociable” (extraversion; $\alpha = .75$), “Has a forgiving nature” (agreeableness; $\alpha = .55$), and “Worries a lot” (neuroticism; $\alpha = .73$). Each item is rated on a scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), and higher scores are reflective of a greater level of that personality trait.

UCLA Loneliness Scale – 8. The UCLA Loneliness Scale – 8 (ULS-8) measures the extent to which individuals feel lonely and lack social connection (Hays & DiMatteo, 1987). Items are rated on a scale of 1 (*Rarely*) to 4 (*Often*). The two positively worded items (“I am an outgoing person” and “I can find companionship when I want it”) were reverse scored so that higher scores were indicative of greater loneliness. Other items included “I am unhappy

being so withdrawn” and “I feel left out”. This measure showed adequate internal consistency ($\alpha = .82$). This was used as a proxy measure for *connecting with others*.

Revised Achievement Motives Scale. The Revised Achievement Motives Scale (RAMS) measures hope for success and fear of failure for academic achievement (Lang & Fries, 2006). This was used as a proxy for *challenging oneself* because individuals who have higher hope for success and lower fear of failure tend to approach more challenging activities (Engeser & Rheinberg, 2008). The RAMS includes 10 items (five for each factor) that are each rated on a 4-point Likert scale from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). Items include “I am appealed by situations allowing me to test my abilities” (hope for success; $\alpha = .86$) and “Even if nobody would notice my failure, I’m afraid of tasks, which I’m not able to solve” (fear of failure; $\alpha = .84$).

Attitude towards Helping Others. Attitude towards Helping Others (AHO) measures the extent to which individuals think other people should be helped (Webb, Green, & Brashear, 2000). This was used as a proxy measure for *giving to others*, because individuals who think that other people should be helped may be more likely to actually engage in helping behaviours. The AHO consists of 4 items that are each rated on a scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Items include, “People should be willing to help others who are less fortunate”, and “People should be more charitable towards others in society”. This measure showed adequate internal consistency in the current sample ($\alpha = .93$).

Godin’s Leisure Time Activity. The Godin’s Leisure Time Activity questionnaire was used to assess individuals’ engagement in exercise over a 7-day period, specifically during their free time (Godin & Shephard, 1997). It asks respondents to report the number of times they engage in 15 minutes or more of mild, moderate, and strenuous exercise during a typical week. Scores are calculated by multiplying the responses to these categories by 3, 5, and 9 respectively. The sum of these three numbers creates the total score. Higher scores are

reflective of greater engagement in physical activity ($\alpha = .55$). This was used as a proxy for *engaging in physical activity*.

Mindfulness Attention and Awareness Scale. The Mindfulness Attention and Awareness Scale (MAAS) measured dispositional mindfulness and, therefore, was treated as the proxy measure for *embracing the moment* (K. W. Brown, & Ryan, 2003). The MAAS includes the assessment of open awareness and attention to the present moment, elements that are also captured by the *embracing the moment* domain. The MAAS consists of 15 items rated on a scale from 1 (*Almost Always*) to 6 (*Almost Never*). Items include “It seems I am “running on automatic” without much awareness of what I’m doing”, and “I find myself preoccupied with the future or the past”. Higher scores are indicative of greater levels of mindfulness ($\alpha = .86$).

Healthy Well-being Experience Scale. The Healthy Well-being Experience Scale (HWES) assesses the extent to which individuals engage in healthy sleeping, eating, and exercising behaviours (B. Miller, 2005). It was used as a proxy for *caring for oneself* since it assesses the extent to which individuals engage in behaviours that are also captured by the *caring for oneself* domain. The HWES consists of 7 items that are each rated on a scale from 0 (*Strongly Disagree*) to 10 (*Strongly Agree*). Items include, “I usually sleep well” (sleeping; $\alpha = .88$), “The food choices I make help me to feel healthier”, (eating; $\alpha = .94$) and “I get enough exercise” (exercising; $\alpha = .96$). Higher scores reflect greater levels of healthy behaviours (overall $\alpha = .89$).

Results

Factor Structure and Reliability

As the size of this sample was small, it did not have adequate statistical power to conduct the bifactor CFA model. Thus, I was unable to test the factor structure of the 6W-

WeB independently on this sample. However, data from this sample was included in the overall sample used to test the bifactor CFA model in Study 4.

Reliability. As was done in Study 1, the alpha reliability estimates were calculated using the scale scores for each of the 6W-WeB subscales. Alpha reliability estimates, as presented in Table 19, show that the 9 subscales of the 6W-WeB again had adequate internal consistency in this sample.

Table 19

Alpha Reliability Indices for Each Subscale of the Six Ways to Well-Being in Study 3B.

	α
Engagement	.85
Importance	.81
Pressure	.87
Connecting with Others	.73
Challenging Oneself	.74
Giving to Others	.72
Engaging in Physical Activity	.78
Embracing the Moment	.76
Caring for Oneself	.76

Desire to Change Scores

To assess whether individuals who were satisfied with their level of engagement in behaviour would also want to change their levels of engagement in valued action, I correlated the *desire to change* score with the scale scores for the three 6W-WeB global scales. *Desire to change* was uncorrelated with *behaviour engagement*, $r(165) = .03, p = .71$, as well as with *activity pressure*, $r(163) = -.15, p = .06$, but had a medium positive correlation with *activity importance*, $r(163) = .40, p < .001$. This may suggest that regardless of an individual's perceived satisfaction with their level of engagement in a behaviour, if they find the behaviour personally meaningful and important, they may still want to increase their level of engagement in that behaviour.

Correlations With Mental Health and Personality

I conducted correlations using scale scores of the 6W-WeB and the mental health and personality variables. These correlations are presented in Table 20. With respect to the mental health variables, the correlations were similar to those seen in Studies 1, 2, and 3A. *Behaviour engagement* had medium positive correlations with emotional and social flourishing, a large positive correlation with psychological flourishing, and a medium negative correlation with psychological distress. This pattern of correlations indicates that individuals with greater levels of satisfaction with engagement in behaviours experienced higher levels of flourishing and lower levels of psychological distress. *Activity importance* had medium positive correlations with all three flourishing subscales and a medium negative correlation with psychological distress, implying that individuals who engaged in behaviours because of autonomous reasons tended to have higher levels of flourishing and lower levels of psychological distress. *Activity pressure* had small negative correlations with emotional and psychological flourishing and a medium positive correlation with psychological distress. This indicated that individuals who engage in action because of controlled reasons tend to

show lower levels of psychological and social flourishing, and greater psychological distress. Lastly, the six behaviours had small to medium positive correlations with emotional and psychological flourishing, small positive correlations with social flourishing (except for the subscales of *embracing the moment* and *caring for oneself*), and small to medium negative correlations with psychological distress. These correlations indicate that autonomous engagement in each of the six behaviour domains is associated with at least some aspects of better mental health.

With respect to personality traits, openness to experience had a small positive correlation with *behaviour engagement*, a medium positive correlation with *activity importance*, and a small negative correlation with *activity pressure*. These correlations indicate that individuals who tend to be more open to experiences also tend to be more satisfied with their level of engagement in valued action and engage in behaviours because of autonomous rather than controlled reasons. These individuals also showed greater autonomous engagement in all six behaviour domains, with the strongest correlation with *embracing the moment*. These correlations may suggest that people who are more open to experiences may engage in the six behaviours to a greater extent, and especially be more engaged in the moment.

The personality trait of conscientiousness had medium positive correlations with *behaviour engagement* and *activity importance*, and a medium negative correlation with *activity pressure*, indicating that individuals who rated themselves as more conscientiousness were more satisfied with their level of engagement in valued action, placed more importance on behaviours, and felt less pressure to engage in activity. Conscientiousness had medium positive correlations with all six behaviour subscales, implying that individuals who were more conscientious also engaged more in the six behaviours. This personality trait had the

strongest link with *engaging in physical activity*, perhaps suggesting that individuals who were conscientious were more diligent about engaging in exercise.

Extraversion had a small positive correlation with *behaviour engagement*, a medium positive correlation with *activity importance*, and a small negative correlation with *activity pressure*. These correlations indicate that individuals who were more extroverted tended to be more satisfied with their level of engagement in valued action, placed more importance on behaviours, and felt less pressured to engage in behaviours. Extraversion had a medium positive correlation with *connecting with others*, and small positive correlations with *challenging oneself*, *giving to others*, *engaging in physical activity*, and *caring for oneself*. This pattern of correlations suggests that individuals who were more outgoing tended to have greater autonomous engagement in activity (besides *embracing the moment*), especially in terms of engaging in social relationships.

Individuals who rated themselves as more agreeable were more satisfied with their engagement in valued action and did so more because of autonomous than controlled reasons, as agreeableness had a small positive correlation with *behaviour engagement*, a medium positive correlation with *activity importance*, and a medium negative correlation with *activity pressure*. Agreeableness also had medium positive correlations with *giving to others* and *embracing the moment*, and small positive correlations with the other four behaviour domains. These results indicate that while agreeable individuals engaged more in valued activity across the board, they were especially engaged in giving behaviours and connecting with the present moment.

Lastly, neuroticism had a medium negative correlation with *behaviour engagement*, a small negative correlation with *activity importance*, and a small positive correlation with *activity pressure*, indicating that individuals who are more neurotic also tend to be less

satisfied with their level of engagement in valued action and tend to engage in behaviours because of controlled rather than autonomous reasons. Neuroticism had a medium negative correlation with engaging in physical activity, and small negative correlations with the other five behaviour domains. These correlations suggest that individuals who tend to worry engage less in all behaviours, especially in physical activity.

Table 20

Zero-Order Correlations Between the Scale Scores of the 6W-WeB Subscales and of Mental Health and Personality Variables in Study 3B.

	Global subscales				Domain subscales				
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.45***	.45***	-.28***	.46***	.43***	.35***	.30***	.28***	.28***
Psych F	.54***	.48***	-.23**	.39***	.41***	.36***	.36***	.29***	.33***
Soc F	.34***	.34***	-.07	.19*	.29***	.21**	.25***	.12	.12
GHQ12	-.42***	-.31***	.32***	-.37***	-.42***	-.30***	-.29***	-.28***	-.30***
Open	.21**	.35***	-.26***	.26***	.25***	.28***	.21**	.33***	.26***
Cons	.41***	.38***	-.40***	.38***	.38***	.32***	.42***	.40***	.32***
Extra	.26***	.33***	-.17*	.39***	.20**	.18*	.22**	.13	.23**
Agree	.29***	.34***	-.39***	.26***	.27***	.45***	.21**	.45***	.27***
Neuro	-.39***	-.16*	.20**	-.17*	-.28***	-.23**	-.33***	-.15*	-.25***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keys' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12, Open = Openness to Experience subscale of the Big Five Inventory – Short Form; Cons = Conscientiousness subscale of the BFI-SF; Extra = Extraversion subscale of the BFI-SF; Agree = Agreeableness subscale of the BFI-SF; Neuro = Neuroticism subscale of the BFI-SF.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself

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

Correlations With Additional Criterion Variables

I conducted correlations using the scale scores of the 6W-WeB and the criterion variables, the results from which are shown in Table 21. Each criterion variable mapped onto one of the six domains of valued activity. The UCLA Loneliness Scale-8 (ULS-8) had a moderate negative correlation with *connecting with others*, indicating that individuals who engaged less in social relationships tended to experience greater levels of loneliness. The ULS-8 had moderate negative correlations with *behaviour engagement* and *activity importance*, and a small positive correlation with *activity pressure*. This pattern of correlations indicates that individuals who reported being lonelier had lower levels of satisfaction with their engagement in valued action, found behaviours less personally meaningful and enjoyable, and felt greater pressure to engage in behaviours.

