Avenues to flourishing: Exploring what context and discrepancy can teach us about well-being

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Content of Dissertation and Contributions of Authors

This dissertation is presented as mainly chapters with one article intended for publication. An article comprising the content of study 2 will be submitted to a peer-reviewed journal following the submission and defense of my thesis. I (Kyle McBride) am the first author of this manuscript, with Dr. Darcy Santor (thesis supervisor) as co-author. The first study presented as a chapter has not been submitted for publication, as it was used as a pilot for the article.

For study 1 and the article study, my contributions included the theoretical formulation of research, completing research and ethics proposals, literature reviews, collecting and analyzing data, and preparing and revising the manuscript. Dr. Santor provided input and expertise at all stages of the process and had some input into all the pieces of this dissertation at some point or another.

I use the phrases “I” and “we” throughout this dissertation. For the former, I am referring to myself (Kyle McBride) and when I say we I am referring to myself and Dr. Santor.

Abstract

This dissertation examined how the concepts of context and discrepancy could expand our knowledge of the intricacies of well-being. While there is a long history of research on well-being that emphasizes different definitions, models and elements of well-being, there have been numerous implications and open questions within the literature that had gone nearly unexamined for decades. Using the PERMA model of well-being as a lens to examine these untested questions/implications, a greater understanding of the mechanics of well-being was established. This greater understanding has implications on how well-being can be understood, measured and promoted in others. I accomplished this through two studies.

In study 1, I created a context-specific approach to measuring the PERMA elements that asked participants to rate their well-being elements across the work and home contexts. We also used existing research to generate discrepancy metrics that represented the level of imbalance between well-being elements. Results supported our measurement approach, replicating factor structure and psychometric qualities seen in past PERMA measurement studies. We examined the relative importance of the PERMA elements and found that, depending on the outcome in question, PERMA elements were different in how they predicted important outcomes. It was also found that discrepancies between well-being elements do have some role in predicting these outcomes as well.

Based on the findings from Study 1, I expanded the scope of measurement approach to include three contexts, school, work and home. I then expanded our relative importance models to include a contextual (e.g., work, school, home) breakdown of PERMA elements. These models revealed a complex interplay between context, element and outcome that suggests that simply maximizing all the PERMA elements equally may not be the most effective approach towards

promoting various benefits associated with well-being. This study also provided some of the earliest supporting evidence for the contextual approach to measuring well-being, and the first to examine the relative importance of PERMA elements with context in mind.

Overall, these studies expand well-being research without needing to create an entirely new multidimensional model or definition of well-being. The methodological advancements presented in these studies and the insights they have immediate implications for policy and practice across a diverse range of fields, including social sciences, workplaces, economic policy, and more. Finally, the theoretical implications of this work will hopefully inspire new approaches to researching well-being that will go on to inform others in their own quests for well-being.

Chapter 1: General Introduction

In my experience, if you ask people what they want in life, they tend to answer in one of two ways. The first approach involves specific things. The overworked person wants a vacation, the student wants good grades, the hungry person wants food, the parent wants their child to succeed (and likely wants a vacation as well). Inevitably, the second approach appears. Most people, if asked in a broad enough fashion, will say something along the lines of "I want to live a good life." As people, we experience all that the world has to offer; the good, the bad, and quite literally everything in between. It makes sense then that we aim to exist in a way that makes us feel good, we try to navigate our lives in a way that maximizes the "good" that life can offer.

It happens when we become sick of that candy that tasted so good on the first bite. We realize that maximizing the "good" isn't so simple anymore. It happens again when that vacation gets a bit too long, and we feel the urge to make some use of our time. We begin to understand that what is "good" for us becomes much less clear as discrepancies begin to form. As we try to balance these differing needs for "good", we start to have jobs and families. When does "good" at work become "bad" at home? What do the discrepancies in what kind of "good" we have in one area compared to another mean overall? How are we supposed to understand this balance and find that "good life"? The quest for the "good life" is the quest for well-being. We are all seeking well-being across a diverse range of lived experiences and contexts. Perhaps as a part of my own search for well-being, I explored how the different factors that make it up can be understood in relation to each other and in relation to the many contexts that people experience their lives within. Although it may feel that the discrepancies in how we experience well-being

get in our way, they may also hold the answers to that elusive question we are all asking ourselves when we reflect on what makes life worth living.

Objectives

This dissertation consists of two studies, one presented in the usual chapter format and another in manuscript format, followed by a general discussion. Together, the studies in this dissertation aimed to build upon existing well-being research by accomplishing four objectives:

1. Review existing research on well-being and its' historical roots to identify gaps in current approaches to researching well-being (Chapter 1).
2. Develop a a novel contextualized adaptation of the PERMA measurement approach to well-being and a corresponding analytical approach that addresses gaps in existing literature (Study 1; Chapter 4)
3. Expand upon existing well-being research by exploring how the importance of various well-being factors changes based on context and the presence of other well-being factors (Study 2; Chapter 5)
4. Propose a new direction that well-being research can take based on my research and discuss the relevance for researchers, practitioners, and policymakers (General Discussion; Chapter 6)

Before addressing these objectives, it is necessary to describe how well-being has been defined, what it encompasses, its importance and the various models that have been created to understand it.

Historical Background of Well-being Research

Hedonia, eudaimonia and their modern relevance. My introduction to well-being as a fundamental human question was not just for dramatic effect. To study well-being is to participate in a philosophical process that can trace its roots back to as early as 435 BCE (Ryff, Boylan & Keyes, 2021). In fact, some of the more common terms researchers use today to understand different aspects of well-being, namely hedonia and eudaimonia, are taken directly from the writings of ancient philosophers like Aristippus, Epicurus and Aristotle (Ryff, Boylan & Kirsch, 2021; Huta & Waterman, 2014; Ryan & Deci, 2001). To be hedonically well is to be satiated here and now. The hedonic approach says that well-being is the presence of positive affect and the absence of negative affect. It is simple, understandable, and relatable to any person. When well-being researchers say happiness, they are usually referring directly to the positive affect associated with the hedonic construct. Time spent without worry, sadness or unsatiated desire is time spent well. In other words, if you feel good, then life is probably good too. This approach is explicit in arguing that the maximization of pleasure and the minimization of discomfort is the goal of well-being. However, even ancient philosophers quickly began to challenge this approach.

Many of us have had the privilege of getting too much of a good thing. When we chase moment to moment pleasure, we inevitably end up feeling the urge for something more. This idea that momentary happiness does not necessarily equate to complete psychological well-being is at the core of eudaimonia (Deci & Ryan, 2008). Aristippus's and Epicurus's hedonism was met with Aristotle's virtuous, potential-seeking eudaimonism. Eudaimonia argues that the goal of well-being is achieved by engaging in a process of self-fulfillment of potential. Well-being is seen as a virtuous process of identifying your potential to do good in the world and seeking to

fulfill that potential, even at the expense of positive affect in the moment. Perhaps the easiest example of this distinction is seen in parenting. Even in the best-case scenarios, the lack of hedonic well-being of parents is painfully obvious. Sleepless nights, financial strain, endless need for care for a being that is completely vulnerable combined with the overwhelming sense of responsibility for something that suddenly matters more than yourself are only some of the factors we see interrupt the ability for parents to engage in even basic hedonistic fulfillment. Despite this, many parents will look back on their decision to raise a child as one of the best things they ever did, deriving a sense of well-being that is hard to comprehend for those who did not engage in the same path. At first glance, eudaimonia seems to invalidate hedonia as a short-term, simplistic view of well-being. However, once the desire for a single, simple definition/approach to well-being is let go of, the interplay between hedonic and eudaimonic well-being reveals a more complicated picture.

Huta and Ryan (2010) challenged the idea that hedonia and eudaimonia are opposing paths to well-being. Across four studies that assessed the correlations that these types of well-being have with various well-being related variables like meaning, vitality and life satisfaction, among many others, they discovered an interesting pattern. Hedonia and eudaimonia were associated more strongly with certain outcomes, while for certain variables like life satisfaction they would overlap to a meaningful degree. Perhaps the most important result was that not only were there people who had high levels of both types of well-being, but that these individuals were the ones who achieved the highest levels of positive outcomes measured across the studies. Huta and Ryan's (2010) results suggest that not only can these two pursuits be balanced with each other, but that this may be the key to the elusive "good life". Regardless, this distinction teaches us several important things about well-being.

First, there are likely many ways to conceptualize well-being that emphasize different outcomes. The short-term need satisfaction of hedonia versus the long-term fulfillment of eudaimonia is a good example of this. Second, different types of well-being should be seen as interrelated pieces of an overall picture of well-being even if at first glance they may seem at odds with each other. Hedonia and eudaimonia fulfill different needs that we have. Striving to obtain a doctorate is all well and good, but without the occasional late night with friends or questionable fast-food order I can say from personal experience that fulfilling one's potential becomes much less likely. A journey that was only ever filled with strife could be hard to look back on, arguably, with the same sense of meaning as one that had some good times in it. The third lesson relates to balance. Not only are different well-being types/factors related to each other, but maximizing well-being overall is likely to involve a complicated dance between various factors that plays out across an individual's life. The positive affect associated with hedonia and the sense of fulfillment and meaning associated with eudaimonia are simply two factors we can examine.

Overall, hedonia and eudaimonia are examples of how longstanding well-being theories are and that our understanding of these concepts is still developing in the modern world. However, do not assume that this encapsulates all the relevant history of well-being research and thought. There have been many developments and theoretical advancements in well-being research that have had as much of an impact if not more on how we talk about well-being than the eudaimonic/hedonic continuum. In fact, these developments have led to one of the fastest growing trends in psychological research of the modern era. To understand this history is to understand where our understanding of well-being is going, and what we may be missing along the way.

Subjective well-being and psychological well-being. You have likely noticed a distinct lack of a formal definition of well-being so far in this dissertation. The issue here is that well-being literature is absolutely filled with various theories, models, and corresponding definitions of what constitutes well-being. The taxonomy becomes even more difficult as, eudaimonia/hedonia being a useful example, many researchers aim to identify types or pathways to well-being that emphasize different things. To feel this confusion is to understand the complexities of well-being as a concept. Regardless, I will review the historical context of well-being research that has happened between and during the earliest discussions between ancient philosophers on well-being up to and including modern integrations of eudaimonia and hedonia as interrelated things. This will eventually lead to a multifactorial understanding of well-being that, while being broad, should help to illustrate the general idea of well-being that I believe assists the most in deepening our understanding of it. For now, a useful definition is one used by Bautista and colleagues (2023) in which they argue that "Well-being is a multifaceted construct that is used across disciplines to portray a state of wellness, health, and happiness".

In his review on what ended up being the emergence of literature on subjective well-being, a term that will be defined shortly, Wilson (1967) echoed the point that his colleague Dodge (1930) had made prior that little progress had been made in understanding the "happy life" since the efforts of the Greek philosophers that I mentioned above. It was only around the early to mid-1900's that interest in well-being as a distinct field of research began to grow into what it has become today. This is reflected in the historical review Oishi, Diener and Lucas (2021) provided in which they recall the earliest use of polling questions on happiness occurring after the Second World War, around the time that large-scale surveys were being developed as an assessment method. Much of this early work centered around the concept of subjective well-

being (SWB). SWB is defined as both the cognitive and affective evaluations that an individual has regarding their life (Oishi, Diener & Lucas, 2021; Diener, 1984). Life-satisfaction is seen as the cognitive component in which a person is seen as a judge of the quality of their own life. The affective component refers to the subjective sense an individual has regarding the presence of positive and negative affect in their life. Despite not being entirely consistent with the hedonistic tradition, SWB does emphasize the importance of positive affect in relation to negative affect (i.e., pleasure versus pain). The subjective component is a significant addition to the Greek's approach, and SWB captured the attention of many. In his seminal review on SWB research, Diener (1984) was quick to mention the rapid growth of research interest on the "good life" that had occurred mainly through the lens of SWB.

The growing popularity of SWB throughout the mid to late 1900s may suggest that the hedonic approach was becoming the focus of well-being research and thought. First, I would like to challenge the assumption that SWB is entirely a hedonistic concept. Admittedly, SWB does emphasize the maximization of positive affect and the minimization of negative affect but the cognitive component does leave significant room for the judgements that we make about our lives outside of our feelings. The same emphasis on indicators of virtuous living seen in the eudaimonic tradition can be judged within people just as much as they are between people. I believe that we can feel good in the moment about the virtuous processes we are engaged in. Second, the eudaimonic approach ended up being represented in its own model of well-being around the late 90's.

Psychological well-being (PWB) is a model that was defined somewhat in response to the frequent usage of SWB and its focus on affect and life satisfaction, taking a more multi-dimensional approach that aimed to incorporate existing frameworks together (Ryff & Keyes,

1995). PWB has six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, self-acceptance (Ryff & Keyes, 1995). Ryff (Ryff & Singer, 2008) has been very clear in her appreciation of Aristotle's work in describing the goals of a good life, and PWB also incorporates many other influences that display the wide effect that eudaimonia has had historically. Self-acceptance, the idea that we should understand and accept the qualities of ourselves, positive or negative, is one of the many ways that Ryff incorporates theories of self-actualization and humanistic psychology seen in the work of Maslow and Rogers. Ryff, being a developmental psychologist, is also clear in her inspirations from the work of Erikson, with the realization of one's potential and an openness to engage in the process of personal growth and the new experiences that are required for such development being at the core of Ryff's explanations of personal growth in the PWB model. Again, Maslow and Rogers are invoked in this dimension of PWB. Purpose in life, essentially the search for meaning we all experience, incorporates Frankl's seminal work on the subject. Ryff then argues that autonomy should be included in the model as it is a requirement for those who wish to engage in the individual process of self-actualization. Environmental mastery incorporates Jahoda's (1958) statements on how the ability of a person to influence or create environments that are conducive to their mental health is important. Finally, positive relations with others as a dimension is an obvious inclusion. Humans are social and the relationships we have tend to end up defining us in many ways.

PWB is an example of how the eudaimonic tradition has continued and how many theories, models, and constructs there are that tie into its main themes. Despite these advancements, the more hedonically oriented SWB and eudaimonically oriented PWB were generally seen as contradictory to each other. I already mentioned above that PWB was

established in response to the popularity of the mainly hedonic SWB model. Both models have had their share of measurement tool validations, factor structure examinations, intervention studies and literature reviews that are not within the scope of this chapter to explore in detail. A common thread across all these valuable pieces of work is the sense that the other model is missing the full picture and that the model being examined at the moment, SWB or PWB, has support for its theoretical structure, psychometric qualities of its measurement tools, and ability to predict important outcomes. Everyone seemed to be somehow right and wrong and the separation of eudaimonia and hedonia, including the arguments made by our philosophical forefathers, echoed in the modern era. Fortunately, we didn't end up waiting another couple of thousand years and entered what will likely be written about as one of the most important eras of thought and analysis of well-being in human history.

Development of Multi-Factor/Dimensional Models of Well-Being

This section will take a less chronological approach and will mainly focus on topics that have occurred concurrently to at least some degree ranging from the early 2000's to around the time this dissertation is being written. However, there are some important moments to mention that will act as anchors and help to piece various models, ideas, and arguments together. For now, the work of Huta and Ryan (2009) mentioned around the beginning of this chapter is worth revisiting. Their core argument was that hedonic and eudaimonic pursuits, being distinct on one hand, still carry significant overlap in how they benefit various outcomes while also seeming to promote the highest levels of well-being when both are present in larger amounts. This interrelatedness and harmonization of distinct and, at times, seemingly disparate factors of well-being are going to be key themes throughout the work summarized below including the studies that I conducted. Another theme is how well-being grabbed the attention of those outside of the

social sciences and beyond. To explain this, it is best to start with understanding the dissatisfaction of a man named Nicholas Sarkozy who happened to be the president of the French Republic in 2008.

Sarkozy commissioned Stiglitz and colleagues (Stiglitz, Sen & Fitoussi, 2010) to form The Commission on the Measurement of Economic Performance and Social Progress due to his dissatisfaction with the current information available to him on the state of the economy and society. The process involved a diverse team of experts aiming to find more effective statistical indicators of economic and societal well-being beyond the usual indicators used at the time, GDP being the most popular. Notably, the report they created had much to say regarding what indicators are worth mentioning when assessing well-being. Perhaps their most relevant recommendation regarding well-being with regards to the current dissertation is that it should be examined as a multidimensional construct. Even SWB can be broken down into components, like positive vs. negative affect and the life satisfaction component. The authors were also quick to mention that well-being is impacted by the various opportunities available to people and the conditions that allow for these opportunities (e.g., capabilities). Education, health and political voice were also implicated as possible well-being components worth measuring from their perspective.

While Stiglitz et al. (2010) were able to list these various components, they took a very different approach compared to the trends that occurred mainly in the psychological field. The authors did not claim to have defined a new type of well-being and argued against the idea of a universal well-being measure being the goal, despite their desire for one as an effective tool for aiding in economic and social well-being measurement. Instead, they argued that an effective approach to measuring well-being involves making value judgements on what components are

most important to measure that are rooted in the context that the researchers find themselves in. As seen in their work, when taking the broad approach necessary to try and develop more effective statistical measurements of well-being on a societal scale, there are arguments for many components of well-being to be included that go far beyond the SWB and PWB continuum. What I take from this is that, depending on the context and nature of what questions about well-being are being asked, many different components could be deemed more or less important to include. By the end of their report, Stiglitz et al., (2010) recommend that statistical systems used to collect information on well-being should aim to provide information that can allow for multiple aggregations of various measures of well-being. Their comments recommend a multivariate approach to measuring well-being without being explicit in what those variables should be.

The development of multidimensional models of well-being was also seen in newer studies on SWB. Sometimes referred to as hierarchical models of SWB (Prilleltrensky et al., 2015; Diener et al., 2009) these conceptualizations of SWB added domain satisfaction on to the existing variables of positive/negative affect and life satisfaction. Domain satisfaction refers to the cognitive judgements that we can make regarding how much life satisfaction we have for specific domains that we interact with, like work, leisure, and family, among many others depending on the study in question. Diener and colleagues (2009) suggest that the value of domain satisfaction measurement lies in the bottom-up understanding of global life satisfaction that it can give, hence the use of the hierarchy term. This is an example of domain/context being added as a dimension to pre-existing well-being models instead of just another measurable factor like health or SES. It is also important to note that the literature on need satisfaction has incorporated the measurement of well-being related constructs across contexts (e.g., Fernet et al.,

2023; Milyavskaya et al., 2009). I will comment on the importance of multiple contexts in well-being measurement and theory at many points later in this dissertation, but for now the idea is to appreciate how encompassing well-being models are starting to become as the multidimensional/multi-factor trend continues.

Aside from including new dimensions like context into well-being models, others like Prilleltrensky and colleagues (2015) have also made attempts to create "overall" well-being models that have corresponding measurement tools that integrate many models into one coherent whole. These authors tested a six-factor model of well-being that included interpersonal, community, occupational, physical, psychological, and economic domains (i.e., "I COPPE"). After creating a measurement tool for this model, their results supported a 7-factor solution that corresponded to the 6 domains they included and an additional overall well-being factor.

Prilleltrensky and colleagues (2015) were able to provide clear justifications for why they included their 6 factors alongside empirically-sound results to support their model, but there are plenty of other examples of multidimensional models of well-being with different amounts of factors and similar levels of theoretical and empirical support. Take for example the Well-Being Profile (WB-Pro) developed by Marsh and colleagues (2020), which integrated a wide range of multidimensional models of well-being together. Their process of deciding on what factors to include involved finding an area of at least some international consensus to base their decisions upon. In line with this, they chose to base their inclusions on the symptoms of psychological ill-being seen across the International Classification of Diseases Mental and Behavioural disorders (WHO, 2019) and the Diagnostic and Statistical Manual of mental Disorders (American Psychiatric Association, 2013). They then cited the work done by Huppert and So (2013) in which these same common symptoms of ill-being seen across the ICD and DSM were

"converted" into a definition of well-being that emphasized the opposite of these symptoms. Huppert and So's (2013) process led to a 10-factor model of flourishing (i.e., a state of high level of well-being) that included competence, emotional stability, engagement, meaning, optimism, positive emotion, positive relationships, resilience, self-esteem, and vitality. The WB-Pro, citing other trends in well-being literature, decided to include 5 more factors to the model: competence, self-acceptance, autonomy, empathy, and pro-social behaviour. This 15-factor model performed well with a good-fitting factor structure, evidence of convergent/divergent validity, test-retest reliability, and other notable indicators (Marsh et al., 2020). Once again, a multidimensional model of well-being was developed that integrated a range of factors with strong theoretical and empirical support.

Mentioning every example of multidimensional models of well-being is not within the scope of this chapter, but the examples provided illustrate some important points. The first and most obvious is that multidimensional models of well-being are justified. Stiglitz and colleagues (2010) argued effectively for the need for wide-scale surveys to include a range of information on well-being that went far beyond SWB and PWB in order to guide effective policy decisions. The WB-Pro (Marsh et al., 2020) and I COPPE (Prilleltrensky et al., 2015) were both able to integrate numerous well-being components into measurement tools that performed quite well while having strong support for their implied factor structures. The second point is that a universal well-being measure that includes all the relevant components may be a fool's errand. As much support as there is for the models described above, they differ significantly in their number of factors. Stiglitz et al.'s (2010) recommendation to justify the inclusion of well-being factors into a model based on the context within which the measurement and resulting policy decisions being made are contained seems to be a wise one. Any multidimensional model of

well-being that could be presented here will have its own corresponding theoretically and empirically supported arguments for including and excluding various factors. As will be discussed later, this desire to find an all-inclusive model or define new types of well-being is still strongly impacting the literature.

At this point I have detailed the trends and developments in well-being research, in a general sense, starting in ancient Greece up to modern times. The lack of a singular operation definition of well-being so far in this dissertation is now clear, as there is certainly not one that has been widely agreed upon and the list of factors that could be included in this definition grows and shrinks depending on the study in question. However, I have not included one particularly popular model of well-being and the massive trend in psychological research that it grew out of. By the end of this next section, I will have explained what this model is, how it fits into existing well-being theory and what it has taught us about well-being in general. I will also explain how this model is particularly suited for expanding our understanding of well-being and informing real-world uses of this understanding.

PERMA

Positive Psychology as the Context for PERMA. A shift in psychological research informed by well-being research occurred during Martin Seligman's 1998 APA presidential address (Fowler et al., 1999). Coining the term "positive psychology," Seligman argued that the field of psychology had been overly focused on addressing deficits in human functioning rather than fostering well-being. The response to his address was massive, with a simple APA Psych Info search with the keyword "positive psychology" listing nearly 7000 articles published from 1998 to 2021 alone. Compared to the broader field of psychology, positive psychology has grown rapidly relative to other subfields in the discipline, with its' bountiful amount of research

networks, journals and books dedicated to the subject in such a short amount of time as evidence of this fact (Linley et al., 2006).

