Technical Manual

Version 2 (2022)

Contents

1. Introduction

Workplace Resilience and Wellbeing® (Wraw) is a psychometric measure of resilience and its impact on personal wellbeing. This online psychometric has been developed by a team of Business Psychology experts at The Wellbeing Project (TWP), a global consultancy specialising in the assessment of wellbeing and resilience together with wellbeing and resilience interventions and resources across many industries and sectors. Wraw is an evolution of its predecessor the 'My Resilience' model, which will be summarised in the next section. Wraw measures the current resilience of individuals, thereby assisting with creating awareness and enabling the development of resilience which ultimately impacts the wellbeing of individuals, teams, leaders and organisations.

Although several scales addressing aspects of resilience or wellbeing have existed for some time (e.g., Ryff, 1989; Connor & Davidson, 2003), at the time of developing My Resilience in 2010 (the predecessor to Wraw 2018), to our knowledge there was a limited number of psychometrics measuring resilience in working populations (Britt et al., 2016) as well as incorporating outcome measures (Chmitorz, 2018). Typically, the focus on resilience in the workplace has been measuring the impact of resilience training (e.g., Robertson, Cooper, Sarkar & Curran, 2015).

Wraw measures the extent to which an individual is resilient at the present time and in the present circumstances. It also takes into account the actions and thoughts that an individual is tapping into, which can enhance or deplete their overall resilience and wellbeing. Furthermore, Wraw measures the extent to which an individual is feeling the impact of the current pressures, challenges and adversities. In the literature, resilience is viewed as dynamic and not necessarily stable throughout one's lifetime, therefore, this assessment provides insights into an individual's *current* levels of resilience.

Wraw is a multi-dimensional measure of resilience and is designed to support the strengthening and development of individual, team, leader and organisational resilience, including elements of their mental, emotional and physical wellbeing. Wraw consists of 5 composite scales, referred to as 'The 5 Pillars of Resilience', and has 12 subscales, which are later summarised in this Technical Manual.

This Technical Manual summarises the literature supporting our operationalisation of resilience and provides detailed information on our five-factor model, known as the '5 Pillars of Resilience'. It also outlines details of the psychometric analysis that has been undertaken of the tool, providing evidence of a statistically robust, valid, and reliable measure of personal resilience.

Historical Background

In order to understand the historical background of Wraw, its predecessor 'My Resilience' (MyR) is summarised here. MyR was designed both as a personal resilience tool as well as a tool to inform what useful resilience interventions might be conducted at an organisational level. It also contained outcome measures that related to how an individual felt about their circumstances. It was, therefore, expected that following a resilience training intervention, there would be an increase in resilient actions and thoughts that would have some kind of positive impact on how the individual felt about their circumstances.

The 5 Pillars of Resilience model that exists within Wraw is, thus, a unique proprietary tool and model that was developed by Sam Fuller and Theresa Coligan at TWP in 2010 as part of MyR. The aim was to create a robust, evidence-based tool and model that measured physical, emotional, mental and social resilience. At the time of development, there were a limited amount, to our knowledge, of existing models offering a holistic approach. Therefore, the theoretical foundations of Wraw draw on interdisciplinary research in psychology (including clinical, positive, developmental, social and organisational psychology) as well as nutrition and the physical sciences.

The model was designed to cover all necessary elements, whilst maintaining a language and simplicity that would resonate with all working individuals. It was developed in such a way that would provide not just an awareness of individuals' current levels of resilience and wellbeing, but also strategies and a proactive approach to build and sustain these.

The 5 Pillars of Resilience model, therefore, draws on a large body of relevant research into individual and external factors that influence resilience to inform its contents and structure. This research shall be summarised in the sections that follow.

Over 8,000 employees in the UK and globally completed the MyR survey to measure their current levels of resilience. Whilst MyR was successful in providing individuals insight into their resilience levels, it was not a psychometric assessment. To provide a more scientific approach, TWP invested to create a complete psychometrically valid tool.

The structure of the model (i.e., 5 Pillars/factors) was statistically tested, using Cronbach's alpha, as part of the scale development process. During development, some items were removed or reworded as necessary, until a suitable structure was arrived at. Correlations between resilience scores (overall Wraw Index and each of the 5 pillars) and Impact Index scores supported the model's validity i.e., that the tool is measuring what it is supposed to and that meaningful conclusions can be drawn from its results.

The development and structure of the MyR tool provided the Wraw psychometric with the 5-factor model (i.e., the 5 Pillars) foundation. For the psychometric, sub-

scales of the Pillars were formed to provide a more comprehensive report. The Impact Index was developed to provide outcome measures of how individuals are feeling about their current circumstances and capacity to deal with them.

Both overall Wraw Index scores and scores on each of the 5 Pillars individually were found to correlate positively (and statistically significantly) with Impact Index scores. This pointed to good validity and provided reassurance that the model and tool are measuring relevant and impactful factors in the context of resilience.

Furthermore, the addition of pressure points and the impact of the leader behaviour questions have enabled the inclusion of environmental factors that could be measured and potentially changed to positively influence workplace resilience and wellbeing.

2. Theoretical Background

Defining Resilience in the workplace

Resilience is a rapidly growing area of research, with an increasing demand to understand how best to equip individuals to cope with the growing challenges presented by the modern world. While Wraw (2018) was developed before COVID-19, it is important to note here that the demand to strengthen resilience and improve wellbeing is even more pressing since the pandemic. Furthermore, occupational lifestyles and cultures have been irrevocably impacted and further emphasises the need for resilience and wellbeing assessment and intervention at this time. For example, annual declines in personal wellbeing in the UK (April 2020 – March 2021) were the greatest the Office for National Statistics has seen (ONS, 2021). A literature review on wellbeing and resilience spans a range of disciplines and fields of study including Developmental Psychology, Clinical Psychology (e.g., Post-Traumatic-Stress-Disorder), Occupational Psychology, Neuroscience, Cognitive and Biological Psychology, and more recently Positive Psychology.

In Huppert's review, The State of Wellbeing Science (2013), she refers to wellbeing as a 'fundamental human goal'. Scholars have been divided on whether a definition of wellbeing refers to positive emotions alone (e.g., Layard, 2005, 2011) or the balance of positive and negative emotions (e.g., Kahneman & Krueger, 2006); known as hedonic balance. Another perspective of wellbeing is a eudaimonic one, which refers to a slightly altered version of Aristotle's concept of eudaimonia (Ong, 2021). It includes a sense of autonomy, mastery, purpose, and connectedness to people, as well as the concept of 'flourishing' (Huppert, 2013; Ryff, 1989; Alexandrova, 2015). Sustainable resilience, another reference to eudaimonia, includes the experience of functioning well, which involves having a sense of engagement and competence, being resilient in the face of setbacks, having good relationships with others, a sense of belonging and contributing to a community (Huppert, 2013). Generally, research on wellbeing combines both hedonic and eudaimonic aspects. This position recognises wellbeing as an internal and outcome-oriented approach (meaning wellbeing is maintained or regained despite significant stress or adversity) and has been taken by a number of authors (e.g., Huppert, 2009; Keyes, 2002; Marks & Shah, 2005; Seligman, 2002, 2011; Ryff, 1989), and aligns with the position taken for the creation and use of Wraw which encompasses individual factors and an outcome-approach to wellbeing and resilience.

At the time of developing Wraw, resilience in Organisational and Occupational Psychology lacked conceptual clarity about its construct and the methodological designs to examine resilience (Britt et al., 2016). To the best of our knowledge, there is no consensus on how to define resilience. In fact, Meredith et al. (2011) reviewed the broad literature on resilience and found 104 definitions that prior researchers had offered on the construct. The Chartered Institute of Personnel Development (CIPD) identify that a consistent theme in defining resilience is 'a sense of adaptation, recovery and bounce back despite adversity and change'

(2011). Meredith et al. organised definitions according to whether they emphasised (a) basic abilities possessed by the individual, (b) the ability to adapt to adverse events and (c) the availability of documentation demonstrating positive changes after adversity (Britt et al., 2016). Some definitions of resilience refer to it as a capacity that resides within individuals (Masten & Narayan, 2012), as an ability of individuals to maintain stable functioning in the face of a highly stressful or traumatic event (Bonanno, 2004), and others as reflecting growth and positive changes after an adverse event (Maguen, 2006). A conflict across the various definitions of resilience is whether an individual must show growth or positive changes following a stressful event to be considered resilient; some definitions require positive growth and most simply require successful adaptation (Britt et al., 2016).

Literature on resilience, until recently, has been heavily influenced by contributions from Developmental Psychology and Child Psychiatry (Connor & Davidson, 2003). There are also important psychological contributions from Clinical, Biological, Cognitive, Sports, and Neuroscience. We review the salient themes in scientific and psychological literature on resilience below, which include Resilience and Personality, Dynamic Nature of Resilience, and Resilience Interventions.

Resilience and Personality

According to the literature, there is some variation in the relationship between resilience and personality. The proposition that personality characteristics can be a source of resilience has roots in developmental research, with most conceptualisations suggesting that at least some variance in resilience outcomes is attributable to personality (Bonnano & Diminich, 2013, Fletcher & Sarkar, 2013). Britt et al. (2016), in their systematic review on resilience, demonstrate that personality-based resilience studies draw from three conceptualisations of traits potentially related to resilience: (a) single trait models, which conceptualise resilience as a distinct trait; (b) composite trait models, which conceptualise resilience as a cluster of traits; and (c) all-inclusive taxonomies such as the five-factor model (FFM) of personality. A salient theme across these models, is the suggestion that resilience is an individual-level characteristic and that it is a quality where individuals demonstrate a relatively consistent level of resilience across multiple contexts. The literature differs in assumptions about the extent to which resilience is malleable and the extent to which resilience is synonymous with personality or an outcome of personality-related processes (Britt et al., 2016).

Connor & Davidson (2003) refer to resilience as 'representing a constellation of characteristics that enable individuals to adapt to the circumstances they encounter'. The FFM is the most widely used framework of personality, and meta-analytic summaries (e.g., Grossman, 2014; Eschelman et al., 2010) support that each of the FFM traits is related to other measures of resilience. Grossman (2014) found that the FFM traits accounted for almost all the variance in self-report measures of resilience. Therefore, evidence does suggest that dispositional characteristics may be strong predictors of self-reported measures of resilience.

However, as Bonanno (2012) notes, the proportion of variance explained by personality traits is typically small. Therefore, despite a dispositional basis to resilience, many other factors may contribute to one's ability to adapt to adverse circumstances. For example, Oshio et al. (2018) conducted a meta-analysis of the research investigating the relationship between resilience and the FFM. The results indicated relationships with all of the big five factors (negative with neuroticism, r =0.46, positive with extraversion, openness, agreeableness and conscientiousness, r ranging from 0.31 – 0.42) but with a large amount of the variance not covered by personality traits. Eley et al. (2013) have also identified that individual differences in personality explain some, but not all, of the variance in resilience (e.g., Eley et al., 2013). Campbell-Sills et al. (2006) found that, whilst resilience was negatively associated with neuroticism and positively related to extraversion and conscientiousness, coping styles also predicted variance in resilience above and beyond the contributions of these personality traits. The American Psychological Association (APA, 2011) note that 'Resilience is not a trait that people either have or do not have. It involves behaviours, thoughts and actions that can be learned and developed in anyone.'

Other studies acknowledge both personality as well as other factors in contributing to the likelihood of an individual to be resilient. For example, Fletcher and Sarkar (2013) acknowledge that resilience is 'the role of mental processes and behaviour in promoting personal assets and protecting an individual from the potential negative effect of stressors. Furthermore, Herrman et al. (2011), in their review on resilience, note that there are biological, personal and environmental or systemic sources of resilience. In consideration of the literature, we will take it that resilience brings together thinking style and behaviour and enables individuals to successfully adapt to the circumstances they encounter, even if these are challenging or threatening. Personality plays some role in one's ability to be resilient, but behaviours, thoughts and actions can be developed and learned and are not fixed. Our view of resilience as a dynamic process, as opposed to a fixed personality trait, is further explored in the literature review below.

The Dynamic Nature of Resilience

There are various indications that resilience develops over time and in context (e.g., Egeland, Carlson, & Sroufe, 1993). In a literature review, Windle (2011) highlighted the dynamic nature of resilience, noting it is 'a dynamic process of adaptation to adversity', thereby recognising that it goes beyond being a stable personality trait. Emerging research in the field of Neuroscience, Cognitive and Biological Psychology further supports the dynamic and non-fixed nature of resilience. In a review on Behavioural and Cognitive strategies that cultivate resilience and neural pathways, Tabibnia and Radecki (2018) note there are considerable benefits to learnable behaviours in enhancing resilience. The intrinsic and fundamental property of neuroplasticity makes it possible to improve adaptation to stress throughout the lifespan because brain structures are dynamic (Southwick & Charney, 2012). Nervous systems enable individuals to adapt to the environment and determine the best course of action, based on past and learnt experiences (Costandi, 2016). Researchers similarly argue that resilience is not

static, but a dynamic process of adaptation to the environment (Lucy et al., 2014). This is useful in considering how Wraw is utilised as it suggests that when measuring individual resilience, it is likely to change over time and that interventions to increase resilience should be possible. For example, Flint- Taylor & Pearn (2013) indicate that resilience has moved from being seen as a remedial or preventative measure to '...a broader focus as capacity or strength-builder to enable people, teams and organizations to sustain high levels of performance in challenging and difficult circumstances'.