The hope for success subscale of the Revised Achievement Motivation Scale (RAMS) had a medium negative correlation with *challenging oneself*, while the fear of failure subscale had a small negative correlation with this domain. These correlations indicate that individuals motivated by hope for success had higher levels of engagement in challenging activities, while those motivated by fear of failure had lower levels of engagement in challenging behaviours. The RAMS hope for success subscale had a small positive correlation with *behaviour engagement*, a moderate positive correlation with *activity importance* and a moderate negative correlation with *activity pressure*. These correlations indicate that individuals who were motivated by the hope for success had greater satisfaction with their level of engagement in valued action, placed more importance on behaviours, and had lower levels of felt pressure. The fear of failure subscale had a small negative correlation with *behaviour engagement* and a small positive correlation with *activity pressure*, indicating that individuals who were motivated by a fear of failing tended to be less satisfied with their engagement in behaviours and tended to engage in behaviours out of a felt sense of pressure.

The Attitude towards Helping Others (AHO) questionnaire had a small positive correlation with *giving to others*, indicating that individuals who thought others should be helped may tend to engage in giving behaviours. The AHO had a small positive correlation with *activity importance*, implying that individuals who had a more positive attitude towards helping others may also place greater importance on engaging in activity.

The Godin's Leisure Time Activity scale had a moderate positive correlation with *physical activity*, indicating that individuals who reported greater engagement in leisure time activity tended to have greater levels of autonomous engagement in physical activity, as measured by the 6W-WeB. This measure of exercise also had a small positive correlation with *behaviour engagement*, a medium positive correlation with *activity importance*, and a small negative correlation with *activity pressure*. These correlations indicate that individuals who engaged more in physical activity during their leisure time, were also more satisfied with their levels of engagement in valued action and engaged in activity because of autonomous rather than controlled reasons.

The Mindfulness Attention and Awareness Scale (MAAS) had a small positive correlation with *embracing the moment*, indicating that individuals who were more mindful were also more engaged with the present moment. The MAAS had a medium positive correlation with *behaviour engagement*, a small positive correlation with *activity importance*, and a small negative correlation with *activity pressure*. These correlations indicate that individuals with greater levels of mindfulness had higher levels of satisfaction with engagement in valued action, placed more importance on behaviours, and felt less pressure to engage in behaviours.

Lastly, the Healthy Well-Being Experience Scale (HWES) sleep subscale had a small positive correlation with *caring for oneself*, while the eating and exercising subscales, and the HWES total score, had moderate positive correlations with *caring for oneself*. These

correlations indicate that individuals who had higher scores on the HWES measure also showed greater engagement in self-care behaviours. The HWES scales had medium positive correlations with *behaviour engagement*, small to medium positive correlations with *activity importance*, and small negative correlations with *activity pressure* (except for the sleep subscale of the HWES). These correlations suggest that individuals who report higher health-related well-being were more satisfied with their level of engagement in activity, and tended to engage in behaviours because of autonomous rather than controlled reasons. As expected, the HWES exercise subscale also had a strong positive correlation with *engaging in physical activity*.

Table 21

Zero-Order Correlations Between the Scale Scores of the 6W-WeB Subscales and of Criterion Variables in Study 3B.

	Global subscales				Domain subscales				
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
ULS	-.45***	-.33***	.25***	-.37***	-.36***	-.29***	-.31***	-.27***	-.27***
RAMSH	.23**	.39***	-.34***	.35***	.31***	.23**	.30***	.30***	.24***
RAMSF	-.28***	-.12	.16*	-.07	-.28***	-.15*	-.31***	-.02	-.18*
AHO	.11	.16*	-.10	.10	.00	.19**	.01	.25***	.11
Ex	.27***	.31***	-.16*	.21**	.23**	.15*	.36***	.06	.17*
MAAS	.30***	.26***	-.20**	.26***	.25***	.26***	.24**	.19*	.20**
HWESSL	.32***	.21**	-.12	.21**	.25***	.14	.24**	.04	.29***
HWSEEA	.38***	.33***	-.21**	.20**	.38***	.14	.38***	.09	.38***
HWSEEX	.48***	.33***	-.24**	.21**	.31***	.19**	.62***	.09	.35***
HWESAll	.47***	.34***	-.22**	.25***	.37***	.19*	.48***	.08	.41***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

ULS = UCLA Loneliness Scale; RAMSH = Revised Achievement Motivation Scale, hope for success subscale; RAMSF = Revised Achievement Motivation Scale, fear of failure subscale; AHO = Attitudes towards Helping Others; Ex = Godin's Leisure Time Activity; MAAS = Mindful Attention and Awareness Scale; HWESSL = Healthy Well-Being Experience Scale sleep subscale; HWSEEA = Healthy Well-Being Experience Scale eating subscale; HWSEEX = Healthy Well-Being Experience Scale exercise subscale; HWESAll = Healthy Well-Being Experience Scale total score.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

Word-Frequency Tabulation

A series of word clouds were constructed to examine the typical ways in which participants engaged in the six behaviour domains. These word clouds contain less than 100 words, as fewer than 100 words were reported in at least three examples (owing to the small sample size). As seen from these word clouds, presented in Figures 38 to 43, the majority of behaviours reported by participants did not overlap across domains, indicating that the six behaviour categories are indeed distinct.

The words presented within these word clouds are similar to those reported by the adolescent sample in Study 3A as well as by the adult samples in Studies 1 and 2. For *connecting with others*, individuals frequently engaged in conversations with their friends, talked with others, and connected with others over the internet. Individuals engaged in *challenging oneself* activities through going to university, learning, working, and cooking. Participants were *giving to others* through volunteering, helping friends, and donating. Participants reported *engaging in physical activity* through walking, going to the gym, playing sport, and running. For *embracing the moment*, participants reported that they pay attention, notice, and enjoy the moment. Participants engaged in *caring for oneself* activities by being healthy, getting enough sleep, and by dieting.

Lastly, I constructed a word cloud for the participants' responses to the 'other' behaviour category. This word cloud is presented in Figure 44. All responses that were reported by at least three participants, such as 'connect', 'physical', 'care', 'active', were already captured by the six behaviour domains of the 6W-WeB. This lends support to the 6W-WeB model, as it suggests that participants' valued actions were captured by the six behavioural domains.



Figure 40. The most frequent words recorded for the two 'giving to others' examples in Study 3B.



Figure 41. The most frequent words recorded for the two 'engaging in physical activity' examples in Study 3B.



Figure 42. The most frequent words recorded for the two 'embracing the moment' examples in Study 3B.



Figure 43. The most frequent words recorded for the two 'caring for oneself' examples in Study 3B.



A word cloud consisting of several words in different colors and sizes. The words are: 'work', 'make', 'read', 'care', 'study', 'physical', 'connect', 'active', 'music', and 'people'. The words are arranged in a roughly vertical stack, with 'work' and 'make' at the top, 'connect' in the middle, and 'people' at the bottom. The colors are orange, blue, and yellow.

work make
read
care study
physical
connect
active music
people

Figure 44. The most frequent words recorded for the ‘other’ example in Study 3B.

Discussion

Study 3B tested the reliability and the construct validity of the Six Ways to Well-Being in an adolescent sample from the Australian Character Study. First, the alpha reliability estimates of the 6W-WeB subscales were acceptable, confirming Hypothesis 1. Second the subscales of the 6W-WeB linked in expected ways to flourishing and psychological distress. The participants of this study had, at the time of assessment, recently started university degrees. Evidence suggests that this is a major transition period in one's life which is associated with unique challenges such as homesickness, loneliness, a change in identity status, and high academic demands (Fisher & Hood, 1987; Kantanis, 2000; Pargetter, 2000; Scanlon, Rowling, & Weber, 2007). These challenges are, in turn, associated with lower levels of well-being and higher levels of psychological distress (Fisher & Hood, 1987; Lu, 1994). The findings of the current study suggest that, regardless of the challenges and distress associated with the transition phase in the participants' lives, valued action was still associated with higher levels of well-being and lower levels of psychological distress. These findings confirmed Hypothesis 2. Third, Hypothesis 3 was confirmed as the personality variables were linked in expected ways to the subscales of the 6W-WeB. Fourth, the behaviour domains were associated with their proxy measures, confirming Hypothesis 4. Lastly, Hypothesis 5 was also confirmed. Word clouds showed that the behaviours reported by participants were unique for each of the six domains, and that the 6W-WeB captured participants' entire range of valued action. Overall, the results from Study 3 confirmed the validity and reliability of the 6W-WeB in two adolescent samples, and indicated that this questionnaire can also be used with adolescents.

CHAPTER 9

STUDY 4: FACTOR STRUCTURE ANALYSES COMBINING ALL SAMPLES

Chapters 6, 7, and 8 presented the analyses and results for studies with four independent samples. In the current chapter, I combine data from these four samples to conduct validation tests requiring a large sample size. In confirmatory factor analyses, increasing the sample size used to conduct analyses increases the statistical accuracy of the covariance and variance estimates, which in turn reduces the error of estimation (Jackson et al., 2009). Therefore, combining the four samples helps maximise the available information, allowing for the examination of the factor loadings of the 6W-WeB bifactor model as well as the measurement invariance of this model across countries, age groups, gender, and levels of psychological distress.

Research Questions and Hypotheses

Research Question 1

Will the final bifactor model (CFA₄) fit the data well in a sample consisting of all participants from Studies 1, 2, and 3?

Hypothesis 1

Considering the adequate fit of the bifactor model in all previous samples in which it was tested, I would expect that this model would also fit the data well in the combined sample.

Research Question 2

Will the factor loadings of the 6W-WeB bifactor model be acceptable?

Hypothesis 2

I expect that, using data from the combined sample, the factor loadings of the bifactor model will be acceptable. Specifically, I hypothesise that (i) all items that are loaded onto the

global factors will have a positive loading, (ii) satisfaction with frequency and importance items will have positive loadings on each of the six behaviour domains, and (iii) the pressure items will have negative loadings on each of the six behaviour domains.

Research Question 3

Will the 6W-WeB factor structure be invariant across gender, age, countries and levels of psychological distress?

Hypothesis 3

As Studies 1 and 2 showed that the 6W-WeB performed similarly in subgroups of females and males, as well as in subgroups of young and old participants, I would hypothesise that the bifactor structure of the measure would be invariant across these groups. I further hypothesise that because the bifactor model fit the data well in independent samples from America and Australia, which included individuals who met criteria for high psychological distress and those who did not, the 6W-WeB bifactor model will be invariant across countries and levels of psychological distress.