Essentially, positive psychology is a focus on understanding and promoting well-being. Already a well-researched subject by the time Seligman made his address, well-being has continued to garner even more attention from researchers, applied professionals and policymakers as the field has grown. One such development in the field of well-being can be traced back to Seligman himself as he aimed to identify the major components implicated in human flourishing. This theory, known as PERMA (Seligman, 2013), has provided a useful model for understanding and researching well-being that incorporates many of the lessons learnt from well-being research in the past. At the core of this theory is the importance of *flourishing*, the same construct mentioned in the last section, a situation in which a person has a sufficient amount of various well-being factors and, therefore, can be deemed as being at a high level of well-being from both an emotional and cognitive perspective (Huppert & So, 2013). In his own work on developing a model of well-being, Seligman focused on 5 factors that he deemed integral for flourishing, summarized in the acronym PERMA (Seligman, 2013).

The PERMA Model of Well-Being. When selecting the components for PERMA, Seligman (2013) had many to choose from. As I demonstrated above with a variety of models (e.g. SWB, PWB, economic surveys, I COPPE, WB-Pro, etc.…), there are many ways to conceptualize well-being, which has resulted in numerous definitions and concepts that have received varying degrees of focus. In the case of PERMA, to create a parsimonious model of well-being that could still capture enough necessary components several distinctions were made. One distinction is that happiness and well-being should not be considered the same thing. Seligman (2013) argues that happiness is an aspect of well-being that is important to understand,

but that it does not itself lie at the center of his well-being theory and that it is instead, an element of well-being. Speaking to elements, Seligman argues that for an element to be included in his well-being theory, it must have three properties. First, is that the element must contribute to well-being. Second, is that the element must be pursued by others for its own sake and not just for the sake of fostering another element. This does not mean that the elements cannot be related in some way, as they inevitably will be due to their relationship with overall well-being. Third, is that the element must be able to be measured and defined independently from any other elements. Taken together, this theory emphasizes that well-being is a construct made up of measurable, observable things that all contribute to well-being, while individually, none of them fully define well-being. This is a multivariate model that sees well-being as a gestalt rather than a singular thing in need of a specific definition. This approach matches with the idea of flourishing in that this state is seen as a culmination of many different yet interrelated things. This emphasis on identifying the elements of well-being rather than finding new types of well-being (Seligman, 2018) is central to understanding the theory and how it can be utilized to explore well-being as a construct.

Positive emotion is the first element of PERMA and is relatively straightforward. The inclusion of this element emphasizes the importance of moment-to-moment positive affect in understanding well-being as a whole. Reflecting the multivariate, elemental approach to well-being that PERMA takes, this element is hedonic in nature and is taken directly from the positive affect factor of SWB. Next is engagement, an element referring to how often one finds themselves feeling fully present and engaged with their lives. This element, in many ways, is directly referring to how often one finds themselves in a flow state, an optimal experience in which one becomes completely absorbed in a present task as their level of skill is just slightly

below the level of difficulty of the task (Nakamura & Csikszentmihalyi, 2002). These first two elements are described as being the only purely subjective ones in the PERMA model (Seligman, 2013). In the case of positive emotion, it is a state that can be reported on directly by a person as they are feeling it. In the case of engagement, this can only be reported upon by the individual in retrospect due to the nature of flow states involving complete absorption in the present moment, though some objective measurement approaches have been attempted (Nakamura & Csikszentmihalyi, 2009). The other elements, at least according to Seligman, are a mix of subjective and objective. They can be determined and measured outside of the individual in many cases but also involve subjective assessments by the individual as well to be fully understood. Again, this mix of subjective and objective aspects in PERMA reflects the mix of these components seen across well-being theories that developed after the early 2000's.

Seligman (2013) established positive relationships as an element of PERMA. Humans being social creatures, this element is an obvious choice and requires no real definition beyond its name. What is not entirely clear, as described by Seligman, is whether or not positive relationships are pursued entirely for their own sake. Already, for other elements, there may be rare cases when another element is not involved. Relationships could be argued as always being pursued to obtain some other element. Seligman is not entirely certain, and he asserts that due to the fundamental ways in which we seek out others and how necessary relationships are for well-being this element is worth including and probably meets his criteria. This issue brings up a very important distinction about PERMA. This theory is concerned with elements that can be observed independently and does not make any claims that these elements do not find many ways to mix with each other in real life circumstances. This open idea that the elements can interact with each other in various ways has implications beyond understanding how they

correlate with each other. This also raises the question as to what ways the elements can differ from each other and what these differences mean for our overall understanding of well-being, among other important questions.

Seligman (2013) defines meaning in his model as "belonging to and serving something that you believe is bigger than yourself." Aside from having obvious ties to eudaimonic theories of well-being, Seligman also claims that meaning has subjective and objective components. Positive emotion is said to be something that the individual cannot be wrong about, as they are reflecting their own internal state. In contrast, Seligman argues that meaning is something that can be determined entirely outside of the individual engaging in the meaningful life. His example of Abraham Lincoln being chronically melancholic despite engaging in very meaningful actions helps to create a separation between positive emotion and meaning. This also points to meaning as a eudaimonic element of well-being, as it reflects the assertion that hedonic factors involve short-term pleasure, while eudaimonic well-being tends to require short-term sacrifices of pleasure to achieve long-term gains (Ryan & Deci, 2001).

Finally, Seligman (2013) refers to achievement as an element that captures the ways in which humans will aim to accomplish things, even just for the sake of accomplishing them. It involves objective actions that people take for a wide variety of subjective reasons. While these actions tend to involve motivation from other areas, like a person who plays competitive games to maximize being in flow or someone who finds meaning in achieving certain things, Seligman includes this as a separate element that can be fostered for its own sake. Again, this element seems to involve subjective and objective aspects. The actions needed for accomplishment are observable, but the sense of it within the person who is aiming for it would involve subjectivity.

Distinctiveness of PERMA. Having so many components of existing well-being theories integrated into PERMA begs the question of how distinct it is. This point was made by Goodman and colleagues (2018) and Kashdan (2017) when they asserted that PERMA was redundant with subjective well-being. To make this point, they found that each PERMA element not only correlates strongly with each other element, but that PERMA also correlated very highly with subjective well-being. They then argued that this means that PERMA does not constitute a unique type of well-being compared to subjective well-being. The issue with this criticism is that PERMA was never intended to be a new form of well-being, and that the value of PERMA has nothing to do with providing new definitions of well-being or identifying new, previously unexamined factors of well-being. In a response to Goodman and colleagues (2017), Seligman (2018) asserts that PERMA is an approach that aims to identify the most important elements implicated in well-being, measure them and aid others in promoting them. He then argues that the strong correlation seen between PERMA and subjective well-being is a testament to the value of the theory in capturing the elements of subjective well-being. He also makes the important distinction that the elements of PERMA are not supposed to be orthogonal. The elements can be measured independently, but due to the nature of being components of importance in well-being they are expected to share variance.

Continuing his defence of PERMA, Seligman (2018) makes the claim that examining well-being theories from a purely psychometric perspective misses some of the added utility of PERMA. By identifying the core elements of well-being, PERMA can provide a multifaceted approach to those who wish to design well-being interventions. Seligman argues that subjective well-being theory as it stood would likely only be able to recommend others to find more satisfaction with life, increase positive emotions and decrease negative emotions from a

subjective point of view. As will be discussed later in this dissertation, I would add that the "elemental" nature of PERMA allows for a berth of new questions to be asked about the nature of well-being that were not entirely possible with pre-existing theories, even from a psychometric perspective. For example, what do the discrepancies between the PERMA elements reveal about overall well-being and other outcomes? My studies used existing measurement tools to examine these discrepancies and found that they did have some predictive value despite not having been examined before in the literature. As will be demonstrated in the studies I conducted, the insights we can gain from these new questions have meaningful implications for theory, measurement, practice, and policy.

Empirical examinations of the structure of PERMA in various samples seem to reflect the points raised above by Seligman (2018). For example, studies using the PERMA Profiler (Butler & Kern, 2016), a tool created to measure each PERMA element individually (more detail below in the measurement section), are generally able to find a factor structure mostly consistent with the PERMA model (e.g., Butler & Kern, 2016). However, reflecting the admission Seligman (2018) makes regarding how PERMA elements are not orthogonal as they inevitably cross-correlate to significant degrees, many of these studies tend to have at least one element cross load too heavily with another to become 5 distinct PERMA factors (e.g., Ryan et al., 2019).

Overall, PERMA draws upon major elements of well-being identified in past research. It is novel in how it picks out these components and implicates them in flourishing, seeing them as pathways/building blocks through which flourishing is achieved. PERMA can be argued as an alternative way of defining SWB, but the fact that it identifies far more factors than SWB and that it aims to inform intervention and theory in a unique way suggests that it constitutes a new approach. As will be seen below, measurement methods for PERMA have been able to explore

these components in unison, leading to new approaches to understanding and measuring factors related to well-being compared to what was available before. However, Seligman (2018) was also explicit in stating that PERMA is certainly not an exhaustive list of the elements of well-being and that the core elements are exclusive in that they would be the ones that are fundamentally necessary to include in a theory of the elements of well-being. Others took this message and found their own expansions to the core PERMA theory.

PERMA+4 and other PERMA developments. Perhaps in part to Seligman's (2018) openness to the idea that PERMA is not an exhaustive model of well-being, additions to the core PERMA model have been made. The first two major additions to PERMA involved physical health factors. The addition of health to the PERMA model (PERMA-H) by Norrish and colleagues (2013) was used to create a framework for education that is fostered by positive psychology concepts (i.e., Positive Education). The authors included physical and mental health as an addition to the model in response to growing evidence of the importance of these factors in academic success (e.g., WHO, 2011) and the relatively high rates of mood disorder symptoms and other mental health-related problems during adolescence (Sawyer et al., 2007). In a similar vein not specific to the education context, Zhivotovskaya (Flourishing Centre, 2014; mentioned in Eacker, 2020) argued that physical well-being as indicated by exercise, diet and sleep should be included together as a vitality element in the core PERMA model (PERMA-V). PERMA-H and PERMA-V both implicate the importance of physical health in understanding well-being. The core PERMA model is an effective summary of the core elements of well-being to date with the addition of physical health doing much to address the reality that the mind and body are deeply interrelated things.

A more recent development in PERMA theory that emerged from workplace well-being research has involved the addition of 4 new domains to the workplace PERMA model. This process (Donaldson & Donaldson, 2020), summarized in Donaldson, Zyl, and Donaldson (2022) began with a systematic review and meta-analysis aimed at identifying additional components to the base PERMA theory that were relevant to the workplace context. These components stayed true to the core of PERMA theory in that they followed the various criteria Seligman (2013; 2018) encouraged researchers to use when considering the addition of new components (e.g., pursued individually for their own sake, independently defined and measured, parsimonious etc....). They determined that physical health, mindset, work environment and economic security were effective additions to what they call the PERMA +4 model. This led to the development of the Positive Functioning at Work Scale (Donaldson et al., 2021), which displayed acceptable validity and measurement invariance while also displaying predictive ability for work-specific outcomes like turnover intention and proactivity, among others. A review article from Cabrera and Donaldson (2024) summarizes the added elements. Physical health refers to many of the same concepts seen in the PERMA-H and PERMA-V models. Mindset is a subjective, cognitive element that refers to people who are growth-oriented and approach their futures with perseverance. Environment, a more objective element, is concerned with the aspects of the work environment that promote well-being (e.g., natural light, nature) and safety. Economic security, a mix of objective and subjective, is the perception of having the financial resources necessary to meet one's needs.

The PERMA+4 model has shown stronger positive correlations with SWB, and more explained variance in regression analyses than the original PERMA model (Donaldson et al., 2021). As summarized in Cabrera and Donaldson's (2023) systematic review of the subject, each

of the components has individually displayed significant, positive correlations with SWB in self and collateral reports (Donaldson & Donaldson, 2020; Donaldson et al., 2021). This model is an effective example of how the core PERMA model can benefit greatly from additions to understand well-being in specific contexts, like the workplace and perhaps even beyond. It stands to reason that health and the other added components to PERMA mentioned above could provide added utility, predictive or otherwise, to our conceptualizations and examinations of well-being as a broad construct. However, the fact that PERMA+4 has more predictive power than PERMA is not surprising, and it is worth considering the value of parsimony when creating models of well-being which is no small feat due to the broad nature of the construct.

There are a wide range of elements that have implications for overall well-being, so adding more to a model would inevitably lead to better predictive power. It is clear that the original PERMA model is not a complete list of well-being factors. However, what remains an open question is whether or not the core PERMA model and its 5 elements are sufficient to understand well-being. How much variance needs to be explained? Exactly how generalizable does the model have to be? When is it worth stopping the addition of elements? These questions of sufficiency are important and interesting, and the efforts surrounding PERMA and additions like PERMA+4 have allowed us to ask them in the first place. This all relates back to Seligman's (2018) argument that the value of the PERMA model cannot just be evaluated in purely psychometric terms. It is a framework meant to be modified and built upon to promote the exploration and promotion of what leads us to flourishing. These questions I have just raised attest to some aspects of the well-being literature that I have criticisms of.

Conceptual Critique of Well-Being Research

For as much progress as well-being research has made, particularly over the past several decades, it has also seen its' fair share of stagnation. My critiques of well-being literature, for now at least, can be summarized in three general points. First are the issues inherent to the tendency for well-being research to either remain staunchly unifactorial or, conversely, to become overly concerned with creating vast amounts of models with growing amounts of factors. Second is the still open question of how many factors are enough to say that we have a clear (but not necessarily complete) picture of someone's well-being. Related to this question is the issue of knowing what truly the necessary components of well-being are, if one could even make such a distinction. Third is the relative lack of research on PERMA elements that considers how different contexts (e.g., work, school, home) play a role in our understanding of the degree to which specific elements of PERMA may be more or less important in different contexts.

More models, more factors, less questions. As I explained before, little development in the discourse on well-being research occurred between the times of the Greeks and the early 1900's (Dodge, 1930). If you can recall, the debate at that point seemed to center almost entirely around the hedonic and eudaimonic approaches to well-being. While both models had several factors implicated in each (e.g., positive and negative affect, life satisfaction), they heavily emphasized an approach to defining well-being under a single unifying model, which proved to be counterproductive and inaccurate as eudaimonia and hedonia are deeply interconnected components (Huta & Ryan, 2009).

This strong desire to develop new types of well-being is also clear in Goodman (2018) and Kashdan's (2017) critiques of PERMA as being too similar to SWB. Despite the various new ways that PERMA suggests we approach the study and promotion of well-being as researchers

(Seligman, 2018), it seems that the issue of psychometric "purity" (e.g., finding the "best" model of well-being) is of more importance to many. I'm not saying that Goodman and Kashdan were completely inaccurate in their critiques, but their focus almost entirely on the psychometric qualities of PERMA makes me wonder if we are heading toward another long period of stagnation similar to the period Dodge (1930) mentioned before well-being research moved from hedonic and eudaimonic discussions into the early stages of multidimensional models seen in SWB. If the primary focus in well-being research is finding the "best" model, what happens to our understanding of the mechanisms of well-being?

If we have all these various models of well-being that each have their own base of psychometric evidence to support them, when do we finally shift our focus towards using these models in a way that deepens our understanding of well-being and how it can be promoted in others? Scale/model validations and the addition of new factors to old models are important pursuits, but also seem to take up most efforts in well-being research. The advice of Stiglitz et al. (2010) to make judgements on what needs to be included in our measurements of well-being and to aim for aggregations rather than overall encapsulations of well-being seems to have been somewhat ignored. As valuable and helpful as it is to gain more validated models of well-being like the I COPPE, WB-Pro and even additions to PERMA like the PERMA-H model, we may have narrowed our focus too much. I believe that we have become too preoccupied with determining exactly what well-being is and what it is not at the expense of asking other questions about well-being that could expand our ability to promote it. Even the strengths of the PERMA model itself can be overshadowed by these issues just like any other new and popular well-being model.

Sufficient versus necessary. One question I have that has only been implied recently with the inclusion of PERMA is what is a sufficient number of factors to include in a well-being model? Rather, when do we have enough in our models to effectively inform theory, practice, and policy (particular emphasis placed on the last two areas)? Another related question is exactly what are the necessary components of well-being? Seligman's (2013) criteria for including various elements in the PERMA model is the first time I have seen an attempt at identifying necessary components of well-being rather than trying to find a complete, unified model of well-being. Despite how difficult it would be to prove you had found all the necessary components, as there are so many other factors that one could argue are necessary, this question could be very useful in specific contexts. For example, what are the necessary components of well-being that a therapist should really know about a client? What about an employer that wants to promote a positive workplace environment for their workers? What about the Prime Minister? If we let go of the need to have a perfect, all-encompassing model of well-being, we can hopefully start to help others make important decisions about well-being based on the context they find themselves in. A perfect overall well-being model is an elusive thing, but an effective well-being model for a specific time and context may be feasible.

Lacking context. Domain satisfaction (Diener, 2009) is a novel and underappreciated inclusion to the well-being discourse that should have gone much, much further. The majority of measurement tools for domain satisfaction focus on single items that assess the life satisfaction component of SWB in specific contexts (Diener, 2009). Why not ask people about how they experience more of these many well-being factors we have identified across contexts? The need satisfaction literature has been able to accomplish this quite successfully (Milyavskaya et al., 2009; Fernet et al., 2023), which begs the question as to what can be learnt about the PERMA

elements if they are measured across multiple contexts within the same sample? How does our understanding of the structure of PERMA change when we examine the factors across contexts like home, work, and school? Despite all the new models we have, the emphasis has continued to be on developing new measures and validating models that seem to gain more and more factors as time goes on.

These general critiques of the well-being field to date and the open questions they have left behind are what informed essentially all of the work I did on my studies. Before these questions can be answered there is an entire body of research on how PERMA has been measured, correlated with other variables and used to inform interventions that is worth summarizing. Despite the advantages that PERMA has in helping me ask some of the questions I posed above, there are also just as many gaps to explore in how this model has been used and understood.

Clinical Implications of the PERMA Model

I wanted to take some time in this dissertation to explore the clinical implications of the PERMA model. Much of my dissertation is focused on how to bridge the gap between well-being research debates and practice/policy. As a clinical psychologist in training with some years of practical experience, I think some comments on the clinical implications of PERMA are worth mentioning and are possible to argue for based on existing research. Further, the studies outlined in this dissertation could have significant implications for the understanding and promotion of well-being in clinical practice.

Since the inception of positive psychology as a distinct field of study, there has been a growing emphasis on developing psychotherapy interventions that expand their focus towards

well-being rather than just mental health symptoms (Jankowski et al., 2020). Seligman, Rashid, and Parks (2006) conducted some of the earliest studies on what they coined positive psychotherapy (PPT), a therapy approach that directly incorporates various elements that would eventually be included in the PERMA model, namely positive emotion, engagement and meaning. They reported on two preliminary studies, the first involving PPT delivered to groups of mild to moderately depressed individuals and the second involving the same demographic but on an individual basis instead. The authors used a wide range of interventions to foster engagement, meaning and positive emotion, with many interventions providing overlap between various elements. They used a structured approach that asked participants to engage in specific homework exercises and in-session discussions to foster well-being. Their group study significantly reduced depressive symptoms up to a one-year follow-up. Their individual study had an even stronger effect, displaying higher remission rates compared to treatment as usual and treatment with medication in an outpatient sample. These are very encouraging results for a, at the time, relatively untested approach to therapy.

Since the early studies on PPT mentioned above and the development of the PERMA model in its entirety, various studies on the efficacy of PERMA-informed psychotherapy have been conducted. PERMA-informed psychotherapy has been compared to CBT interventions for test anxiety, showing similar efficacy (Alibak & Alibak, 2021). Other studies have found PERMA-informed psychotherapy interventions to work, as well as other established therapy approaches in online, individual and group settings (Seligman et al., 2006). From my experience, there are usually many possible roads one can take to help a client meet their goals in therapy. Research on what has been called the “dodo bird effect” has shown us that the differences in performance across the many therapy modalities being used today can be quite minimal, though

this remains a controversial topic (Budd & Hughes, 2009). One explanation of the dodo bird effect explains it as the therapeutic alliance between the therapist and client being the main mechanism of change in therapy, and it may even be best to see these common factors of therapy, like alliance, and the specific techniques used in different modalities as being interconnected (de Felice et al., 2019). Whatever conclusions end up being drawn regarding the dodo-bird effect, I would argue that the different approaches used by therapists and clients are all possible ways to get to the same positive outcomes that we aim for in psychotherapy. I see PPT and its developments as simply new ways for clients and therapists to promote positive outcomes with the added benefit of promoting well-being beyond symptom reduction that PERMA aims for. As a clinician that aims to find multiple avenues to positive client outcomes, more validated methods to achieve results are always welcome and allow me to meet a more diverse range of clients and presenting problems. In my mind the main benefit of PPT is the unique role it plays in promoting well-being compared to existing and past therapy approaches. The PERMA model is particularly suited for this as it provides a parsimonious model for clinicians to inform their interventions around that captures the core elements of well-being seen across the history of well-being research and measurement.

Other multidimensional models could be effective as well, but, in my opinion, they tend to include far more factors than PERMA (e.g., I COPPE) or become far too focused on a specific definition of well-being (e.g., SWB or PWB) to provide the parsimony and flexibility needed by clinicians to approach their clients' problems in an effective way. I think back to the comment Seligman (2018) made regarding SWB and how this model could only tell someone to increase positive affect, minimize negative affect and aim for some degree of satisfaction with their life overall. These are relevant elements but do not go nearly far enough to capture the variety of

experiences, problems and resulting pathways to solutions that therapists are faced with daily. Conversely, if a model tried too hard to incorporate every possibly relevant element of well-being with minimal overlap, clinicians and clients may struggle to organize themselves and their efforts towards an integrated approach towards well-being. Again, I believe this is another example of the importance of making value judgments on what to include in our well-being models based on the context we are working within (Stiglitz et al., 2010). Core aspects of well-being that have been emphasized for quite some time like eudaimonia and hedonia are likely almost always important to include but the degree to which one expands the multifactorial approach should be informed by use scenarios and the population in question, not just psychometric quality above anything else. At the very least, clinicians must make these types of judgments all the time and I'm confident other professionals that deal with well-being feel the same. Whether or not the PERMA model is the best approach to use in clinical settings is certainly up for debate, strengths aside.