Resilience training interventions

Resilience training has empirical and theoretical evidence. It is important to understand the benefits it may bring and what evidence supports this if we are to justify making interventions in the workplace. Wraw is designed both as a personal resilience tool and to inform how resilience interventions might be made at a team and organisational level. It also contains outcome measures that relate to how an individual feels about their circumstances. We would, therefore, expect that following a resilience training intervention, there would be an increase in resilient actions and thoughts that would have some kind of positive impact on how the individual feels about their circumstances.

Resilience-building programmes are typically used as part of primary preventive efforts, which aim to promote wellness and competence in order to prevent the negative effects of some future stressor (Masten, 2007). In contrast, Stress Management Interventions (SMIs) tend to use a secondary prevention approach to reduce the severity of symptoms that arise in response to a stressor (Richardson & Rothstein, 2008). In their meta-analytic review of 37 studies, Vanhove et al. (2016) found that resilience-building programmes have had a statistically significant, albeit modest, effect across health and performance criteria. This effect is weaker than that observed among occupational SMIs, but it is similar to effects evidenced through other meta-analyses of primary prevention techniques. Vanhove et al. (2016) note that the fact that resilience-building and other primary prevention approaches have had modest effects should not diminish their perceived utility to organisations. Even small preventive effects at the individual level have the potential to yield considerable benefits (e.g., sickness absence) at the organisational level (Sorensen, Emmons, Hunt, & Johnston, 1998).

This is further supported by the systematic review of resilience training in the workplace by Sarkar & Curran (2015) which indicates that resilience training can improve personal resilience, and although they note the empirical evidence is tentative, there is a large effect for mental health and subjective wellbeing outcomes. Most of the programmes reviewed utilised a Cognitive Behavioural approach to developing resilience.

The researchers quoted above note the difficulties of research in this area, for example, given the different training regimes and starting points for participants, as well as the need to have comparable study designs. These aspects should be taken into account in any future research.

3. Evidence supporting the structure of the '5 Pillars of Resilience'

The Wraw® psychometric is underpinned by our model of resilience, the '5 Pillars of Resilience'. The 5 Pillars have evolved from the 'My Resilience' diagnostic and are derived from a combination of research evidence and our extensive work at TWP with individuals, teams, and organisations in the area of wellbeing and resilience. Our model views the 5 Pillars as inter-related, whereby enhancing capabilities in one Pillar is likely to have positive benefits in some or all of the other Pillars.

The 5 Pillars are: Energy, Future Focus, Inner Drive, Flexible Thinking and Strong Relationships.
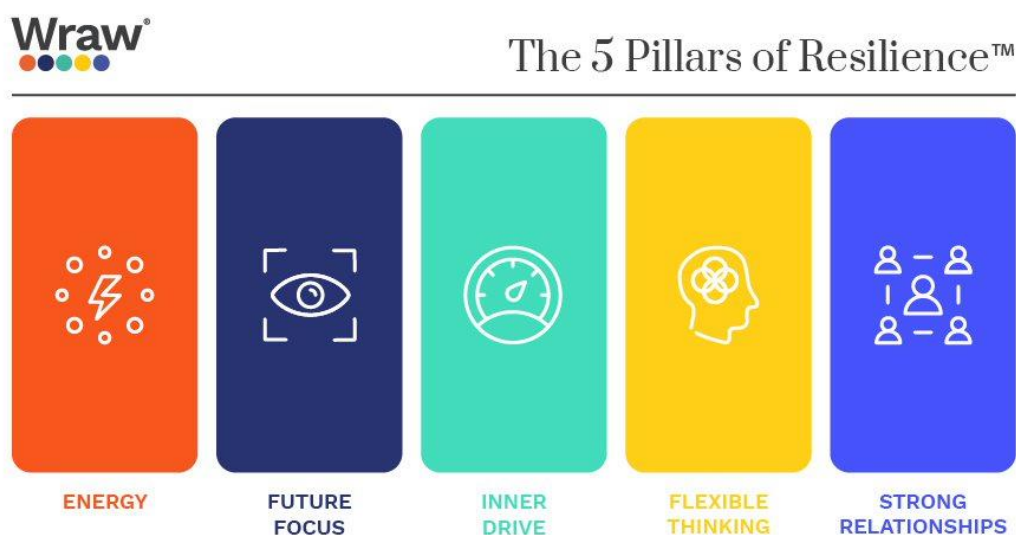
One measure of the validity of a tool is the extent to which the concepts that it covers are identifiable in other models and tools that look at resilience. This next section will identify the research that was used to substantiate each pillar as well as provide the subscales that form part of each pillar.

Energy

The impact of physical energy on resilience is part of our model, as it sheds light on how resilience can be managed and developed. There exists a large body of scientific research highlighting the numerous health benefits of eating well, regular exercise and physical movement, sleeping well, and maintaining boundaries between work and home life. This research will be summarised below to provide evidence for the role of 'Energy' as one of the 5 Pillars in the model. A definition of 'Energy' and its subscales ('Physical Activity', 'Sleep', 'Boundaries', and 'Healthy Consumption') will then be discussed.

Existing scales measuring resilience align with some of the subscales identified in the Energy Pillar. For example, Winwood et al. (2013) found that a component of their 'Resilience at Work' scale was staying healthy, which involves having a good level of physical fitness and a healthy diet. It is relevant to note that the same study takes chronic fatigue and poor sleep as an outcome, rather than as a contributor to 'Resilience at Work'. However, the behaviours that are pre-cursors to getting good sleep are still of interest to us in terms of their ultimate impact on energy levels. For example, in a study exploring the relationship between smartphone screen-time and sleep, Christensen et al. (2016) found that longer average screen-time during bedtime and the sleeping period was associated with poor sleep quality, decreased sleep efficiency, and longer sleep onset latency (the length of time it takes a person to go from complete wakefulness to the first stage of sleep).

Research by Warburton et al. (2006) into the health benefits of physical activity suggests that people with good cardiovascular fitness tend to cope better with psychological stressors and are less prone to negative mood states (such as anxiety and depression) and burnout. Mithu Storoni (2017) highlights the physiological benefits of moderate, not excessive exercise, in 'helping to return to baseline after a stressful experience', by lowering cortisol levels and reducing the emotional response to stress. In a review of research into exercise as a treatment for psychiatric disorders, results of studies generally support the use of exercise as an alternative or adjunctive treatment in treating depression (Barbour et al., 2007). Whilst cited with a note of caution, as the research relates to those experiencing chronic stress, Puterman et al. (2011) found that physical activity may be particularly beneficial to those experiencing chronic stress, with active women better able to turn off their stress response faster than a non-active control group.

The study of sleep is of relevance to resilience, with research focusing in clinical and military settings identifying a link between impaired sleep and a number of physical and mental health conditions such as depression and anxiety. A study of the US military population found that those reporting insomnia symptoms were less resilient (measured by outcomes of resilience such as lost workdays, self-related health). Interestingly, this study reported a U-shaped association, with both short and long sleepers less resilient than those sleeping 7 hours a night. The field of Neuroscience has much to contribute here, with the neuroscientist

Matthew Walker's book 'Why We Sleep' (2018) highlighting the multiple benefits of sleep to health and wellbeing. A recent study (Lerner at al, 2017) found that better quality sleep, consisting of more REM (Rapid Eye Movement) sleep can help to build emotional resilience by helping individuals to be less prone to encoding traumatic emotions and 'hard wiring' fear into their brains.

Nutrition and healthy habits may also bolster resilience. Research suggests that staying hydrated may reduce the biological stress response in individuals (Backes et al., 2015) and dehydration can affect your mood in a negative way (Ely et al., 2013). Research in the area of nutrition found that eating probiotic yoghurt reduced general perceived anxiety and stress (Mohammedi et al., 2015), and eating a meal that has a high glycaemic index at breakfast time may increase levels of cortisol (the stress hormone) compared to a meal with a low glycaemic index (Micha et al., 2011).

The unique hypothesis presented by Wraw is that people might have lots of positivity, determination and motivation, but that this doesn't always serve them well and can create a tipping point mentally/emotionally if their physical resilience (i.e. their energy) is impacted. Wraw looks at how physical resilience might be compromised in the longer term by an otherwise robust individual.

In consideration of the literature on physical activity, sleep, boundaries, healthy consumption, and their evidenced effect on resilience, the concept of 'Energy' was identified as one of the 5 Pillars in the model. Energy is defined in Wraw as the following:

Sustaining and renewing physical energy to have the capacity to keep going through challenging times.

The four subscales that form the Energy pillar, and their definitions, are:

Subscale	Definition
Physical Activity	Sustaining physical exercise and movement.
Sleep	Preserving your sleep and ensuring you maintain good sleep patterns.
Boundaries	Sustaining physical energy by taking breaks and maintaining boundaries (not allowing work to take over)
Healthy Consumption	Eating and drinking healthily despite pressures, without relying on substances to calm or stimulate.

Future Focus

Research suggests having or developing a focus on the future can have a significant effect on resilience. This research will be summarised below to provide evidence for the role of 'Future Focus' as one of the 5 Pillars in the model. A definition of 'Future Focus' and its subscales ('Purpose' and 'Personal Control') will then be discussed.

The work of Seligman has been hugely influential in the field known as 'Positive Psychology (e.g. Seligman, 2003, 2011) and his research highlights the importance of meaning and purpose in one's life as having important positive outcomes on wellbeing. The ability to identify with one's work as meaningful has been evidenced in the research. Bartone (1999) found that city bus drivers who found their work meaningful and were proud of their job responded more positively when faced with work-related stress than those who viewed their role as 'just a job'. Another study found that when faced with an organisational crisis, those workers who expressed a sense a purpose in their work and other activities were more resilient than those workers who did not (Maddi, 1987). Therefore, research on meaning and purpose within an individual's life suggest an interaction with psychological resilience.

Other research has also found that meaning and purpose within an individual's life have an effect on resilience. Jew et al. (1999) found that the concept of 'future orientation' was a subscale of resilience., Winwood et al. (2013) found that a component of 'Resilience at Work' was finding one's calling, where an individual seeks work that has a purpose, a sense of belonging, and fit within one's own core values and beliefs. Whilst a note of caution should be employed in applying findings from clinical research, there is evidence that having goal-directed actions that reflect an individual's values could compensate for the effects of adversity (Kent et al., 2015).

Maddi (2013) conceptualises the notion of 'personal hardiness' and researches its relationship to resilience. Maddi defines 'personal hardiness' as a pattern of attitudes and strategies that facilitate turning stressful circumstances from potential disasters into growth opportunities. He identifies 'three C's' of hardiness attitudes, which include control, challenge, and commitment. The Control element refers to the belief that no matter how bad things get, 'hardy' individuals will keep trying to turn the stressors from potential disasters into growth opportunities. 'Personal hardiness' is relevant here because having a clear sense of purpose and direction, i.e. having a 'Future Focus' when approaching adverse events with adaptation and potential growth moments, demonstrates psychological resilience.

Rotter's (1954) concept of 'locus of control' is also of relevance here, describing the extent to which individuals believe that they themselves are responsible for future outcomes (internal locus of control) or whether they attribute these to external factors (external locus of control). For example, when receiving exam results, individuals with an internal locus of control may tend to praise or blame themselves (depending on the results) whereas those with an external locus of

control tend to praise or blame external factors such as the teacher or exam (Carlson, 2007). Research into the role of resilience and locus of control for predicting Post-Traumatic Stress Disorder (PTSD) in firefighters found that locus of control was a positive predictor of PTSD symptoms, whereby those with an external locus of control were associated with more PTSD symptoms (Onyedire et al., 2017). This is relevant to the 'Future Focus' pillar as the 'locus of control' relates to having 'personal control' and clear direction without ruminating or holding oneself back.

In consideration of the literature on meaning/purpose, 'personal hardiness', and the 'locus of control', and their evidenced effect on resilience, the concept of 'Future Focus' was identified as one of the 5 Pillars in the model. Future Focus is defined in Wraw as the following:

Having a clear sense of purpose and direction to help move forwards without getting stuck or feeling held back.

The two subscales that form Future Focus, and their definitions, are:

Subscale	Definition
Purpose	Having a clear sense of purpose and direction.
Personal Control	Seeking and believing you have personal control over your situation.