Methods

Participants and Design

Data from samples in Study 1, Study 2, Study 3A, and Study 3B were combined to produce one large dataset. There were 3358 participants included in this study. Participants' age ranged from 12-65 years ($M = 34.93$, $SD = 15.48$) and 63.16% of them were female.

Measures

Only the quantitative items from the six domains assessed by the 6W-WeB, and the information about participant age and gender, were utilised in this study.

Results

Factor Structure and Reliability

I tested the adjusted bifactor model (CFA₄) to examine whether this model would fit the data well in the combined sample. The fit indices were above the acceptable thresholds and comparable to those noticed in previous studies reported in this thesis: $\chi^2(534) = 3932.47, p < .001, CFI = .92, TLI = .91, RMSEA = .044, 90\% CI [.042 .045]$.

Reliability and factor loadings. The alpha reliability values for the global and domain scales of the Six Ways to Well-Being are reported in Table 22, along with the factor loadings of each subscale. The alpha reliability estimates were calculated using the scale score for each of the 6W-WeB subscales. All subscales again showed adequate internal consistency. The factor loadings were the lambda values from the model output using the lavaan R package (Rosseel, 2012). It is important to note that as this is a bifactor model, the factor loadings of the items on the specific factors will be smaller than those for the factor loadings of the items on the global factors. This is because the global factors partial out what is common among all items that load onto it before the factor loadings of items on the specific domain factors are examined.

All 6W-WeB manifest items loaded on their respective latent factors in expected ways. Specifically, all manifest items had positive loadings on the three global latent factors, the satisfaction with frequency and importance manifest items had positive loadings on each of the domain latent factors, and the pressure manifest items had negative loadings on each of the domain latent factors.

Table 22

Factor Loadings for Each Subscale of the Six Ways to Well-Being in all Samples Combined.

	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
α	.90	.88	.94	.78	.76	.77	.76	.78	.76
Con1Freq	.57			.53					
Con2Freq	.64			.34					
Chal1Freq	.59				.51				
Chal2Freq	.67				.34				
Give1Freq	.55					.47			
Give2Freq	.62					.37			
Phys1Freq	.53						.58		
Phys2Freq	.63						.44		
Emb1Freq	.58							.55	
Emb2Freq	.63							.44	
Care1Freq	.49								.60
Care2Freq	.65								.32
Con1Imp		.45		.72					
Con2Imp		.62		.44					
Chal1Imp		.42			.73				
Chal2Imp		.59			.39				
Give1Imp		.44				.67			
Give2Imp		.54				.51			
Phys1Imp		.44					.67		
Phys2Imp		.51					.49		
Emb1Imp		.50						.68	
Emb2Imp		.57						.55	
Care1Imp		.44							.69
Care2Imp		.60							.38
Con1Pres			.70	-.33					
Con2Pres			.76	-.19					
Chal1Pres			.70		-.34				
Chal2Pres			.72		-.17				
Give1Pres			.70			-.30			
Give2Pres			.74			-.25			
Phys1Pres			.70				-.28		
Phys2Pres			.71				-.19		
Emb1Pres			.75					-.25	
Emb2Pres			.76					-.20	
Care1Pres			.70						-.31
Care2Pres			.74						-.15

Note. Eng = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

Measurement Invariance

In order to examine whether the 6W-WeB bifactor model performed similarly in different subgroups, I tested measurement invariance across countries (America vs Australia), age (young vs old), gender (female vs male), and levels of psychological distress (those meeting criteria for high psychological distress vs those not meeting criteria). The sample was divided as follows: for measurement invariance across countries, I split the sample based on where participant data were collected from. Sample 1 was from America (n = 1800), while Samples 2, 3A and 3B were from Australia (n = 1558). To test age invariance, I split the sample into two equal age groups: participants between the ages of 12 and 38 (n = 2035), and participants between the ages of 39 and 65 (n = 1322). The cut-off of 38/39 was used as it divides the sample in two equal halves based on age (i.e., each age range is 23 years). One participant had not reported their age, and therefore, were not included in the age invariance testing. For gender invariance, I split the sample into female (n = 2121) and male (n = 1234) participants. Respondents who identified as 'other' genders (n = 3) were excluded from this analysis because a third subgroup comprised of these participants would not have a large enough sample size for analysis. Lastly, for measurement invariance across levels of psychological distress, participants were divided based on the GHQ cut off score of 11/12. Participants scoring 11 and under did not meet case criteria (n = 1009), while those of scores of 12 and over met criteria for high psychological distress (n = 1293). Note that only a proportion of individuals in Sample 1, and all participants in Samples 2 and 3B completed the GHQ.

The results for these measurement invariance tests are presented in Table 23. Results show that the fit indices of the 6W-WeB measurement model remained stable with the addition of each restraint for the comparisons between countries, age groups, and gender. While the 6W-WeB model was invariant across levels of psychological distress at the

configural, metric, and scalar levels, the fit of the residuals and means invariance models were not adequate. That is, the CFI for the residual invariance model increased by more than .01 compared to the scalar invariance model. As mentioned in Chapter 5 (p. 61), the residuals and means invariance models are rarely achieved in practice (Bialosiewicz et al., 2013), and therefore, achieving scalar invariance is usually enough to conclude that a measurement model is invariant across groups.

Thus, the factor structure of the 6W-WeB model as measured by a bifactor model, was invariant, at least to the scalar invariance level, across countries, age, gender, and levels of psychological distress. The results imply that the 6W-WeB questionnaire is interpreted in a conceptually similar manner by participants across different subgroups, allowing for comparisons of 6W-WeB scores across these subgroups.

Table 23

Summary of Goodness of Fit for Measurement Invariance Structural Equation Models of the Six Ways to Well-Being Bifactor Model Across Countries, Age, Gender, and Levels of Psychological Distress, in the Combined Sample.

Model	χ^2	df	CFI	TLI	RMSEA [90% CI]
Country					
Step 1: Configural invariance	4370.13	1068	.93	.91	.043 [.042 .044]
Step 2: Metric invariance	4554.41	1131	.92	.91	.042 [.041 .044]
Step 3: Scalar invariance	4640.03	1158	.92	.91	.042 [.041 .043]
Step 4: Residuals invariance	4705.07	1194	.92	.92	.042 [.041 .043]
Step 5: Means invariance	4797.98	1203	.92	.92	.042 [.041 .043]
Age					
Step 1: Configural invariance	4455.38	1068	.92	.91	.043 [.042 .045]
Step 2: Metric invariance	4550.51	1131	.92	.91	.042 [.041 .044]
Step 3: Scalar invariance	4633.68	1158	.92	.91	.042 [.041 .043]
Step 4: Residuals invariance	4729.56	1194	.92	.91	.042 [.041 .043]
Step 5: Means invariance	4802.40	1203	.92	.91	.042 [.041 .043]

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval.

The robust fit indices of the models (i.e., when using the MLR estimator) can improve as more restraints are added, because of the scaling factor.

Table 23 (continued)

Summary of Goodness of Fit for Measurement Invariance Structural Equation Models of the Six Ways to Well-Being Bifactor Model Across Countries, Age, Gender, and Levels of Psychological Distress, in the Combined Sample.

Model	χ^2	<i>df</i>	CFI	TLI	RMSEA [90% CI]
Gender					
Step 1: Configural invariance	4534.91	1068	.92	.91	.044 [.043 .045]
Step 2: Metric invariance	4584.41	1131	.92	.91	.043 [.042 .044]
Step 3: Scalar invariance	4686.75	1158	.92	.91	.043 [.042 .044]
Step 4: Residuals invariance	4793.95	1194	.92	.91	.042 [.041 .043]
Step 5: Means invariance	4950.73	1203	.91	.91	.043 [.042 .044]
Psychological distress					
Step 1: Configural invariance	3509.49	1068	.92	.90	.045 [.043 .046]
Step 2: Metric invariance	3493.83	1131	.92	.91	.043 [.041 .044]
Step 3: Scalar invariance	3532.96	1158	.92	.91	.042 [.041 .044]
Step 4: Residuals invariance	4404.21	1194	.89	.89	.048 [.047 .050]
Step 5: Means invariance	4665.87	1203	.89	.88	.050 [.049 .051]

Note. CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval.

The robust fit indices of the models (i.e., when using the MLR estimator) can improve as more restraints are added, because of the scaling factor.

Discussion

This study combined the samples from Studies 1, 2, 3A, and 3B to further test the factor structure of the 6W-WeB. Results confirmed Hypothesis 1, as the bifactor model of the 6W-WeB fit the data well. The factor loadings of this bifactor model were also as expected, confirming Hypothesis 2. Lastly, the 6W-WeB bifactor model was shown to be invariant across countries, age, gender, and level of psychological distress, suggesting that the factor structure of the questionnaire does not vary between subgroups and assesses the same underlying constructs in all subgroups. Therefore, Hypothesis 3 was also confirmed. Overall, the findings of Study 4 provide support for the robustness of the bifactor representation of the 6W-WeB.

CHAPTER 10

GENERAL DISCUSSION

Overview of Thesis Studies

The primary aim of this thesis was to develop and validate a new questionnaire that assesses the ‘what’ and ‘why’ of valued action. This new measure, called the Six Ways to Well-Being (6W-WeB), consists of three global factors, namely, *behaviour engagement*, *activity importance*, and *activity pressure*, as well as six behaviour domains: *connecting with others*, *challenging oneself*, *giving to others*, *engaging in physical activity*, *embracing the moment*, and *caring for oneself*. Through four studies, I have examined the following: (i) the factor structure of the 6W-WeB; (ii) its links with well-being indices through zero-order correlations, structural equation models, and multiple regressions; (iii) its links with theoretically-relevant variables of experiential avoidance, nonattachment, personality traits, and measures specifically related to each of the six behaviour domains; (iv) its known-groups validity by comparing individuals who met criteria for high psychological distress with those who did not; (v) the typical ways in which individuals engaged in the six behaviour domains; and (vi) the barriers and enablers of valued action.

Overall, there were six major findings. First, the 6W-WeB was best represented by a bifactor structure. Second, valued action, as assessed by the 6W-WeB, was associated with greater levels of mental health and well-being, and the overall 6W-WeB model explained substantial variance in these measures. Third, the correlations of the 6W-WeB subscales with theoretically-relevant variables were as expected. Fourth, the 6W-WeB could differentiate between individuals who met criteria for high psychological distress and those who did not. Fifth, idiographic responses indicated that individuals engaged in the six behaviour domains in unique ways (i.e., the behaviours did not overlap substantially) and that these six domains

captured the vast majority of valued action. Lastly, results from Study 2 helped gain important information about the factors that got in the way of valued action, as well as how the six behaviours helped and hindered engagement in each other. In the current chapter, I delve into these results by discussing their meaning, implications, and clinical utility. I also highlight the limitations of this thesis and present some ideas for future research.