A final implication of PERMA in clinical settings is as an outcome monitoring tool. Outcome monitoring tools take the form of questionnaires that clients complete at regular intervals, usually before or after each session, that ask them about various aspects of their symptoms and level of functioning. Take for example the Outcome Questionnaire-45 (OQ-45; Lambert et al., 2013), a scale that measures clients' levels of psychological symptoms of disturbance, interpersonal problems, and social role functioning. Total and subscale scores are calculated, and the therapist is given an output that shows the expected trajectory of psychological disturbance of their client. Outcome monitoring tools like the OQ-45 and the feedback it provides to both therapists and clients have been associated with improved therapeutic outcomes in randomized trials (e.g., Bickman et al., 2011; De Jong et al., 2014) and,

consequently, meta-analyses (e.g., Lambert, Whipple & Kleinstauber, 2018; Lambert & Shimokawa, 2011).

Studies examining the benefit of various positive psychology interventions have used PERMA-based measurement tools to assess outcomes. Rowe and Carnelley (2019) measured PERMA elements to determine the effect of an intervention on caregivers of stroke survivors. Hulbert-Williams and colleagues (2019) measured well-being changes in chronic pain patients participating in Acceptance and Commitment Therapy using a PERMA measure. Another somewhat "clinical-adjacent" example is the study by Green, Grant and Oades (2006) that measured changes in PERMA elements in participants who completed a course of cognitive-behavioural life coaching.

The studies mentioned above are proofs of concept for measuring the therapeutic impact of interventions on important aspects of well-being even if they do not always directly involve purely psychotherapy settings and practices. However, the problem is that there are essentially no studies examining the impact of using PERMA measures in a similar fashion to tools like the OQ-45. If we know that measuring outcomes throughout therapy and providing feedback on them to both clients and therapists is effective, and we also know that there is value in focusing on well-being as an outcome in therapy aside from just symptom reduction, then it is likely that using PERMA measures or even other well-being measures in the same fashion as outcome monitoring tools could be beneficial in their own right for therapists and clients. Again, due to the balance that the PERMA model strikes by being parsimonious yet still multifactorial, I think it is uniquely suited as a model to measure well-being outcomes in a therapeutic context.

The studies in my dissertation have important implications for clinical practice. As will be explained in more detail below, my studies involve measuring PERMA elements across

contexts (home, school, work) and examining the discrepancies between the elements within and across these contexts in order to understand the mechanisms of well-being across context and to determine the role that discrepancies across well-being elements plays in predicting important outcomes. Clinically, being able to determine the level of well-being and what elements of well-being are impacted differentially across contexts like work and home can be crucial. In the case of a clinician working with a client who is dealing with significant workplace burnout, consistently measuring well-being in and outside of work becomes relevant when trying to understand the intricate details of how that client is experiencing burnout. Further, the discrepancies between well-being elements, particularly across contexts, could reveal important information about what is impacting clients. For example, if a client is reporting feelings of disconnection from others but a therapist only asks about/measures relationship quality in general, or in the client's personal life, important aspects of that client's well-being could be missed. People spend their lives across different contexts and, naturally, it makes sense to argue that all of these contexts could play a potential role in that life becoming hard to navigate.

With the inception of positive psychotherapy as a trend and a focus on well-being promotion, clinicians have a lot of new information regarding the well-being of their clients to process. As positive psychology interventions continue to be tested and refined, new avenues into outcome monitoring and other areas may be worth exploring. My studies have specific implications in this area relating to the importance of incorporating context and discrepancy when examining well-being elements in clinical practice. These implications will be expanded upon below in later sections, but for now there is a large base of empirical evidence regarding PERMA that needs to be understood.

Chapter 2: Empirical Investigations of PERMA

The goal of this chapter is to summarize the large body of evidence that has been collected on the psychometric qualities of PERMA scales and measures, the correlations that PERMA elements have demonstrated and the impact that PERMA interventions have had in various settings. I will also provide a critique of the various empirical investigations of PERMA that have been conducted to date, identifying significant gaps in the literature that I will aim to address through two studies that will be presented in chapters 4 and 5. To begin, it would be prudent to identify the various ways in which PERMA has been measured and the insights into the structure of PERMA that these measures have provided us with.

Psychometric Studies of PERMA

How PERMA is measured. As a part of their systematic review on the PERMA model and their own additions to it, Donaldson and Cabrera (2024) screened 1734 articles and included 111 articles that empirically and quantitatively examined the entirety of the PERMA model in various ways. As a result of this work, they were able to provide some general insights into how PERMA has been measured. They identified four categories of PERMA measurement approaches: scales solely developed to measure PERMA, combinations of existing scales to measure PERMA elements, usage of items from previously administered surveys, and measures created for variations of the PERMA model. By far, the most popular category was the first one, with the PERMA-Profiler (Butler & Kern, 2016) being the most widely used PERMA measurement tool. Due to its' popularity and emphasis on explicitly measuring the five elements of PERMA, the literature on the PERMA-Profiler is the natural place to start when exploring the psychometric evidence of the PERMA model.

PERMA Profiler. As argued by Butler and Kern (2016), measures that assessed PERMA elements did exist at the time but would not necessarily include every element, would only use one or two items for each element, or included elements among numerous other non-PERMA items (e.g., Su, Tay & Diener., 2014; Diener et al., 2010). To address these gaps, Butler, and Kern (2016) created the PERMA-Profiler (PERMA-P), a multidimensional scale of well-being that assesses each PERMA element separately. This scale has 15 PERMA-related items (3 per each element) that were picked through a process of reduction and refinement of hundreds of potential items over the course of 3 studies. This scale also includes 8 additional items that assess overall well-being, negative emotion, loneliness, and physical health. Each item is rated on a 0-10 Likert scale (never/not at all – always/completely, depending on the item). Butler & Kern (2016) demonstrated that the PERMA-P displayed internal and cross-time consistency, convergent, divergent, and content validity, in addition to acceptable model fit statistics across eight studies (N = 31,966) with geographically diverse samples. Butler and Kern's (2016) model fit statistics came from the use of confirmatory factor analysis in which a 5-factor model (1 factor for each element) was tested against their Profiler data. In the two samples they used for their CFA process, the 5-factor model adequately fit the data, with engagement having the weakest fit statistics across both samples. These results support the view that PERMA elements, originally envision by Seligman (2013), are generally distinct but correlated. However, these initial psychometric analyses left the question about the incremental utility or validity of these scales unanswered.

PERMA-P scale validations have been conducted across the world, including Brazil (Carvalho, Aquino & Natividade, 2023), Greece (Pezirkianidis et al., 2021), Australia (Bartholomaeus et al., 2020), Germany (Wammerl et al., 2019), Italy (Giangrasso, 2021), China

(Li et al., 2021) and Indonesia (Idris et al., 2018), among others. A common theme across all of these validations of the PERMA-P is that it tends to display strong evidence of reliability and validity. What is less consistent, is the exact factor structure of PERMA. Theoretically, all of the PERMA-P items should fit some form of 5-factor model in which the 3 items associated with each PERMA element fit onto a respective factor. Several studies have been able to observe this factor structure (e.g., Giangrosso, 2021; Hidayat et al., 2018; Butler & Kern, 2016). In most of these cases, the PERMA-P displays a factor structure of 5 PERMA elements that are moderately to highly intercorrelated but distinct. However, some studies have found an alternative factor structure in which the 5 PERMA elements act as second order factors for an overall well-being factor (e.g., Bartholomaeus et al., 2020). Further, when comparing these two types of 5-factor structures together in the same sample, Wammerl and colleagues (2019) found that the correlated 5-factor model fit best. There are also examples of when 3 or 2 factor models fit the data (e.g., Ryan et al., 2019; Khaw & Kern, 2014). These seem to be cases of one or more factors cross-loading too heavily due to the intercorrelated nature of the PERMA elements as referred to by Seligman (2018). Bartholomaeus and colleagues (2020) found similar problems with factor structure differences across multiple samples. The inconsistency in what number of factors best accounted for the structure of the PERMA items in the studies outlined above raises some issues. One such issue is the distinctiveness of each of the elements, but there are also the issues of incremental utility and validity of each element relative to the others. The distinctiveness and inconsistent factor structure issues are commonly reported on, as seen above, but few studies have systematically investigated the incremental utility or validity of each of the 5 elements.

Despite the evidence for the 5-factor structure of the PERMA-P, there are examples of when 3 or 2 factor models fit the data (e.g., Ryan et al., 2019; Khaw & Kern, 2014). These seem

to be cases of one or more factors cross-loading too heavily due to the intercorrelated nature of the PERMA elements as referred to by Seligman (2018). The cross-loading issue is what Bartholomaeus, and colleagues (2020) were referring to when they examined the PERMA-P's structure across multiple samples. Overall, there seems to be evidence that the PERMA-P supports the implied 5-factor model of PERMA elements across a diverse range of samples to some extent. There are also examples of when the intercorrelated nature of the PERMA elements obscures the 5-factor structure. Some have also noted issues with the reliability of the engagement items (Bartholomaeus et al., 2020) which could also be playing a role. Once again this raises concerns regarding the distinctiveness of the five PERMA elements.

So far, it has been shown that the PERMA-P is the most popular measure of PERMA and that it displays acceptable psychometric qualities while, mostly, fitting with the 5-factor model implied by PERMA's theoretical underpinnings with some inconsistencies that are likely due to the intercorrelated nature of the PERMA elements. All in all, if one wants to measure PERMA elements in as straightforward a way as possible, the PERMA-Profiler is probably their best bet. However, around the time she was working on developing and evaluating the psychometric performance of the PERMA-P, Peggy Kern made a variation to her scale that revealed a gap in well-being/PERMA research that, I would argue, has not been filled to this day. She chose to measure PERMA elements contextually.

Workplace PERMA Profiler. After creating the PERMA-P, a modified version was created to assess the 5 PERMA elements in a workplace-specific context (Workplace PERMA-P; Kern, 2014). This version is the first example of measuring PERMA elements across contexts and retains the same structure as the original through the use of 3 Likert items rated on an 11-point (0-10) scale for each PERMA element. The modifications to each item are generally quite

minor, usually adding in the prefix “at work” to most original items. Some items have been modified beyond adding work-specific prefixes or suffixes in order to assess similar constructs in a workplace context (e.g., “To what extent do you receive help and support from coworkers when you need it?”). The original authors never conducted a psychometric validation of the Workplace PERMA-P. However, like the PERMA-P, the workplace version has become quite popular and has numerous examples of scale validation studies examining its’ psychometric qualities.

However, a number of psychometric evaluations of the Workplace PERMA-P have been conducted globally, including samples and translations for countries such as Japan (Watanabe et al., 2018), Korea (Choi et al., 2019), China/USA (cross-cultural comparison; Jimenez et al., 2022) and Latin America (Chaves et al., 2023). Like the PERMA-P, the results from these global validation studies indicate that the Workplace PERMA-P displays acceptable reliability and validity, both convergent and divergent. Regarding factor structure, the Workplace PERMA-P seems to display the same trend of marginal 5-factor model fit similar to results seen with the PERMA-P. However, studies like the one conducted by Jimenez and colleagues (2022) found that effective cross-cultural comparisons were not always possible, suggesting that cultural differences in how we approach work may not always allow for the exact same items to be used depending on the culture in question. Results of this study suggest that There may be a number of contexts in which PERMA elements should be investigated explicitly. Investigating context is important for a number of reasons, not just to understand the degree to which various domains of well-being may differ across contexts including culture, but also the generalizability of the PERMA model in general.

These studies suggest that the Workplace PERMA-P may be a reliable measure of well-being like its more generalized counterpart with a distinct need for additional evidence, particularly in cross-cultural comparisons. Another issue is that direct comparisons of the PERMA-P and the Workplace PERMA-P have not been conducted. The presence of each of these scales implies that PERMA elements, and therefore well-being, can be measured across different contexts. As will be seen below, workplace well-being measurement has been used frequently, but the implication that PERMA elements can be measured across separate contexts has not been tested fully. To accomplish this, one would have to measure PERMA elements from a workplace context and measure them outside of the workplace context within the same sample. As far as I am aware, this has only been done once and was published as I was writing this dissertation.

Rice (2024) conducted a study in which the PERMA Profiler and Workplace PERMA Profiler were administered to 601 MTurk participants online. Rice's goal was to see how the psychometric properties of the Profilers varied across each measure when used within the same sample. Despite being a relatively simple study, the results were entirely novel compared to the numerous scale validation studies for the Profilers that I mentioned above. Instead of focusing entirely on issues like convergent and divergent validity or factor structure, Rice was instead able to show that the PERMA constructs were able to be measured equivalently across scales. Furthermore, the covariances and means did have variance across the measures within the same participants, indicating that each Profiler showed its' own distinct utility in measuring PERMA elements within their respective contexts. The only exception was the relationships factor, which was likely due to one of the items in this element requiring significantly more changes to it than the other items to be adapted to the workplace context. This study stands alone in suggesting that

the PERMA elements can be measured across contexts within the same individual and yield added information as a result.

This contextual aspect of PERMA warrants further investigation and could be a valuable addition to the PERMA model that, instead of adding elements to the model, implicates the importance of context in understanding well-being in a more direct way than what has been done in the literature to date beyond notable examples like need satisfaction. I will revisit this issue below at the end of the chapter. For now, it is important to understand the correlates of PERMA.

Correlational Studies of PERMA

The correlates and outcomes associated with PERMA have been examined across a wide range of studies. Reflecting its' theoretical roots, PERMA element subscale scores, mainly measured using the PERMA-Profiler but not always, have been positively correlated with SWB (e.g., Choi, 2021; Donaldson et al., 2021; Kern et al., 2014; Goodman et al., 2018; Tansey et al., 2018). PERMA has also been found to be positively correlated with a wide range of positive factors/outcomes and negatively correlated with negative factors/outcomes. For example, Tansey et al. (2018) assessed the factor structure and correlates of PERMA in a sample of college students with disabilities. They found that PERMA, as measured using various pre-existing self-report scales that assessed each element individually, was positively correlated with life satisfaction, self-esteem, self-efficacy and locus of control while being negatively correlated with perceived stress, academic problems and relationship problems. In their development of the PERMA Profiler, Butler and Kern (2016) found that each PERMA element was positively associated with a measure of flourishing (Flourishing Scale; Diener et al., 2010), mental well-being and physical health while being negatively associated with loneliness and depression. Giangrosso (2018), interested in how the PERMA-Profiler displayed convergent validity with

eudaimonic constructs, found that the PERMA elements were all positively related to the various subdomains of Ryff's (1989) Psychological Well-Being Scale: self-acceptance, autonomy, personal growth, environmental mastery, positive relationships, purpose in life.

Aside from SWB, PWB and other types of factors associated with well-being that have been discussed so far in this dissertation, correlation studies examining PERMA have found relationships between PERMA elements and factors that are contextually specific or linked to other theories. For example, in one study that examined the workplace context using the Workplace PERMA Profiler, Yang et al. (2022) found that PERMA measured in the workplace context was positively associated with job control and supervisor support. In a study examining the relationship between PERMA elements and 24 different character strengths, Wagner et al. (2020) found that each element correlated positively with every character strength they measured to different degrees depending on the element in question.

There have been so many correlational results reported on the PERMA model that it is beyond the scope of this chapter to mention them all. However, what is important about the numerous studies examining the core elements of PERMA is that PERMA elements are related to a wide range of outcomes with respect to both performance in the workplace as well as various physical and mental health indicators and numerous things in between. Despite the utility of these studies, their results do leave a gap in that few if any of these studies have in fact examined the extent to which the relative importance of the relationship between outcomes such as job performance and the five different elements vary from one context to the next. To summarize what has been presented here, the PERMA elements are not only related to the SWB and PWB constructs that they were largely derived from, but that they are also related to a wide range of well-being adjacent factors spread across an equally wide range of contexts and peoples. Finally,

it is time to reflect on some of the interventions and longitudinal results that have come from PERMA research.

Longitudinal/Intervention Studies of PERMA

In their review of the PERMA literature, Cabrera and Donaldson (2024) identified nine PERMA-based intervention studies. I will use the information they collected to summarize these studies below. Aside from one quasi-experimental design (Shoshani, 2021), all the interventions used a form of randomized control trial design. The interventions took various forms, including group psychotherapy (Furchtlehner et al., 2020), online interventions (Gander et al., 2016; Neumeier et al., 2017) and school-based interventions (Shoshani, 2021), among others. These studies were conducted across a broad range of geographic locations, with a third of them were conducted with Chinese samples (Tu et al., 2021; Luo et al., 2022; Chen et al., 2022). The range of time taken for the interventions varied significantly, being as brief as one week with daily exercises lasting as short as 5 minutes (Neumeier et al., 2017) to a 30-week program that saw participants completing 2-hour sessions every 2 weeks (Shoshani, 2021). Unfortunately, the article by Chen and colleagues (2022) was recently retracted due to various issues, so I will refrain from including their results at this time.

Furchtlehner et al. (2020) sought out to compare two group-based interventions for treating depression. They took ninety-two participants that met criteria for a depressive disorder and randomly assigned one half to a Cognitive-Behavioural Therapy (CBT) condition and the other half to a Positive Psychotherapy (PPT) condition. The PPT condition consisted of a manualized approach (Rashid & Seligman, 2013) in which each session (14 total) had the participants meet with a trained therapist and discuss PERMA-related topics with homework to complete before the next session. Results indicated that the PPT condition displayed moderate to

high effect sizes both within and between groups as seen in post-treatment and 6 month follow up assessment of depressive symptoms. These effect sizes were also larger for the PPT condition compared to the CBT condition.

Gander et al. (2016) conducted a large (N = 1624) randomized, placebo-controlled study that assigned participants to seven conditions. All conditions were done online, with one condition for each PERMA element, one condition that tried to focus on all of them and a control condition that asked participants to write down early memories. This design allowed for a multi-level modelling analytic approach in which the authors were able to report on the individual effects of each element/condition across 5 time points. One finding was that the length of the various positive effects for each condition was not the same. The effect that the positive emotion and accomplishment conditions had on a happiness outcome measure was still significant at 6 months follow-up while the other conditions only maintained significant effects up to 3 months. Further, some conditions simply performed better than others depending on the outcome being examined. One example of this is the fact that the effect size of the positive relationships condition on depressive symptoms was twice to three times higher than any other condition. Finally, it was also found through moderation analyses that participants that started the intervention with very low or high levels of either happiness or depressive symptoms tended to receive the least benefit compared to participants with less extreme scores. This is one of the rare studies that compares the relative importance of PERMA elements in relation to an outcome, an issue I will discuss in more detail below. However, the study did not once again examine the relative importance of different PERMA elements explicitly. As I will discuss below in the methodology of my studies, there are specific analytical approaches that can be used to explicitly evaluate the relative importance of PERMA elements when predicting outcomes. Despite not

aiming to examine the relative importance of PERMA elements, Gander and colleagues (2016) did provide some information regarding the differential impact of PERMA elements as themes used within intervention conditions which is relevant to the issue of relative importance.

Grant and Atad (2021) aimed to compare the coaching psychology approach towards enhancing well-being with PERMA-based interventions. They randomly assigned 393 M.B.A students to attend 13 lectures and complete exercises that were either based on existing coaching psychology interventions, PERMA-based interventions or a control condition that focused on organizational behaviour. Both conditions showed benefits, but the coaching condition provided more benefits with regard to goal attainment, self-insight, PWB and solution-focused thinking. The authors suggested that coaching psychology concepts could be used to enhance PERMA-based interventions in the future.

Taking an approach that focused specifically on the workplace context, Neumeier et al. (2017) provided an online intervention aimed at improving employee well-being using the PERMA model. They took a longitudinal approach, randomly assigning 431 employees to either a PERMA condition, gratitude condition or a waitlist control condition. Both the gratitude and PERMA conditions yielded significant effects, but the outcomes measured tell an interesting story. There were small but significant effect sizes for SWB, but moderate effect sizes for a measure of work-related SWB, a contextually specific measure of well-being. This suggests that positive psychology interventions can be directed to specific contexts and can even yield context-specific outcomes. This contextual aspect of well-being research is surprisingly unexplored despite sounding somewhat intuitive. This issue, among some others I will mention that come from the measurement and correlational research I reviewed, reveals more gaps in the well-being literature that I aim to fill.

Critique of empirical investigations of PERMA

The research I have reviewed above shows us many things. First, the PERMA elements are measurable in a reliable, consistent, and valid manner, with some room left for debate on the exact factor structure of the model. Furthermore, the PERMA Profiler (Butler & Kern, 2016) is by far the most popular measure of PERMA and has the largest body of evidence to support the points I just mentioned above. Second, the PERMA elements are correlated with a wide range of outcomes one would expect which has formed a large evidence base for the convergent and divergent validity of PERMA measures. Third, many have found ways to incorporate the PERMA model into effective interventions across a diverse range of contexts, peoples and problems. At worst, the PERMA interventions perform about as well as existing approaches. At best, they can even do better than existing approaches. This is all valuable information to have, but I believe that this literature has failed to explore some key areas of well-being despite the amount of work that has been done.

Context and discrepancy. As I mentioned in Chapter 1, little theoretical development in well-being across contexts has been mentioned to date aside from domain satisfaction and need satisfaction research. The empirical research on PERMA makes this issue even more clear. Despite the widespread use of contextually specific scales like the Workplace PERMA Profiler (Kern, 2015) and PERMA interventions that promote well-being in specific contexts (Gander, 2016; Neumeier, 2017), only one study to date has even attempted to measure PERMA across contexts (Rice, 2024). You can center entire systematic reviews around PERMA and its' empirical findings (Cabrera & Donaldson, 2024), with PERMA scale validations spanning the entire globe, yet the issue of understanding the role of context and discrepancy when studying PERMA elements remains almost completely untouched. Rather, there are effective ways of

measuring PERMA, and even ways to measure it in different contexts, but there is minimal research determining what discrepancies between the PERMA elements mean for overall well-being and how differences in the elements across contexts can inform our understanding of PERMA. At the very least, this situation suggests that there is a pittance of data available regarding how well-being elements can be observed across contexts. If Rice (2024) is correct and we can measure the PERMA elements across contexts within the same participants, this could have massive implications. Firstly, what other contexts could we feasibly measure? Take for example student well-being. Provided that most of the items of the PERMA Profiler could be modified appropriately, what new insights could we gain from measuring well-being elements in this context? Second, and perhaps most importantly, what could we learn if we compare well-being elements across contexts?

Understanding and investigating the extent to which elements of well-being differ across contexts has a number of important practical implications for both understanding deficits in well-being as well as tailoring interventions to address the clinical needs of clients and patients. Imagine a therapist trying to help a client who is dealing with a variety of stressors and problems but has no clear diagnosis. The therapist, informed by the principles of positive psychotherapy and aware of the importance of multifactor approaches to well-being like PERMA, aims to help her client achieve higher levels of well-being. She begins to ask about the PERMA elements, initially aiming to find ways to help the client promote them but starts to notice an odd pattern. She asks about the presence and quality of interpersonal relationships, a very good question based on what we know about well-being and discovers that the client has very lacking relationships at work compared to outside of work. What does this discrepancy in the same

PERMA elements across contexts mean for the client's overall well-being? On top of that, what should the therapist and client do?