Inner Drive

Research suggests that possessing an inner strength, i.e., confidence, self-belief, and motivation, are important components of resilience. This research will be summarised below to provide evidence for the role of 'Inner Drive' as one of the 5 Pillars in the model. A definition of 'Inner Drive' and its subscales ('Motivation' and 'Self-belief') will then be discussed.

Internal capacities such as self-confidence and self-efficacy have been shown to be related to positive outcomes after stressful events (Bonanno et al., 2002; Bonanno et al., 2005; Schok et al., 2010). In the Resilience Evaluation Scale (RES), a two-factor psychometric on psychological resilience, there are two underlying constructs: self-confidence and self-efficacy (van der Meer et al., 2018). Here, self-confidence is defined as having trust in oneself, and self-efficacy is understood as having positive beliefs about adaptive coping with stressful situations. The secondary appraisal concept of the Lazarus and Folkman model on stress guided the two-factor RES (Lazarus, 1996). Similarly, Martin et al. (2003) found that academic resilience comprises of self-belief (confidence), a sense of control, low anxiety (composure), and persistence (commitment) as assessed through the Student Motivation Scale (Martin, 2001, 2002). This is referred to as the *Four Cs: Confidence, Control, Composure, and Commitment.* Therefore, motivation and self-belief (i.e., inner drive) have been shown to be positively related to resilience.

Carol Dweck, known for her work on the mindset psychological trait (e.g. Dweck, 2017) notes that those who are driven and motivated to overcome challenges are more likely to have a growth mindset. McClelland's (1961) need for achievement, which is reflected to some degree under Future focus (in relation to goals), is also relevant for this Pillar. McClelland noted that people who are achievement-motivated prefer to master a task or situation, seeking advancement in their work, as well as realistic but challenging goals. This sense of motivation aligns with our concept of 'Inner Drive', as those who put in effort to progress are more likely to persist in the face of difficulty, which is an important component of resilience.

Lundman et al. (2007) investigated resilience in relation to age and gender and its underlying structure. They found that one of the identified characteristics of resilience was self-reliance; a belief in oneself and their capabilities. This is also supported by the research and theory around the 'locus of control', described above (Rotter, 1954), whereby those with stronger internal locus of control may be more likely to sustain self-belief when faced with challenges, believing that they have the capacity to cope with adversity and change. Connor &Davidson (2003) also identified trust in one's instincts as a factor in their resilience scale, which is likely to underpin self-reliance and motivation. Furthermore, Neenan (2018) highlights the importance of developing self-belief as a key strength underpinning resilience, and the notion of being able to get the best out of yourself within the constraints that you have.

In consideration of the literature on elements such as self-belief, motivation, confidence and commitment, 'Inner Drive' was identified as one of the 5 Pillars in the model. Inner Drive is defined in Wraw as the following:

Sustaining self-belief when times get tough, displaying confidence, motivation and perseverance.

The two subscales that form Inner Drive, and their definitions, are:

Subscale	Definition
Motivation	Maintaining effort to reach the best outcome, irrespective of difficulties encountered.
Self-Belief	Having and sustaining confidence in your own ability or judgement.

Flexible Thinking

Research suggests that developing optimism, and redirecting attention to the positive, can boost resilience. This research will be summarised below to provide evidence for the role of 'Flexible Thinking' as one of the 5 Pillars in the model. A definition of 'Flexible Thinking' and its subscales ('Open Mindedness' and 'Positive Framing') will then be discussed.

Seligman (2002) has concentrated a lot of his research in this area, looking at how optimists and pessimists tend to differ in their explanatory styles (how they explain events to themselves and others). Pessimists tend to believe in the permanence and universality of negative events and tend to react negatively when faced with challenging situations. Optimists, however, tend to have a more adaptive explanatory style and view negative events as short-term and specific to the circumstances. They also tend to believe they are able to cope positively and can minimise the threat posed by challenging circumstances. Seligman's concept of learned optimism, i.e., we can learn to think more like optimists, as well as Cognitive Behavioural Therapy techniques (e.g. Padesky & Mooney, 2012) have been used in different ways to explore and enhance resilience. In conducting research with students, Jew (1999) also found optimism to be a sub-scale of resilience, where those who are higher on the 'Resiliency scale' are more likely to have a higher internal 'locus of control'. The work of Carol Dweck on 'Growth Mindset' (e.g. Yeager and Dweck, 2012), in particular with children and students, explores how students who believe they can 'grow' or 'develop' to do anything are more resilient and also tend to achieve higher results and outcomes. Further research by Dawson and Pooley (2013) identified that higher levels of optimism predicted resilience in first year university students. Adaptability to change is also a consistent theme throughout the literature on resilience. For example, 'positive acceptance of change' is a factor identified from research on the Connor & Davidson Resilience Scale. Winwood et al. (2013) found that maintaining perspective was a component of 'Resilience at work'. This included reframing setbacks, having a solution focus and managing negativity.

The field of Neuroscience is also of relevance here, as there is evidence that changing the way that we think can cause changes in the activation of brain regions associated with the processing of emotions that are aligned with resilience, such as fear and anxiety. In one study (Ochsner & Bunge, 2002), participants were presented with neutral or negative situations and asked to respond naturally, whilst their brains were scanned. They were then instructed to interpret the situations differently so as to feel less negative about them. This reappraisal of the negative situations impacted on a number of functions associated with the processing of emotions: negative emotions decreased, there was increased activation in areas of the region of the brain related to cognitive control (prefrontal cortex), and decreased activation of the amygdala (involved in the processing of 'raw' emotions and central to the 'flight or flight' response). Studies like these provide further support for the notion that the more we are able to 'think flexibly', the more resilient we are likely to become.

In consideration of the literature on concepts such as optimism, pessimism, 'growth-mindset', acceptance of change, having perspective, and their evidenced effect on resilience, 'Flexible Thinking' was identified as one of the 5 Pillars in the model. Flexible Thinking is defined in Wraw as the following:

Having an open and optimistic mindset, enabling a positive and adaptive response to change and challenges.

The two subscales that form Flexible Thinking, and their definitions, are:

Subscale	Definition
Open-Mindedness	Readily seeing and taking account of different views and ways of doing things.
Positive Framing	Thinking in helpful and proportionate ways about situations.

Strong Relationships

Research suggests that there is a connection between social support and individual resilience. This research will be summarised below to provide evidence for the role of 'Strong Relationships' as one of the 5 Pillars in the model. A definition of 'Strong Relationships' and its subscales ('Building Trust' and 'Accessing Support') will then be discussed.

There is a large body of research supporting a connection between social support and physical and mental health outcomes in a variety of populations (e.g. Barth, Schneider & Von Kanel, 2010; Reblin & Uchino, 2008). Research into the effect of social support on a wide range of health conditions including cancer (Manne et al., 1999) and cardiac illness (Holahan et al., 1995) highlight the positive impact on sufferers on outcomes including the ability to cope, display of depressive symptoms, and mood. In a review of the research, Afifi (2018) notes that social relationships have the strongest influence on whether someone can adapt positively to adversity.

Research on how students cope with a transitional move to university found that perceived social support predicted resilience in first year university students (Dawson & Pooley, 2013). Furthermore, research on teachers' resilience (Greenfield 2015) indicates that it is characterised by dynamic interactions between four broad constructs: thoughts, relationships, actions, and challenges. Greenfield found that relationships and actions often act as a buffer in combination to protect teachers' beliefs about themselves/their role from external challenges. In addition, family relationships and social relationships, such as mentoring, have been cited as related to resiliency (Werner & Smith, 1982). Connor & Davidson (2003) identified secure relationships made up part of one factor in their resilience scale. Winwood et al. (2013) found two components of 'Resilience at work', which tie in with strong relationships. These are interacting cooperatively, which includes both seeking and offering support and building networks both inside and outside the workplace.

The short form of the Interpersonal Support Evaluation List (ISEL-12, Cohen, Mermelstein, Kamarck & Hoberman, 1983) describe overall perceived support, and contains three subscales representing perceived availability of appraisal (advice or guidance), belonging (empathy, acceptance, concern) and tangible social support (help or assistance, such as material or financial aid).

Again, the field of Neuroscience has research evidence of note here. When put through two different 'stress tests' (attending a mock job interview, being put under pressure to solve a complicated maths problem mentally), participants who were invited to bring a friend as opposed to attending alone were found to have lower levels of cortisol, the stress hormone (Heinrichs et al., 2003).

In consideration of the literature on concepts such as social support, social relationships, accessing support, and their evidenced effect on resilience, 'Strong

Relationships' was identified as one of the 5 Pillars in the model. Strong Relationships is defined in Wraw as the following:

Building open and trusting relationships and being willing to call on these for help and support if facing a challenge.

The two subscales that form Strong Relationships, and their definitions, are:

Subscale	Definition
Building Trust	Seeking to develop trust, understanding and emotional awareness with others.
Accessing Support	Sharing what you are going through and being prepared to access help.

Additional evidence supporting the 5 Pillars of Resilience model can be cited in the Dolan Criteria from 2020 (Dolan, 2020). Dolan is a professor of behavioural science, a member of the National Well-being Advisory Forum for the Office of National Statistics and an adviser to the UK government. In 2020, Dolan suggested 10 specific criteria required to keep people happy and well. These map effectively to the 5 Pillars model that Sam Fuller & Theresa Coligan created in 2010.

Dolan Criteria 2020	5 Pillars Model 2010
1. **Keep Moving** - exercise is invaluable, even small amounts 2. **Go Outside -** fresh air is energising	Energy
3. **Maintain A Purpose** - have a goal to grow your self	Future Focus
4. **Accept It Can Be Tough** - especially in current times but do not stop striving 5. **Sweat the Small Stuff** - focus on delivering your best in the here and now- stay in the present	Inner Drive
6. **Value What You Have** - do not close your mind by constantly comparing to others, especially on social media 7. **Don't Be Scared to Ask For Help** - drop that stiff upper lip	Flexible Thinking
8. **Communicate** - keep talking and listening 9. **Help Others** - giving of yourself is exceptionally fulfilling for the human condition 10. **Remember & Respect Difference** – look for new types of people to connect with, it can open your mind	Strong Relationships

Measurement of the 5 Pillar Scales

Within the 5 Pillar scales, there are groups of items that aim to look at resilience from different angles. Exploring an individual's resilience from these different perspectives is helpful in using the tool for practical and developmental purposes and allows for the gaining of further insight that can in turn support various developmental recommendations.

These measures are Wraw Index, Resilient Actions, Resilient Thoughts, and the Impact Index. They are explained below.

Wraw Index

The scores of the 5 Pillar scales, which are the results of the responses to the 90 items, are combined into an overall score called the Wraw Index. This is therefore an overall measure of the degree to which an individual is resilient at the present time and in the present circumstances, in relation to the comparison group. The Wraw Index is broken down into Resilient Actions and Resilient Thoughts. Thus the 90 items are each classified as either being a Resilient Action or a Resilient Thought.

Resilient Actions

This is a measure of the extent to which an individual takes action to help sustain and enhance their resilience. The Resilient Actions items comprise 58 of the 90 items.

Examples of Resilient Action items include:

I regularly eat lunch at my desk; I make sure I get help when I need it; I readily get distracted from the direction I'd ideally like to take.

Displaying or not displaying the Resilient Actions will indicate, according to the model, the extent to which someone will be resilient. For example, if someone ensures that they have dedicated time to eat lunch, this is likely to enhance their resilient behaviour and have a positive impact on how they feel.

Resilient Thoughts

This is a measure of the extent to which the individual thinks about themselves, others or the situation in a way that enhances their own resilience. The Resilient Thoughts items comprise 32 of the 90 items.

Examples of Resilient Thought items include:

I can cope with what comes my way; For the foreseeable future, I'm stuck with the issues I'm facing; On the whole I think clearly about things.

As with Resilient Actions, we see a relationship between Resilient Thoughts and the extent to which someone is resilient. One way to deal with low resilience is to challenge unhelpful thinking. These items can provide insight into what shift in thinking might be required to improve resilience and wellbeing.

Impact Index

In addition to the above-mentioned 90 items, there are 22 further items that form the Impact Index. The Impact Index is a measure that describes the extent to which an individual is feeling the effects of the pressures, challenges, and adversities that they are currently experiencing. These items are a useful indicator within the tool that can further assist with the development of resilience.

According to our model, resilience, or lack of it, has a positive or negative effect on an individual. We should therefore be able to assess the impact that a level of resilience has on the people who complete the Wraw questionnaire.

Examples of items from the Impact index include:

I don't feel I've got much energy; I find it difficult to see beyond today; I feel isolated at work.

The Impact Index therefore tells us what impact the current challenges are having on a person, which in turn impacts their wellbeing. Taken as a group, these items thus provide a very good indication of the extent to which individuals are feeling generally positive or negative about their situation. These items don't in themselves tell us very much about what needs to be done, but they do tell us whether something should be done to intervene.