Factor Structure Validation

With regard to factor structure, the fit of the 6W-WeB bifactor model was superior to alternate models with only the three global factors or only the six domain factors. This bifactor model was shown to be adequate in three independent samples as well as in the combined sample. The reliability estimates of the 6W-WeB subscales and factor loadings of the bifactor model were all satisfactory. Further, results from correlational analyses and measurement invariance tests suggest that the 6W-WeB can be reliably used by Americans and Australians, males and females, young and old individuals, as well as individuals who meet criteria for high psychological distress and those who do not. The word-frequency tabulation of the idiographic responses was also in line with the factor structure of the 6W-WeB. Specifically, the little overlap between examples reported in each of the six domains suggest that the six domains are most likely distinct. The results also suggest that a wide range of human valued action is captured by the six domains; the responses in the ‘other’ category tended to overlap with those in the six pre-existing categories.

There were some instances of misfit in the model, but further investigation revealed that the misfit did not challenge the basic assumptions of the bifactor model, i.e., there were three global factors and six domain-specific factors. Specifically, some of the misspecification of the bifactor model lay in the correlated residuals between the first and second *activity pressure* items within each of the specific factors. These residual correlations could imply that felt pressure is pervasive across different activities within the same domain. That is, if an

individual feels pressured to challenge themselves in one way, they may also feel pressured to challenge themselves in other ways. These findings are consistent with past research; a study showed that students who had higher levels of controlled motivation in one subject at school also had higher controlled motivation in other subjects (Ratelle et al., 2007). Further, the correlation between controlled motivation in different subject areas was higher than the correlations for either identified or autonomous motivation across subjects.

In Study 4, the pervasiveness of controlled motivation was also evident in the factor loadings of items on the latent constructs; items on the global factor of *activity pressure* had the largest factor loadings (and complementarily, the pressure items on the domain factors had the lowest factor loadings). These factor loadings suggest that most of the variance in items assessing pressure may be attributed to the global factor of *activity pressure* and that there is little variance left over in these items to be accounted for by the specific behaviour domains.

Overall, the results suggest that the 6W-WeB questionnaire is best represented by a bifactor model with the following structure: 3 correlated global factors (*behaviour engagement, activity importance, and activity pressure*) and 6 correlated behaviour domains (*connecting with others, challenging oneself, giving to others, engaging in physical activity, embracing the moment, and caring for oneself*).

Is the 6W-WeB Linked to Well-Being?

Results presented in all four studies of this thesis indicate that both the global scales and the domain scales of the 6W-WeB are indeed associated with well-being. Specifically, satisfaction with the frequency of behaviour engagement, engaging in action because of autonomous rather than controlled reasons, and greater engagement in each of the six behaviours, are all correlated with greater levels of flourishing and lower levels of psychological distress. In addition, as examined through structural equation models, the entire

6W-WeB measure, as captured by the bifactor model, explained 23-32% of the variance in flourishing and 21-23% of the variance in psychological distress. The results, in terms of the specific global and domain factors, are discussed below.

Global Factors

Behaviour engagement. According to a popular model of well-being (Lyubomirsky et al., 2005), 50% of the variance in well-being is thought to be accounted for by biological indicators, 10% by demographics, and the remaining 40% by engaging in intentional activity. The behavioural activation (BA) literature provides evidence for the positive association between intentional activity and well-being (see Mazzucchelli, Kane, & Rees, 2010, for a meta-analysis). The aim of BA is to increase behavioural engagement, which brings individuals into contact with positive reinforcements and, in turn, improves their well-being. The results of my thesis studies are in line with previous findings in so far as being satisfied with one's engagement in activity (i.e., thinking that one is engaging in activities enough) is related to higher well-being and lower psychological distress.

Activity importance and pressure. Across the studies presented in this thesis, the results consistently showed a positive link between autonomous motivation (*activity importance*) and well-being, and a negative link between controlled motivation (*activity pressure*) and well-being. These results are consistent with previous findings in the literature; individuals who act autonomously have higher levels of well-being and lower levels of mental illness, while those who engage in actions because of controlled motivation experience greater levels of mental illness (Ryan & Deci, 2017; Sheldon & Kasser, 1995). Indeed, an individual's overall level of autonomous motivation (i.e., their trait levels of autonomy) is associated with subjective vitality, an important indicator of well-being (Sheldon, Ryan, & Reis, 1996).

As mentioned in Chapter 4, individuals are more likely to persist with autonomously motivated behaviours over time, while controlled behaviours are more likely to be discontinued (Deci & Ryan, 2008; Kasser et al., 2002). Further, when people act autonomously, they tend to be more invested in the action and have a more positive experience than when they are driven by controlled motivation (Ryan & Connell, 1989). Therefore, it is important that clinicians try to increase their clients' levels of autonomy and reduce their levels of controlled motivation for engaging in action. Fortunately, research shows that clinicians who are autonomy supportive can, in fact, increase their clients' levels of autonomous motivation (Ryan & Deci, 2017; G. C. Williams, Freedman, & Deci, 1998). For instance, an experimental study showed that clinicians' autonomy-supportive interpersonal style predicted clients' autonomous motivation, which in turn, predicted smoking cessation (G. C. Williams, Gagné, Ryan, & Deci, 2002). A longitudinal intervention study found that perceived autonomy support (from both clinicians and non-clinicians) was associated with increases in autonomous motivation over the intervention period, and in turn, higher autonomous motivation at the end of the intervention was associated with reductions in symptoms of eating disorders (Steiger et al., 2017).

To be autonomy supportive, a clinician would need to offer their clients choice, minimise controls, and acknowledge feelings (Williams et al., 2002). For instance, if a client presents with low general levels of autonomy, the clinician could give them a choice of which domains they would like to begin engaging in. If the client only has low autonomous motivation in one domain, the clinician could suggest a few different ways to increase engagement in that domain, and see if the client is interested in choosing one. Doing so would involve the client in the decision-making process.

Behaviour Domains

Supporting the evidence presented in Chapter 3, all six behaviours were reliably associated with lower psychological distress and higher levels of flourishing. These results indicate that the six domains of behaviour, as measured by the 6W-WeB, are indeed associated with better mental health. When the associations of all six behaviours with well-being were assessed simultaneously through multiple regressions, results suggested that the domains of *challenging oneself* and *engaging in physical activity* were the most consistent unique predictors of both high flourishing and low psychological distress. These findings are consistent with past evidence that underline the importance of challenging behaviours and exercise for improved mental health and well-being (Biddle & Ekkekakis, 2005). A daily diary study with a sample of teachers showed that challenges at work (such as working hard and using high-level skills) were associated with greater positive affect and work engagement (Tadić, Bakker, & Oerlemans, 2015), while another daily diary study showed that individuals have higher levels of life satisfaction on days they exercise compared to days they do not (Maher et al., 2013).

As engagement in all six domains was associated with greater well-being, perhaps clinicians can seek to increase their client's autonomous engagement in any domain the client chooses. However, future research could identify which, if any, of these six domains may provide the client with greater well-being benefits. For instance, a longitudinal study that evaluates participants' concurrent engagement in all six behaviour domains, may be able to model which of the six domains should be the initial target of interventions. Such a study could also assess whether increasing engagement in the six ways is additive (i.e., the more behaviours you engage in, the better your well-being will be). However, it is possible that high levels of engagement in all six domains may not be feasible because of conflicting demands on resources such as time, or because such engagement may lead to exhaustion. It

is, therefore, important to note that the aim of the 6W-WeB is to encourage valued action by providing individuals with a framework of the kinds of behaviours they could engage in, while also helping them understand that the form of their motivation is important. In other words, the 6W-WeB does not imply that individuals must engage in *all* six domains to see improvements in well-being.

Known-Groups Validity

The link between the 6W-WeB subscales and mental health is further supported by the analysis of known-groups validity. Results from Studies 1 and 2 indicated that the 6W-WeB could differentiate between individuals who met criteria for psychological distress (as measured by the General Health Questionnaire – 12) and those who did not; the former group had lower mean scores on *behaviour engagement*, *activity importance*, and the six behaviours, and higher mean scores on *activity pressure*, as compared to the latter. Besides providing support to the link between the 6W-WeB and mental health, the known-groups validity also indicates that this new measure of valued action has clinical utility. It can enable clinicians to recognise if their client is potentially experiencing psychological distress. More importantly, by noticing that a client has low levels of autonomous engagement in valued activity, the clinician can take necessary steps to target behaviour engagement, to potentially reduce psychological distress.

How is the 6W-WeB Associated With Experiential Avoidance and Nonattachment?

In Study 1, I examined the associations between the 6W-WeB and theoretically-relevant variables of experiential avoidance (EA) and nonattachment. In terms of EA, the subscales of behavioural avoidance and distress endurance may be of particular relevance to CBS clinicians, as these subscales are concerned with engagement in (or the avoidance of engagement in) something of importance. While behavioural avoidance assesses the extent to which individuals *avoid* valued action in the face of distress, distress endurance measures

their *willingness* to engage in valued action in the face of such distress (Gómez, Chmielewski, Kotov, Ruggero, & Watson, 2011). Results from Study 1 indicate that individuals who report lower levels of behavioural avoidance and higher levels of distress endurance, tend to have greater engagement in each of the six behaviour domains and are less driven by controlled forms of motivation. Greater distress endurance was also associated with higher levels of satisfaction with the frequency of engagement and autonomous motivation. Thus, these results suggest that having distressing thoughts and emotions may not be a barrier for meaningful activity for such individuals, allowing them to lead a more value-consistent life, in turn benefitting their well-being. Indeed, previous research also shows that individuals who have low EA tend to be more engaged in valued activity. For instance, a cross-sectional study showed that EA (as measured by the Acceptance and Action Questionnaire) was negatively correlated with living in line with one's values (as measured by the Valued Living Questionnaire; Wilson et al., 2010). In another study with cancer patients, greater EA was associated with lower success in living according to values in domains such as family relationships (Ciarrochi et al., 2011).

While experiential avoidance is concerned with avoiding negative internal experiences (Gómez et al., 2011; S. C. Hayes et al., 2011), nonattachment involves a flexible way of relating to one's experiences without clinging on to positive aspects of life (Sahdra, Ciarrochi, Parker, Marshall, et al., 2015). In Study 1, nonattachment was positively correlated with behaviour engagement, activity importance, and the six behaviours, and negatively correlated with activity pressure. The results suggest that individuals who are aware of the fleeting nature of experiences and do not cling to positive emotions, events, and ideals, are presumably more engaged in activities and do so because these actions are consistent with their values. Nonattached individuals may be more able to move towards meaningful action in their everyday lives, without being held back by expectations of what their experiences

should ideally be. The pattern of results observed is consistent with past research showing that nonattachment is linked with lower levels of depression and anxiety (Sahdra et al., 2010), better mental health (Ciarrochi, Sahdra, Yap, & Dicke, 2019), and high pro-sociality (Sahdra, Ciarrochi, Parker, Marshall, et al., 2015).

What is the Link Between 6W-WeB Subscales and Personality Traits?