The only suggestions that our hypothetical therapist could take from PERMA literature take the form of implications. Butler and Kern (2016) suggested that the PERMA Profiler could be used to identify deficits that could be targeted and enhanced directly. This implies that each PERMA element can and quite possibly should be maximized. Seligman (2013) was explicit in stating that maximizing the PERMA elements is the clearest path to flourishing. He even says as much when he writes "well-being is a combination of feeling good as well as actually having meaning, good relationships and accomplishment. The way we choose our course in life is to maximize all five of these elements." (Seligman, 2013, pg.25). This sounds like good advice on the surface, but I'm not satisfied, and neither is our hypothetical therapist. Isn't it normal to have different qualities and even types of relationships across contexts? My relationships with my colleagues matter to me, but they matter in a very different way than the ones I have with my partner or my family that I never see at work. And more importantly it presumes that there is an incremental benefit associated with enhancing well-being within a single element relative to any and all others. This is both a theoretically important question as well as an empirical one. There are no studies to date that tell us anything about what the discrepancies between the PERMA elements could predict when it comes to important outcomes.

Discrepancies in the elements across contexts are only one area this type of research could examine. Even if only one context is examined, the discrepancies between the elements could still be meaningful. Maybe it is true that to be truly happy, we need to maximize each element. We could spend another hundred or so years arguing about the "best" model that captures the "best" elements of well-being to find out what we need to maximize then. Before we

continue on in this process, it would be prudent to actually test the maximization implication. Recall the example I gave early on in chapter one when I described how parenting involves short-term deficits in things like positive emotions but eventually leads to long term increases in positive emotions and even meaning and other eudaimonic factors. Are well-being elements simply boxes we need to check and balance through maximization and identifying deficits? This doesn't necessarily match with what we see in examples like parenting. For the parents, these elements are pathways to well-being that ebb and flow in relation to each other and the contexts that the parents live their lives within. Within that ebb and flow exists a network of discrepancies between the elements that is always changing. This perspective has no explicit evidence in its' defense, and I think that it may be worth collecting some. At the very least, when I think about that hypothetical therapist and then try to apply existing well-being theory to my own clinical work, I find myself feeling underequipped when faced with questions of context, discrepancy and utility. If this was not enough, the implication of maximization found within PERMA theory (Seligman, 2013) and empirical study (Butler & Kern, 2016) raises another question that has not been addressed appropriately to date. Which elements are most important?

Why relative importance matters. The body of evidence suggesting that the PERMA elements are associated with important outcomes, the presence of numerous interventions that have led to observable gains from participants who fostered PERMA elements and the longstanding tradition of emphasizing well-being with elements that went on to make up the PERMA model all make it clear that the PERMA elements, any issues aside, are fundamental, important aspects of well-being. However, as I will explain in detail below, the relative importance of the PERMA elements has gone mostly unexamined. I will use chapter 3 to explore

the lack of evidence base of relative importance data in PERMA research, but for now it is important to talk about why this issue is worth exploring in the first place.

As mentioned before, Butler and Kern (2016) suggested that tools like the PERMA Profiler be used to identify deficits in the elements and that interventions could focus on those. Seligman (2013) also argues that the goal of the PERMA model is to maximize each element, which implies that they are equally important. In the case that someone has a clear deficit in one element, this approach makes sense. However, what if someone is lacking in multiple elements or all of them? The maximization approach would suggest that any element is fine to start with or all at once, if possible, but that maximizing all of them is still required. This can be an issue for many reasons, both practical and theoretical. To return to my hypothetical clinical examples, therapists tend to see their clients once per week for about an hour, 10 minutes of which tends to be note writing, and the cost of these sessions means that many cannot spend month after month trying to focus on every possible approach they could feasibly come up with to address their problems. As a therapist myself, I can attest to the emphasis in our training on finding an efficient approach to our clients' problems that is informed by their individual characteristics and the context of their problems. An approach that is informed by the relative importance of the PERMA elements would instead focus on identifying what elements are best to address first for a client based on what the evidence base suggests to be relatively important for well-being in general, an evidence base that we do not have, and then would focus on what is most important based on the outcomes that the client is looking for and what *context* these deficits are found in. This approach could allow for much more efficient and in-depth interventions to be made, perhaps being able to reduce the cost of interventions while increasing effectiveness overall. The only cost is upfront, as we would need to move away from validation studies for existing

PERMA scales, factor structure validations and debates on what should be included in the model towards an approach that examines relative importance within and across contexts.

There are already examples of relative importance being a factor in PERMA. Recall Gander (2016), in which PERMA interventions for each element were compared to each other. The effect size of for the positive relationships condition on depressive symptoms was twice to three times higher than any other condition. This is an example of how, depending on the outcome in question, the PERMA elements can vary in their impact. Combine this issue with the evidence suggesting that PERMA can be measured effectively across contexts (Rice, 2024) and the gap in literature becomes very clear. If we could understand the patterns of relative importance of well-being elements, especially across contexts and desired outcomes, our ability to promote well-being would become far more specific and likely effective as a result. Filling this gap doesn't just benefit clinicians, as the work done by those who are attempting to inform policymakers also emphasizes the importance of measuring and understanding well-being in a way that suits the needs of the society, or context in other words, in question (Stiglitz et al., 2010).

Despite the potential utility of having information on the relative importance of PERMA elements and the ability we have to measure them across contexts, the literature to date on these subjects is at best lacking and in some cases is basically non-existent. I will summarize what empirical evidence of relative importance currently exists and what can be learnt from the gaps that this evidence has left to be examined.

Chapter 3: Evaluating the Incremental Utility of Well-Being elements

Overview of Approaches

Despite the rich body of research on the correlates and outcomes associated with PERMA, either as a whole model or its individual elements, very few approach the issue of relative importance/incremental utility. As seen above in the PERMA intervention literature, this is also a rarely addressed issue in those studies. For any given outcome/correlate of PERMA, which elements display the most incremental utility? To clarify, incremental utility in the context of this dissertation is the degree to which an element provides added predictive value when predicting an outcome above and beyond what is predicted by other elements. The question of incremental utility of PERMA elements has gone relatively unexamined, with very few studies to date having made any explicit attempt at answering it. I will give some examples below of the types of studies that have results that allude to the issue of relative importance but do not directly address it. There are also some examples of studies that are more explicit in mentioning the relative importance/incremental utility of the PERMA elements, but as will be explained, these also have their own issues.

Kern and colleagues (2015) measured the PERMA elements in a sample of 516 school age boys. As this study pre-dated the PERMA Profiler, they used items from pre-existing scales to create their PERMA measure, with each element being operationalized. The authors reported the partial correlations of each PERMA element with a range of outcomes, controlling for the other elements so that the unique degree of correlation between each element and outcome could be examined. Each element, after controlling the effect of the other elements, displayed a different pattern of results. For example, achievement was significantly correlated with 6 different positive outcomes while engagement was only significantly correlated with 2. The

authors did not use any kind of predictive modelling, like regression, not to mention dominance analysis or random forests analysis, but regardless were able to provide some information on the differing relationships that the PERMA elements have with various outcomes.

In a dissertation study, Umucu (2017) delivered an online survey to 205 student veterans that included the PERMA Profiler and other predictor variables like hope, optimism, secure attachment, coping flexibility, and resilience. Outcomes included college life adjustment, health-related quality of life and life satisfaction. One of the goals of this study was to determine how the PERMA elements uniquely predicted the outcome variables. To accomplish this, hierarchical regression was used. In the first step, demographic covariates were entered, then a second step with the non-PERMA predictors and a final step with the PERMA elements. This analysis was able to show that the PERMA elements had a significant amount of unique predictive variance after having accounted for demographic covariates and the non-PERMA predictors but does not really allow for relative importance between the elements themselves to be compared, as all elements were considered in a block.

Huck and colleagues (2021) are another example of a more explicit approach to measuring the relative importance of the PERMA elements. They also used a hierarchical regression approach and found that PERMA elements explained significant amounts of additional variance above and beyond various demographic predictors (e.g., age, gender, race, employment, education level) and variables specific to those who have alopecia. Debatably, only the two studies using hierarchical regression (Huck et al., 2021; Umucu, 2017) even referred directly to the issue of relative importance. In the other studies, relative importance was not a major focus or may have not even been directly mentioned at all, essentially making any relative importance-related information in these studies incidental. Furthermore, due to how the elements

were inserted into the steps of the hierarchical regressions together, effective comparisons of the predictive power of each PERMA element were not entirely possible. However, even if these analyses were set up in a more effective way for relative importance to be examined, there are inherent flaws to examining relative importance with regression and correlations that have not been fully addressed in the literature, which I will address momentarily.

Critique of Approaches

Aside from the majority of PERMA research not even attempting to explore relative importance explicitly, there are analytical issues with the existing evidence for relative importance. Starting with the use of partial correlations (Kern et al., 2015), which do allude to differences in the strength of relationships that the PERMA elements have with various outcomes yet still do not tell us anything about the unique levels of explained variance of these elements in relation to outcomes. At best, this approach is exploratory and needs to be followed up with some other form of analysis.

As seen in some of the other examples I mentioned above (Umucu, 2017; Huck et al., 2021), a very common approach used in PERMA research is regression. Whether a stepwise, hierarchical or some other form of multiple regression is used, these types of analyses can tell us about unique explained variance. One could either run a full model and compare the individual effect sizes of the predictors, see what variables remain in a stepwise regression after a series of steps, or see what amount of variance explained is left over after putting various PERMA elements into a model in a hierarchical fashion. However, there are two core issues with regression in the context of PERMA: multicollinearity and overfitting.

A well-established finding is that the PERMA elements are interrelated and tend to correlate strongly with each other (Seligman, 2018). When a regression model is run, the regression coefficients that are used to compare the predictive power of the predictors all assume that the other predictors remain constant, which means that if the predictors in the model are correlated coefficients can end up reflecting the effect of various other predictors in the model (IBM, 2023). This makes any meaningful comparison between predictors in a traditional regression model unreliable in the case of multicollinearity, an issue that is almost certain to come up when measuring PERMA elements. Further, multicollinearity is associated with another problem, overfitting.

Overfitting is defined as “modeling the random noise in the training data rather than the true underlying relationships. This results in a model that is too complex and performs well on training data but poorly on new, unseen data" (Hastie, Tibshirani, & Friedman, 2009, p. 219). When there are many factors to examine in a model, and especially when they are strongly related to each other, most regression approaches will have the issue of overfitting (IBM, 2023). With a large sample size, overfitting can occur when the regression method chosen generates a model that is capturing the increased amount of random noise and fluctuations in the data more so than the true patterns one actually wants to examine in the dataset. Essentially, the model starts to rely more on the idiosyncrasies of the dataset than desired, making the model far too specific and therefore not generalizable to the broader population of interest. With highly interrelated predictors, also known as multicollinearity, the model used in a regression analysis could struggle to distinguish the individual predictive power of each variable. It could even cause one variable to be given more importance in the model than another variable that has an equal level of importance simply because the two were strongly related at the onset of the analysis.

These two problems are the basis of overfitting; when the model defined in a regression analysis fits the dataset so closely that one cannot generalize the results to the actual population of interest. The noise in the relationships between predictors is emphasized rather than the patterns between them.

The issue here is that not only are PERMA studies not being explicit enough in examining relative importance but also that the analytical techniques used to create some of the data that we could use to imply relative importance information are rife with issues. Fortunately, there are other methods that have been created to address these issues that could be applied to PERMA research in meaningful ways.

Dominance Analysis

Dominance analysis (DA) is a modification of multiple regression designed to explicitly assess the relative importance of predictors in a model (Azen & Budescu, 2003; see Tighe & Schatschneider, 2014 for an effective summary and example). In dominance analysis, the regression model is first defined normally, with each predictor that the researcher wants to be compared being put into the model with an outcome variable. Then, every single possible combination of predictors is run in their own separate regression models for the predictor. This means that every single variable solution, two variable solution and so on is calculated. For each solution/model, an R^2 value is calculated, a numerical representation of predictive power. Then, a series of comparisons is conducted with the various predictors and their performance, aiming to determine if any given predictor is “dominant” over the others when predicting an outcome variable.

Originally, Budescu defined dominance as a predictor having more predictive ability than another in every possible subset model. However, dominance was later separated into 3 types by Azen and Budescu (2003) to provide a hierarchy of dominance. These 3 types are complete, conditional, and general dominance. *Complete dominance* is the original definition, in which a predictor has more predictive power compared to another predictor in every possible subset model and the model in which every predictor is present. This would mean that the predictor variable, on its own or in the presence of any/every other predictor accounts for more explained variance in outcome scores no matter the model/solution. It is the most stringent possible display of relative importance in DA. *Conditional dominance* is assessed by comparing the average of the additional contributions of a predictor within every model size seen in the subset models to the other predictors. If this average is greater for one predictor compared to another, it is said to have conditional dominance over the lesser. Finally, there is general dominance. *General dominance* takes an averaging approach similar to conditional dominance, except it is established when a predictor's additional contribution averaged across all the conditional values is greater than another predictor's. Complete dominance implies conditional and general dominance and conditional dominance implies general dominance, acting in a hierarchical fashion. Furthermore, the added level of detail from the predictor comparisons and the different levels of dominance avoids the issues of the other regression techniques mentioned previously. There is no need to rely on individual regression coefficients and corresponding p values that may be inflated due to multicollinearity. Overall, dominance analysis provides much more comparative information to assess relative importance.

There is currently one study to date that has used dominance analysis to explicitly assess the relative importance of the PERMA elements. Jimenez and colleagues (2023) conducted a

meta-analysis of studies using the PERMA-P and Workplace PERMA-P. They then conducted a series of dominance analyses that paired the PERMA Profiler and the Workplace PERMA Profiler with outcomes including health, depressive symptoms and job performance (the PERMA Profiler was only used for the health outcome). In this study, accomplishment was the strongest predictor for the prediction of health. When predicting the same outcome with the Workplace PERMA Profiler, positive emotions were the strongest predictor. When predicting depressive symptoms with the Workplace Profiler, positive emotions were also the strongest predictor. Finally, in the DA that predicted job performance with the Workplace Profiler, accomplishment was the strongest predictor, with positive emotions not displaying dominance of any sort over any of the other elements.

These results from Jimenez and colleagues (2023) provide initial evidence into the differential impact that each PERMA element can have depending on outcome, element and context in which the element was measured. In the case of the Profilers used and outcomes in question in Jimenez et al. (2023), positive emotion and accomplishment tended to be the strongest predictors, but this changed significantly depending on the context and outcome in question. I have been able to find similar and other distinct patterns of relative importance in my own work, as will be described below. Despite the utility of asking about relative importance and the proof I have presented above that this is a feasible goal to accomplish when measuring and studying PERMA, only Jimenez et al. (2023) and myself have sought out to examine this topic. What Jimenez and colleagues (2023) did not consider however is the degree to which the discrepancy between the PERMA elements across work and non-work contexts contributes to various outcomes.

Chapter 4: Pilot Study

Overview and Rationale

The pilot study aimed to accomplish four goals. The first goal, a measurement/psychometric one, was to develop an approach to measuring the PERMA elements across multiple contexts within the same sample. This goal allowed for the various gaps and untested implications described above to be tested directly. The second goal was to examine the relative importance of the PERMA elements with multiple outcomes and contexts in mind. The addition of multiple contexts allowed for the question of relative importance to be asked not just within the PERMA elements, but also the same PERMA elements across various contexts. Consequently, the third goal was to examine any results found in the core PERMA model and determine how they change depending on the context in question. Finally, the fourth goal was to understand the role of discrepancy/balance in our understanding of PERMA and well-being in general. These goals were met by using a cross-sectional survey design in which employed students provided information on various PERMA elements across multiple contexts, namely work and home (e.g., life outside of work).

The current study also aimed to enhance and refine existing well-being theory in several ways. PERMA research is lacking examinations into how well-being elements can be effectively analyzed across context, what discrepancies between PERMA elements mean for our understanding of overall well-being and what importance the elements have in predicting outcomes relative to the other elements. First, a novel approach to measuring well-being elements across contexts within the same sample was developed and validated. This approach made use of pre-existing tools and techniques within the literature, most notably the PERMA-P (Kern, 2016). Second, various analytical techniques aimed at exploring issues of discrepancy,

context and relative importance were examined for feasibility. These analytical techniques are outlined below.

The first objective of the pilot study was to determine if the home and work PERMA scales remained reliable, valid, and consistent after having been modified from their original forms seen in the PERMA Profiler. The workplace PERMA scales did not need any modifications since they were already written specifically for the workplace and the original PERMA Profiler was modified to ensure the items were measuring each pillar separately from the workplace. In order to adequately assess the role of context (e.g., work versus home) questions should refer explicitly to the context being assessed. The general, original version of the PERMA Profiler does not explicitly refer to any context. It is, in a sense, a general assessment of PERMA, which would be insufficient to assess any effect of context. Accordingly, the operationalization of each of the five elements needed to be changed.

In addition to the concerns stated above, there has been a general lack of evidence indicating how the PERMA scales perform when measuring the same elements in the sample across different contexts. This allows for the usual psychometric analyses that would be conducted in a study using a scale like the PERMA Profiler to be expanded upon significantly. Aside from reliability, consistency and convergent/divergent validity, the structure of the PERMA element variables is also important to consider as there is a large amount of pre-existing literature on this subject to compare with. A natural starting point was calculating the correlations between the PERMA elements in various combinations and the outcome measures. This is because any problems with the scales can be identified very quickly by examining the strength and direction of their correlations with each other and the outcome measures. For example, due to the nature of well-being theory it is obvious that each PERMA element should never

positively correlate with an outcome measure like mental health problems. Conversely, satisfaction with life should have some form of positive relationship with each PERMA element.

What should be noted is that despite these broad patterns of convergent and divergent validity being expected, the degree to which each PERMA element fits these patterns varies. As an example, what if an element like engagement has a very strong positive relationship with satisfaction with life when measured in the workplace, but its contextual counterpart element has a much weaker one, or even a non-statistically significant one? These intricacies were explored as well, as they provided a depth of information that you would not be able to get from a correlation matrix that only includes one context. This added depth of information due to measuring PERMA across contexts, was its own objective throughout each analysis.

Creating one correlation matrix for all the PERMA subscales compared to the outcome measures and one for each overall PERMA score (work and home) compared to the outcome measures was the first step in determining if our modified scales are reliable and effective (across contexts). These analyses were necessary to determine convergent and divergent validity to be established with each subscale and total scale. For example, it was expected that a variable like mental health symptoms would have a negative relationship with essentially every PERMA subscale or total scale to at least some extent. Conversely, satisfaction with life should theoretically display the opposite result. Further, past research on the structure of the PERMA Profiler tends to show a high level of interrelatedness among the subscales (e.g., Goodman, 2018). We expected to see the same result, which will have implications further on in the analytic plan. Means, alphas and standard deviation scores also allowed for any obvious measurement issues to be identified, with the alpha scores providing an initial metric for reliability.

The correlation coefficients and descriptive statistics revealed many of the psychometric qualities of the PERMA measures. However, the structure of the scales needed to be examined with different techniques. This was accomplished using factor analysis. Factor analysis is a type of analysis, with different types, in which the inter-item relationships within a given measure are summarized. It is correlational in nature and allows for researchers to see how the items of a scale tend to relate to each other in broad terms, usually by examining how they "load" separately, or not, on to latent factors. These factors are essentially groups of items that tend to relate to each other more strongly than other items that load on to their own separate factors. Exploratory factor analysis (EFA) is used to identify the latent factors present among various items. As the natural groupings of items emerge, different amounts of latent factors are revealed. Each item is given a loading value for each factor, with some tending to load on one factor more than the others, some loading on multiple factors evenly or any other type of pattern. For example, for a scale like the PERMA Profiler, you would generally expect the results to indicate that there are 5 factors, one for each element the scale aims to measure, with each item loading most on the factor it was intended to match with. In reality, there tends to be cross-loadings of the PERMA items and a clear 5-factor solution is not always found, but the general pattern is a good example to explain the concept of EFA. In the current study, EFA was used to see how the modified PERMA scales compare to past EFA results from the original scales. Do the latent factors and loadings of items resemble what past research has shown, particularly with similar student samples?

The next major objective of the pilot study was to examine the relative importance of each PERMA element in predicting outcomes (e.g., mental health, work quality, satisfaction with life). Clearly, each element has a role to play in various outcomes. However, there is a distinct

lack of research that has tried to compare the difference in predictive power among the elements depending on which outcome is being predicted. The differences that these comparisons could reveal are important as, for example, fostering every element in the goal of increasing mental health is much harder than fostering one or two elements that are more important for mental health than the others. Or perhaps it does not matter which element is fostered for mental health and any amount of any element is useful to the same extent. Either way, it would be useful to know the relative predictive importance of the PERMA elements.

One common approach to explore relative importance would be some form of multiple regression. A predictive model could be generated in which the variance in scores of an outcome variable across participants is predicted by each total PERMA pillar score. The variance explained in the outcome measure scores by each predictor can then be compared. To do this, specific regression techniques could be used. The simple answer would be to use simultaneous regression. This approach would involve calculating the variance in outcome scores explained by each predictor by calculating them all in one step. A regression coefficient for each predictor will be calculated with a corresponding p-value. At first glance, this seems like enough information to compare the predictors; one could simply see if any predictors did not reach significance and then rank order the rest based on how much variance is explained by each using the regression coefficients. One major problem however is the issue of multicollinearity. When conducting simultaneous multiple regression with highly interrelated predictors, something to be expected with the PERMA elements, issues like model overfitting can occur (Hawkins, 2004). This makes it very difficult to accurately compare the predictors within the model.

As another example, one could conduct a stepwise multiple regression in which each total PERMA pillar variable could be regressed onto a given predictor, like satisfaction with life, in

either a forwards or backwards direction using multiple steps. A forwards direction approach could work, as each predictor would be added in sequence, testing for a statistically significant change in predictive power at each step. A backwards method may be better, as it starts with a full model, something we may want to use since there is a pre-existing theoretical model for PERMA and it removes predictors in each step based on how they influence predictive power. Each of these methods could provide some insight into the relative importance of each PERMA element, however stepwise regression is also known to have many issues (Antonakis & Dietz, 2011; Whittingham et al., 2006). These concerns and the problems with simultaneous regression are major issues and are likely part of the reason why relative importance has not been examined in depth yet with PERMA. Fortunately, researchers have approached this type of analytic problem in the past with their own tailored solutions.