It is important to note that variance in response to these items will not be entirely explained by resilience alone, but that there is evidence to suggest a strong relationship between the Impact Index and the rest of the items in Wraw i.e. the Wraw Index (see Section 6 for further detail).

Additional Survey Elements

Alongside Wraw, there are additional survey elements that Practitioners can activate when setting up a project, should their clients want to obtain this information. These survey elements (Leader Index, Pressure Points, Free Text Comments) provide further insights into the leadership and organisational behaviour that is supporting or hindering wellbeing.

Leader Index is the extent to which individuals feel their resilience and wellbeing are actively supported by their own line manager, including through modelling good practice. There are 7 items that individuals are asked to respond to about their manager using a 5-point likert scale (strongly disagree, disagree, neither disagree nor agree, agree, strongly agree). A lower percentage indicates that on

average, respondents feel that their line manager could do more to support and model resilience and wellbeing. A higher percentage indicates that on average, respondents feel that the line manager adopts and models behaviour that supports resilience and wellbeing. The 7 statements are also provided with a % favourable score which is the percentage of respondents who 'strong agreed' or 'agreed' with the 5 positive statements and 'strongly disagreed' of 'disagreed' with the 2 negative statements.

Pressure Points is an overview of pressure points that are currently impacting negatively on resilience and wellbeing within the team and organisation. Individuals are asked to select up to 3 pressure points in their workplace which impact most negatively on their resilience or wellbeing. The results are presented as a percentage and denotes the frequency of mention. These pressure points were based on the Job Demands-Resources model by Bakker & Demerouti (2007).

Free Text Comments is an optional field where individuals are invited to provide anonymised comments in relation to the questions *'What (if anything) could your line manager do to better support your resilience and wellbeing?'* and *What (if anything) could your organisation do to better support your resilience and wellbeing?*

These survey elements offer valuable additional insight into how effectively a line manager is in terms of building a safe and supportive working environment for their team as well as what is happening in the organisation that is causing pressure and having a detrimental impact on the wellbeing and resilience of employees.

These survey elements are generated in the Leader Report and Organisation Report.

4. Wraw Scoring methodology

Administration and rating scale

Wraw is administered as an online psychometric tool with all instructions provided on screen.

The Wraw questionnaire contains 112 statements. There is a 5-point 'likert' scale for respondent to express the extent to which they agree or disagree with each statement (strongly disagree, disagree, neither disagree nor agree, agree, strongly agree).

Scale structure and number of items

Index	No. Index items	Pillars	No. Pillar items	Subscales	No. items
Wraw	90	Energy	26	Physical activity	5
				Sleep	5
				Boundaries	6
				Healthy consumption	10
		Future focus	15	Purpose	8
				Personal control	7
		Inner drive	15	Motivation	6
				Self-belief	9
		Flexible thinking	17	Open minded	9
				Positive framing	8
		Strong relationships	17	Building trust	10
				Accessing support	7
Impact	22				22
Total items					112

There is a good balance of positively and negatively phrased items in Wraw (see below), helping to reduce acquiescence bias.

Index	Positive items	Negative items
Wraw	49	41
Impact	11	11

Scoring

The Wraw software automatically scores responses to the items and reports them at the scale level. This predominantly involves converting the raw scores for each scale into standardised (sten scores), using whichever norm (comparison) group has been selected in the software. These are referred to as 'comparison scores' in the reporting of Wraw.

There are some exceptions to this, for example the pillar scores are also reported as 'summative scores', expressed as a percentage of the maximum possible pillar score. These are a combined sum of responses against each Pillar. They do not take account of any comparison to the scores of others. The summative scores are presented in percent format for each Pillar, offering a clear and simple insight into the 'resilience gap'. This 'gap' reflects the extent to which there is scope to develop greater resilience. The maximum score is 100%. The smaller the resilience gap, the stronger the pillar. The larger the resilience gap, the more opportunity there is to develop that pillar.

Interpreting sten scores

Sten scores have a range 1 to 10, a mean of 5.5 and a standard deviation of 2. Sten scores of 5 or 6 are average or typical for the comparison group. A score of 4 is slightly below average and a score of 7 is slightly above average. Scores of 8, 9 and 10, can be considered to be high, very high and extremely high respectively, and similarly scores of 1, 2 and 3 reflect extremely low, very low and low respectively.

The coaching language advised for the sten scores is as follows:

Sten score	Representation	Coaching Interpretation
1, 2 or 3	Low	Less well developed
4, 5, 6, or 7	Medium (or 'Mid')	Typical
8, 9 or 10	High	Well developed

Collective reporting of scores

In cases where Wraw is reported collectively for a group, this is done by not only providing the average sten score, which can mask differences in highs and lows, but also by showing the trend in terms of frequencies in sten scores for the group.

5. Norm Groups

Previously, Wraw used a norm group of four hundred (N=400), but this has been updated with the adoption of a larger (N=9,000) and more representative norm group. This shows the ongoing commitment of The Wellbeing Project to consistently develop and update the tool. Interestingly, when a sten comparison was conducted, changes in sten assignment were relatively small, despite the enlargement of the norm group by over 20 times, which reflects the quality of the previous norm of 400.

5.1 The Global Worker Norm Group

The current Global Worker norm group contains nine thousand participants (N=9,000) from 82 countries. Despite this broad representation of countries, 61% of the norm group are UK-based. The information below provides the demographic breakdown of this norm group, including by age, gender, work sector, work pattern, work environment, industry sector, country, department, and role level.

Table 5.1. Distribution of age in the Global Worker norm group

Age	N	%
18-25	628	6.98%
26-35	2209	24.54%
36-45	2904	32.27%
46-55	2374	26.38%
Over 55	885	9.83%
Grand Total	9000	100.00%

The age profile above shows a reasonable and even cross section of different age groups. Analysis of the UK workforce indicates that 65% of UK workers were over the age of 35 in May to July 2018 (ONS A05 data), and this closely aligns with the Global Worker norm group, with 68.48% of its nine thousand sample reporting their sample over the age of 35. The largest subset of workers is the 36-45 age group (32.27%).

Table 5.2. Distribution of gender [1] in the Global Worker norm group

Gender	N	%
Male	4500	50.00%
Female	4500	50.00%
Grand Total	9000	100.00%

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[1] This does not include participants who identified as non-binary/gender fluid. An analysis of the reliability data indicated there was no statistical difference for this group.

The Global Worker norm group reflects a 50/50 distribution of males and females. This is roughly aligned with the proportion of male and female workers in the UK, as 53% of UK workers were male and 47% female (ONS EMP04 data, May to July 2018).

Table 5.3. Distribution of work sector in the Global Worker norm group

Work Sector	N	%
Private sector	6688	74.31%
Public sector	1737	19.30%
Third sector/not for profit	575	6.39%
Grand Total	9000	100.00%

The work sector profile above is broadly consistent with what is found in terms of the proportion of private, public and third sector workers in the UK. According to an ONS data (EMP02, May to July 2018), 76.15% of UK workers were from the private sector, 17% were from the public sector, and 7% were from the third sector (non-profit). There is a similar spread in the work sector profile above to this ONS data.

Updated ONS data from 2022 maintains that the work sector profile above is consistent with workers in the UK. According to ONS data (AH1020, 2022), 75.73% of UK workers are from the private sector, 17.54% are from the public sector, and 6.74% are from the third sector (non-profit). Again, there is a similar spread in the work sector profile depicted in Table 5.3 to this ONS data.

Table 5.4. Distribution of work pattern in the Global Worker norm group

Work Pattern	N	%
Full time (non-shift work)	7463	82.92%
Full time (shift work)	761	8.46%
Part time (non-shift work)	653	7.26%
Part time (shift work)	123	1.37%
Grand Total	9000	100.00%

The data above relating to work pattern, shows that respondents predominantly worked full time (91.38%). This is a higher proportion than were in the UK workforce at the time, as according to ONS data (EMP01, May to July 2018) 74% of workers were full time.

Table 5.5. Distribution of work environment in the Global Worker norm group

Work Environment	N	%
Office based	2487	27.63%
Office or Site based	2050	22.78%
Mixed Office/Site and Home based	1694	18.82%
Home based	1465	16.28%
Mobile or field based	797	8.86%
Mixed office and home based	502	5.58%
Not specified	5	0.06%
Grand Total	9000	100.00%

The Global Worker norm sample includes participants experiencing a broad range of work environments in their employment. The most commonly cited work environments are 'office based' at 27.63% and office or site based at 22.78%, which equates to 50.41% for the office-type environment. It must be noted that some of the data gathering for this norm group occurred during the Covid-19 pandemic.

In the future, it will be interesting to see if there might be a decrease in the percentage of the office-type work environment and an increase in the hybrid-type work environment (mixed office/site and home based) post-pandemic as more organisations are choosing the hybrid work environment option going forward. Additional research will be done in the future to explore this.

Table 5.6. Distribution of industry sector in the Global Worker norm group

Industry Sector	N	%
Banking and Finance	1999	22.21%
Science and Pharmaceuticals	1092	12.13%
Health and Social Care	888	9.87%
Engineering and Manufacturing	733	8.14%
IT and Information Services	475	5.28%
Consulting and Management	418	4.64%
Business	409	4.54%
Retail	379	4.21%
Teaching and Education	354	3.93%
Charities and Voluntary Work	353	3.92%
Energy and Utilities	238	2.64%
Recruitment and HR	208	2.31%
Marketing	147	1.63%
Construction	125	1.39%
Hospitality	122	1.36%
Accountancy	120	1.33%
Advertising and PR	112	1.24%
Public Administration	107	1.19%
Law	93	1.03%
Transport & Logistics	93	1.03%
Environment and Agriculture	91	1.01%
Telecommunications	86	0.96%
Defence and Security	81	0.90%
Property	68	0.76%
Tourism and Sport	64	0.71%
Media and Publishing	60	0.67%
Creative Arts and Culture	48	0.53%
Armed Forces and Emergency Services	37	0.41%
Grand Total	9000	100.00%

The Global Worker norm group included respondents representing a large array of industry sectors, with 28 industries reflected in the sample. The most commonly represented industry was the banking and finance sector (22.21%), followed by Science and Pharmaceuticals (12.13%) and Health and Social Care (9.87%).

Table 5.7. Distribution of countries in the Global Worker norm group

Country	N	%
United Kingdom (UK)	5497	61.08%
Canada	1256	13.96%
United States of America (USA)	469	5.21%
Netherlands	297	3.30%
Ireland	187	2.08%
France	147	1.63%
Germany	121	1.34%
Belgium	95	1.06%
Japan	76	0.84%
Luxembourg	68	0.76%
India	58	0.64%
Australia	53	0.59%
Malaysia	49	0.54%
China	44	0.49%
Singapore	34	0.38%
Poland	33	0.37%
Afghanistan	31	0.34%
Italy	31	0.34%
Malta	31	0.34%
Hong Kong	30	0.33%
Denmark	25	0.28%
Switzerland	24	0.27%
Czech Republic	23	0.26%
Mexico	22	0.24%
Spain	21	0.23%
Brazil	19	0.21%
South Africa	19	0.21%
Russia	16	0.18%
Turkey	15	0.17%
Albania	14	0.16%
Thailand	14	0.16%
Nigeria	13	0.14%
Sweden	11	0.12%
Norway	10	0.11%
Trinidad and Tobago	10	0.11%
Portugal	9	0.10%
New Zealand	8	0.09%
Ukraine	8	0.09%
United Arab Emirates (UAE)	7	0.08%
Algeria	6	0.07%

Country	N	%
Morocco	6	0.07%
Romania	6	0.07%
Armenia	5	0.06%
Greece	5	0.06%
Kenya	5	0.06%
Austria	4	0.04%
Egypt	4	0.04%
Hungary	4	0.04%
Andorra	3	0.03%
Bahamas	3	0.03%
Barbados	3	0.03%
Bulgaria	3	0.03%
Lithuania	3	0.03%
Philippines	3	0.03%
Vietnam	3	0.03%
Argentina	2	0.02%
Colombia	2	0.02%
Finland	2	0.02%
Ghana	2	0.02%
Jordan	2	0.02%
Lebanon	2	0.02%
Nepal	2	0.02%
Pakistan	2	0.02%
Qatar	2	0.02%
Swaziland	2	0.02%
Uganda	2	0.02%
Zimbabwe	2	0.02%
Angola	1	0.01%
Brunei	1	0.01%
Burundi	1	0.01%
Cameroon	1	0.01%
Chile	1	0.01%
Cyprus	1	0.01%
Iceland	1	0.01%
Indonesia	1	0.01%
Iraq	1	0.01%
Israel	1	0.01%
Kazakhstan	1	0.01%

Country	N	%
Mozambique	1	0.01%
Slovakia	1	0.01%
South Korea	1	0.01%
Tanzania	1	0.01%
Grand Total	9000	100.00%

The most notable statistic here is that the sample is 61.08% UK based, indicating the Wraw has a strong UK focus. However, it should also be noted that the Global Worker norm group also includes participants representing 81 other countries. This enables the psychometric to draw from an exceedingly diverse range of nationalities.