I examined the associations of the 6W-WeB subscales with personality variables in Study 3B, as personality is one of the largest established areas of psychological research and predicts many important life outcomes, including well-being (Roccas et al., 2002; Schmutte & Ryff, 1997). The examination of the link between 6W-WeB and personality traits was largely exploratory, as there has been little research exploring the link between valued action and personality. However, previous studies have examined the link between certain personality traits and autonomous and controlled motivation. In Study 3B of this thesis, individuals who reported greater levels of openness to experience, conscientiousness, extraversion, and agreeableness, and lower levels of neuroticism, had higher scores for *activity importance* and lower scores for *activity pressure*. These results are generally in line with the few studies conducted in this area. A study in a sample of undergraduate students showed conscientiousness to be positively associated with autonomous motivation (Di Domenico & Fournier, 2015). A prospective study showed baseline autonomous motivation to be associated with greater openness, agreeableness, and extraversion, while controlled motivation at baseline was associated with neuroticism. Additionally, in hierarchical regression models where baseline autonomous motivation and all five personality traits were entered as independent variables, results showed that openness, conscientiousness, and agreeableness significantly predicted end-of-year autonomous motivation. Similarly, conscientiousness negatively predicted end-of-year controlled motivation (Holding, Hope, Verner-Filion, & Koestner, 2019).

The results from Study 3B further showed that individuals who report greater levels of openness to experience, conscientiousness, extraversion, and agreeableness, and lower levels of neuroticism, were more engaged in the six behaviours. There have been a handful of past studies that have examined the link between personality traits and some behaviour domains. For instance, a meta-analysis showed that conscientiousness, extraversion, and openness were positively related to physical activity, while neuroticism was negatively linked to physical activity (K. E. Wilson & Dishman, 2015). A cross-sectional study showed openness to experiences, conscientiousness, extraversion, and agreeableness, to be positively associated with dispositional mindfulness, while neuroticism and mindfulness were negatively correlated with each other (Hanley, 2016). Some past research has also explored the link between personality and psychological flexibility, results from which suggest that individuals who show certain personality traits may be more open and willing to engage in valued action. For instance, in one study, higher levels of extraversion and conscientiousness, and lower levels of neuroticism were associated with greater psychological flexibility (Steenhaut, Demeyer, De Raedt, & Rossi, 2018).

While personality traits cannot easily be the target of behavioural intervention (as described in Chapter 1), the results from Study 3B are useful in that they help situate the 6W-WeB within the larger psychological literature. The fact that the results are consistent with much of the research exploring personality and some of the specific components of the 6W-WeB, suggests that this new measure of valued action does indeed show construct validity.

Associations of the Behaviour Domains With Specific Criterion Variables

To assess the construct validity of each of the six behaviour domains, I examined their links with questionnaires that were theoretically-relevant to them. Results showed that each domain was correlated with its proxy measure, implying that the six domains were indeed measuring what they intended to measure. Specifically, *connecting with others* was

associated with the UCLA Loneliness-Scale – 8 (ULS-8), *challenging oneself* was correlated with the Revised Achievements Motives Scale, *giving to others* was correlated with Attitudes to Helping Others, *engaging in physical activity* was associated with the Godin’s Leisure Time Activity questionnaire as well as with the exercise subscale of the Healthy Well-Being Experience Scale (HWES), *embracing the moment* was correlated with the Mindful Attention and Awareness Scale (MAAS), and *caring for oneself* was associated with all subscales of the HWES.

However, the proxy measures were, to some extent, also correlated with the other domains. This may, in part, be because the proxy measures used were approximations of the constructs captured by the domain factors, rather than exact replications. For instance, the ULS – 8 (the proxy measure for *connecting with others*) assesses the extent of one’s subjective loneliness and isolation. While this is related to engaging in social relationships (or the lack, thereof), it is not concerned with what types of social relationships one engages in, or why one does so. The ULS-8 may have also been negatively correlated with the *challenging oneself* domain because individuals who feel lonely and isolated might find it difficult to do something that pushes them. Another example is the MAAS, which was correlated with all six domains. This may have been because people can be mindful regardless of the actions they engage in. It is important to bear in mind, however, that the MAAS has been criticised as a measure “mindfulness”. As the items are all negatively worded, the MAAS may be a measure of mindlessness, which may not be empirically equivalent to mindfulness (Grossman, 2008; Höfling, Moosbrugger, Schermelleh-Engel, & Heidenreich, 2011). Measurement error may have also played a role in the correlations between the proxy measures and the six domains, as no questionnaire can perfectly capture the intended construct. Future research may consider different proxy measures of the 6W-WeB domain factors and further test the construct validity of the six behaviour domains.

Barriers and Enablers

In Study 2, participants were asked about the barriers and enablers of valued action. In terms of the barriers, they reported the factors that prevent them from engaging in each domain, and rated how often these barriers occurred as well as the extent to which they felt they could overcome these barriers. Through a series of word clouds, I showed that while there were some common barriers that got in the way of valued action across domains, there were also a few specific barriers to each domain. For instance, for *engaging in physical activity*, participants frequently reported physical health-related factors as barriers. These factors included injuries, pain, and disability, amongst others. The ratings for how frequently barriers occurred and how able they felt to overcome these barriers were similar for all domains. However, engaging in physical activity had a slightly higher rating for frequency of barrier occurrence and a slightly lower rating for ability to overcome barrier, which may have been due to the unique health-related barriers mentioned in this category.

Interestingly, the most frequently reported barrier for each domain was “time”. Previous studies have also found perceived lack of time to be a barrier for behaviour engagement, especially in relation to physical activity (e.g., Salmon, Owen, Crawford, Bauman, & Sallis, 2003). However, only a handful of studies have examined the association of subjective evaluation of a lack of time and actual availability of time. For instance, a study conducted in a Brazilian sample found that individuals who perceived having little time to exercise did indeed have less available leisure time, and were also less physically active (Reichert, Barros, Domingues, & Hallal, 2007). In contrast, other studies have concluded that a perceived lack of time is not associated with actual availability of time to engage in action. In a study of African American and Hispanic women, perceived lack of time to engage in physical activity was not correlated with actual amount of free time. This study also found that, on average, the participants spent 28 hours a week engaging in sedentary leisure time

activities such as watching television (Heesch & Mâsse, 2004), indicating that it might be a lack of motivation, rather than a lack of time, that is a barrier to engagement in exercise.

However, it should be noted that more studies are needed to accurately examine the association between perceived lack of time and actual free time. Future research could examine the differences between individuals who state time as a barrier and those who do not, in terms of their life situations. For instance, we may find that individuals who feel they do not have enough time to engaged in valued action are those with high-pressure jobs and parenting responsibilities. In terms of clinical utility, this could suggest that clinicians could help their clients manage their time efficiently and start engaging in valued action in small ways, such as taking a 5-minute coffee break with a colleague or playing a physically active game with their children. It would be important to clarify that valued action does not always have to be laboured and time-intensive. For instance, research has shown that even ten minutes of physical activity can improve mood (Abdallah et al., 2008).

I assessed the extent to which each of the six ways helped or hindered engagement in the other domains. An interesting pattern was the dynamic between *connecting with others*, *giving to others*, and *caring for oneself*. *Caring for oneself* was reported as the most frequent barrier, and least frequent enabler, to both *connecting with others* and *giving to others*. In contrast, *connecting with others* and *giving to others* did not seem to get in the way of *caring for oneself* to the same extent, and both were frequently reported as enablers to engaging in self-care activities. This pattern of responses may suggest perhaps, that individuals find the idea of engaging in self-care activities self-indulgent, and that engaging in such activities would leave less time to give to and care for others. Such a phenomenon can be seen in the self-compassion literature, wherein individuals frequently cite difficulties with being self-compassionate (Pauley & McPherson, 2010), and that being compassionate to someone else

is easier than showing compassion to oneself (Neff, 2003). This seems to occur partly due to the misconception that being compassionate and kind towards oneself is equated with being selfish. Interestingly, even clinicians who use compassion-focused therapy with their clients report that showing compassion to themselves felt strange at first (Gale, Schröder, & Gilbert, 2017). Research finds, however, that compassion for oneself actually increases one's ability to be compassionate towards others and reduces compassion-related burnout (Beaumont, Durkin, Martin, & Carson, 2016a, 2016b). This may be an important point for clarification in interventions, i.e., that caring for oneself does not mean that one cannot spend as much time with others or that one would need to stop caring for others.

The Clinical Utility of the 6W-WeB

While I have already outlined some of the ways in which the 6W-WeB could be useful for clinicians, this section provides a summary. The results of this thesis indicate that the 6W-WeB (i) is linked to well-being, (ii) explains variance in well-being indices, and (iii) can reliably differentiate between individuals who experience high levels of psychological distress and those who do not. These findings (and others described previously in this chapter) suggest that the 6W-WeB has potential treatment utility for clinicians (Ciarrochi, Zettle, et al., 2015).

By using the 6W-WeB, clinicians can identify their clients' levels of behaviour engagement, autonomy, and control – both across behaviour domains as well as within each domain. This will enable clinicians to quickly assess whether the client is generally behaviourally active, and whether they are motivated by autonomous or controlled forms of motivation across their lives. Domain scores can inform the clinician about specific behaviours the client values the most, and which behaviours, if any, they feel most pressured to engage in. Such information will, therefore, enable clinicians to capitalise on behaviours that are motivated by autonomous reasons and explore in further detail why their client feels

pressured to engage in some domains. By addressing behaviours that involve controlled motivation, the clinician could, in turn, reduce the psychological distress felt by the client, as research shows lower controlled motivation to be associated with better mental health (Ryan & Deci, 2017). The 6W-WeB could, therefore, not only identify behaviours that may form the target of intervention, but it could also provide information about the function of the behaviours the client engages in. The measure can, therefore, help a clinician to orient their clients towards valued actions, the central point of ACT interventions (Hayes et al., 2011).

Importantly, using the 6W-WeB in clinical interventions will help shift the focus away from how a client feels to what they do. As mentioned in Chapter 2, there are a myriad of issues associated with pursuing positive states and avoiding negative states, such as the counterproductive nature of directly attempting to increase happiness (Mauss et al., 2012; Schooler et al., 2003). Therefore, an important benefit of the 6W-WeB is that it will be consistent with the core message of behavioural interventions - engaging in valued action may enrich and benefit one's life.

While the 6W-WeB could provide a comprehensive first glance of a client's valued action, it is important to note that it is not a replacement for detailed clinical interviewing. A client's responses to the 6W-WeB can make initial sessions easier, by providing the clinician with talking points. However, it is only a glimpse into the client's valued action, which will have to be followed up with further, detailed, conversations to get a thorough understanding of an individual's actions and motives.

The 6W-WeB may also benefit people who do not suffer from a clinical disorder. Completing the 6W-WeB may provide a starting point of self-reflection; an examination of what the individual does, what they could do more of, and why they do what they do. Such self-reflection may enable individuals to change their behaviours, if needed, by engaging in the six domains of behaviour for autonomous reasons. While purely speculative, such self-

reflection has the possibility of individual's self-identifying issues and, consequently, seeking professional help.