One way to deal with the issue of relative importance is dominance analysis (DA). As described in Chapter 3, dominance analysis is a modification of multiple regression that assesses the relative importance of predictors in a model (Azen & Budescu, 2003; see Tighe & Schatschneider, 2014 for an effective summary and example). With regards to the pilot study, dominance analysis was used to determine the relative importance of PERMA elements as predictors across various outcome measures. For any given outcome, each total PERMA score for each pillar was entered as a predictor into a basic multiple regression model. Then, using dominance analysis, a series of outputs assisted in determining various dominance relationships across the predictors. This approach avoided the common issues with stepwise regression listed above while providing much more information regarding the relative importance of the PERMA pillars through the use of comparisons of the predictors across various subset models. It accomplished this through the use of many comparisons between all the possible combinations

of predictors. Instead of just having to rely on potentially inflated differences between R^2 values or the relatively small amount of comparisons that can be made between the steps of a stepwise regression, DA provides much more comparative information that is appropriate for understanding the relative importance of a series of predictors.

Finally, there is the question of how much added value a measurement of discrepancy between PERMA elements could provide. Aside from measuring PERMA across multiple contexts being a unique contribution, it also allows for the examination of discrepancy in well-being across contexts within the same sample. Both within and between context discrepancy scores were calculated (see the metrics section below for formulas), representing the degree of discrepancy participants experience between the PERMA pillars both within a context and across contexts. One of the major goals of study 1 was to find a way to calculate these discrepancies and then see if they had any predictive value for outcomes above and beyond the PERMA pillar scales they were derived from.

A useful method to analyze the added value of these discrepancy measures is by using hierarchical regression. This method allows researchers to determine if a predictor variable, like discrepancy, explains a statistically significant amount of variance in an outcome variable after having accounted for the variance explained by other variables. In this case, we aimed to determine if between context or within context discrepancy scores were able to explain a statistically significant amount of variance across various outcome measures after having accounted for the variance explained by the total scores for each PERMA pillar as measured through the PERMA Profilers. This is a very direct way to determine if these discrepancy metrics provide any added value beyond the PERMA pillars they were derived from. Although there are certainly issues with regression techniques, as described above, hierarchical regression in the

context of testing added value of discrepancy scores was worth conducting to at least see if the expected result can be found in the first place.

Testing discrepancy across domain and context

As PERMA theory involves various elements of well-being, it is natural to wonder how much it matters when they differ in various ways. With regards to well-being discrepancy metrics, the goal of the pilot study was to simply determine if they can provide any level of evidence of added predictive value for various outcomes. If this can be shown to be the case, then these metrics can be expanded upon with more in-depth analysis later. As it stands, assessing for the presence of added value is a much simpler analytic problem to solve compared to establishing a clear picture of relative importance among a set of predictors. All that really needed to be examined is if discrepancy scores could show some kind of statistically significant added predictive value above and beyond the PERMA elements scales they were derived from. However, statistical significance is not the only criteria in this analysis. As described above, regression techniques can produce artificially smaller p-values. This means that the effect size will need to be examined carefully, which admittedly could also be inflated. Despite these problems, even a relatively small effect size would be encouraging. Small impacts across a wide range of well-being elements across a large sample can add up significantly. Further, these discrepancy measures are not some added items or scales on top of a pre-existing survey. They are derived from the already collected PERMA scores using simple calculations. This means that even if discrepancy scores provide a small degree of added value, there would really be little point in not calculating and using them in analysis. This point also speaks to the implications of discrepancy scores on the application of PERMA theory in various settings, a topic that will be discussed later.

Discrepancy. To operationalize discrepancy, the present study used a strategy based on the one used by Emery, Toste and Heath (2015), which was originally created by Milyavskaya and colleagues (2009). Within Context Discrepancy (WCD) was calculated by determining the absolute difference between each participants' scores on the five PERMA subscales used in the PERMA Profiler (Butler & Kern, 2016) and then summing them together. Since there are five PERMA subscales per Profiler, there were a total of 10 absolute differences to sum together. The final number is a within-context PERMA discrepancy score with higher scores indicating more discrepancy across the PERMA elements within a specific context. This approach allows for two within-context discrepancy scores to be created; one for work and one for non-work contexts. The Between Context Discrepancy (BCD) metric is calculated in the same manner using absolute differences in PERMA elements across contexts instead to calculate final scores (i.e., P at work – P outside of work, etc....). In the case of BCD scores, there are only 5 differences to sum as each PERMA subscale score simply needs to be compared to its counterpart. The final number in the case of BCD is a measure of discrepancy in PERMA elements across the home and work contexts. Example formulas are presented below:

$$WCD^{work} = (|P^{work} - E^{work}|) + (|P^{work} - R^{work}|) + (|P^{work} - M^{work}|) + (|P^{work} - A^{work}|) + \ldots\ldots\ldots$$

$$BCD = (|P^{work} - P^{home}|) + (|E^{work} - E^{home}|) + (|R^{work} - R^{home}|) + (|M^{work} - M^{home}|) + \ldots\ldots\ldots$$

Using a hypothetical example, assume that someone named Dan experiences significantly lower levels of engagement, relationship satisfaction, meaning and accomplishment at work

compared to other areas of his life, suggesting that Dan achieves greater wellbeing at work than outside of work. This would be an example of a high BCD score, as most sources of PERMA element satisfaction are higher at work than outside of work. Numerically, we would likely see much lower scores on most PERMA elements at work compared to outside of work, yielding larger absolute difference scores in PERMA elements across contexts.

In contrast, if the pattern seen in Dan's PERMA element levels were relatively similar at work compared to outside of work, overall, there may still exist considerable discrepancies across the different elements of wellbeing he experiences. Overall, Dan may derive equal amounts of overall well-being from work and from outside of work, however, the sources of well-being may be very different. Dan may, in this instance, exhibit a profile of wellbeing at work that is highly variable, with each PERMA element varying from the others within a given context to a large extent. Dan could have very similar levels of engagement and meaning at work compared to outside of work (i.e., Engagement at work vs. Engagement outside of work both equal 1 and Meaning at work vs. Meaning outside of work both equal 5), but the differences between engagement compared to meaning within each context can still be quite large (i.e., 1 vs. 5). This would be an example of low BCD, but high WCD. Consequently, if Dan had two highly variable patterns of PERMA element satisfaction that differ from each other, one at work and one elsewhere, this would be an example of high within and between-context discrepancy.

The discrepancy scores were used in analyses that assessed their added predictive value above and beyond the PERMA element scale scores they were derived from. In the pilot study, these analyses were only in-depth enough to verify the discrepancy scores as valuable variables for other analyses for future studies. Essentially, this first implementation of discrepancy scores was proof of concept.

Metrics

PERMA. The 5 pillars that make up PERMA theory were measured with two versions of the widely used PERMA Profiler (Butler & Kern, 2016; Kern, 2014). The structure of each Profiler used in the pilot study was the same, only the wording of the items was different across versions. For each scale, each PERMA pillar was measured through the use of 3 Likert scale items rated on a 0-10 range of scores. “Not at all/never” and “completely/always” were used as anchors for the lowest and highest numbers respectively. A total PERMA well-being score was created by calculating the average across all PERMA items and individual pillar scores were also created by calculating the average of their 3 respective items. Higher scores on the total PERMA scale indicate higher levels of overall well-being, with higher scores on the pillar scales indicating higher levels of those individual scales.

Unique to this study, PERMA was measured in and outside of the workplace. The workplace version of the scale simply used the pre-existing Workplace PERMA Profiler (Kern, 2014) as the items were already created to be context-specific to the workplace. Modifications were made to the original PERMA Profiler in order to make sure the items were clearly excluding the workplace context.

In the original PERMA Profiler, health, loneliness, global happiness and negative emotion items were also used (only global happiness was included in the total PERMA score). Removing the health items was justified as there was not a clear way to assess it across contexts and the present study is more concerned with the core pillars of PERMA and the discrepancies between them rather than trying to measure every possible contributor to well-being. In fact, PERMA theory was never intended as a “catch-all” approach to measuring well-being (Seligman, 2018). This reason also explains the lack of a loneliness item in the pilot study. I

found that “global happiness” was better represented through the Satisfaction with Life Scale (SWLS; Diener et al., 1985) since it was going to be used as an outcome measure for various models and therefore could benefit from measurement using more than one item. Negative emotion, for the purposes of the present study, was better represented with other measures for similar reasons.

The PERMA Profilers were at the center of every analysis in the study. Validity, correlations, predictive models and relative importance models all consistently involved the PERMA Profiler scales. Furthermore, the discrepancies between the various PERMA pillar scale scores, both within each scale and across the scales were included as variables for other analyses.

Pilot Study: Introduction

The purpose of the following study was, put broadly, to examine the feasibility and preliminary validity of utilizing measures of PERMA that would better assess the importance of PERMA across contexts (i.e., work and home) and the utility of adopting a number of analytic approaches that would more accurately assess questions pertaining to relative importance and discrepancy. To explore the issues of relative importance, context and discrepancy, a context-specific (i.e., outside of work) version of the PERMA-P (Butler & Kern, 2016) had to be created and used in tandem with the Workplace PERMA-P (Kern, 2014). Consequently, the first goal of the study was to assess the psychometric qualities of the modified PERMA-P and to see how factor analysis results compared to past research. This goal allowed for a context-specific modification of PERMA measurement to be verified. A second goal was to determine the relative importance of the PERMA elements in predicting important outcomes. The third goal was to use the contextual measurement approach to see how any pattern of results changed based on

context. The fourth goal was to examine how the discrepancies between PERMA elements can act as their own predictors of outcomes.

The modified PERMA-P and discrepancy metrics were defined, created and an online survey was given to employed undergraduate students. Aside from the contextual PERMA measures, other outcome measures relating to constructs like mental health symptoms and SWB were also included in the survey. Cross-sectional data was then analyzed using various approaches, starting with correlational, factor structure, and psychometric analysis and ending with various forms of model testing including regression and dominance analysis.

Hypotheses. The first hypothesis involved the measurement approach used in the study. As will be described below, a modified version of the original PERMA Profiler (Butler & Kern, 2016) was created that explicitly measures PERMA elements outside of the workplace context. It was hypothesized that this modified PERMA Profiler would display evidence of acceptable convergent and divergent validity, while also aligning with the expected factor structure seen in other PERMA scales. Similarly, various discrepancy metrics (see measures section below) were created that were intended to quantify the degree to which the PERMA elements differed within and across contexts (i.e., discrepancy within PERMA elements at work, discrepancy within PERMA elements outside of work, discrepancy between the same PERMA elements compared across contexts). It was hypothesized that the discrepancy metrics would be significantly correlated with the various outcome measures and display some degree of added predictive utility above and beyond the PERMA element scale scores they were derived from.

The second hypothesis was related to added predictive utility. That is, it was hypothesized that a PERMA measurement approach that measured the elements across work and non-work contexts, combined with discrepancy scores calculated from these measured elements, would

have added predictive utility above and beyond overall PERMA Profiler scores when predicting various outcomes.

The third hypothesis aimed to assess the concept of relative importance with regards to the PERMA elements. Current PERMA research has little information on how the elements may or may not be differentially associated with various outcomes. It was hypothesized that the PERMA elements, measured separately, would display notable differences in how they predicted various outcomes.

A power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) was used to estimate what an appropriate sample size would be given the types of analyses used, regression being the primary benchmark. With a relatively high power and medium effect size at the conventional 0.05 alpha, a minimum of 138 participants was indicated. As seen below, much more than that minimum was collected which was assumed to have lead to an appropriate sample size.

Methods

Procedure

The study was conducted online through Qualtrics (Qualtrics, 2005), an online survey hosting service. Participants had to be enrolled as either full or part-time students while also being employed in a full or part-time position. The participants accessed the survey online through a link provided to them through the University of Ottawa's Integrated System of Participation in Research (ISPR), a service in which undergraduate students can receive course credit for participating in research studies. The survey began with a description of the study, an informed consent form and then collected basic demographic information. The actual survey

items consisted mainly of Likert response style questions that asked participants to rate their level of endorsement with a variety of statements over various periods of time, usually in the span of recent weeks to a month or so (see measures below for details). Participants could complete the survey at their leisure, and results were exported into excel documents that were stripped of identifying information, cleaned of any incomplete or obviously fake responses (i.e., long response sets across multiple measures) and then imported into RStudio (RStudio team, 2020) for analysis.

Sample characteristics

Before cleaning the dataset for incomplete responses, obvious response sets and a few test participants used when developing the survey, the total number of participants was 431.The final sample for the pilot study consisted of undergraduate students (n = 316) enrolled at the University of Ottawa. Students signed up for the study through the university's Integrated System of Participation in Research (ISPR) to receive course credit for their participation. The participants were predominantly female (72%) and within the 24-and-under age range (95%).

Measures

Mental health impairment. The mental health impairment outcome variable was created using various items from the Patient Health Questionnaire-9 (Kroenke, Spitzer & Williams, 2001) and the General Anxiety Disorder-7 (Spitzer et al., 2006) measures. Regardless of what scale the items came from, each was presented as a statement of some form of difficulty that the participant was asked to rate the presence of over the past month using a Likert response scale with four anchors (not at all (0), somewhat (1), a lot (2), almost all the time (3)). The average score across all the items was used for the final variable. This total score represents the general

level of mood and anxiety symptoms the participant has experienced over the past month with higher scores indicating higher levels of impairment.

It should be noted that not every item from each scale was used. The goal of the impairment variable was to measure basic mood and anxiety symptoms as a general metric of mental health issues; it was not focused on full diagnostic criteria for anxiety and depressive disorders. For example, the PHQ-9 has an item that assesses suicidal thoughts. I did not include this item as it is more appropriate for safety assessments in a clinical setting whereas the goal of the impairment metric was to provide a general sense of fundamental mental health symptoms like low mood and excessive worrying.

From an analytic perspective, the mental health impairment variable will act as an outcome variable in predictive models. These models will allow for the relationship between each PERMA pillar and discrepancy metrics with mental health to be explored. As mentioned above, this will be done with both DA and hierarchical regression. Further, as a measure of impairment, this measure will be used as a tool to examine divergent validity with the PERMA Profilers and other variables in the study.

Problems at work. The problems at work outcome variable was created using various items used in pre-existing surveys like the 2011 Conference Board of Canada Survey of Mental Health in the workplace and some added items that were created to be used alongside the pre-existing ones. These added items are similar in theme to the Conference Board items and have been used in a research project that examined the 14 factors of mental health in the workplace identified by the Mental Health Commission of Canada (Standards Council of Canada, 2013). The response scale, timeframe and style of statements used in the problems at work metric are all the same as the mental health impairment metric. Comparatively, these items do include some

mention of mood but are more focused on the workplace context (e.g., “how often have you experienced feeling tired at work”). Some of these items also focus on basic issues with performance at work (e.g., “missing deadlines” or “being unproductive”). The average score across all the items was used for the final variable. This total score represents the general level of workplace-related functional impairment the participant has experienced over the past month, with higher scores indicating higher levels of impairment. This outcome variable will be used within various predictive models as an outcome variable. Due to its nature as a measure of impairment/problems, it will also be used to establish divergent validity with the PERMA Profiler measure and convergent validity with the mental health impairment measure.

Satisfaction with Life. The Satisfaction with Life Scale (SWLS; Diener et al., 1985) is a 5-item scale through which participants indicate agreement or disagreement with items on a 7-point scale (strongly disagree to strongly agree) that assesses global cognitive judgements of one’s satisfaction with life. The average score of all the items was used as the final variable score with higher scores indicating higher levels of life satisfaction.

The SWLS fills two roles from an analytic perspective in the present study. First, life satisfaction has been used as a correlate in many types of PERMA studies (e.g., Goodman et al., 2018; Donaldson et al., 2021; Kern et al., 2014; Choi, 2021) that should theoretically correlate positively with any PERMA pillar, as these pillars make up the various important aspects of well-being that one would expect a person to judge when making a cognitive judgement of their life satisfaction. Conversely, SWL should correlate negatively with any impairment scales. This allows for the SWLS to be used as a variable through which evidence of convergent and divergent validity can be established with any of the other measures. Due to the modified nature of the PERMA Profilers used in the study, this kind of evidence becomes even more important

than it would normally be. Second, when testing various models, SWL can be used as an outcome variable representing a broad, overall sense of satisfaction. PERMA is an inherently hierarchical model in which the individual pillars are all connected to an overall well-being construct. To include PERMA pillars within predictive models as predictors, there needs to be an outcome variable that can represent this overall sense of well-being/satisfaction. SWL can serve as such a variable.

Results

Psychometrics and Validity

An intercorrelation analysis was conducted among the context-specific PERMA subscales to understand their relationship to one another. Results of the intercorrelations are presented in table 1 for all the subscales. Simple statistics, such as the mean, standard deviation, and Cronbach alpha, were calculated. It was expected that all PERMA subscales would correlate positively across and within contexts. Further, each subscale was expected to show evidence of sufficient internal consistency represented by Cronbach's Alpha. The columns labelled 1 through 8 correspond to the numbered variables in the first column. The numbers in each of the cells within the numbered columns correspond to calculated correlation coefficients between the various PERMA element scale scores that match up in those respective cells. There are 3 groups of coefficients, two of them are bolded and one is underlined. The bolding and underlining are used to separate groups of correlations. For example, the top cluster of bolded coefficients are all of the intercorrelations between the home PERMA element scales. The underlined coefficients are all of the correlations between the work and home PERMA elements scale scores while the bottom right cluster of bolder coefficients are the intercorrelations between the work PERMA element scale scores.

Table 1. *Descriptive statistics and correlations for context specific PERMA scores*

Variable	*Alpha*	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. P home		6.91	1.78									
2. E home		7.62	1.56	**0.47**								
3. R home		7.62	1.96	**0.58**	**0.48**							
4. M home		6.88	1.97	**0.59**	**0.5**	**0.6**						
5. A home		7.01	1.76	**0.62**	**0.48**	**0.59**	**0.75**					
6. P work		6.25	2.1	0.4	0.18	0.28	0.32	0.39				
7. E work		6.11	2.11	0.37	0.28	0.3	0.33	0.35	**0.73**			
8. R work		6.96	2.27	0.31	0.2	0.33	0.29	0.32	**0.62**	**0.53**		
9. M work		6.03	2.48	0.25	0.2	0.26	0.28	0.34	**0.56**	**0.63**	**0.47**	
10. A work		6.83	2.01	0.38	0.31	0.33	0.4	0.46	**0.6**	**0.61**	**0.55**	**0.63**

All correlations were significant at the $p < .01$ *level*

Results showed that intercorrelations (i.e., top bolded group of coefficients) among PERMA elements within the home context were all significant and positive, indicating that every PERMA element measured within the home context were positively related to each other. That is, high levels of each home PERMA subscale were related to higher levels of all other home PERMA subscales. Results also showed that all coefficients indicated moderate to large (e.g., no lower than 0.30 and some higher than 0.50) associations among the home PERMA subscales according to Cohen's (1988) conventions for interpreting correlation coefficients. Finally, the Cronbach's Alpha scores of each subscale indicated acceptable internal consistency (e.g., scores ranging from 0.76 to 0.92). As hypothesized, all the home PERMA subscales correlated positively with each other and displayed evidence of internal consistency.

All within-context PERMA element intercorrelations for the work context are included in the bottom right group of coefficients in Table 1. Like the home context PERMA subscales, it was expected that the work context PERMA subscales would correlate positively with each other and display evidence of internal consistency. Results showed that intercorrelations among PERMA elements within the work context were all significant and positive, indicating that every

PERMA element measured within the work context were positively related to each other. That is, high levels of each work PERMA subscale were related to higher levels of all other work PERMA subscales. Results also showed that all coefficients indicated moderate to large (e.g., no lower than 0.30 and some higher than 0.50) associations among the work PERMA subscales according to Cohen's (1988) conventions for interpreting correlation coefficients. Finally, the Cronbach's Alpha scores of each subscale indicated acceptable internal consistency (e.g., scores ranging from 0.47 to 0.73). As hypothesized, all the work PERMA subscales correlated positively with each other and displayed evidence of internal consistency.

Between context correlations were also examined. The between-context correlation is the correlation between each PERMA subscale and its contextual counterpart (e.g., home positive emotion and work positive emotion, home engagement and work engagement etc....). Between-context PERMA element intercorrelations are underlined in Table 1. It was hypothesized that each PERMA subscale would be positively correlated with its contextual counterpart and all of the other subscales from the other context as well (e.g., positive correlations between all the home and work subscales). Results indicate that all the PERMA elements positively correlate with their contextual counterparts. These correlations tended to be weaker than what was seen in the within-context correlations (i.e., coefficients less than .40) but were still statistically significant, except for the relationship between the positive emotion elements, which did reach a moderate correlation. Further, each element correlated with every other element across contexts as well, though many of these tended to be weaker relationships compared to within-context correlations.

In summary, the results of Table 1 indicate that the PERMA subscales are positively and strongly related to each other. The relationships between the subscales within contexts tended to

be stronger (e.g., work PERMA items correlated stronger with each other than the home versions), while the relationships between items of differing contexts were weaker. The exceptions to this were the positive emotion and achievement subscales, as they had moderately strong relationships with their respective counterparts. In addition, all the subscales displayed acceptable internal consistency. In general, these results are consistent with the stated hypotheses, in that the PERMA subscales were significantly related to each other in a positive manner, both within and across the home and work contexts.

Contextual PERMA outcome correlations. The results of an intercorrelation analysis between each contextual PERMA subscale (i.e., the PERMA subscales that measured each element in either a work or home context) and the three outcome measures are summarized in Tables 2 and 3. This was conducted mainly to assess the convergent and divergent validity of the subscales and to see if any patterns emerged depending on the context in question. It was hypothesized that the work and home PERMA subscales would demonstrate convergent and divergent validity by showing significant positive correlations with SWLS scores and the inverse for the mental health symptoms and problems at work scales.

The results of the correlation analysis between each home PERMA subscale and the three outcome measures are presented in Table 2. The correlation coefficients indicate that, aside from the engagement subscale, each PERMA element measured in the home context displayed a significant positive relation to the satisfaction with life scale and a significant negative relation to mental health symptoms and problems at work. That is, higher levels of PERMA elements were associated with higher levels of satisfaction with life and lower levels of mental health symptoms and problems at work. The only exception was the engagement subscale, which had no significant relationship with the mental health symptoms and problems at work scales. Results

also showed that all coefficients, aside from the engagement subscale, indicated low to moderate (e.g., no lower than 0.10 and no higher than 0.50) associations among the home PERMA subscales and the outcome measures according to Cohen's (1988) conventions for interpreting correlation coefficients.