Table 5.8. Distribution of departments in the Global Worker norm group

Department Name	N	%
Other	2161	24.01%
Operations	1406	15.62%
Marketing & sales	1313	14.59%
Human resources	968	10.76%
Finance	872	9.69%
IT	554	6.16%
Customer service	549	6.10%
Research & Development	385	4.28%
Production	230	2.56%
Strategy	201	2.23%
Legal	154	1.71%
Facilities	83	0.92%
Distribution	64	0.71%
Purchasing	60	0.67%
Grand Total	9000	100.00%

Findings from the Global Worker norm group indicated a breadth of departments represented in the sample of nine thousand respondents. The option of 'Other' was chosen by the largest subset (24.01 %), followed by 'Operations' (15.62%) and 'Marketing and Sales' (14.59%).

Table 5.9. Distribution of role levels in the Global Worker norm group

Role Level	N	%
Director/Executive	1351	15.01%
Senior Manager	2043	22.70%
Line Manager	1915	21.28%
Non-manager	3487	38.74%
Student	204	2.27%
Grand Total	9000	100.00%

Analysis of the Global Worker norm indicated that the largest group were 'Non-managers' (38.74%), and that 58.99% of the sample classed themselves as being in a managerial role or above (i.e., Line Manager, Senior Manager or Director/Executive). It is difficult to make a direct comparison with ONS data of this nature, as specific reference is made to 'professions'. Nevertheless, the proportion of managers does seem to be on the high side (e.g., Dayan and Edwards 2015 noted that only 4% of the NHS workforce were managers, in comparison to 10% of UK workers).

5.2 The Leader Norm Group

The Wraw 'Leader' norm group contains four thousand participants who were employed in leadership positions when they completed the psychometric. The information below provides the demographic breakdown of this norm group, including by age, gender, work sector, work pattern, work environment, industry sector, country, department, and role level. Table 5.10 presents the age breakdown of the Leader norm group.

Table 5.10. Distribution of age in Leader norm group

Age	N	%
18-25	42	1.05%
26-35	492	12.30%
36-45	1451	36.28%
46-55	1500	37.50%
Over 55	486	12.15%
Prefer not to say	29	0.73%
Grand Total	4000	100.00%

As with the General Worker norm group, the age profile of the Leader norm reflects an even distribution of ages across the sample. When comparing these

two norm groups, perhaps the most notable characteristic about the Leader norm is that it skews slightly older than the General Worker norm. The largest subgroup consists of the 46-55 age group, which includes 37.5% of the sample.

Table 5.11. Distribution of gender in Leader norm group

Gender	N	%
Male	2000	50.00%
Female	2000	50.00%
Grand Total	4000	100.00%

As with the General Worker norm group, the Leader norm group contains a 50/50 split of males and females in the sample of four thousand.

Table 5.12. Distribution of work sector in Leader norm group

Work Sector	N	%
Private sector	3192	79.80%
Public sector	634	15.85%
Third sector/not for profit	174	4.35%
Grand Total	4000	100.00%

The work sector profile of the Leader norm is similar to the General Worker norm, albeit with a slightly larger amount of the sample employed in the private sector (79.8%) compared to the 74.3% employed by this sector in the General Worker norm.

Table 5.13. Distribution of work pattern in Leader norm group

Work Pattern	N	%
Full time (non-shift work)	3649	91.23%
Full time (shift work)	140	3.50%
Part time (non-shift work)	202	5.05%
Part time (shift work)	9	0.23%
Grand Total	4000	100.00%

As with the General Worker norm group, the considerable majority of the participants reside in full time (non-shift work) positions. When compared, this subgroup is approximately 9% larger in the Leader norm, with 91.23% of the sample employed in this capacity.

Table 5.14. Distribution of work environment in Leader norm group

Work Environment	N	%
Office based	1223	30.58%
Office or Site based	880	22.00%
Mixed Office/Site and Home based	772	19.30%
Home based	592	14.80%
Mixed Office and Home based	334	8.35%
Mobile or Field based	195	4.88%
Not specified	4	0.10%
Grand Total	4000	100.00%

The distribution of participants by work environment is similar when comparing the Leader norm to the General Worker norm. Office based workers remain the largest subgroup at 30.58%, followed by Office or Site based workers at 22.00%.

Table 5.15. Distribution of industry sector in Leader norm group

Industry Sector	N	%
Banking and Finance	1398	34.95%
Engineering and Manufacturing	335	8.38%
Science and Pharmaceuticals	292	7.30%
Health and Social Care	283	7.08%
Consulting and Management	239	5.98%
Business	219	5.48%
Retail	165	4.13%
Teaching and Education	117	2.93%
IT and Information Services	110	2.75%
Charities and Voluntary Work	99	2.48%
Recruitment and HR	79	1.98%
Marketing	77	1.93%
Environment and Agriculture	60	1.50%
Construction	57	1.43%
Hospitality	56	1.40%

Industry Sector	N	%
Advertising and PR	52	1.30%
Energy and Utilities	49	1.23%
Law	47	1.18%
Telecommunications	45	1.13%
Transport & Logistics	40	1.00%
Accountancy	36	0.90%
Media and Publishing	32	0.80%
Public Administration	30	0.75%
Creative Arts and Culture	29	0.73%
Property	20	0.50%
Tourism and Sport	17	0.43%
Armed Forces and Emergency Services	9	0.23%
Defence and Security	8	0.20%
Grand Total	4000	100.00%

In line with the General Worker norm sample, participants employed in the 'banking and finance' industry sector remain the largest subgroup of the Leader norm, albeit substantially larger (34.95%). The second and third largest subgroups are 'engineering and manufacturing' industries, which contain 8.38% and 7.30% of the Leader norm group respectively.

Table 5.16. Distribution of countries in Leader norm group

Country	N	%
United Kingdom (UK)	2009	50.23%
Canada	984	24.60%
United States of America (USA)	266	6.65%
Netherlands	94	2.35%
Ireland	78	1.95%
Germany	49	1.23%
Luxembourg	48	1.20%
France	38	0.95%
Malaysia	36	0.90%
China	26	0.65%
India	24	0.60%
Switzerland	22	0.55%
Australia	21	0.53%
Denmark	18	0.45%
Singapore	18	0.45%

Country	N	&
Brazil	17	0.43%
Hong Kong	17	0.43%
Japan	17	0.43%
Belgium	16	0.40%
Poland	15	0.38%
Italy	14	0.35%
Czech Republic	13	0.33%
Russia	13	0.33%
Thailand	13	0.33%
Mexico	12	0.30%
Trinidad and Tobago	10	0.25%
Malta	8	0.20%
Afghanistan	7	0.18%
South Africa	7	0.18%
Sweden	7	0.18%
Spain	6	0.15%
Norway	5	0.13%
Portugal	5	0.13%
United Arab Emirates (UAE)	5	0.13%
Albania	4	0.10%
Bahamas	4	0.10%
Austria	3	0.08%
Greece	3	0.08%
Hungary	3	0.08%
Morocco	3	0.08%
Ukraine	3	0.08%
Barbados	2	0.05%
Bulgaria	2	0.05%
Finland	2	0.05%
Kenya	2	0.05%
New Zealand	2	0.05%
Romania	2	0.05%
Slovakia	2	0.05%
Swaziland	2	0.05%
Turkey	2	0.05%
Uganda	2	0.05%
Zimbabwe	2	0.05%
Andorra	1	0.03%
Argentina	1	0.03%
Armenia	1	0.03%

Country	N	%
Burundi	1	0.03%
Cameroon	1	0.03%
Chile	1	0.03%
Cyprus	1	0.03%
Iceland	1	0.03%
Iraq	1	0.03%
Kazakhstan	1	0.03%
Lebanon	1	0.03%
Lithuania	1	0.03%
Nigeria	1	0.03%
Qatar	1	0.03%
South Korea	1	0.03%
Tanzania	1	0.03%
Vietnam	1	0.03%
Grand Total	4000	100.00%

Whilst the Leader norm includes fewer represented countries in its sample, with 69 compared with the General Worker norm of 81, this is understandable given the smaller size of the group. The United Kingdom remains the largest subgroup, with over 50.23% of the sample working there.

Table 5.17. Distribution of departments in Leader norm group

Department Name	N	%
Other	833	20.83%
Operations	762	19.05%
Human resources	604	15.10%
Finance	516	12.90%
Marketing & sales	499	12.48%
IT	205	5.13%
Strategy	158	3.95%
Research & Development	112	2.80%
Customer service	109	2.73%
Legal	77	1.93%
Production	64	1.60%
Facilities	23	0.58%
Purchasing	21	0.53%
Distribution	17	0.43%
Grand Total	4000	100.00%

As with the General Worker norm group, participants selecting 'Other' when asked to identify their department were also the largest subgroup in the Leader norm group, with 20.83% of participants. Similarly, Operations were the second largest subgroup, with 19.05% of participants included in this subgroup.

Table 5.18. Distribution of role level in Leader norm group

Role Level	N	%
Director/Executive	1554	38.85%
Senior Manager	2446	61.15%
Grand Total	4000	100.00%

In line with the Leader norm requirement, all participants were employed at either 'Director/Executive' or 'Senior Manager' level, with a distribution of 38.85% and 61.15% respectively.

6. Psychometric Properties of Wraw

The Wraw psychometric includes 12 subscales encompassed by its five-pillar structure. The theoretical and empirical underpinnings of these components have been discussed earlier in Section 3. This chapter will begin by exploring the descriptive statistics and correlations for the various pillars and scales. The chapter will then progress to reporting various statistics relevant to the psychometric's reliability, before concluding with information about its validity.

Descriptives and Correlations

Analysis of over twelve thousand Wraw completions enables us to provide a detailed overview of the psychometric's statistical properties. Table 6.1 displays the descriptive statistics of the primary scales included in Wraw. The mean for each scale's set of items is calculated after assigning a 0-4 score to each relevant item response on the agreement scale (i.e., '0' for 'strongly disagree' through to '4' for 'strongly agree'). For negatively scored items, these scores are reversed.

Table 6.1. Descriptive Statistics of the Primary Scales

Primary Scales	No. items	Mean	Standard Deviation
Energy	26	2.26	1.29
Future Focus	15	2.64	0.97
Inner Drive	15	2.56	1.03
Flexible Thinking	17	2.79	0.92
Strong Relationships	17	2.68	1.00
Resilient Actions	58	2.51	1.32
Resilient Thoughts	32	2.63	1.16
Wraw Index	90	2.55	1.10
Impact Index	22	2.65	1.04

These scales can all be taken as approximating to a normal distribution, with comparable standard deviations across the five pillars (and scales). The data illustrates that the primary scale with the highest mean is 'Flexible Thinking' with an item average of '2.79'. The primary scale with the lowest mean is 'Energy' with an item average of '2.26'.

Table 6.2 below illustrates the various correlations of Wraw's primary scales.

Table 6.2. Correlations of the Primary Scales

	Energy	Future Focus	Inner Drive	Flexible Thinking	Strong Relationships	Resilient Actions	Resilient Thoughts	Wraw Index	Impact Index
Energy	1								
Future Focus	.46**	1							
Inner Drive	.42**	.79**	1						
Flexible Thinking	.35**	.74**	.79**	1					
Strong Relationships	.37**	.55**	.53**	.54**	1				
Resilient Actions	.84**	.78**	.75**	.72**	.69**	1			
Resilient Thoughts	.49**	.89**	.89**	.87**	.69**	.81**	1		
Wraw Index	.74**	.86**	.84**	.81**	.72**	.97**	.92**	1	
Impact Index	.54**	.79**	.71**	.69**	.64**	.76**	.83**	.83**	1

Analysis indicates various moderate and high correlations strengths between the five pillars. These reflect desirable relationships between the pillars without cause for concern that conceptual overlap is too high to suggest construct redundancy. Caution is urged when comparing some correlations at designation level, as items used to generate pillar scores may also be used to generate designation scores (i.e., Resilient Actions, Resilient Thoughts, and overall Wraw Index).

Table 6.3 displays the descriptive statistics of the 12 subscales encompassed by Wraw's five pillars. The mean for each subscale's set of items is calculated with the approach described above, with a score ranging from 0-4 applied to each response option.

Table 6.3. Descriptive Statistics of the Subscales

Pillars	Subscales	No. items	Mean	Standard Deviation
Energy	Physical Activity	5	2.21	1.24
	Sleep	5	2.41	1.31
	Boundaries	6	1.83	0.94
	Healthy Consumption	10	2.48	0.99
Future Focus	Purpose	8	2.72	0.83
	Personal Control	7	2.55	1.11
Inner Drive	Motivation	6	2.84	0.89
	Self-Belief	9	2.38	0.96
Flexible Thinking	Open-Mindedness	9	2.82	0.99
	Positive Framing	8	2.75	1.02
Strong Relationships	Building Trust	10	2.72	1.14
	Accessing Support	7	2.62	1.01

Analysis indicates comparable standard deviations across the twelve subscales. The data illustrates that the subscale with the highest mean is 'Motivation' with an item average of '2.84'. The subscale with the lowest mean is 'Boundaries' with an item average of '1.83'. Similar standard deviations are reported across the primary scales.