Limitations and Future Research

Cross-Sectional Data

Data from all samples used in this thesis were cross-sectional. While the results presented in this thesis were replicated in four independent samples with varied demographic characteristics, and consistently showed the 6W-WeB to be linked with well-being, longitudinal research is needed to accurately call the six behaviours 'ways' to well-being. Such research can help assess the extent to which autonomously engaging in the six behaviours over time improves well-being, and provide evidence for causal ordering. I would expect the 6W-WeB to predict well-being, as previous longitudinal research has shown valued action and autonomous motivation to be important for well-being (Gloster et al., 2017; Ryan & Deci, 2017). Longitudinal studies could also highlight the beneficial nature of some behaviours over others, enabling clinicians to reliably start behavioural activation in one domain (perhaps *engaging in physical activity*) that could then be extended to the other five. Future research would also be needed to assess the within-person time invariance of the scale, i.e., test-retest reliability.

Sample Characteristics

The results from the four studies are limited in generalisability due to the characteristics of the samples used. While I attempted to test the pattern of 6W-WeB scores for individuals with likely mental health problems (based on previously established cut-offs using the General Health Questionnaire – 12) and established scalar invariance across levels of psychological distress, all four samples used in this thesis were from the general population. It would be beneficial to test the validity and reliability of the 6W-WeB in a purely clinical sample.

Another issue was that all samples used in this thesis were from Western countries (i.e., America and Australia) because of the ease of recruiting through survey companies such as Survey Monkey and Qualtrics, as well as the use of convenience samples and secondary data. However, it is important that the 6W-WeB also be validated in non-western samples to establish the cross-cultural nature of the constructs measured by it. Having said that, I would not expect wildly different results in samples from different countries as past research has provided cross-cultural support for the links between motivation and well-being (Ryan & Deci, 2017), as well as between valued activity and well-being (Hooper & Larsson, 2015). In terms of the idiographic responses, the open-ended “other” category of the 6W-WeB would help inform us of any cross-cultural differences in behaviours perceived to be important.

Construct Validity

Future research should test the incremental and discriminant validity of the 6W-WeB in terms of other valued action measures, such as the Valued Living Questionnaire. While the theoretical reasons for the benefits of the 6W-WeB over and above previous measures of valued action, as well as the difference between the 6W-WeB and these measures, were described in Chapter 2 (i.e., previous measures do not assess both the ‘what’ and the ‘why’ of valued action), empirical research will help clarify the unique role of the 6W-WeB in assessing valued action.

Conclusion

Despite some limitations, the results of the studies presented in this thesis are potentially useful. The factor structure, content validity, criterion validity, and clinical utility of the 6W-WeB were demonstrated in four independent samples. In addition, the results add to the existing literature on valued action by (i) providing evidence for six distinct behaviour domains; (ii) indicating that the more individuals are satisfied with their engagement in these six behaviours, the more likely they are to experience well-being; (iii) suggesting that if

individuals engage in action because of autonomous rather than controlled motivation, they experience greater levels of well-being; and (iv) providing clinicians with a questionnaire that can help them refocus their clients on valued action rather than internal states like depression or anxiety. Importantly, the results suggest that the 6W-WeB may facilitate clinical interventions by focusing clinicians on the specific behaviours that need to be targeted, allowing them to work with clients in meaningful ways.

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SUPPLEMENTARY MATERIALS

S1: Factor Score Correlations

In addition to the correlations using scale scores of the 6W-WeB reported in the main thesis, I conducted zero-order correlations using the factor scores of the Six-Ways to Well-Being (from the bifactor model CFA₄) and scale scores of the theoretically-relevant variables of flourishing, psychological distress, experiential avoidance, nonattachment, personality, and criterion variables specific to each of the six behaviour domains. The results from these analyses are presented in Tables S1-S5.

When interpreting factor score correlations, it is important to remember that factor scores separate out the variance explained by the global factors in a set of items from the variance explained by the domain specific factors in the same set of items. In other words, the factor score for a global factor takes into account only what is common across all the items without accounting for the variance explained by the specific domain factors that also explain variance in those items. Conversely, the factor score for a domain factor only accounts for the variance explained by that specific factor, after the variance explained by the global factor is partialled out.

Generally, the results obtained from these correlations were similar to those using scale scores. Correlations using both methods are usually comparable, although correlations using scale scores tend to be larger than those using factor scores, as the factor scores take into account only the unique variance accounted for by that factor, while scale scores take into account all the variance accounted for by the items within the subscale.

Table S 1

Zero-Order Correlations Between the Factor Scores of the 6W-WeB Subscales and Scale Scores of Theoretically Relevant Variables in Study 1.

	Global factors			Domain specific factors					
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.32***	.26***	-.06	.24***	.24***	.20***	.24***	.17***	.19***
Psych F	.37***	.28***	-.09*	.23***	.23***	.19***	.25***	.15***	.20***
Soc F	.39***	.20***	.11*	.12**	.21***	.07	.21***	.04	.08
GHQ12	-.25***	-.22***	.27***	-.19***	-.17***	-.12***	-.20***	-.11***	-.22***
BehAvd	.02	-.07	.31***	-.03	-.06	-.05	-.04	-.07	-.05
DisAver	.07	-.03	.28***	-.03	-.04	.01	-.00	-.08	-.12**
DstSup	.21***	.15***	.02	.08	.15***	.09*	.02	.09*	.01
RepDen	.03	-.15***	.48***	-.20***	-.02	-.09	-.04	-.18***	-.12**
Procst	-.19***	-.22***	.37***	-.13**	-.19***	-.09*	-.13**	-.09*	-.09*
DisEndr	.35***	.37***	-.20***	.21***	.26***	.19***	.15***	.22***	.13**
NAS-7	.37***	.45***	-.19***	.30***	.27***	.29***	.15***	.24***	.23***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12, Multidimensional Experiential Avoidance Subscale – 30 subscales: BehAvd = behavioural avoidance; DisAver = distress aversion; DstSup = distraction and suppression; RepDen = repression/denial; Procst = procrastination subscale; DisEndr = distress endurance, NAS-7 = Nonattachment Scale – 7.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

Table S 2

Zero-Order Correlations Between the Factor Scores of the 6W-WeB Subscales and Scale Scores of Theoretically Relevant Variables in Study 2.

	Global factors					Domain factors			
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.37***	.30***	-.09**	.16***	.00	.12***	.20***	.05	.16***
Psych F	.42***	.34***	-.13***	.20***	-.02	.15***	.19***	.08*	.16***
Soc F	.36***	.25***	.07*	.12***	-.04	.09*	.21***	-.04	.12***
GHQ-12	-.36***	-.27***	.18***	-.09**	.01	-.05	-.13***	-.04	-.12***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

Table S 3

Zero-Order Correlations Between the Factor Scores of the 6W-WeB Subscales and Scale Scores of Theoretically Relevant Variables in Study 3A.

	Global factors					Domain factors			
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.41***	.34***	-.25***	.09*	.11**	.06	.04	.04	.06
Psych F	.42***	.34***	-.23***	.14**	.17***	.09	.03	.02	.04
Soc F	.41***	.34***	-.22***	.13**	.11*	.08	.02	.00	.07

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

Table S 4

Zero-Order Correlations Between the Factor Scores of the 6W-WeB Subscales and Scale Scores of Theoretically Relevant Variables in Study 3B.

	Global factors				Domain factors				
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
Emo F	.40***	.40***	-.21**	.36***	.22**	.22**	.09	.15*	.11
Psych F	.45***	.36***	-.16*	.32***	.25***	.29***	.16*	.14*	.21**
Soc F	.26***	.21**	-.01	.19*	.26***	.24**	.16*	.07	.10
GHQ12	-.38***	-.31***	.29***	-.23**	-.18*	-.17*	-.11	-.09	-.11
Open	.19*	.37***	-.26***	.14	.06	.15*	.08	.21**	.12
Cons	.42***	.45***	-.40***	.11	.01	.02	.17*	.10	.06
Extra	.22**	.28***	-.17*	.29***	.08	.11	.12	.00	.13
Agree	.29***	.36***	-.39***	.02	-.03	.26***	-.01	.26***	.06
Neuro	-.34***	-.17*	.18*	-.08	-.15*	-.11	-.22**	-.02	-.10

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

Keyes' flourishing measure subscales: Emo F = emotional flourishing; Psych F = psychological flourishing; Soc F = social flourishing, GHQ-12 = General Health Questionnaire-12, Open = Openness to Experience subscale of the Big Five Inventory – Short Form; Cons = Conscientiousness subscale of the BFI-SF; Extra = Extraversion subscale of the BFI-SF; Agree = Agreeableness subscale of the BFI-SF; Neuro = Neuroticism subscale of the BFI-SF.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

Table S 5

Zero-Order Correlations Between the Factor Scores of the 6W-WeB Subscales and Scale Scores of Theoretically Relevant Variables in Study 3B.

	Global factors				Domain specific factors				
	Eng	Imp	Pres	Con	Chal	Give	Phys	Emb	Care
ULS	-.37***	-.25***	.20**	-.30***	-.24***	-.21**	-.20**	-.15*	-.13
RAMSH	.22**	.37***	-.32***	.21**	.10	.08	.14	.15*	.05
RAMSF	-.22**	-.11	.14	-.04	-.19**	-.10	-.24**	.05	-.11
AHO	.13	.17*	-.08	.03	-.11	.12	-.11	.23**	.07
Ex	.19*	.19*	-.09	.15*	.19**	.09	.37***	-.02	.16*
MAAS	.26***	.24**	-.20**	.15*	.13	.16*	.14	.06	.09
HWESSL	.33***	.27***	-.13	.09	.10	-.04	.15*	-.15*	.12
HWSEEA	.34***	.30***	-.17*	.07	.22**	-.01	.32***	-.12	.26***
HWSEEX	.34***	.21**	-.18*	.16*	.24**	.08	.63***	-.10	.30***
HWESAll	.41***	.32***	-.19**	.13	.21**	.01	.42***	-.15*	.26***

Note. The table is shaded according to the strength of the significant correlations, in increments of .10.

ULS = UCLA Loneliness Scale; RAMSH = Revised Achievement Motivation Scale, hope for success subscale; RAMSF = Revised Achievement Motivation Scale, fear of failure subscale; AHO = Attitudes towards Helping Others; Ex = Godin's Leisure Time Activity; MAAS = Mindful Attention and Awareness Scale; HWESSL = Healthy Well-Being Experience Scale sleep subscale; HWBEA = Healthy Well-Being Experience Scale eating subscale; HWSEEX = Healthy Well-Being Experience Scale exercise subscale; HWESAll = Healthy Well-Being Experience Scale total score.

6W-WeB subscales: Engage = behaviour engagement; Imp = activity importance; Pres = activity pressure; Con = connecting with others; Chal = challenging oneself; Give = giving to others; Phys = engaging in physical activity; Emb = embracing the moment; Care = caring for oneself.