Table 2. *Correlations for HOME PERMA scores and outcome variables*

PERMA Element	Satisfaction with Life	Mental Health Symptoms	Problems at Work
1. Positive emotion	0.48**	-0.37**	-0.20**
2. Engagement	0.20**	-0.03	-0.03
3. Relationships	0.41**	-0.25**	-0.17**
4. Meaning	0.48**	-0.28**	-0.21**
5. Achievement	0.49**	-0.31**	-0.25**

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

The results of the correlation analysis between each work PERMA subscale and the outcome measures are presented in Table 3. The correlation coefficients indicate that each PERMA element measured in the work context displayed a significant positive relation to the Satisfaction with Life Scale and a significant negative relation to mental health symptoms and problems at work. That is, higher levels of PERMA elements were associated with higher levels of satisfaction with life and lower levels of mental health symptoms and problems at work. Results also showed that all coefficients, aside from the engagement subscale, indicated low to moderate (e.g., no lower than 0.10 and no higher than 0.30) associations among the home PERMA subscales and the outcome measures according to Cohen's (1988) conventions for interpreting correlation coefficients.

Table 3. *Correlations for WORK PERMA scores and outcome variables*

PERMA Element	Satisfaction with Life	Mental Health Symptoms	Problems at Work
1. Positive emotion	0.28**	-0.24**	-0.28**
2. Engagement	0.26**	-0.13*	-0.21**

3. Relationships	0.17**	-0.14*	-0.28**
4. Meaning	0.21**	-0.12*	-0.17*
5. Achievement	0.23**	-0.10	-0.22**

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

As hypothesized, most of the PERMA subscales, work and home, displayed evidence of convergent and divergent validity with the outcome measures. That is, higher levels of the PERMA elements were associated with higher levels of satisfaction with life and lower levels of mental health symptoms and problems at work. One exception to this was the home engagement subscale which did not have a significant relation to the problems at work or mental health symptoms subscales, though the workplace version of the subscale did. Additionally, the work achievement subscale did not have a significant correlation with mental health symptoms.

Structural Validity

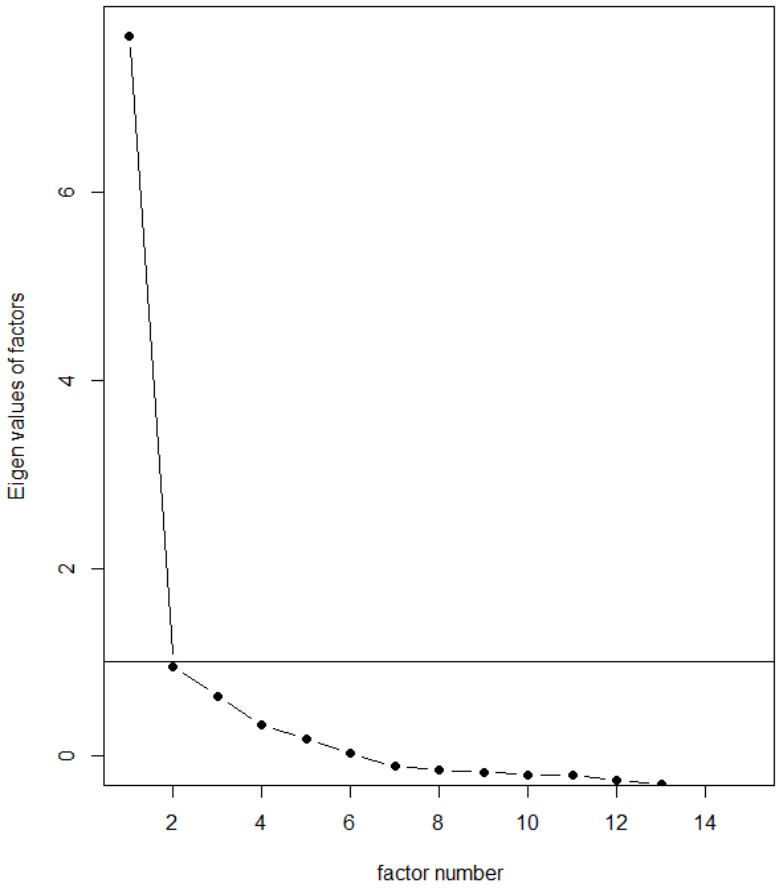
Due to the usage of modified PERMA Profiler scales in the study, the structural validity of the PERMA scales was examined using EFA. Existing theory and research of the original and workplace versions of the PERMA Profiler suggests that there tends to be a general pattern of each PERMA element within a given scale loading onto its' own factor (e.g., Khaw & Kern, 2014). However, in most of these studies at least two of the elements tend to load their items together onto a single factor, leading to 3-4 factor solutions more often than a clean 5-factor solution implied by the core PERMA model. It was hypothesized that the scales used in the pilot study would follow a similar trend to past research.

This process began with a series of exploratory factor analyses (EFA) using the psych and nFactors packages available in RStudio (RStudio Team, 2020). As there were two PERMA scales used, two analyses were conducted. EFA allows one to explore the latent relationships between various items that make up variables in a dataset. In this case, EFA was used to see how the

various PERMA items tended to load onto various latent factors without imposing any kind of structure on them a-priori. The first involved workplace PERMA items while the second involved home PERMA items.

Workplace PERMA EFA. First, eigenvalues for all 15 workplace PERMA items were calculated using Rstudio and then used to generate a scree plot (see table 5 and figure 1). In total, 3 of the eigenvalues were greater than 1, suggesting that a latent 3 factor structure was sufficient. Next, a promax rotation was applied to the 3 factors. This rotation method was chosen as it is an oblique rotation commonly used with larger datasets in which factors are expected to correlate. This method then allows for correlations between the factors to be assessed (Murphy, 2021). Since the various PERMA elements are generally expected to correlate as they all relate to overall well-being, this method was used.

Figure 1. *Scree plot for workplace PERMA item EFA*



Correlations between each of the 3 factors were all strong, suggesting that the oblique rotation method was acceptable. Factor loadings are presented in table 6 and seem to suggest that a three-factor solution was acceptable. Nearly all the loadings are above 0.4, and each factor has at least 3 items loading on to it. There also seems to be minimal cross loading of items across the factors. When testing the hypothesis that 3 factors were sufficient given the items selected, a chi square statistic of 317.94 (63, $p < .0001$) also suggests a 3-factor solution. Examining the factor loadings suggests that the positive emotion and engagement elements load onto factor 1. Factor 2 includes meaning and achievement while factor 3 includes relationships. Combining these results with the fact that factor 2 negatively correlated with factors 1 and 3 suggests that, in a workplace

context, meaning and achievement elements are at odds with positive emotion, relationships, and engagement elements in the student sample.

Table 4. *Workplace PERMA EFA factor correlations and Eigen Values*

Factor	Eigen Value	1	2	3
1	8.13			
2	1.45	-0.74		
3	1.1	0.71	-0.62	

Table 5. *Workplace PERMA EFA factor loadings*

Item	Item Description	Factor 1	Factor 2	Factor 3
P1 WORK	At work, to what extent do you feel joyful?	1	-	-
P2 WORK	At work, to what extent do you feel positive	0.94	-	-
P3 WORK	At work, to what extent do you feel contented?	1.02	-	-
E1 WORK	At work, to what extent do you become absorbed in what you are doing?	0.71	-	-
E2 WORK	To what extent do you feel excited and interested in your work?	0.54	-	-
E3 WORK	At work, to what extent do you lose track of time doing something you enjoy?	0.43	-	-
R1 WORK	To what extent do you receive help and support from your coworkers when you need it?	-	-	0.91
R2 WORK	To what extent do you feel appreciated by your coworkers?	-	-	0.96
R3 WORK	To what extent are you satisfied with your professional relationships?	-	-	0.85
M1 WORK	To what extent is your work purposeful and meaningful?	-	1.05	-
M2 WORK	To what extent do you feel that what you do at work is valuable and worthwhile?	-	1.08	-
M3 WORK	To what extent do you generally feel that you have a sense of direction in your work?	-	0.84	-
A1 WORK	To what extent do you feel you are making progress towards accomplishing your work-related goals?	-	0.43	-
A2 WORK	To what extent do you achieve the important work goals you have set for yourself?	-	0.34	-
A3 WORK	To what extent are you able to handle your work-related responsibilities?	-	-	-

Note: Values are rounded to the second decimal place. Values less than 0.3 are not printed.

Cronbach's alpha coefficients were calculated for each of the 3 latent factors identified. The raw alpha coefficient for factor 1 (positive emotion/engagement) was 0.91, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in the factor would not increase internal consistency. The raw alpha coefficient for factor 2 (meaning/achievement) was 0.90, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in factor 2 would not increase internal consistency. Finally, the raw alpha coefficient for factor 3 (relationships) was 0.90, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in factor 3 would not increase internal consistency.

To summarize, the workplace PERMA items met the expected theoretical structure of PERMA seen in past research outlined above. All the items seemed to play a role in the internal consistency of the scale. Overall, these results suggest that the modified workplace PERMA scale used in the pilot study behaved as expected.

Home PERMA EFA. First, eigenvalues for all 15 home PERMA items were calculated using Rstudio and then used to generate a scree plot (see table 7 and figure 2). In total, 4 of the eigenvalues were greater than 1, suggesting that a latent 4 factor structure was sufficient. Next, a promax rotation was applied to the 4 factors. This rotation method was chosen as it is an oblique rotation commonly used with larger datasets in which factors are expected to correlate. This method then allows for correlations between the factors to be assessed (Murphy, 2021). Since the various PERMA elements are generally expected to correlate as they all relate to overall well-being, this method was used.

Figure 2. *Scree plot for home item PERMA EFA*

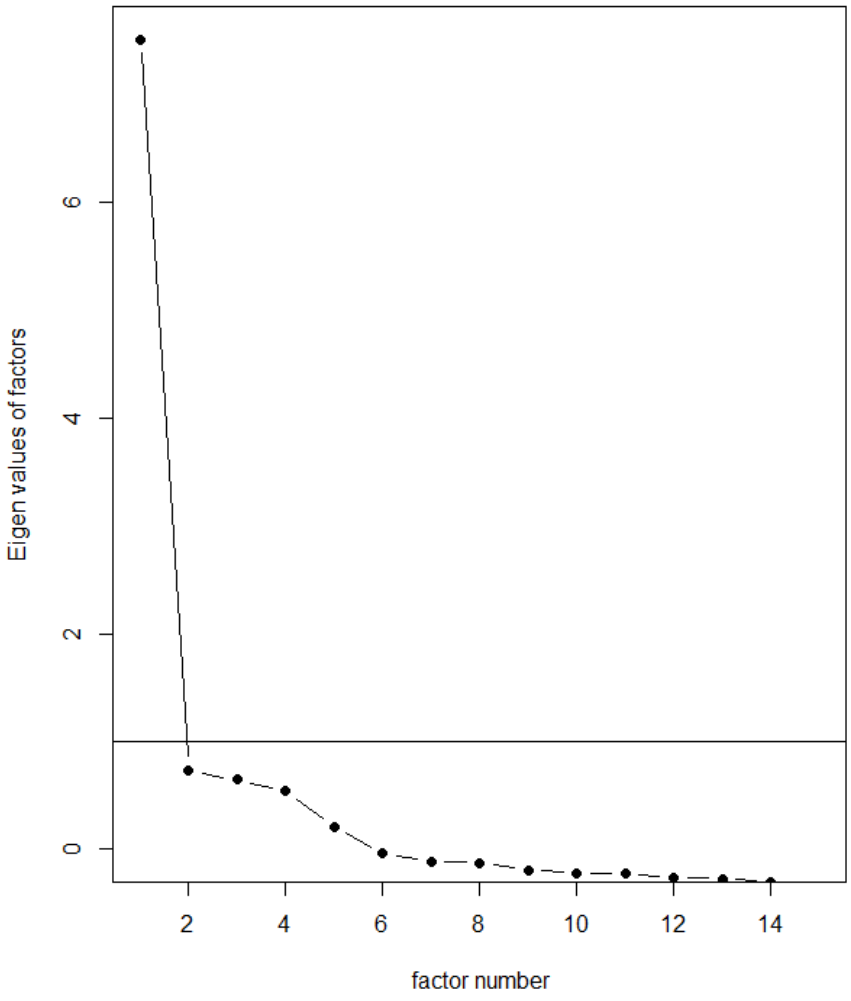


Table 6. *Home PERMA EFA factor correlations and Eigen Values*

Factor	Eigen Value	1	2	3	4
1	7.99				
2	1.26	-0.64			
3	1.16	-0.66	0.58		
4	1.09	0.69	-0.57	-0.61	

Table 7. *Home PERMA EFA factor loadings*

Item	Item Description	Factor 1	Factor 2	Factor 3	Factor 4
P1 HOME	In your daily life outside of work, to what extent do you feel joyful?	-	0.87	-	-
P2 HOME	In your daily life outside of work, to what extent do you feel positive	-	0.92	-	-
P3 HOME	In your daily life outside of work, to what extent do you feel contented?	-	0.9	-	-
E1 HOME	In your daily life outside of work, to what extent do you become absorbed in what you are doing?	-	-	-	0.64
E2 HOME	To what extent do you feel excited and interested in things not associated with your work?	-	-	-	1.02
E3 HOME	In your daily life outside of work, to what extent do you lose track of time doing something you enjoy?	-	-	-	0.49
R1 HOME	To what extent do you receive help and support from people you know outside of work when you need it?	-	-	0.77	-
R2 HOME	To what extent do you feel appreciated by your coworkers?	-	-	0.95	-
R3 HOME	To what extent are you satisfied with your personal relationships, outside of work?	-	-	0.8	-
M1 HOME	To what extent do you lead a purposeful and meaningful life outside of work?	0.87	-	-	-
M2 HOME	To what extent do you feel that what you do in your life outside of work is valuable and worthwhile?	0.88	-	-	-
M3 HOME	To what extent do you generally feel that you have a sense of direction in your life outside of work?	0.97	-	-	-
A1 HOME	To what extent do you feel you are making progress towards accomplishing your goals in your daily life outside of work?	0.74	-	-	-
A2 HOME	Not including work-related goals, to what extent do you achieve the important goals you have set for yourself?	0.65	-	-	-
A3 HOME	To what extent are you able to handle your responsibilities in your daily life outside of work?	0.56	-	-	-

Note: Values are rounded to the second decimal place. Values less than 0.3 are not printed.

Correlations between each of the 4 factors (see table 6) were all highly to moderately correlated, suggesting that the oblique rotation method was acceptable. Factor loadings are presented in table 8 and seem to suggest that a 4-factor solution was acceptable. All the loadings

are above 0.4, and each factor has at least 3 items loading on to it. There also seems to be minimal cross loading of items across the factors. When testing the hypothesis that 4 factors were sufficient given the items selected, a chi square statistic of 183.84 (51, $p < .001$) also suggests a 4-factor solution. Examining the factor loadings suggests that the meaning and achievement elements load onto factor 1. Factor 2 includes positive emotion while factor 3 includes relationships. Factor 4 includes all of the engagement element items. The meaning/achievement factor correlated negatively with the positive emotion and relationship factors. The engagement factor also correlated negatively with the relationship factor.

Cronbach's alpha coefficients were calculated for each of the 4 latent factors identified. The raw alpha coefficient for factor 1 (meaning/achievement) was 0.92, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in the factor would not increase internal consistency. The raw alpha coefficient for factor 2 (positive emotion) was 0.92, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in factor 2 would not increase internal consistency. Next, the raw alpha coefficient for factor 3 (relationships) was 0.91, indicating that the overall factor was internally consistent. Further, analysis indicated that removing any of the items in factor 3 would not increase internal consistency. Finally, the raw alpha coefficient for factor 4 (engagement) was 0.76, indicating acceptable but noticeably lower consistency than the other factors. Analysis for this factor also indicated that removing any items would not increase internal consistency.

Overall, the results of the EFA analyses suggest that both the work and home version of the PERMA Profiler used in the study were able to produce several internally consistent factors. Aside from one achievement item in the work profiler, all the items across both scales loaded

onto a factor with minimal cross loading. The latent factor structure of the workplace items tended to group more elements together than the home profiler, with the latter nearly displaying a latent 5-factor structure consistent with the 5-element structure seen in PERMA. Across both PERMA scales, all latent factors correlated with each other and displayed negative correlations unique to each scale.

Discrepancies.

In addition to examining the relation between PERMA scales and the various outcome measures, the discrepancies among the PERMA scales within each context and between the contexts were included in a series of correlation analyses. To reiterate, three discrepancy variables were calculated. Two Within Context Discrepancy scores (WCD) were calculated, one for each contextual scale (e.g., work and non-work). These were calculated by summing the absolute differences between each combination of PERMA element scales, as stipulated in the equation below

$$WCD^{work} = (|P^{work} - E^{work}|) + (|P^{work} - R^{work}|) + (|P^{work} - M^{work}|) + (|P^{work} - A^{work}|) + \ldots\ldots$$

This led to two WCD scores, one for each PERMA profiler. For each context that a Profiler measures well-being within, its respective WCD score represents the level of discrepancy between the elements of well-being that were measured. One Between Context Discrepancy score (BCD) was also calculated by determining the absolute differences between each work and non-work PERMA Profiler's subscales (e.g., P at work – P outside of work, etc....) and then summing that total. This led to one BCD score that represents the overall discrepancy between the levels of well-being experienced across work and non-work contexts, as stipulated in the equation below

$$BCD = (|P^{work} - P^{home}|) + (|E^{work} - E^{home}|) + (|R^{work} - R^{home}|) + (|M^{work} - M^{home}|) + \ldots\ldots\ldots$$

The results of an intercorrelation analysis between the three discrepancy measures and the outcome measures are summarized in Table 4. It was expected that each type of discrepancy would be significantly related to the outcome measures, indicating potential evidence of added predictive utility that would be assessed later on with regression. Results indicated that each type of discrepancy was significantly negatively correlated with SWL, meaning that as the level of absolute difference between the PERMA elements either within a context, like the workplace, or between contexts (e.g., difference between the level of an element compared across work and non-work contexts) increased, SWL decreased.

Conversely, each type of discrepancy was significantly positively correlated with the mental health symptoms and problems at work scales. That is, higher levels of discrepancy, either BCD or WCD, were associated with higher levels of mental health symptoms and problems at work while also being associated with lower levels of satisfaction with life. In general, these results were consistent with the hypotheses indicated above.

Table 8. *Intercorrelations of discrepancy and outcome measures*

Variable	1	2	3	4	5
1. Within home discrepancy					
2. Within work discrepancy	0.26**				
3. Between context discrepancy	0.27**	0.53**			
4. Satisfaction with life	-0.29**	-0.13*	-0.15**		
5. Mental health symptoms	0.27**	0.26**	0.25**	0.49**	
6. Problems at work	0.25**	0.21**	0.25**	0.29**	0.65**

*$p < .05$, **$p < .01$, *all discrepancy scores are calculated as absolute differences*

Hierarchical regressions

In order to examine the incremental utility of PERMA elements and discrepancy, a series of hierarchical regressions were conducted using the various PERMA element total scores, outcome measures (e.g., mental health, work satisfaction) and discrepancy scores. It was hypothesized that adding additional PERMA items from multiple contexts and discrepancy scores would both lead to added predictive power for the various outcome variables. In a hierarchical regression, an outcome variable is selected and then, through sequential steps, predictor variables are added to the model. After each addition of predictors, one can then assess the relative change in predictive power in the model after controlling for the impact that predictors in previous steps have had. This type of analysis was chosen for its ability to determine if adding in discrepancy scores after controlling for initial total PERMA scores would still yield predictive value.

Satisfaction with life. The independent variables used in the first series of regressions included total PERMA scores from the work and non-work scales, between context discrepancy scores and both versions of the within context discrepancy scores. The outcome variable was the overall well-being variable as represented by Satisfaction with Life Scale scores. Non-work PERMA scores were entered into the first step to control for the impact of PERMA elements in day-to-day life outside of work. Overall, this model was significant, indicating that non work PERMA elements predict satisfaction with life, $F\,(1, 314) = 113.9$, $p < .001$, $R^2 = .266$. Next, work-specific PERMA was added in a second step to see if it added any predictive value after having controlled for non-work PERMA, examining the value of an added context. The addition of this variable was not significant, $\Delta F\,(1, 313) = 0.52$, $p > .05$, $\Delta R^2 = .001$. In the third step, the between context discrepancy variable was added to determine if the addition of discrepancy between PERMA elements across contexts provided added predictive utility after controlling for

total PERMA scores from each context. The addition of this variable was significant, ΔF (1, 312) = 6.94, p = .009, ΔR^2 = .016. In the fourth step, the two within context discrepancy variables were added to determine if this form of discrepancy could also add predictive value after having controlled for all previous predictors, including between context discrepancy. The addition of these variables was insignificant, ΔF (2, 310) = 6.94, p = .019, ΔR^2 = .01.

This analysis indicates that, for the student sample used in the pilot study, adding in work-related PERMA metrics did not seem to add a significant amount of predictive power for satisfaction with life after having already accounted for non-work PERMA. Further, WCD scores also did not add significantly more predictive power to the model while BCD scores did, although the effect size was low. This suggests that well-being discrepancy can add some predictive power when predicting satisfaction with life, specifically when examining these discrepancies across contexts.

Mental health symptoms. A second hierarchical regression was conducted similar to the one above, though this time the mental health variable was used as the outcome in the model. Further, only two steps were used this time. In step one, total PERMA scores were entered. This model was significant, indicating that PERMA predicts mental health, F (1, 314) = 26.41, p < .001, R^2 = .078. Next, BCD and both WCD variables were added in a second step to see if they added any predictive value after having controlled for total PERMA scores. The addition of these variables was significant, ΔF (3, 311) = 8.58, p < .001, ΔR^2 = .071.

These results suggest that PERMA scores are effective at predicting mental health symptoms, something to be expected. Notably, adding discrepancy scores into the model did add a significant and moderate change in predictive power. In fact, the change in R^2 nearly doubled.

This supports the idea that assessing multiple contexts and discrepancy when studying well-being provides added value in predicting outcomes.

Problems at work. A third hierarchical regression was conducted the same as the one immediately above, but instead of mental health being the outcome variable, the problems at work scale was used. In step one, total PERMA scores were entered. This model was significant, F (1, 314) = 29.88, $p < .001$, $R^2 = .087$. Next, BCD and both WCD variables were added in a second step to see if they added any predictive value after having controlled for total PERMA scores. The addition of these variables was significant, ΔF (3, 311) = 5.78, $p < .01$, $\Delta R^2 = .084$.

Similar to the result above, PERMA scores were effective at predicting problems at work. Although the effect size was small to moderate, adding discrepancy scores into the model, once again, provided a significant change in predictive power to the model. Combined with the results seen above, it would seem that adding in various contexts when assessing PERMA elements as well as calculating discrepancies both within contexts and between contexts in PERMA elements allows for added value in predicting different outcomes relating to different things; in this case, mental health symptoms and problems at work.