Table 6.4 below illustrates the various correlations of the subscales in Wraw.

Table 6.4. Correlations of the Subscales

	Physical Activity	Sleep	Boundaries	Healthy Consumption	Purpose	Personal Control	Motivation	Self-Belief	Open-Mindedness	Positive Framing	Building Trust	Accessing Support
Physical Activity	1											
Sleep	.29**	1										
Boundaries	.32**	.42**	1									
Healthy Consumption	.38**	.37**	.40**	1								
Purpose	.27**	.37**	.20**	.31**	1							
Personal Control	.26**	.43**	.31**	.33**	.68**	1						
Motivation	.21**	.28**	.07**	.25**	.62**	.57**	1					
Self-Belief	.25**	.41**	.30**	.31**	.65**	.71**	.55**	1				
Open-Mindedness	.18**	.25**	.12**	.22**	.58**	.56**	.61**	.58**	1			
Positive Framing	.22**	.37**	.22**	.29**	.63**	.72**	.61**	.73**	.68**	1		
Building Trust	.22**	.30**	.21**	.26**	.47**	.73**	.46**	.45**	.50**	.58**	1	
Accessing Support	.17**	.31**	.22**	.24**	.39**	.45**	.34**	.40**	.31**	.40**	.59**	1

Analysis indicated a range of correlational strengths between the twelve subscales. As expected, several of the highest correlations were identified between subscales encompassed within the same pillar. Smaller correlations between 'less-connected' constructs also served to reflect the conceptual breadth covered by the items in Wraw. A further breakdown of Wraw's subscales is presented in the inter-item correlation tables 6.5 – 6.16. For all the correlation analyses, ** correlation is significant at the 0.01 level (2-tailed).

Table 6.5. Inter-item correlations of the Physical Activity Subscale

	3	6	54R	85	86R
3	1				
6	.18**	1			
54R	.16**	.55**	1		
85	.18**	.74**	.56**	1	
86R	.17**	.77**	.58**	.73**	1

Table 6.6. Inter-item correlations of the Sleep Subscale

	1R	57	69R	88	90R
1R	1				
57	.524**	1			
69R	.258**	.157**	1		
88	.217**	.247**	.177**	1	
90R	.446**	.600**	.328**	.280**	1

Table 6.7. Inter-item correlations of the Boundaries Subscale

	27R	30	33	61R	65	87R
27R	1					
30	.30**	1				
33	.38**	.31**	1			
61R	.23**	.29**	.31**	1		
65	.34**	.28**	.55**	.24**	1	
87R	.10**	.09**	.09**	.14**	.08**	1

Table 6.8. Inter-item correlations of the Healthy Consumption Subscale

	34	36R	38	40R	46	55R	78R	79	80R	89
34	1									
36R	.04**	1								
38	.37**	.03**	1							
40R	.05**	.22**	.08**	1						
46	.20**	.06**	.25**	.09**	1					
55R	.13**	.04**	.21**	.10**	.15**	1				
78R	.22**	.08**	.26**	.12**	.16**	.15**	1			
79	.05**	.33**	.03**	.06**	.04**	-.04**	.07**	1		
80R	.08**	.10**	.02*	.06**	.08**	.07**	.19**	.02*	1	
89	.09**	.08**	.10**	.11**	.02**	0.01	.13**	.15**	-0.02	1

Table 6.9. Inter-item correlations of the Purpose Subscale

	10	41R	49R	67	92	93R	94	95
10	1							
41R	.43**	1						
49R	.23**	.39**	1					
67	.29**	.40**	.42**	1				
92	.27**	.33**	.32**	.31**	1			
93R	.23**	.35**	.34**	.26**	.48**	1		
94	.11**	.13**	.24**	.25**	.19**	.12**	1	
95	.33**	.41**	.44**	.42**	.45**	.37**	.28**	1

Table 6.10. Inter-item correlations of the Personal Control Subscale

	11R	63	91R	96	97	98R	99R
11R	1						
63	.27**	1					
91R	.24**	.27**	1				
96	.12**	.29**	.13**	1			
97	.23**	.37**	.25**	.27**	1		
98R	.33**	.30**	.32**	.16**	.26**	1	
99R	.26**	.30**	.31**	.19**	.30**	.31**	1

Table 6.11. Inter-item correlations of the Motivation Subscale

	25	47	104	105R	106R	107
25	1					
47	.19**	1				
104	.17**	.20**	1			
105R	.14**	.24**	.10**	1		
106R	.14**	.25**	.13**	.46**	1	
107	.23**	.25**	.26**	.29**	.35**	1

Table 6.12. Inter-item correlations of the Self-Belief Subscale

	4	21R	42	44R	58R	62R	68	101R	102
4	1								
21R	.11**	1							
42	.25**	.17**	1						
44R	.17**	.19**	.27**	1					
58R	.16**	.33**	.21**	.16**	1				
62R	.26**	.30**	.35**	.30**	.42**	1			
68	.21**	.11**	.33**	.20**	.18**	.34**	1		
101R	.14**	.19**	.13**	.15**	.33**	.40**	.12**	1	
102	.23**	.13**	.38**	.24**	.18**	.30**	.25**	.09**	1

Table 6.13. Inter-item correlations of the Open-Mindedness Subscale

	12	14	17R	18	20	23R	83	108	109R
12	1								
14	.16**	1							
17R	.22**	.22**	1						
18	.16**	.46**	.25**	1					
20	.18**	.54**	.26**	.40**	1				
23R	.17**	.35**	.34**	.46**	.36**	1			
83	.11**	.20**	.14**	.27**	.21**	.25**	1		
108	.21**	.36**	.23**	.35**	.38**	.28**	.23**	1	
109R	.11**	.30**	.26**	.34**	.25**	.33**	.12**	.24**	1

Table 6.14. Inter-item correlations of the Positive Framing Subscale

	8	19R	43R	48	70R	72R	73	111
8	1							
19R	.26**	1						
43R	.24**	.49**	1					
48	.34**	.34**	.35**	1				
70R	.17**	.32**	.34**	.19**	1			
72R	.28**	.35**	.28**	.28**	.25**	1		
73	.29**	.44**	.35**	.39**	.22**	.28**	1	
111	.24**	.31**	.31**	.36**	.22**	.23**	.37**	1

Table 6.15. Inter-item correlations of the Building Trust Subscale

	2R	16	31R	35R	45	76	112	113	114	117R
2R	1									
16	.08**	1								
31R	.23**	.13**	1							
35R	.18**	.06**	.39**	1						
45	.09**	.22**	.12**	.11**	1					
76	.05**	.20**	.12**	.03**	.30**	1				
112	.23**	.14**	.17**	.20**	.13**	.06**	1			
113	.06**	.19**	.07**	.03**	.38**	.23**	.09**	1		
114	.15**	.26**	.25**	.18**	.23**	.18**	.19**	.16**	1	
117R	.13**	.13**	.19**	.18**	.23**	.12**	.10**	.18**	.20**	1

Table 6.16. Inter-item correlations of the Accessing Support Subscale

	13	22R	52	74R	75	115R	116
13	1						
22R	.18**	1					
52	.15**	.39**	1				
74R	.26**	.27**	.29**	1			
75	.15**	.33**	.44**	.23**	1		
115R	.27**	.24**	.15**	.23**	.21**	1	
116	.37**	.19**	.19**	.33**	.24**	.22**	1

Reliability

It is important that psychometric tools provide a reliable (i.e., consistent) measure of what they seek to measure, as without this they cannot be accurate. The term 'reliability' therefore refers to the degree to which psychometric results are free from measurement error.

Internal Reliability of the Primary Scales

Internal reliability determines the extent to which items in a personality scale are 'pulling' in the same direction. Higher Cronbach's Alpha scores lend support to the view that the items are combining effectively to measure an underlying construct, and that participant scores are less likely to change due to measurement error. They also indicate whether the construct being addressed is broad and complex or narrow and specific and provides reassurance that that scale is internally consistent. Cronbach's Alphas above 0.7 are typically desired (Nunnally & Bernstein, 1994), although this will be affected by the number of items in a scale, with lower numbers of items less likely to generate higher alphas. Table 6.17 below presents the Cronbach's Alphas of the primary scales.

Table 6.17. Cronbach's Alphas of the Primary Scales

Primary Scales	No. items	Cronbach's Alpha
Energy	26	0.82
Future Focus	15	0.85
Inner Drive	15	0.79
Flexible Thinking	17	0.86
Strong Relationships	17	0.79
Resilient Actions	58	0.89
Resilient Thoughts	32	0.89
Wraw Index	90	0.93
Impact Index	22	0.91

Statistical analysis of the measures presented in Table 6.17 above indicate high Cronbach's Alphas across all of Wraw's primary scales. The lowest alpha is reported by the 'Strong Relationships' scale with a '0.788', but this is comfortably above the desired 0.7. The highest alpha is reported by the Wraw Index scale (0.93), but this would be influenced by the greater number of items it contains. Overall, these findings indicate strong internal consistency across all of Wraw's primary scales. An important follow-up analysis is to check that these values remain steady across different demographics.

Table 6.18 presents the findings of an analysis comparing Cronbach's Alphas after dividing by gender.

Table 6.18. Cronbach's Alphas of the Primary Scales by Gender

	Reliabilities		
	Males (4925)	Females (7508)	Non-Binary/Gender Fluid (106)
Energy	0.84	0.84	0.85
Future Focus	0.89	0.88	0.90
Inner Drive	0.90	0.89	0.92
Flexible Thinking	0.86	0.86	0.88
Strong Relationships	0.84	0.83	0.86
Resilient Actions	0.89	0.88	0.92
Resilient Thoughts	0.89	0.89	0.92
Wraw Index	0.94	0.93	0.95
Impact Index	0.92	0.91	0.93

Analysis of Cronbach's alpha by gender indicates that the strong levels of reliability reported in the previous analysis do not vary or fall significantly between groups when the sample is divided by gender. This demonstrates the consistency of the Wraw is likely to remain high, regardless of how the individuals using it identify.

Table 6.19 presents the Cronbach's alpha of the primary scales by age group.

Table 6.19. Cronbach's Alphas of the Primary Scales by Age

	Reliabilities					
	18–25 (880)	26–35 (3115)	36–45 (3986)	46–55 (3247)	Over 55 (1203)	Prefer not to say (134)
Energy	0.85	0.84	0.84	0.84	0.84	0.84
Future Focus	0.90	0.89	0.88	0.89	0.88	0.90
Inner Drive	0.91	0.90	0.90	0.89	0.89	0.91
Flexible Thinking	0.87	0.86	0.87	0.86	0.85	0.89
Strong Relationships	0.84	0.83	0.84	0.83	0.83	0.85
Resilient Actions	0.90	0.89	0.89	0.88	0.88	0.89
Resilient Thoughts	0.90	0.90	0.89	0.89	0.88	0.91
Wraw Index	0.94	0.94	0.94	0.93	0.93	0.94
Impact Index	0.92	0.91	0.91	0.92	0.91	0.91

As with gender, analysis of Cronbach's Alpha by age indicates that internal consistency is not adversely affected by the age of respondents. The final group-level analysis of Cronbach's Alpha focussed on role level and is presented in Table 6.20 below.

Table 6.20. Cronbach's Alphas of the Primary Scales by Role Level

	Reliabilities				
	Director/Executive (1777)	Senior Manager (2793)	Line Manager (2700)	Non-manager (5010)	Student (283)
Energy	0.86	0.84	0.84	0.84	0.77
Future Focus	0.88	0.88	0.88	0.89	0.87
Inner Drive	0.89	0.89	0.89	0.89	0.88
Flexible Thinking	0.85	0.85	0.85	0.86	0.83
Strong Relationships	0.84	0.83	0.83	0.83	0.84
Resilient Actions	0.89	0.89	0.88	0.88	0.88
Resilient Thoughts	0.89	0.89	0.88	0.89	0.88
Wraw Index	0.94	0.93	0.93	0.93	0.93
Impact Index	0.92	0.91	0.91	0.91	0.90

Role-level analysis of the primary scales' reliability provided clear support for consistency at each level of the organisational hierarchy. The student group typically had the lowest Cronbach's Alpha scores, most likely due to the fact that students' work structure may vary more than the more common structure experienced by employees working within organisations. However, these alpha scores still remained comfortably above the 0.7 threshold.

One of the advantages of collecting information about the internal reliability coefficients of Wraw's primary scales it that they enable us to calculate the standard error of measurement values for each scale.