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

S2: List of Deleted Words From Word-Frequency Tabulation Analyses

The following words were deleted from the six domain factor word clouds:

"adequate", "adequately", "afternoon", "afternoons", "alot", "amount", "avoid", "back",
 "basic", "basically", "big", "bring", "busy", "cant", "common", "commonly", "daily", "day",
 "days", "dont", "easily", "end", "ending", "engage", "ensure", "even", "every", "everyday",
 "extend", "extensive", "extra", "extras", "favorite", "favorites", "favourite", "favourites",
 "feel", "feeling", "feels", "find", "finding", "finds", "frequent", "frequently", "friday", "full",
 "fully", "happen", "havent", "high", "hour", "hours", "ive", "keep", "keeping", "leave",
 "length", "list", "long", "longer", "loose", "lose", "lot", "lots", "low", "min", "minute",
 "minutes", "monday", "month", "months", "morning", "mornings", "next", "night", "nights",
 "nil", "nill", "open", "pay", "place", "plenty", "previous", "proper", "properly", "put", "puts",
 "regular", "regularly", "saturday", "set", "short", "shorter", "small", "space", "start",
 "starting", "stay", "stuff", "sunday", "take", "takes", "taking", "theyr", "thing", "things",
 "thursday", "time", "times", "timing", "tuesday", "typical", "typically", "way", "ways",
 "wednesday", "week", "weeks", "what", "wont", "wouldnt", "wrong", "year".

The following word clouds were removed from the barriers to valued action word clouds: "adequate", "adequately", "afternoon", "afternoons", "alot", "amount", "barrier", "barriers", "basic", "basically", "big", "bit", "bring", "cant", "common", "commonly", "daily", "day", "days", "dont", "easily", "end", "ending", "engage", "ensure", "even", "every", "everyday", "extend", "extensive", "extra", "extras", "favorite", "favorites", "favourite", "favourites", "feel", "feels", "find", "finding", "finds", "frequent", "frequently", "friday", "full", "fully", "give", "good", "happen", "havent", "hour", "hours", "ive", "keep", "keeping", "lack", "list", "loose", "lose", "lot", "lots", "low", "make", "min", "minute", "minutes", "monday", "month", "months", "morning", "mornings", "next", "night", "nights", "nil", "nill", "open", "pay", "plenty", "previous", "proper", "properly", "put", "puts", "regular", "regularly", "saturday", "set", "small", "start", "starting", "stay", "stuff", "sunday", "take", "takes", "taking", "theyr", "thing", "things", "thursday", "tuesday", "typical", "typically", "way", "ways", "wednesday", "week", "weeks", "what", "wont", "wouldnt", "wrong", "year".

S3: Similarity Across Groups

Table S 6

Zero-Order Correlations Between Each of the Subscales of the 6W-WeB in Study 1, Using Scale Scores. Correlations From the Younger Subgroup are in the Lower Triangle, While Those From the Older Subgroup are in the Upper Triangle.

	1	2	3	4	5	6	7	8	9
1 Engagement	–	.699***	-.187***	.607***	.614***	.581***	.638***	.594***	.560***
2 Importance	.663***	–	-.380***	.700***	.674***	.660***	.634***	.698***	.636***
3 Pressure	-.072*	-.249***	–	-.626***	-.597***	-.645***	-.492***	-.637***	-.633***
4 Connecting with Others	.565***	.621***	-.618***	–	.595***	.655***	.481***	.697***	.591***
5 Challenging Oneself	.609***	.650***	-.545***	.582***	–	.597***	.510***	.625***	.538***
6 Giving to Others	.563***	.622***	-.590***	.661***	.598***	–	.494***	.635***	.562***
7 Engaging in Physical Activity	.611***	.609***	-.513***	.546***	.601***	.524***	–	.489***	.535***
8 Embracing the Moment	.439***	.619***	-.659***	.626***	.569***	.581***	.498***	–	.587***
9 Caring for Oneself	.555***	.629***	-.588***	.599***	.567***	.575***	.562***	.607***	–

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

Table S 7

Zero-Order Correlations Between Each of the Subscales of the 6W-WeB in Study 1, Using Scale Scores. Correlations From the Female Subgroup are in the Lower Triangle, While Those From the Male Subgroup are in the Upper Triangle.

	1	2	3	4	5	6	7	8	9
1 Engagement	–	.766***	-.116**	.597***	.619***	.607***	.624***	.529***	.599***
2 Importance	.641***	–	-.288***	.680***	.691***	.675***	.665***	.670***	.663***
3 Pressure	-.178***	-.328***	–	-.654***	-.604***	-.635***	-.578***	-.687***	-.636***
4 Connecting with Others	.603***	.642***	-.606***	–	.661***	.702***	.603***	.703***	.649***
5 Challenging Oneself	.619***	.647***	-.568***	.553***	–	.675***	.600***	.672***	.612***
6 Giving to Others	.581***	.617***	-.603***	.635***	.561***	–	.596***	.658***	.641***
7 Engaging in Physical Activity	.624***	.603***	-.483***	.474***	.537***	.474***	–	.600***	.688***
8 Embracing the Moment	.535***	.645***	-.616***	.629***	.557***	.569***	.446***	–	.641***
9 Caring for Oneself	.559***	.614***	-.594***	.565***	.528***	.526***	.477***	.571***	–

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

Table S 8

Zero-Order Correlations Between Each of the Subscales of the 6W-WeB in Study 2, Using Scale Scores. Correlations From the Younger Subgroup are in the Lower Triangle, While Those From the Older Subgroup are in the Upper Triangle.

	1	2	3	4	5	6	7	8	9
1 Engagement	–	.723***	-.290***	.660***	.689***	.627***	.619***	.609***	.681***
2 Importance	.689***	–	-.385***	.661***	.709***	.708***	.584***	.676***	.691***
3 Pressure	-.111*	-.245***	–	-.634***	-.612***	-.647***	-.537***	-.668***	-.625***
4 Connecting with Others	.564***	.614***	-.591***	–	.620***	.638***	.491***	.675***	.583***
5 Challenging Oneself	.604***	.616***	-.527***	.512***	–	.672***	.509***	.624***	.629***
6 Giving to Others	.601***	.666***	-.566***	.633***	.542***	–	.488***	.631***	.608***
7 Engaging in Physical Activity	.655***	.611***	-.538***	.542***	.579***	.562***	–	.440***	.554***
8 Embracing the Moment	.523***	.678***	-.610***	.601***	.583***	.600***	.543***	–	.661***
9 Caring for Oneself	.590***	.639***	-.622***	.605***	.539***	.628***	.652***	.634***	–

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

Table S 9

Zero-Order Correlations Between Each of the Subscales of the 6W-WeB in Study 2, Using Scale Scores. Correlations From the Female Subgroup are in the Lower Triangle, While Those From the Male Subgroup are in the Upper Triangle.

	1	2	3	4	5	6	7	8	9
1 Engagement	–	.781***	-.181***	.639***	.680***	.631***	.646***	.608***	.675***
2 Importance	.620***	–	-.298***	.656***	.700***	.713***	.658***	.718***	.699***
3 Pressure	-.220***	-.322***	–	-.620***	-.563***	-.619***	-.590***	-.658***	-.615***
4 Connecting with Others	.577***	.614***	-.617***	–	.583***	.658***	.592***	.660***	.674***
5 Challenging Oneself	.604***	.602***	-.581***	.544***	–	.656***	.616***	.673***	.617***
6 Giving to Others	.611***	.650***	-.594***	.632***	.541***	–	.607***	.672***	.642***
7 Engaging in Physical Activity	.649***	.574***	-.512***	.472***	.507***	.487***	–	.617***	.662***
8 Embracing the Moment	.520***	.630***	-.616***	.613***	.529***	.556***	.416***	–	.687***
9 Caring for Oneself	.591***	.607***	-.639***	.509***	.538***	.596***	.590***	.586***	–

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

S4: Regressions Using Structural Equation Models

Table S 10

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 1 Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	<i>p</i> value	R^2
Emotional flourishing				.23
Behaviour engagement	.35	.10	.000	
Activity importance	-.05	.11	.637	
Activity pressure	-.03	.05	.488	
Connecting with others	.11	.09	.163	
Challenging oneself	.12	.08	.084	
Giving to others	.07	.10	.458	
Engaging in physical activity	.14	.07	.025	
Embracing the moment	.05	.10	.548	
Caring for oneself	.04	.10	.680	
Psychological flourishing				.29
Behaviour engagement	.42	.11	.000	
Activity importance	-.04	.12	.667	
Activity pressure	-.08	.06	.139	
Connecting with others	.15	.09	.055	
Challenging oneself	.08	.08	.202	
Giving to others	.06	.11	.521	
Engaging in physical activity	.15	.09	.047	
Embracing the moment	.00	.11	.964	
Caring for oneself	.05	.13	.620	

Table S 10 (continued)

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 1 Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	<i>p</i> value	R^2
Social flourishing				.22
Behaviour engagement	.48	.09	.000	
Activity importance	-.13	.09	.082	
Activity pressure	.14	.06	.008	
Connecting with others	.05	.10	.570	
Challenging oneself	.16	.08	.017	
Giving to others	-.06	.09	.477	
Engaging in physical activity	.10	.07	.095	
Embracing the moment	-.07	.10	.410	
Caring for oneself	.01	.06	.921	
Psychological distress				.23
Behaviour engagement	-.27	.06	.000	
Activity importance	.10	.06	.049	
Activity pressure	.31	.04	.000	
Connecting with others	-.14	.05	.002	
Challenging oneself	-.07	.04	.079	
Giving to others	.05	.05	.288	
Engaging in physical activity	-.13	.04	.001	
Embracing the moment	.06	.05	.171	
Caring for oneself	-.16	.05	.000	

Table S 11

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 2 Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	p value	R^2
Emotional flourishing				.23
Behaviour engagement	.32	.07	.000	
Activity importance	.10	.08	.163	
Activity pressure	-.04	.04	.247	
Connecting with others	.14	.07	.027	
Challenging oneself	.02	.05	.686	
Giving to others	-.01	.07	.856	
Engaging in physical activity	.19	.07	.003	
Embracing the moment	-.04	.06	.489	
Caring for oneself	.02	.08	.811	
Psychological flourishing				.32
Behaviour engagement	.41	.08	.000	
Activity importance	.08	.08	.252	
Activity pressure	-.09	.04	.016	
Connecting with others	.21	.08	.002	
Challenging oneself	.01	.06	.921	
Giving to others	.00	.07	.995	
Engaging in physical activity	.16	.07	.005	
Embracing the moment	-.01	.07	.914	
Caring for oneself	-.02	.09	.758	

Table S 11 (continued)

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 2 Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	<i>p</i> value	R^2
Social flourishing				.24
Behaviour engagement	.34	.07	.000	
Activity importance	.07	.08	.266	
Activity pressure	.14	.04	.000	
Connecting with others	.14	.07	.017	
Challenging oneself	-.03	.05	.473	
Giving to others	-.02	.06	.657	
Engaging in physical activity	.24	.07	.000	
Embracing the moment	-.12	.06	.029	
Caring for oneself	.00	.07	.983	
Psychological distress				.21
Behaviour engagement	-.41	.07	.000	
Activity importance	.06	.07	.338	
Activity pressure	.17	.04	.000	
Connecting with others	-.08	.07	.226	
Challenging oneself	.01	.05	.883	
Giving to others	.09	.06	.102	
Engaging in physical activity	-.11	.07	.078	
Embracing the moment	-.01	.06	.823	
Caring for oneself	-.06	.08	.380	

Table S 12

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 3A Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	<i>p</i> value	R^2
Emotional flourishing				.24
Behaviour engagement	.43	.12	.000	
Activity importance	-.01	.11	.962	
Activity pressure	-.08	.07	.145	
Connecting with others	.07	.09	.359	
Challenging oneself	.09	.07	.163	
Giving to others	-.03	.09	.721	
Engaging in physical activity	.03	.08	.653	
Embracing the moment	.01	.07	.933	
Caring for oneself	.02	.09	.758	
Psychological flourishing				.30
Behaviour engagement	.49	.12	.000	
Activity importance	-.02	.12	.806	
Activity pressure	-.06	.07	.305	
Connecting with others	.18	.10	.031	
Challenging oneself	.16	.08	.019	
Giving to others	.00	.09	.951	
Engaging in physical activity	.01	.08	.843	
Embracing the moment	-.06	.07	.358	
Caring for oneself	-.04	.10	.635	

Table S 12 (continued)

Standardised Path Coefficients and Variance Explained (R^2) From Structural Equation Models in Study 3A Showing the Unique Variance Explained by the Subscales of the Six Ways to Well-Being in Criterion Variables.