Dominance Analyses (DAs)

To examine the relative importance of each PERMA pillar, three DAs were conducted: one for each outcome variable (i.e., satisfaction with life, mental health symptoms, problems at work) using the total PERMA subscale variables as predictors. These DAs provided the information necessary to rank order the importance of each PERMA pillar as predictors of each outcome variable. As described earlier in the data analysis plan section, DA calculates an R^2 value, a numerical representation of how much variance something predicts in a statistical

model, for every possible combination of predictors in relation to an outcome variable (Azen & Budescu, 2003) and then determines if a predictor has more predictive power compared to another predictor in every possible subset model and the model in which every predictor is present. This would mean that the predictor variable, on its own or in the presence of any/every other predictor accounts for more explained variance in outcome scores no matter the model/solution. This result would indicate that the predictor has displayed complete dominance over the other predictors, also implying that it has achieved conditional and general dominance.

The results of the three dominance analyses are as follows. When predicting SWL, a model containing all predictors accounted for approximately 23% of the variance. Results from the predictor comparisons for complete dominance indicated that positive emotion completely dominated all other predictors. Meaning completely dominated engagement and relationships while achievement completely dominated relationships and generally dominated engagement and meaning. Engagement and relationships did not exhibit dominance at any level.

When predicting mental health symptoms, a model containing all predictors accounted for approximately 17% of the variance. Results from the predictor comparisons for complete dominance indicated that positive emotion completely dominated all other predictors. Engagement generally dominated relationships, meaning and achievement. Relationships conditionally dominated achievement and meaning conditionally dominated achievement and generally dominated relationships and achievement. Achievement did not exhibit dominance at any level.

When predicting presence of issues at the workplace, a model containing all predictors accounted for approximately 11% of the variance. Results from the predictor comparisons for complete dominance indicated that positive emotion completely dominated all other predictors.

Relationships displayed complete dominance over engagement, meaning and achievement. Meaning displayed general dominance over engagement. Achievement displayed complete dominance over meaning and general dominance over engagement as well. Engagement did not exhibit dominance at any level.

Discussion

The current study developed a context-specific measurement approach to PERMA that also included discrepancy metrics between the PERMA elements within and across contexts. This approach allowed for new relative importance models of PERMA to be examined that filled a gap in the literature regarding how the PERMA elements could be differentially important for various outcomes. In addition, this study was able to establish initial findings on the added predictive utility of examining the discrepancy between PERMA elements within and across contexts.

Although the exploratory factor analysis results suggest a 1-2 factor solution to the PERMA scale used in the present study, a CFA analysis with five factors was still used. This approach was intended to see how the PERMA scales, one of which was modified to be specific to the out-of-work context, behaved in an unrestrained approach. A 5-factor CFA was then used to see how the items performed when constrained to the theoretical structure of the PERMA model. The overall philosophy of this approach was to explore how the PERMA items behaved compared to existing results and theory so that we could be confident that the Profilers used with our sample were at least comparable to existing samples and results.

The suggestion that a higher order factor structure likely exists when measuring well-being elements with the PERMA Profilers has been documented (e.g., Bartholomaeus et al.,

2020; Fernandes, Zanini, & Peixoto, 2024) and does bring up an important debate regarding the psychometric inconsistencies that the PERMA Profiler has with its underlying theory. However, this debate was beyond the scope of the present study, as the main intent was to see if the context-specific measurement of the PERMA elements could be extended beyond the workplace setting and then to begin collecting data on the relative importance of the elements in predicting important outcomes. Even if there is a large general well-being factor accounting for most of the variance in EFA with PERMA, the individual elements are still going to be worth measuring individually and comparing. Seligman's point that each PERMA element is sought after for its own sake (Seligman, 2013) should not be taken lightly. There are almost certainly improvements that can be made in how these elements are measured with the engagement scale being one commonly noted example of this issue (e.g., Wammerl et al., 2019). In the pilot study, EFA and CFA were used to compare to existing research to see if the modified Profiler behaved similarly to existing evidence, not to fully explore these psychometric issues.

Regarding the negative factor correlations in the EFA despite the PERMA subscales being positively related in the correlation matrix, this could easily be due to the presence of a higher order factor structure that was not properly modelled in part due to overextraction of factors. If there is a higher order, general well-being factor that is accounting for much of the variance across the items in the EFA analysis and an oblique rotation method is used that allows for correlations between factors, the left-over residual correlations between the other factors beyond the first major one can actually be negatively correlated (Markon, 2019; Beauducel & Hilger, 2023). These partial relationships (Eid et al., 2017; Burns et al., 2020) that are left over can reflect how items relating to focus and flow may be in some ways at odds with the hedonic aspects of positive emotion, or perhaps some other explanations. More investigation would be

needed to fully unravel the exact patterns on display in these EFA results, though in cases of oblique rotation in EFA with items that arguably have a higher order factor structure like PERMA these types of results can occur and have been documented elsewhere outside of the PERMA literature (e.g., Beauducel & Hilger, 2023).

The results confirmed that the context-specific PERMA scales were consistent, reliable and valid comparable to the unmodified PERMA Profiler. I then established using dominance analysis that the PERMA elements do in fact have notable differences in their relative importance for predicting outcomes relating to mental health, workplace well-being and satisfaction with life. The discrepancies seen between the PERMA elements did seem to provide some evidence of added predictive value for those outcomes as well, though not always. In general, the results support an approach to examining PERMA that emphasizes deepening our understanding of well-being through the questions of relative importance, context and discrepancy rather than attempting to create a singular definition or model of well-being through adding components and emphasizing psychometric qualities.

Conclusion 1: PERMA can be measured across contexts effectively. Echoing the results from Rice (2024), results from the present study suggest that the same PERMA elements can be measured across contexts. Correlational results indicated that both the Workplace PERMA-P and the modified PERMA-P were correlated with each other and tended to correlate with their own elements more so than elements in the other version of the scale. Cronbach's alpha coefficients were all in the acceptable range as well. The outcome correlations displayed evidence of convergent and divergent validity across both contextual PERMA scales, though the engagement subscale in the home context failed to reach significant correlations with various outcomes while its contextual counterpart did. This is at least somewhat consistent with past research on the

PERMA Profiler, as the engagement subscale has been known to display psychometric issues (e.g., Bartholomaeus et al., 2020). At the very least, these initial results suggest that the modified PERMA-P for the home context displays expected psychometric performance compared to past usage of the PERMA-P.

Factor analysis results provide added detail on how the two PERMA scales performed. EFA results reflected the factor inconsistencies that tend to occur with the PERMA Profilers (Bartholomaeus et al., 2020; Ryan et al., 2019) in that various elements would load on to the same factor to some extent. All the items within a subscale are still loaded together and not across different factors, aside from the third achievement item on the workplace version of the profiler which did not strongly load onto any factor. Expecting a clear and consistent 5-factor solution is certainly not realistic for the profilers, and the results here show consistent behaviour across both profilers. Taken together, the modified profiler seemed to perform similarly to past versions of the profilers in other studies in addition to the Workplace PERMA-P used within the same sample. Although these results reflect the inconsistencies in factor structure and psychometric issues that still need to be understood regarding the PERMA-Profiler, the goal was met in that the modified scale performed as expected. The discrepancy metrics also displayed evidence of convergent and divergent validity, providing initial support for their usage, though their performance in the analytical techniques used have more to say regarding their worth as new metrics.

Conclusion 2: The predictive importance of the PERMA elements changes relative to the outcome in question. To date, this is the second study that has ever explicitly examined the relative importance of PERMA elements using a tailored analytic technique like dominance analysis (Jimenez et al., 2023). As discussed in the data analytic plan, dominance analysis allows

for much more effective comparison in terms of relative importance of predictors in a regression model than simple multiple regression techniques (Azen & Budescu, 2003). What that means is that dominance analysis allows for clear distinctions in the predictive power of various predictors in a model to be compared to each other, while traditional regression techniques do not, making tests like dominance analysis a requirement for those who wish to explicitly assess the relative importance of various predictors. As a test of feasibility, the dominance analysis approach provided several important findings. An overall result was that positive emotion tended to act as the strongest predictor relative to the other elements across all outcomes. Not only is this evidence that the PERMA elements are not necessarily all equally important for all outcomes, but this result was also found in Jimenez and colleagues' (2023) dominance analyses as well. Similar again to their results, the present study found that after accounting for the dominant effect of positive emotion, the pattern of dominance for the other elements varied significantly depending on the outcome in question.

This attests to the complex patterns of relative importance across PERMA elements that have gone nearly unexamined to date. The next natural step to take now that this approach has shown merit is to include all of the contextual PERMA element subscales individually instead of put together like they were in the DA. This will allow for the issue of context to be examined in more depth. For example, we can see that not all elements are equal in importance for outcomes like mental health. For a sample of students, what matters more? Positive emotion at work or outside of work? These are the types of questions that are possible now with the inclusion of relative importance analysis and contextual PERMA scales.

Conclusion 3: Discrepancy may have added value depending on the outcome. As discussed in the data analysis plan, hierarchical regression does have certain weaknesses when

comparing changes in predictive power, though for the present study this method was used to look for even minimal evidence of the added predictive power that could be gained from including context and discrepancy into common regression models of well-being. Though not always consistently useful, depending on the outcome in question discrepancies did add low to moderate amounts of predictive power. A similar result was found when comparing steps with one versus two sets of contextual PERMA element subscales. Although much more detail could be gained by refining analytical techniques, these results do seem to support the hypothesis that adding context and discrepancy into the model would provide added predictive utility. At the very least, context and discrepancy seem to play a meaningful role in how well-being can be understood.

Implications, Limitations, Modifications for a full study.

Context and discrepancy do seem to play an important role and the lack of research examining their role should be addressed. Tailored analytical techniques like DA have proven to be effective tools at asking specific questions like the one of relative importance. Although hierarchical regression and even dominance analysis may not always prove to be the best approaches (see following data analysis plan below for details on these issues), they have provided more than enough data to suggest that these issues warrant further investigation.

Even though this study in many ways was meant as “proof of concept” it still provides meaningful implications to PERMA and well-being theory. Ideas on the balance of and sufficient amount of various PERMA elements should not remain implied, as it turns out that, depending on the outcome, there are likely many meaningful distinctions to make in what elements are most important depending on the effect desired and the context in question. More research on the

patterns of relative importance needs to be done, though the replication of some of the patterns seen in Jimenez and colleagues (2023) is an effective starting point.

From a measurement perspective, it seems that participants were able to differentiate enough between the same PERMA elements in and outside of work to yield results like the ones summarized above. This fuels the point that researchers should be not only aiming to create contextually specific measures of well-being when warranted, but to incorporate multiple measurements of the same factors across contexts in their study design if possible. Effective measures of general, broad well-being constructs like the SWLS already exist. Future research could benefit in at least some cases by being more specific, using existing theory and techniques in novel ways to deepen understanding rather than introducing entirely new elements to well-being theory and expanding the list of relevant factors overall.

Making suggestions for changes in practice and policy at this point is not entirely justified as more replication and refinement of our analytical techniques may be needed first. At the very least though, the results of this study would suggest that for anyone aiming to promote flourishing, that they should have some understanding of how the various important elements are experienced across contexts. Furthermore, they should also be aware of how the patterns of discrepancy across those elements, within and between contexts, are playing some role in overall well-being. More work will need to be done before the many details and additional questions those implications bring up can all be addressed, though a useful starting point has been established.

Some limitations of the study are worth addressing. First is the lack of separation of PERMA elements in the DA results. Future research will include all of the contextual PERMA elements separately into any relative importance analyses so that the issue of context can be

examined in tandem with relative importance. This is computationally very taxing, but it may be possible to find alternative methods of relative importance analysis to assist with this task. Second is the lack of a school context measure of the PERMA elements. This would have been a useful addition due to the use of a student sample, and since school is likely more important and therefore more impactful to these participants than their primarily part-time jobs the results would have probably been more appropriate to their situation and experiences of well-being. Although it was worth only having one modified PERMA-P in the study to compare to the existing workplace version, any future studies of this nature with samples like students should aim to create contextual PERMA scales that assess the most important contexts that students experience. Further, having three contexts to examine patterns of discrepancy and relative importance in is likely more interesting and useful for expanding knowledge than two.

Chapter 5: Introduction and Rationale for Study Two

Results from the pilot study emphasized the importance of context. The PERMA elements were shown to be measurable across work and non-work contexts and the discrepancy between various PERMA elements across these contexts displayed some degree of importance for predicting outcomes. Given the importance of both context and discrepancy identified in the pilot study, research on well-being in students should ideally consider the importance of the school context (i.e., schoolwork is engaging and meaningful; schoolwork is a source of pleasure and accomplishment). Failure to do so would result in meaningful sources of well-being in this population, and their resulting discrepancies with other sources, to be ignored despite the potential insights that could be gained.

Relative importance of the PERMA elements depending on outcome was also found to be an important topic in the pilot study. The predictive power of the same PERMA elements differed significantly depending on the outcome being predicted. Combined with the importance of context described above, research on well-being should also consider the importance of examining the relative importance of the PERMA elements broken down across contexts (e.g., work, home, school). It is one thing to find that a PERMA element has different predictive power depending on the outcome, but it is another thing entirely to find that a PERMA element has different levels of predictive power depending on what context it was measured in as well as what outcome is being predicted. This is a similar concept to examining interactions in an ANOVA, except the issue of relative importance is being examined instead of group differences.

To address the issues raised above, a study was conducted that made various additions compared to the pilot study. To expand the issue of context, substantive additions were made by measuring PERMA elements in an additional context, school. Methodological additions were made as well, including CFA to examine the added school PERMA measure in addition to existing PERMA measures, as well as new relative importance improvements in the form of Random Forests Analysis, as will be discussed below.

Hypotheses and Objectives

Similar to study 1, the first objective of study 2 was to determine the validity, reliability and consistency of the PERMA scales. The results of study 1 supported the usage of the modified, context-specific PERMA Profiler measures for work and home, which begged the question of what other relevant contexts could be examined. To continue developing the contextual approach to measuring well-being, a school-specific version of the PERMA Profiler was created. This added profiler allows for even more discrepancies to be examined and fits the

student sample used in study 2. The same correlational approach will be used from study 1. Correlation matrices that show the relation between each context-specific PERMA scale and various outcome measures will be created. As described in the metrics section below, new outcome measures will be used. Updated mental health items, a work performance measure, and a satisfaction with life scale will be included as outcome measures in the correlational analyses. The problems at work and mental health symptoms scales from study 1 will be replaced with measures that have undergone more validation but that still capture the relevant constructs. In the case of mental health, a validated measure of depression, anxiety and stress (non-clinical populations) will be used and in the case of work outcomes, instead of a scale assessing for problems at work a scale that assesses individual work performance will be used instead. A primary reason for this change aside from the desire to use more clearly validated measures was that there was some overlap between the mental health and work problems scale items in study 1 in that both asked questions regarding stress levels that could have led to some overlap in variance of responses. The newer scales are clearly capturing two different outcomes.

Expected results of the correlation analyses are similar to study 1. In general, the PERMA scales are expected to show evidence of convergent and divergent validity with the various outcome measures though there may be differences to note based on which context and pillar is being examined. The same high level of interrelatedness between the PERMA scales is also expected, as seen in study 1 and past research. Means, Cronbach's Alphas and standard deviations will be calculated as well, providing evidence of reliability in the case of the alphas.

The next objective is to examine the structure of the PERMA measures. The same EFA and CFA approach from study 1 will be used with the addition of the school PERMA Profiler. In the EFA analysis, each Profiler is expected to show some degree of cross-loading across factors,

with most factors being represented by items from one PERMA pillar, two at most. Again, CFA will be used in a more exploratory sense to see how well the school PERMA items fit the imposed 5-factor model implied in PERMA theory.

An overall goal of both studies has been to explore how adding the contextual PERMA scales can deepen our understanding of well-being. With five PERMA pillars and three contexts, there is the opportunity to expand upon the relative importance research question of study 1. In study 1, total scores for each PERMA pillar were used in a series of DA for each outcome variable. For example, when predicting SWL, positive emotion displayed complete dominance over all other predictors. What if instead of total scores, each contextual scale was included separately as predictors in the DA?

This would allow for an entirely new question to be asked: Does the predictive power of each PERMA element for a given outcome differ at all depending on which context the pillar was measured in? Using the SWL example again, positive emotion is a relatively dominant predictor of SWL compared to the other PERMA pillars. Adding context into the picture, does it matter then what context these levels of positive emotion are coming from? What if positive emotion in one context has significantly more predictive power compared to positive emotion from another? Does this change depending on which outcome measure is being examined? Are there any patterns of dominance across the pillars? For example, what if positive emotion was usually dominant over engagement for a given outcome, but when comparing contextual scales, it is revealed that positive emotion at school, work and home are dominated by engagement at school but not engagement at work and home?

This approach is similar to what is done to test interactions within repeated measures ANOVA. However, since the outcome scores were only collected once in a non-repeated

measures fashion, an ANOVA would not work particularly well since there are no group average comparisons to make for the outcome scores. Since DA is using regression, it is only concerned with predictive power displayed through how the variability in outcome scores can be explained by various predictor variables.

Relative Importance. The usage of dominance analysis in study 1 allowed for the relative importance of the PERMA elements to be explored without relying on interpreting standardized beta coefficients in multiple regression, an approach that is rife with issues (Azen & Budescu, 2003; Mizumoto, 2022). Dominance analysis accomplished this by examining the average predictive performance of each predictor in a given model across a set of subset models that consisted of every possible combination of predictors (Budescu, 1993; Azen & Budescu, 2003), avoiding common issues with multiple regression analysis, like suppression effects (Hair, Babin, Anderson, & Black, 2019, cited in Mizumoto, 2022).

Due to the effectiveness of DA in revealing patterns of relative importance, it will be used again in the following study with some noteworthy expansions. First, each contextual PERMA scale (e.g., work, home, school) will be entered into the dominance analysis model instead of the total scale scores. This will allow for the questions of relative importance and contextual variability to converge, allowing us to examine how PERMA elements differ in their predictive importance across outcome and context. Dominance analysis is also worth expanding upon. For example, Mizumoto's (2022) methodology also recommends verifying the results of dominance analysis with random forests, another addition I intend to incorporate into the next study.

Random forests (RF) analysis, introduced by Breiman (2001), is a non-parametric, machine-learning approach to predicting a response variable based on a given set of predictor variables (Rothacher & Strobl, 2023). The RF process begins with the creation of decision trees.

Decision trees aim to make predictions for a given outcome in a dataset by "splitting" participants into different branches based on the values of predictor variables (Fife & D'Onofrio, 2022). Using PERMA as an example, let's say I want to predict the SWLS scores of someone using a decision tree. The tree may begin with some but not all the PERMA elements as predictors (the lack of all predictors in a tree will be explained below). At the top of the tree, a node is created that splits the predictions in one of two directions based on whether positive emotion scores are above or below a cutoff value. Based on this, the tree continues into two branches, that could promptly end in predicted values being generated but will likely branch off additional times based on the scores of other continuous predictor variables that I included in the base model. The cutoff values used to branch decision nodes in addition to the variables selected as best suited for splitting nodes are decided by the decision tree algorithm in a way that optimizes prediction accuracy (Fife & D'Onofrio, 2022; Rothacher & Strobl, 2023). Now that I've explained how the trees work, it is time to describe the forest.

Naturally, RF is an approach that uses multiple (usually 500-1000) decision trees to generate aggregated results that attest to how various predictors in a model explain variance in an outcome variable, with relative importance being one area that these results are particularly suited for (Mizumoto, 2022). In RF, each of these many trees use randomly selected observations (e.g., bootstrapping) and predictor variables, hence the example above of a tree that does not have every predictor that would have been stated in the base model inputted into the RF analysis (Fife & D'Onofrio, 2022). For each tree, around 67% of the base sample is used to train the tree while the remainder is used for an "out of bag" sample (OOB; Breiman, 2001). The OOB sample for each tree is also ran through the tree, creating predictions that are then compared to the predictions generated for that given tree by its' corresponding set of observations that was not

selected for the OOB sample. This is essentially a type of cross-validation, and the final prediction accuracy of the tree model is determined by the OOB sample (Fife & D'Onofrio, 2022). After completing this process across many trees, the resulting "forest" of predictive models leads to aggregated results that can teach us about the predictive performance of predictors without the pitfalls of interpreting standardized beta coefficients in multiple regression (Mizumoto, 2022) while also having inherent protection from overfitting due to the built in bootstrapping and result aggregation of the RF process (Breiman, 2001).

The qualities of RF and the aggregated results that it provides are clearly useful for exploring the relative importance of predictors like the PERMA elements. This does however beg the question as to why even use DA if RF is so useful? Mizumoto (2022), aside from providing a helpful guide to generating useful relative importance metrics using DA, also recommends using RF and DA together when evaluating relative importance. Mizumoto's (2022) first point is that due to DA being parametric (e.g., assumes linear relationship) and RF being nonparametric, one can use both to double-check the ranking of predictors from an initial DA approach. If they do differ, he explains that this could reveal that the data does not meet the assumptions of multiple regression. He also suggests that due to the very different nature of the algorithms used in DA and RF that they are well-suited to confirming results, providing additional confidence in the overall relative importance results being presented. I would also add that the plotting options available with RF allow for non-linear relationships between the predictor and outcome variables to be revealed, including interactions (Rothacher & Strobl, 2023), a feature that DA does not inherently have that could add depth to the overall results and inform post-hos analyses. Finally, cross-validation is an inherent part of RF (Mizumoto, 2022) while it is not in DA. Due to the multicollinearity across the PERMA elements seen in study 1

and past research, cross-validation is a welcome added measure to address issues with overfitting.

For the following study, RF analysis will be used to verify the results of the updated DA procedure described above. For each outcome, a model with each contextual PERMA element and the discrepancy metrics as predictors will be created. For each model, a DA and RF analysis will be run, and results will be compared. The DA results will attest to the exact amount of variance that each predictor is explaining in rank order, while the RF will verify this rank order while also allowing me to examine any non-linear relationships or interactions in the data. This approach builds upon the approach used in study 1 by adding cross-validation, verification of results across two different analytical approaches, added relative importance details, and the ability to detect non-linear relationships and interactions within my models. This should prove to be a more thorough, rigorous and interesting approach to exploring my research questions using analytical techniques that have been supported by existing research.

Chapter 6: Study Two

Please note that Chapter 6 is in manuscript form, which will be submitted for review for publication at some point.

Pathways to Flourishing: Using Context and Discrepancy to Understand Well-Being

Abstract

Despite extensive research on Martin Seligman's model of wellbeing (PERMA), key questions concerning the relative importance of different elements within this model, the contextual specificity of the elements, and significance of discrepancy both among elements and across context remain untested. 1219 employed Canadian undergraduate students completed existing and modified versions of the PERMA Profiler to measure well-being elements across work, home and school contexts. Relative importance and discrepancy of these elements was

investigated using analytical methods like dominance analysis and random forests analysis against a variety of outcome variables. Results showed that the modified PERMA scales displayed acceptable psychometric performance, discrepancy across elements was implicated as an important predictor in some cases and findings indicated that the PERMA elements had various patterns of relative importance depending on the context they were measured in and the outcome in question.