Table 6.21 below presents scale-level insight across several metrics.

Table 6.21. Means, Standard Deviations and Standard Error of Measurements of the Primary Scales

Primary Scales	Mean	STD	SEM	95% Confidence Interval	Upper Limit	Lower Limit
Energy	58.85	13.53	5.72	11.21	70.06	47.63
Future Focus	39.61	7.86	3.06	6.00	45.60	33.61
Inner Drive	38.46	6.69	3.04	5.95	44.41	32.51
Flexible Thinking	47.37	8.31	3.16	6.19	53.56	41.18
Strong Relationships	45.53	7.61	3.50	6.87	52.40	38.67
Resilient Actions	145.54	22.28	7.55	14.81	160.35	130.73
Resilient Thoughts	84.28	14.11	4.61	9.04	93.32	75.23
Wraw Index	229.82	34.66	8.90	17.45	247.27	212.37
Impact Index	58.36	12.63	3.70	7.26	65.62	51.10

The table above indicates the various lower and upper ranges for each scale where there is a 95% chance an individual's 'true' score will fall. The strong reliabilities cited earlier serve to ensure a high degree of confidence in the scores of respondents whilst also serving to evidence the level of error that may be present. The final reliability analysis involved split-half reliability, which involved splitting the items in each pillar in half and assessing the consistency of their outputs. We also conducted this analysis comparing Males (N=4,925) and Females (N=7,508) to ensure that split-half reliability remained consistent between these groups. Findings are illustrated in Table 6.22 below.

Table 6.22. Split-half Reliability of the 5 Pillars

Pillar	Correlation between parts			Spearman-Brown Coefficient		
	Males (4925)	Females (7508)	All (12,563)	Males (4925)	Females (7508)	All (12,563)
Energy	0.77	0.77	0.77	0.87	0.87	0.87
Future Focus	0.83	0.81	0.82	0.91	0.89	0.90
Inner Drive	0.84	0.84	0.84	0.91	0.91	0.91
Flexible Thinking	0.78	0.80	0.79	0.88	0.89	0.88
Strong Relationships	0.76	0.74	0.75	0.86	0.85	0.86

Analysis indicated strong split-half reliability across each of the five pillars, averaging approximately 0.8. This reliability remained consistently high for both

males and females, with 'Strong Relationships' reporting the lowest Cronbach's Alpha and 'Inner Drive' the highest.

Internal Reliability of the Subscales

Analysis of Wraw's primary scales evidenced high levels of reliability that held firm across gender, age and job role. Subsequent analyses were conducted to identify the levels of reliability at the subscale level. Lower Cronbach's Alphas were expected given that subscales contain significantly fewer number of items relative to the overarching primary scales. Table 6.23 below presents the findings of this analysis.

Table 6.23. Cronbach's Alphas of the Subscales

Pillars	Subscales	No. Items	Cronbach's Alpha
Energy	Physical Activity	5	0.82
	Sleep	5	0.71
	Boundaries	6	0.67
	Healthy Consumption	10	0.54
Future Focus	Purpose	8	0.79
	Personal Control	7	0.70
Inner Drive	Motivation	6	0.64
	Self-Belief	9	0.73
Flexible Thinking	Open-Mindedness	9	0.76
	Positive Framing	8	0.77
Strong Relationships	Building Trust	10	0.65
	Accessing Support	7	0.70

As can be seen from the above, the majority of subscales are exceeding the Cronbach's Alpha benchmark level of 0.7 and where this is not the case, with four subscales ('Boundaries', 'Healthy Consumption', 'Motivation' and 'Building Trust') comes very close to this. Although 'Healthy Consumption' hangs together slightly less well as a whole (0.54), the scale has some more discrete component parts, which individuals are likely to be able to identify with (e.g., eating healthily, drinking healthily, not relying on substances). Hence, we feel there is value in looking at the overall picture against these and how this contributes to physical resilience. However, it should be borne in mind that in general the main scales provide the most robust picture, so these should be the primary focus of any feedback. Table 6.24 presents findings of the analysis into the Cronbach's Alphas of the subscales by gender.

Table 6.24. Cronbach's Alphas of the Subscales by Gender

		Reliabilities		
		Males (4925)	Females (7508)	Non-Binary/Gender Fluid (106)
Energy	Physical Activity	0.81	0.82	0.81
	Sleep	0.71	0.71	0.72
	Boundaries	0.67	0.67	0.70
	Healthy Consumption	0.56	0.53	0.54
Future Focus	Purpose	0.80	0.78	0.79
	Personal Control	0.71	0.70	0.76
Inner Drive	Motivation	0.65	0.63	0.62
	Self-Belief	0.71	0.73	0.80
Flexible Thinking	Open-Mindedness	0.75	0.76	0.78
	Positive Framing	0.76	0.77	0.80
Strong Relationships	Building Trust	0.61	0.64	0.67
	Accessing Support	0.71	0.70	0.69

Analysis of Cronbach's Alpha by gender indicates that, as with the primary scales, the reliabilities of the subscales do not vary significantly between the genders. This further demonstrates the consistency of Wraw remains high, regardless of the groups using it.

Table 6.25 presents the Cronbach's Alpha of the primary scales by age group.

Table 6.25. Cronbach's Alphas of the Subscales by Age

		Reliabilities					
		16-25 (880)	26-35 (3115)	36-45 (3986)	46-55 (3247)	Over 55 (1203)	Prefer not to say (134)
Energy	Physical Activity	0.82	0.82	0.82	0.82	0.81	0.81
	Sleep	0.71	0.72	0.71	0.69	0.71	0.71
	Boundaries	0.68	0.68	0.67	0.66	0.66	0.71
	Healthy Consumption	0.53	0.54	0.54	0.55	0.56	0.61
Future Focus	Purpose	0.80	0.79	0.78	0.79	0.76	0.82
	Personal Control	0.71	0.70	0.71	0.71	0.66	0.75
Inner Drive	Motivation	0.66	0.63	0.66	0.62	0.61	0.66
	Self-Belief	0.74	0.73	0.72	0.73	0.72	0.75
Flexible Thinking	Positive Framing	0.79	0.77	0.77	0.76	0.74	0.79
	Open-Mindedness	0.78	0.75	0.77	0.75	0.75	0.78
Strong Relationships	Building Trust	0.66	0.64	0.65	0.64	0.65	0.67
	Accessing Support	0.72	0.70	0.71	0.70	0.68	0.75

As with gender, analysis of Cronbach's Alpha by age indicates that the internal consistencies of the subscales are not adversely affected by the age of respondents. This provides added peace of mind when working with a group of participants of varying age.

The final group-level analysis of Cronbach's Alpha focussed on role level and is presented in Table 6.26 below.

Table 6.26. Cronbach's Alphas of the Subscales by Role Level

		Reliabilities				
		Director /Executive (1777)	Senior Manager (2793)	Line Manager (2700)	Non-manager (5010)	Student (283)
Energy	Physical Activity	0.83	0.82	0.82	0.82	0.73
	Sleep	0.73	0.70	0.70	0.72	0.60
	Boundaries	0.70	0.67	0.67	0.66	0.33
	Healthy Consumption	0.56	0.54	0.53	0.55	0.47
Future Focus	Purpose	0.77	0.78	0.78	0.78	0.77
	Personal Control	0.71	0.69	0.68	0.70	0.67
Inner Drive	Motivation	0.56	0.59	0.61	0.65	0.66
	Self-Belief	0.73	0.72	0.71	0.72	0.56
Flexible Thinking	Positive Framing	0.75	0.75	0.74	0.76	0.69
	Open-Mindedness	0.74	0.74	0.74	0.76	0.74
Strong Relationships	Building Trust	0.65	0.66	0.64	0.63	0.69
	Accessing Support	0.71	0.70	0.70	0.70	0.63

Role-level analysis of the subscales' reliability provided clear support for consistency at each level of the organisational hierarchy. As with the primary scales, the student group typically had the lowest Cronbach's Alpha scores, with the 'Boundaries' subscale particularly low. Thematic analysis suggests that some of the items in this subscale may be slightly less applicable to students' work schedules, and this could account for the dip in reliability. For example, the items that state 'I often respond to emails outside working hours' and 'I often use my phone laptop or iPad before I go to bed' might be less appliable for students. This suggests a degree of caution is advised when interpreting students' data for this subscale.

As with the Primary scales, analysis was undertaken to calculate the standard error of measurement values for each scale. Table 6.27 below presents subscale-level insight across several metrics.

Table 6.27. Means, Standard Deviations and Standard Error of Measurements of the Subscales

Pillars	Subscales	Mean	STD	SEM	95% Confidence Interval	Upper Limit	Lower Limit
Energy	Physical Activity	11.03	4.98	2.11	4.14	15.17	6.89
	Sleep	12.05	3.94	2.12	4.16	16.21	7.89
	Boundaries	10.99	4.35	2.51	4.92	15.91	6.08
	Healthy Consumption	24.78	5.39	3.64	7.14	31.92	17.64
Future Focus	Purpose	21.77	4.61	2.14	4.19	25.96	17.57
	Personal Control	17.84	3.95	2.15	4.21	22.05	13.63
Inner Drive	Motivation	17.03	2.90	1.75	3.43	20.46	13.60
	Self-Belief	21.43	4.64	2.43	4.76	26.19	16.67
Flexible Thinking	Open-Mindedness	25.38	4.59	2.25	4.40	29.78	20.98
	Positive Framing	21.99	4.49	2.17	4.25	26.24	17.74
Strong Relationships	Building Trust	27.23	4.56	2.71	5.30	32.53	21.92
	Accessing Support	18.31	3.97	2.17	4.26	22.56	14.05

The table above indicates the various lower and upper ranges for each subscale where there is a 95% chance an individual's 'true' score will fall. Whilst these ranges are relatively larger than those of the primary scales, this is driven by the lower Cronbach's Alphas resulting from subscales' smaller item counts.

Validity

It is important that validation studies are conducted to establish the extent to which a psychometric tool serves its purpose i.e., whether you can draw relevant conclusions from the tool's scores about the subject in hand. Looking at the validity or accuracy of the scales in measuring what they are designed to measure is central to this.

There is no apparent 'gold standard' available for validity and resilience (Windle et al., 2011). However, in their methodological review of resilience measurement scales, Windle et al. found that eight resilience scales achieved the highest scores in terms of validity, and three scales received the highest ratings overall; both times this included the Connor-Davidson Resilience Scale (CD-RISC). The CD-RISC consists of 25 items rated on a 5-point Likert scale that address 5 factors: personal competence, high standards, and tenacity; trust in one's instinct, tolerance of negative effects, and strengthening effects; positive acceptance of change and secure relationships; control; and spiritual influences. The validation sample of the CD-RISC consists of 6 groups (general population, primary care, psychiatric outpatients, generalised anxiety disorder, and PTSD) and suggests that health influences resilience and resilience can improve through treatment (Smith-Osborne & Bolton, 2013; Connor & Davidson, 2003; Davidson et al., 2005; Vaishnavi, Connor & Davidson, 2007). Below we discuss how validity for the Wraw tool is supported by a correlational design between Wraw and the CD-RISC.

To better understand the relationship between the Wraw measures and the 25-item CD-RISC (Connor & Davidson, 2003) measure, a correlational analysis was conducted using a sample of 216 participants who had completed both variables. The sample was 23.61% Male, 75.93% Female, and 0.46% Non-binary/Gender fluid. A breakdown of the sample's age is given in Table 6.27 below.

Table 6. 27 Breakdown of sample by Age

Age	N	%
18-25	12	5.56%
26-35	36	16.67%
36-45	68	31.48%
46-55	69	31.94%
Over 55	30	13.89%
Prefer not to say	1	0.46%
Grand Total	**216**	**100.00%**

A variety of industries were reflected in the sample. The most represented industries consisted of 'Teaching and Education' (16.67%), 'Consulting and Management' (15.28%), and 'Health and Social Care' (8.80%).

Table 6.28 below presents findings of the analysis, which identified the correlations the CD-RISC measure had with the Pillars and Designations of Wraw.

Table 6.28 Wraw Correlations with the CD-RISC25 Scale (n = 216)

Wraw		CD-RISC
Pillar	Energy	.396**
	Future Focus	.751**
	Inner Drive	.724**
	Flexible Thinking	.662**
	Strong Relationships	.457**
Designation	Wraw Index	.687**
	Impact Index	.608**
	Resilient Actions	.626**
	Resilient Thoughts	.716**

** Correlation is significant at the 0.01 level (2-tailed).

As expected, analysis indicated numerous and significant relationships between the CD-RISC scale and the various measures encompassed in Wraw. The largest relationship was with the Pillars of 'Future Focus' (.751) and 'Inner Drive' (.724), followed by the 'Resilient Thoughts' Designation (.716). These relationships demonstrate clear and desirable conceptual overlap between CD-RISC and aspects of Wraw. Definitions like 'Having a clear sense of purpose and direction to help move forwards without getting stuck or feeling held back' (Future Focus) and 'Sustaining self-belief when times get tough, displaying confidence, motivation and perseverance' (Inner Drive) are conceptually relevant to resilience, and the findings have evidenced this effectively.