	Estimate	SE	<i>p</i> value	R^2
Social flourishing				.23
Behaviour engagement	.46	.11	.000	
Activity importance	-.03	.11	.735	
Activity pressure	-.04	.06	.427	
Connecting with others	.14	.09	.074	
Challenging oneself	.08	.08	.305	
Giving to others	.00	.09	.955	
Engaging in physical activity	-.01	.09	.949	
Embracing the moment	-.06	.07	.280	
Caring for oneself	.00	.09	.999	

APPENDICES

Appendix A: The Six Ways to Well-Being (6W-WeB)**Life Activity Survey****Instructions:**

You will be asked a series of questions about the activities you engage in. To answer these questions, please focus on behaviours that:

- 1) You typically engage in.
- 2) Are observable from the outside.
- 3) You actually engage in, rather than those you think you should engage in.

You will first be asked to report examples of behaviours, after which you will be asked to rate each of these on three scales. Please select a number from 1 to 6 on these scales to rate the extent to which you agree with it.

CON: Typical ways in which I connect with others.

Think of the typical ways in which you connect with the people around you. How do you connect with family, friends, neighbours, community groups, or other people?

Examples: having conversations, interacting on the internet, doing activities together, celebrating, going out together, etc.

1. Here is an example of how I typically connect with others:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically connect with others:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

CHAL: Typical ways in which I challenge myself.

Think of the typical ways in which you challenge yourself and learn new things.

Examples: Trying something new, learning a musical instrument, trying to cook your favorite food, fixing something, developing your skills, taking on new responsibilities, signing up for an online course, etc.

1. Here is an example of how I typically challenge myself:

- a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically challenge myself:

- a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

GIVE: Typical ways in which I give to others.

Think of the typical ways in which you give to and/or help others.

Examples: Helping someone to do something, volunteering, making a donation, doing something kind for a friend or stranger, working for a cause, etc.

1. Here is an example of how I typically give to others:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically give to others:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

PHYS: Typical ways in which I engage in physical activity.

Think of the typical ways in which you engage in physical activities.

Examples: Going for a walk or a jog, cycling, going to the gym, dancing, playing sports with friends, etc.

1. Here is an example of how I typically engage in physical activity:

- a) **I am satisfied with how frequently I do this.**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- b) **This is personally important or enjoyable. I do it because I want to do it.**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- c) **I feel pressured to do this (e.g., from others or from a sense of guilt).**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically engage in physical activity:

- a) **I am satisfied with how frequently I do this.**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- b) **This is personally important or enjoyable. I do it because I want to do it.**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

- c) **I feel pressured to do this (e.g., from others or from a sense of guilt).**

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

EMB: Typical ways in which I embrace the moment.

Think of the typical ways in which you get fully involved in the present moment.

Examples: Being curious, catching sight of something beautiful, noticing something unusual, enjoying and appreciating food, paying full attention to another person, and, in general noticing the world around you and what you are feeling. Just about any activity can involve embracing the moment.

1. Here is an example of how I typically embrace the moment:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically embrace the moment:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

CARE: Typical ways in which I care for myself.

Think of the typical ways in which you care for yourself.

Examples: Maintaining a healthy diet, getting enough sleep or doing something relaxing after a hard day.

1. Here is an example of how I typically care for myself:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

2. Here is a second example of how I typically care for myself:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

Other behaviours I engage in (Optional).

Is there any other activity that you engage in, that does *not* fit into any of the previously mentioned categories:

- 1) Connecting with others
- 2) Challenging myself
- 3) Giving to others
- 4) Being physically active
- 5) Embracing the moment
- 6) Caring for myself.

If so, please describe this 'other' behaviour below and rate it on the same three scales as before.

Another behaviour that I typically engage in:

a) I am satisfied with how frequently I do this.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

b) This is personally important or enjoyable. I do it because I want to do it.

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

c) I feel pressured to do this (e.g., from others or from a sense of guilt).

1	2	3	4	5	6
Disagree Strongly	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Strongly

Appendix B: Barriers and Enablers Extension to the 6W-WeB

Instructions:

Previously we asked you about how you *typically* engage in behaviour.

Now we will ask you about behaviours that are *personally important or enjoyable* to you.

This could be something you mentioned previously or something different.

We would like to learn about *what gets in the way* of you engaging in these personally important and enjoyable behaviours.

Connecting with Others

Think about a way in which you connect with others that you find personally important. Now think about **what makes it difficult** for you to connect with others in this way.

1. Write what makes it difficult below:

2. How often does this difficulty occur?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this difficulty?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Challenging Yourself

Think about a way in which you challenge yourself that you find personally important. Now think about **what makes it difficult** for you to challenge yourself in this way.

1. Write what makes it difficult below:

2. How often does this get in the way?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this barrier?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Giving to Others

Think about a way in which you give to others that you find personally important.

Now think about **what makes it difficult** for you to give to others in this way.

1. Write what makes it difficult below:

2. How often does this get in the way?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this barrier?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Engaging in Physical Activity

Think about a way in which you engage in physical activity that you find personally important.

Now think about **what makes it difficult** for you to engage in physical activity in this way.

1. Write what makes it difficult below:

2. How often does this get in the way?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this barrier?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Embracing the Moment

Think about a way in which you embrace the moment that you find personally important.
Now think about **what makes it difficult** for you to embrace the moment in this way.

1. Write what makes it difficult below:

2. How often does this get in the way?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this barrier?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Caring for Yourself

Think about a way in which you care for yourself that you find personally important.
Now think about **what makes it difficult** for you to care for yourself in this way.

1. Write what makes it difficult below:

2. How often does this get in the way?

1	2	3	4	5
Rarely	Sometimes	Often	Very Often	Always

3. To what extent do you feel you can overcome this barrier?

1	2	3	4	5
Not at all able to overcome	Slightly able to overcome	Moderately able to overcome	Very much able to overcome	Completely able to overcome

Instructions:

Think again of how you *typically* engage in the six behaviour categories. We want to know about which of these behaviours are in conflict with each other, and which ones work together.

We will now ask you about which of the six behaviours *help or get in the way* of you engaging in each of the other behaviours.

Connecting with Others

1. Which of the other behaviours sometimes **help you** connect with others? Select all that apply.
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you connecting with others? Select all that apply.
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

Challenging Yourself

1. Which of the other behaviours sometimes **help you** challenge yourself? Select all that apply.
 - Connecting with others
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you challenging yourself? Select all that apply.
 - Connecting with others
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

Giving to Others

1. Which of the other behaviours sometimes **help you** give to others? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you giving to others? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Engaging in physical activity
 - Embracing the moment
 - Caring for yourself
 - None of them

Engaging in Physical Activity

1. Which of the other behaviours sometimes **help you** engage in physical activity? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Embracing the moment
 - Caring for yourself
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you engaging in physical activity? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Embracing the moment
 - Caring for yourself
 - None of them

Embracing the Moment

1. Which of the other behaviours sometimes **help you** embrace the moment? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Caring for yourself
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you embracing the moment? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Caring for yourself
 - None of them

Caring for Yourself

1. Which of the other behaviours sometimes **help you** care for yourself? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - None of them

2. Which of the other behaviours sometimes **get in the way** of you caring for yourself? Select all that apply.
 - Connecting with others
 - Challenging yourself
 - Giving to others
 - Engaging in physical activity
 - Embracing the moment
 - None of them

Appendix C: Ethics Approval Letters

Appendix C1: Ethics Approval Letter for Study 1 and Study 2



Human Research Ethics Committee
Project Approval Letter

Principal Investigator/Supervisor:	Professor Joseph Ciarrochi
Co-Investigator(s):	Dr Baljinder Sahdra
Student Researcher:	Geetanjali Basarkod (Doctoral Student)
Project title:	Behavioral Measure of Well-Being
Project approval period:	03/08/2015 – 31/12/2019
Human Research Ethics Committee (HREC) Register Number:	2015-148E

This is to certify that the above application has been reviewed by the Australian Catholic University Human Research Ethics Committee (ACU HREC). The application has been approved for the period given above.

Researchers are responsible for ensuring that all conditions of approval are adhered to and that approval for modifications to the protocol are approved prior to implementation. In addition, the ACU HREC must be notified of any reportable matters including, but not limited to, incidents, complaints and unexpected issues.

Researchers are also responsible for ensuring that they adhere to the requirements of the *National Statement on Ethical Conduct in Human Research*, the *Australian Code for the Responsible Conduct of Research* and the *University's Code of Conduct*.

Any queries relating to this application should be directed to the Manager, Research Ethics and Integrity (resethics.manager@acu.edu.au).

Kind regards,

26/02/2019

Nina Robinson
 Research Ethics & Integrity Officer
 On behalf of the ACU HREC Chair, Associate Professor Michael Baker

Research Ethics and Integrity | Office of the Deputy Vice-Chancellor (Research)
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Appendix C2: Ethics Approval Letter for Study 3A



Human Research Ethics Committee

Project Approval Letter

Principal Investigators/Supervisors:	Professor Joseph Ciarrochi and Dr Baljinder Sahdra
Student Researchers:	Geetanjali Basarkod and Emma Devine (Doctoral Students)
Project title:	Outcomes of Positive Educational Environments for Loreto Staff and Students
Project approval period:	05/11/2015 – 31/12/2019
Human Research Ethics Committee (HREC) Register Number:	2015-213H

This is to certify that the above application has been reviewed by the Australian Catholic University Human Research Ethics Committee (ACU HREC). The application has been approved for the period given above.

Researchers are responsible for ensuring that all conditions of approval are adhered to and that approval for modifications to the protocol are approved prior to implementation. In addition, the ACU HREC must be notified of any reportable matters including, but not limited to, incidents, complaints and unexpected issues.

Researchers are also responsible for ensuring that they adhere to the requirements of the *National Statement on Ethical Conduct in Human Research*, the *Australian Code for the Responsible Conduct of Research* and the University's *Code of Conduct*.

Any queries relating to this application should be directed to the Manager, Research Ethics and Integrity (resethics.manager@acu.edu.au).

Kind regards,

A handwritten signature in blue ink that reads 'N. Robinson'.

26/02/2019

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