The Wraw tool is designed to help increase resilience so that it can, in turn, impact positively on wellbeing, as indicated by the Impact Index. Criterion-related validity is therefore relevant as we are seeking to measure the impact of an individual's resilience on their wellbeing via the Impact Index.

An important pre-cursor for criterion-related validity is to establish that there is a significant relationship between the Wraw measures of resilience and the Impact Index. A concurrent study of this kind showed a strong relationship between the measures of resilience and the Impact Index (using Pearson's Correlation Coefficient):

Table 6.29. Impact Index Correlations with Primary Scales

Primary Scale	Correlation coefficient with Impact Index
Energy	.54**
Future Focus	.79**
Inner Drive	.71**
Flexible Thinking	.69**
Strong Relationships	.64**
Resilient Actions	.76**
Resilient Thoughts	.83**
Wraw Index	.83**

* N=12,565, all significant at the P< 0.001 level

Given these findings are all highly statistically significant, it suggests that individuals who demonstrate higher resilience (as measured by the scales above) are likely to gain a higher score on the Impact Index (i.e. they feel fewer effects from challenges, pressures and adversities). Similarly, low resilience scores, would produce an expectation of low Impact Index scores.

The strongest correlation is between Resilient Thoughts and the Impact Index (0.83), indicating that there is a strong relationship between how an individual thinks about their situation and their wellbeing. While it is always important to be cautious about ascribing a causal relationship to such findings, it does suggest that this is a key area to focus on in terms of positively impacting wellbeing.

If no intervention is made to improve the resilience of low scorers, our prediction is that both their resilience scores and Impact Index will remain low. In contrast, if a targeted intervention is made to uplift resilience scores, our prediction is that the Impact Index will improve. Whilst our anecdotal evidence from early versions of Wraw is consistent with this, we are looking to gather validation data to support this hypothesis going forwards.

Factor Analysis

Wraw categorises its twelve subscales into five pillars to maximise the ability of practitioners to develop the various facets of wellbeing through interventions and workshops. This enables the psychometric to provide overarching insight into an individual's wellbeing using pillar and designation-level information, whilst simultaneously maintaining the ability to communicate specific actions, techniques and goals that focus on specific aspects of wellbeing that may be of greater concern to the individual. With this in mind, data from over twelve thousand respondents was subject to a factor analysis to explore how the twelve subscales loaded onto broader underlying factors off the psychometric. Findings from this analysis can be found in Table 6.30 below.

Table 6.30 Factor Analysis (Varimax Rotation with Kaiser Normalisation) of the Wraw subscales

		Factor 1	Factor 2
Energy	Physical Activity	0.13	0.65
	Sleep	0.31	0.64
	Boundaries	0.06	0.79
	Healthy Consumption	0.19	0.71
Future Focus	Purpose	0.78	0.22
	Personal Control	0.79	0.31
Inner Drive	Motivation	0.80	0.04
	Self-Belief	0.78	0.28
Flexible Thinking	Open-Mindedness	0.81	0.03
	Positive Framing	0.85	0.18
Strong Relationships	Building Trust	0.66	0.23
	Accessing Support	0.53	0.28

N = 12,433

Factor analysis of the Wraw data provided a fascinating insight into the most prominent underlying factors underpinning the twelve subscales. Analysis extracted two prominent factors from the data, with the first factor accounting for a sizable 46% of the variance. Further scrutiny of the findings indicates a strong 'thoughts' basis for the subscales loading most prominently onto factor one ('Positive Framing', 'Open-Mindedness', 'Motivation', and 'Personal Control'), whilst factor two suggested a stronger 'physiological' basis (e.g., 'Boundaries', Healthy Consumption', 'Physical Activity', and 'Sleep').

An additional factor analysis was also conducted after dividing participants into males and females. The purpose of this was to ensure the structure of the Wraw did not differ significantly between these two groups. Table 6.31 presents findings of this analysis.

Table 6.31. Factor Analysis (Varimax Rotation with Kaiser Normalisation) of the Wraw subscales by gender (females in parentheses)

		Factor 1	Factor 2
Energy	Physical Activity	0.14 (0.11)	0.62 (0.66)
	Sleep	0.31 (0.30)	0.66 (0.63)
	Boundaries	0.06 (0.05)	0.78 (0.79)
	Healthy Consumption	0.20 (0.19)	0.70 (0.71)
Future Focus	Purpose	0.79 (0.78)	0.24 (0.21)
	Personal Control	0.79 (0.79)	0.33 (0.30)
Inner Drive	Motivation	0.80 (0.80)	0.05 (0.03)
	Self-Belief	0.77 (0.78)	0.30 (0.27)
Flexible Thinking	Open-Mindedness	0.81 (0.81)	0.04 (0.02)
	Positive Framing	0.84 (0.85)	0.21 (0.16)
Strong Relationships	Building Trust	0.68 (0.65)	0.24 (0.23)
	Accessing Support	0.57 (0.50)	0.28 (0.28)

N = 12,433 (females = 7,508)

The clear finding from the analysis detailed above was that the structure of Wraw remains consistent between males and females. This aligns with the previous gender analyses on reliability illustrated in Tables 6.18 and 6.24, which indicated that Wraw remained internally consistent across the genders for both scales and subscales respectively.

7. Wraw Report Types

The range of Wraw reports have been designed for use in a multitude of personal development applications. A summary of each of the reports is provided below. If you require more detailed information, report prices, or sample reports, please contact The Wellbeing Project directly or visit our website (www.wrawindex.com).

Overview: Components available in each Report Type

Report Type	Wraw Index	Impact Index	Pillar Scores (summative)	Pillar Scores (comparison)	Leader Index	Pressure Points	Free Text	Heat Map	Action Plan
Wraw Snapshot			⊙						⊙
Wraw Individual	⊙	⊙	⊙	⊙					⊙
Wraw Team*	⊙	⊙	⊙	⊙					⊙
Wraw Leader					⊙	⊙	⊙⁺		⊙
Wraw Leaders' Summary*	⊙	⊙			⊙		⊙⁺		
Wraw Organisation*	⊙	⊙	⊙	⊙	⊙	⊙	⊙⁺	⊙	

* Contains combined level data across a group (e.g. a team, a group of leaders or the organisation)

⊙ Requires named leaders with their consent because they need to consent to being given feedback on themselves by their team members

⁺ Free text question option available i.e. What (if anything) could your line manager (for Leader report) / organisation (for Organisation report) do to better support your resilience and wellbeing?

Snapshot Report

The Snapshot Report is designed to give a top-level summary of an individual's current levels of wellbeing and resilience, as defined by the 5 Pillar's model. The report is designed to be relevant for any occupational context and is used to identify strengths and opportunities for development. It has been designed to be used without requiring an accredited coach to feed back the results and is not created to be used as any part of a selection process for recruitment.

Key features of the Snapshot Report:

- **Summative Scores** presented as a percentage for each pillar, highlighting to individuals the extent to which for each pillar there is scope to develop greater resilience

- **Development Strategies** providing high-level strategies to develop each pillar

- **Personal Action Plan** designed to encourage individuals to reflect on their results and identify key steps to maintain or enhance their resilience

Individual Report

The Individual Report is designed to give a comprehensive overview of an individual's current levels of wellbeing and resilience, as defined by the 5 Pillar's model. The report is designed to be relevant for any occupational context and level of seniority and is used to deliver insight as part of individual development or one-to-one coaching around the topic of wellbeing and resilience. It is not designed to be used as any part of a selection process for recruitment.

Key features of the Individual Report:

- **Wraw Index** providing an overall measure of the individual's current demonstration of resilience in relation to the comparison group, broken down into resilient actions (extent to which the individual takes action to help sustain and enhance their resilience) and resilient thoughts (extent to which the individual thinks about themselves, others or the situation in a way that enhances their own resilience)

- **Impact Index** indicating the extent to which an individual is feeling the effects of the pressures, challenges and adversities they are currently facing

- **Summative Scores** presented as a percentage for each pillar, highlighting to individuals the extent to which for each pillar there is scope to develop greater resilience

- **5 Pillars Overview and In Depth** comparing individual's scores against the comparison group for each Pillar and associated subscales, and providing specific strategies to enhance resilience and wellbeing for each
- **Personal Action Plan** designed to encourage individuals to reflect on their results and identify key steps to maintain or enhance their resilience

Team Report

The Wraw Team Report has been designed for team development and coaching, specifically for teams who are looking to enhance their collective wellbeing and resilience. The team report views the team's collective wellbeing and resilience through a number of different lenses and is based on combining and analysing each individual's Wraw scores. All responses are anonymised.

The team report should be delivered through an accredited Wraw practitioner through a group feedback, coaching or team development session.

Key features of the Team Report:

- **Wraw Index** providing an overall measure of the team's current demonstration of resilience in relation to the comparison group

- **Impact Index** indicating the extent to which the team is feeling the effect of current pressures

- **Summative Scores** presented as a percentage for each pillar, highlighting to teams the extent to which for each pillar there is scope to develop greater resilience

- **5 Pillars Overview and In Depth** comparing the team's scores against the comparison group for each Pillar, and providing specific strategies to enhance resilience and wellbeing for each Pillar

- **Team Action Plan** designed to encourage the team to reflect on their results and identify key steps to maintain or enhance their resilience

Leader Report

The Wraw Leader Report has been designed for use with an individual leader, to help them gain valuable insight into how effectively they are viewed by their team in supporting resilience and wellbeing. Individual team members complete Wraw in relation to their Line Manager / Leader and the report presents the collective responses of team members. All responses are anonymised. The Leader Report should be delivered by an accredited Wraw practitioner through an individual feedback or coaching session.

Key Features of the Leader Report:

- **Leader Index** indicating the extent to which individuals feel their resilience and wellbeing are actively supported by their own line manager, including through modelling good practice

- **Pressure points** presented as an overview of pressure points that are currently impacting negatively on resilience and wellbeing within the team

- **Free Text Comments** whereby it is possible to view anonymised responses to the question *'What (if anything) could your line manager do to better support your resilience and wellbeing?'*

- **Leader Action Plan** designed to encourage individuals to reflect on their results and identify key steps to maintain or enhance their resilience

Leaders' Summary Report

The Wraw Leader's Summary Report has been designed for use with groups of Leaders. It provides valuable insight into how effectively a group of leaders or managers are building a safe and supportive working environment and what this means for the individuals who report into them. All responses are anonymised. The Leader Report should be delivered by an accredited Wraw practitioner through individual feedback or group development or coaching session.

Key Features of the Leaders' Summary Report:

- **Leader Index** indicating the extent to which respondents feel their resilience and wellbeing are actively supported by their line manager, including through modelling good practice

- **Wraw Index** providing an overall measure of how respondents are demonstrating the 5 Pillars in relation to the comparison group

- **Impact Index** indicating the extent to which respondents are feeling the effect of current pressures

- **Free Text Comments** whereby it is possible to view anonymised responses to the question *'What (if anything) could your line manager do to better support your resilience and wellbeing?'*

Organisation Report

The Wraw Organisation Report provides a top-level overview of the way employees responded to the Wraw questionnaire. It provides valuable insight into the current levels of wellbeing and resilience within an organisation and can be used to help inform organisation-wide strategy, planning and implementation.

Key Features of the Organisation Report:

- **Wraw Index** providing an overall measure of the organisation's current demonstration of resilience in relation to the comparison group

- **Impact Index** indicating the extent to which the organisation's people are feeling the effect of current pressures

- **Summative Scores** presented as a percentage for each pillar, highlighting to the organisation the extent to which for each pillar there is scope to develop greater resilience, helping to prioritise key areas of focus

- **5 Pillars Overview and In Depth** comparing the organisation's scores against the comparison group for each Pillar

- **Leader Index** indicating the extent to which respondents feel their resilience and wellbeing are actively supported by their line manager, including through modelling good practice

- **Pressure Points** which is an overview of pressure points that currently impact most negatively on resilience and wellbeing within the organisation

- **Free Text Comments** whereby it is possible to view anonymised responses to the question *What (if anything) could your organisation do to better support your resilience and wellbeing?*

- **Heat Map** providing an overview of the whole organisation drawing on sten scores relative to the comparison group

8. Wraw Test Taker Requirements

In order to complete Wraw, the test taker will require a device such as a laptop, desktop computer or mobile phone because the psychometric questionnaire is completed electronically.

The test taker will need to be able to see the questionnaire and complete it using typing (to complete the biographical details and open-ended questions) as well as clicking on options to respond to items presented using a 5-point Likert scale. Hearing is not required as the entire user interface is in written format.

The test taker would need to have command of the test language (reading and understanding). Wraw is currently only available in English, but additional translations are being explored.

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