Introduction

The long history of research and thought on well-being has been mostly centered around specific types of well-being, like hedonia and eudaimonia, which trace their roots as far back as the writings of ancient philosophers like Aristippus, Epicurus and Aristotle (Ryff, Boylan & Keyes, 2021; Huta & Waterman, 2014; Ryan & Deci, 2001). The question of what constitutes a "good life," a question at the core of well-being research, has captured the minds of many of us and continues to do so today. In recent years, multidimensional approaches to well-being have been developed, with Seligman's (2013) PERMA model of well-being being a particularly popular example. Despite the advancements seen in well-being research, significant gaps in our understanding of the intricacies of well-being remain. The current study aims to expand upon current well-being research trends, moving away from identifying the "best" collection of elements to include in a well-being model and instead using PERMA to understand the underlying patterns and mechanics of well-being. Specifically, the relative importance of the PERMA elements in predicting important outcomes and the degree to which the discrepancies between the elements within and across contexts (e.g., work, home, school) remains unexamined.

Importance of multidimensional well-being

Any information that can teach us about the promotion of individual living conditions (i.e., well-being) is of obvious importance from both bottom-up and top-down perspectives. As individuals we aim to live lives that are beneficial to us and policymakers are invested in finding solutions to the well-being issues of those impacted by their policies. Take for example the Report by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2010) requested by President Sarkozy of the French Republic in 2008, which emphasized the growing economic importance of understanding and promoting the well-being of citizens using a multidimensional approach.

Seligman's PERMA model (2013) of well-being is one such multidimensional model of well-being that incorporates aspects of past well-being research like subjective well-being and psychological well-being, that are all implicated in human flourishing, a concept that Seligman argues (2013) is a state in which important elements of well-being are optimized within a person. From a correlational perspective, well-being elements seen in PERMA have been associated with a wide range of positive outcomes (e.g., Kern et al., 2015; Butler & Kern, 2016; Seligman, 2018; Watanabe et al., 2021; Coffey et al., 2016). From an applied perspective, various PERMA-informed interventions have been developed and have yielded observable changes in the well-being of participants (e.g., Norrish et al., 2013; Shoshani, 2021; Gander et al., 2016; Neumeier et al., 2017).

Current priorities in well-being research

Although the multidimensional approach to well-being has been beneficial, current trends surrounding these models may have become too focused. First is the large number of multidimensional models that have and continue to be created. To name a few examples, there is the I COPPE (Prilleltensky & Prilleltensky, 2006), WB-Pro (Lawton, 1991), WHO-5 (Bech,

Olsen, Kjoller & Rasmussen, 2003) and even expansions to the original PERMA model like the PERMA+4 model (Norrish, Williams, O'Connor & Robinson, 2013). Although the debate regarding which components should be included in an overall well-being model is a welcome and important one, significant research effort has been dedicated to creating new models and debating over "correct" definitions of well-being and their respective dimensions. A second example to illustrate this is seen in Goodman and colleagues' (2018) and Kashdan's (2017) criticisms of the PERMA model when they asserted that PERMA was redundant with subjective well-being. Among one of their evidence points was the non-orthogonal nature of the PERMA elements and their strong correlations with existing SWB measures. Although there is merit in their criticisms, the overwhelming focus of this debate on the unique nature of well-being scales and their psychometric merit, although certainly important, may be constraining important and fascinating new questions we can ask about the mechanics of well-being that models like PERMA could give us access to.

Testing implications

Within the PERMA model are implications about the nature and mechanics of well-being that are worth testing. The first implication relates to the relative importance of the PERMA elements. Seligman's original conceptualization of the PERMA model (Seligman, 2013) implies that each PERMA element is equally important for overall well-being and flourishing, or at least does not say otherwise. Although many models of PERMA have been analyzed across many samples, only one study to date has ever explicitly examined the relative importance of each PERMA element in predicting important outcomes (Jimenez et al., 2023). To date, it is generally implied that maximizing the PERMA elements is the desired approach. What has not been tested explicitly is whether or not there are other avenues to high overall well-being and other desirable

outcomes that involve certain PERMA elements more or less than others depending on the outcome, context, or person in question. The second implication to test comes from the existence of context-specific PERMA measures like the Workplace PERMA Profiler. This implies that the well-being elements that PERMA includes are measurable across contexts in a meaningful way. Despite this implication, only one study has even attempted to see if the PERMA elements could be measured across contexts within the same sample, with results suggesting that this is actually possible for participants to distinguish (Rice, 2024).Finally, the addition of context begs another question. Does the discrepancy across PERMA elements, both within a context or across contexts, matter at all in our overall understanding of PERMA and well-being? Aside from noteworthy examples like the need satisfaction literature (e.g., Milyavskaya et al., 2009; Fernet et al., 2023), well-being research, PERMA especially, tends to not focus on context and discrepancy.

The following study aimed to address these implications and questions using novel approaches to measuring and analyzing PERMA-based data. By modifying pre-existing PERMA scale items and creating new ones to examine both work and school contexts, the contextual factor missing from existing PERMA theory can be examined in addition to the potential role of discrepancy across the elements that make up PERMA.

Method

Participants

Participants consisted of students enrolled in undergraduate studies at a Canadian university (n = 1219) who were given course credit for participating in the study. The original dataset consisted of 1775 participants before incomplete responses, test participants used for survey development and those that failed the effort test were removed. These participants

answered a series of questionnaires online using the Qualtrics (Qualtrics, 2005) survey hosting system. Participants had to be enrolled as either full- or part-time students while also being employed in any form of work; part-time or full-time. The participants were predominantly female (72%) and within the 24-and-under age range (96%). Most participants were employed on a contract, part-time basis (67%).

Procedure

Students completed the online survey through the university's study participation system to receive course credit for their participation which was hosted through Qualtrics (Qualtrics, 2005). Participants were eligible to participate if they were fluent in English, were enrolled as a student and were working in some sort of employment. The survey consisted of various questionnaires that measured various predictors and outcomes that are listed in detail below in the measures section. Participants were able to complete the survey online through a computer or phone at their leisure. The study was approved by the University of Ottawa's Research Ethics Board. Data analysis was conducted using RStudio (RStudio Team, 2020) and various statistical analysis packages available from R's package repository.

Measures

The survey consisted of several scales intended to measure the various constructs of interest, in addition to a number of demographic questions. The primary questionnaires used were the PERMA and Workplace PERMA Profilers (Kern, 2014; Butler & Kern, 2016). These questionnaires use Likert response scale ratings (0-10) of agreement with certain statements to measure the presence of each PERMA element. Each PERMA element is measured with 3 items. Total scores for each element subscale and an overall total score were calculated by calculating

the averages across the relevant item responses. Higher scores indicate increased levels of each PERMA element. Both the PERMA Profiler and its workplace version have shown acceptable consistency and reliability across a wide range of populations (Butler & Kern 2016; Watanabe et al., 2018; Choi et al., 2019; Jimenez et al., 2022; Chaves et al., 2023).

Due to the contextual nature of the present study, the items used in the original PERMA Profiler were modified to ask about each element in a way that excluded both work and school settings (e.g., "How often do you feel joyful" vs. **Outside of your life at work and school,** how often do you feel joyful?"). The workplace version of the profiler was already context specific, so it was not modified. Due to the nature of the sample, a school version of the PERMA Profiler was created using similar conventions as the modifications for the original profiler to focus the items on the school context.

The Satisfaction with Life Scale (SWLS: Diener et al., 1985) is a 5-item scale intended to measure participants' global, cognitive judgements of how satisfied they are with their lives. Participants are asked to indicate how much they agree or disagree with the items that are presented on a Likert-response scale (1-7, strongly disagree to strongly agree). A total score was calculated by averaging the responses across items, with higher scores indicating higher levels of satisfaction with life as a cognitive judgement. The SWLS has been used extensively throughout well-being research and has displayed acceptable consistency and reliability across a wide range of populations (Pavot & Diener, 2008). For the present study, SWLS scores were mainly used as an outcome measure to see how various PERMA elements across contexts were different in their relation to overall satisfaction with life. SWLS scores were also used to examine the convergent and divergent validity of the modified PERMA scales as they are generally expected to be positively related to SWL in general.

The Depression, Anxiety and Stress Scale – 21 item version (DASS-21; Henry & Crawford, 2005) is a scale consisting of 3 subscales that aim to measure depression, anxiety and stress. Each subscale consists of 7 items presented as statements of various symptoms participants may have experienced over the past week that are endorsed on a Likert scale (0-3, did not apply to me at all to applied to me very much or most of the time). Although subscale scores can be calculated, the present study was interested in general mental health symptoms as an outcome so a total score consisting of an average across all items was calculated. In the present study, the DASS-21 was used as an outcome measure across various models and was also used to determine the convergent and divergent validity of the modified PERMA Profilers. The DASS-21 has been shown to be a reliable measure across samples from a wide range of countries when used in a unidimensional fashion (i.e., total scores used instead of composite scores), which was how it was used in the present study (Zanon et al., 2021).

The Work Performance Inventory (WPI; Griffin, Neal & Parker, 2007) is a measure of various effective behaviours at work that has demonstrated evidence of reliability in measuring individual work performance (Carpini, Parker & Griffin, 2017). The WPI is intended to be used to measure these behaviours in any job or work environment. Although the WPI includes additional scales for work performance at the team and organizational level, only the individual level scale was used. The scale consists of 10 items presented as statements indicating self-rated participation in various aspects of work behaviours associated with proficiency, adaptivity and productivity. Participants responded on a Likert-style scale (1-5, very little to a great deal) to indicate how much they agree that they engage in these behaviours. A total score was generated by computing the average score across all 10 items, with higher scores indicating higher levels of work performance on an individual level. In the present study, the WPI was used as an outcome

measure across various models and was also used to determine the convergent and divergent validity of the modified PERMA Profilers.

Participants also completed several demographic questions. Racial demographic information is presented in Table 9. Approximately half of the sample identified as white, with most of the remaining participants identifying as Middle Eastern, Black and Asian. Regarding disability status, 94% of participants identified as able-bodied. Approximately 83% of participants did not report being a part of the LGBTQ+ community. When asked if they made enough income to support themselves and their dependents, 44% of participants indicated that they did not while 25% stated that they made "just enough to get by", with the remainder stating that they did make enough or chose not to answer.

Table 9. *Demographic Breakdown by Racial Group*

Group	Number that identified	Percentage of total sample
Indigenous	14	1%
Middle Eastern	138	11%
Black	175	14%
Asian	184	15%
Latin American	17	13%
White	633	51%
Prefer not to answer	18	1%
Other (not listed)	40	3%

Results

Results for the current study are presented in the following sections, namely (a) psychometrics and validity, (b) external validity, (c) structural validity,

Psychometrics and Validity

Within context correlations. An intercorrelation analysis was conducted among the work, home, and school PERMA Profiler subscales to examine their relationship to one another. Results of the intercorrelations are presented in Table 10 for all the subscales. Simple statistics, such as the mean, standard deviation, and Cronbach alpha were calculated. It was expected that all PERMA subscales would correlate positively across and within contexts, Further, each subscale was expected to show evidence of sufficient internal consistency demonstrated by acceptable Cronbach's alpha values.

Results showed that intercorrelations among PERMA elements within the home context were all significant and positive, ranging from 0.42 to 0.72, indicating that all PERMA elements measured within the home context were positively related to each other. That is, high levels of each home PERMA subscale were related to higher levels of all other home PERMA subscales. Results also showed that all coefficients indicated moderate to large associations among the home PERMA subscales according to Cohen's (1988) conventions for interpreting correlation coefficients. Finally, Cronbach's Alpha scores of each subscale indicated acceptable internal consistency, ranging from 0.8 to 0.93.

The within-context PERMA element correlations for the work and school contexts also displayed a similar pattern of results to the home context results. All displayed moderate to large, statistically significant, positive correlations within each contextual scale with intercorrelations between the work scales ranging from 0.45 to 0.7, and intercorrelations between the school scales ranging from 0.45 to 0.71. Further, Cronbach's Alpha scores also all indicated evidence of internal consistency, as seen in the second column of Table 10.

Between context correlations. Between context correlations were also examined. In all cases, the correlations were significant and positive though noticeably weaker than the within-

context correlations. For example, most between context correlations ranged from weak to moderate (0.12 to 0.52). The fact that the between-context correlations were noticeably weaker than the within-context correlations indicates that the various PERMA scales are certainly related to each other across work, home and school contexts but are still more strongly related to other scales within a shared context.

Table 10. *Between and within context correlations for PERMA subscales*

Variable	*Alpha*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. P home	0.91	6.9	1.8														
2. E home	0.81	7.8	1.6	0.54													
3. R home	0.9	7.6	2	0.5	0.48												
4. M home	0.92	6.5	2.2	0.61	0.46	0.53											
5. A home	0.87	6.5	2	0.55	0.42	0.49	0.72										
6. P work	0.92	6.1	2.1	0.28	0.18	0.23	0.23	0.27									
7. E work	0.82	6	2.2	0.18	0.21	0.18	0.18	0.21	0.7								
8. R work	0.88	7.1	2.2	0.22	0.22	0.35	0.22	0.25	0.59	0.48							
9. M work	0.93	5.8	2.6	0.19	0.12	0.22	0.24	0.29	0.61	0.69	0.45						
10. A work	0.8	6.7	2	0.21	0.23	0.27	0.25	0.35	0.54	0.58	0.47	0.61					
11. P school	0.93	5.1	2.1	0.52	0.28	0.3	0.43	0.4	0.28	0.22	0.18	0.2	0.22				
12. E school	0.86	5.5	2.1	0.34	0.27	0.25	0.33	0.32	0.22	0.24	0.15	0.17	0.21	0.72			
13. R school	0.9	5.4	2.3	0.35	0.23	0.36	0.39	0.36	0.25	0.2	0.3	0.27	0.23	0.56	0.49		
14. M school	0.91	6.4	2.3	0.31	0.21	0.31	0.42	0.38	0.2	0.16	0.19	0.17	0.26	0.6	0.65	0.48	
15. A school	0.91	6.4	2.3	0.36	0.24	0.33	0.43	0.5	0.2	0.18	0.21	0.2	0.29	0.55	0.53	0.45	0.63

Please note that all correlations in this table were significant at the $p < .01$ *level*

In summary, the results of Table 10 indicate that the PERMA subscales are all interrelated. This multicollinearity will be relevant for further analyses described below. Within-context correlations tended to be the strongest, though significant positive correlations between the contexts were also demonstrated throughout the matrix. Between-context correlations were noticeably weaker than the within-context correlations. In general, both within and across the home, work and school elements, high levels of one PERMA subscale tend to be associated with higher levels of other PERMA subscales.

Structural Validity

The structural validity of the context specific PERMA questionnaires was examined using both exploratory principal components analysis (PCA) as well as confirmatory factor analysis (CFA). Results are presented below, beginning with PCA.

PCA. In order to examine the structure of various items that were used to measure the PERMA elements in the home, work and school contexts, a principal component analysis (PCA) was conducted. Results are presented in Tables 11 and 12. Items for each PERMA element from every contextual scale (e.g., work, home, school) were included in the PCA. Results indicated that 7 factors had eigenvalues noticeably greater than 1, however, scree plot results indicated 4 significant factors. Therefore, 4 factors are presented in Tables 11 and 12.

Table 11. *Eigenvalues for PERMA factors*

Factor	Eigenvalue	% of variance	Cumulative % of variance
1	14.57	32.38	32.38
2	5.82	12.93	45.3
3	3.69	8.21	53.51
4	1.9	4.23	57.74

For the factor pattern matrix presented in Table 12, the first factor displayed negative relationships with all of the PERMA items across all contexts. Only 3 school items and 1 work item had their strongest loading on this factor. For the second factor, there was a variety of positive and negative loadings. However, for the items that had their strongest loading on this factor the relationships were positive in direction and consisted of groupings of various workplace items, though not all of them. For the third factor, several groups of home context items loaded strongly onto the factor with negative relations while some groups of school items loaded strongly but in the opposite direction. Finally, the fourth factor had various items load

strongly onto it, with the clearest pattern being the achievement items from home and school loading positively onto the factor.

Table 12. *Factor pattern matrix*

Item	PC1	PC2	PC3	PC4
PW1	-0.144	**0.253**	0.029	-0.076
PW2	-0.148	**0.227**	0.033	-0.081
PW3	-0.134	**0.242**	0.033	-0.101
PH1	-0.169	-0.089	**-0.204**	-0.112
PH2	-0.169	-0.086	**-0.176**	-0.112
PH3	-0.155	-0.089	**-0.179**	-0.108
PS1	**-0.180**	-0.130	0.155	-0.145
PS2	**-0.180**	-0.123	0.169	-0.123
PS3	-0.170	-0.132	**0.174**	-0.111
EW1	-0.114	**0.194**	0.047	0.016
EW2	-0.136	**0.275**	0.053	0.031
EW3	-0.108	**0.235**	0.055	-0.062
EH1	-0.136	-0.052	**-0.187**	-0.155
EH2	-0.120	-0.040	**-0.249**	-0.141
EH3	-0.103	-0.059	-0.202	**-0.214**
ES1	-0.151	-0.103	**0.198**	-0.092
ES2	-0.160	-0.125	**0.222**	-0.079
ES3	-0.137	-0.112	**0.224**	-0.121
RW1	-0.116	**0.180**	-0.035	-0.172
RW2	-0.130	0.189	-0.030	**-0.205**
RW3	-0.125	0.191	-0.010	**-0.196**
RH1	-0.138	-0.028	**-0.219**	-0.112
RH2	-0.158	-0.047	**-0.193**	-0.111
RH3	-0.150	-0.050	**-0.219**	-0.108
RS1	-0.155	-0.059	0.105	**-0.190**
RS2	-0.155	-0.072	0.121	**-0.161**
RS3	**-0.151**	-0.068	0.118	-0.133
MW1	-0.135	**0.254**	0.048	0.128
MW2	-0.139	**0.249**	0.036	0.130
MW3	-0.125	**0.253**	0.035	0.140
MH1	-0.179	-0.085	**-0.199**	0.162
MH2	-0.171	-0.106	**-0.190**	0.163
MH3	-0.172	-0.102	-0.174	**0.185**
MS1	-0.160	-0.119	**0.186**	0.069
MS2	-0.158	-0.128	**0.188**	0.057
MS3	-0.158	-0.134	**0.209**	0.105

AW1	-0.139	**0.219**	0.040	0.169
AW2	-0.128	**0.206**	0.029	0.180
AW3	**-0.111**	0.097	-0.021	0.075
AH1	-0.178	-0.060	-0.166	**0.248**
AH2	-0.161	-0.059	-0.169	**0.271**
AH3	-0.159	-0.059	-0.129	**0.239**
AS1	-0.169	-0.117	0.131	**0.212**
AS2	-0.160	-0.110	0.125	**0.208**
AS3	-0.153	-0.108	0.129	**0.189**

Strongest loading of each item on a factor is bolded

CFA. Due to the usage of modified PERMA Profiler scales in the study that needed to be verified, the structural validity of the PERMA scales was examined using a series of CFA analyses. Existing theory and research of the original and workplace versions of the PERMA Profiler suggests that there tends to be a general pattern of each PERMA element within a given scale loading onto its' own factor (e.g., Khaw & Kern, 2014). However, in most of these studies at least two of the elements tend to load their items together onto a single factor, leading to 3-4 factor solutions more often than a clean 5-factor solution implied by the core PERMA model. It was hypothesized that the scales used in the present study would follow a similar trend to past research.

Using the lavaan (Rosseel, 2012) and factoextra (Kassambara & Mundt, 2020) packages in RStudio (RStudio Team, 2020), a series of confirmatory factor analyses (CFA) were conducted. CFA was used as it is an effective tool at seeing how the latent relationships across various items, in this case PERMA Profiler items, fit or do not fit some kind of preexisting model. The first of these analyses were conducted with the items from the home/non-work PERMA Profiler. Since the profiler includes 3 items for each element subscale, a 5-factor model was created in which the 3 items for each subscale were tied to their respective factors. The second CFA for the workplace PERMA Profiler was essentially the same, though instead the workplace items were used. The third CFA was conducted with the school PERMA items in the

same fashion as the other analyses described above. As the PERMA Profilers and the original PERMA model can be seen to imply a 5-factor model corresponding to each of the PERMA elements, these CFA analyses were used to test if the data from the present study fit these pre-existing models.

Non-work CFA. Fit indices for the non-work CFA model are presented in Table 13. After defining the 5-factor model, outputs with various fit indices were returned. The comparative fit index value (CFI) was 0.99, indicating very good fit overall. Root mean square error of approximation value returned at 0.038, indicating good fit. Each item was found to be statistically significantly loaded onto each of their respective factors defined at the beginning of the analysis, as shown in Table 14. That is, when imposing the 5-factor structure implied in PERMA theory onto the data collected through the modified home PERMA Profiler, the results suggest that the data fits the model to an acceptable degree.

Table 13. *Non-work PERMA CFA Fit Indices*

Fit Index	Value
Chi-Square (χ^2)	222.021
Degrees of Freedom (df)	80
p-value	<.001
Comparative Fit Index (CFI)	0.990
Tucker-Lewis Index (TLI)	0.986
Root Mean Square Error of Approximation (RMSEA)	0.038
90% CI for RMSEA	0.032–0.044
Standardized Root Mean Square Residual (SRMR)	0.027

Table 14. *Latent Variable Loadings for Non-work PERMA CFA*

Latent Variable	Indicator	Estimate	Standard Error	Standardized Estimate
phome	P_H1_1	1.000	—	0.925

phome	P_H1_2	1.003	0.021	0.898
phome	P_H1_3	0.987	0.024	0.834
ehome	E_H1_1	1.000	—	0.760
ehome	E_H1_2	1.085	0.042	0.809
ehome	E_H1_3	1.051	0.043	0.750
rhome	R_H1_1	1.000	—	0.825
rhome	R_H1_2	1.073	0.029	0.900
rhome	R_H1_3	1.006	0.028	0.872
mhome	M_H1_1	1.000	—	0.913
mhome	M_H1_2	1.018	0.021	0.904
mhome	M_H1_3	1.059	0.023	0.873
ahome	A_H1_1	1.000	—	0.923
ahome	A_H1_2	0.943	0.022	0.870
ahome	A_H1_3	0.744	0.025	0.708

Workplace CFA. Fit indices for the workplace PERMA CFA are presented in Table 15. For the workplace PERMA scale, the CFI was calculated at 0.983, indicating very good fit overall. The RMSEA value returned as 0.049, indicating good fit. Each item was found to be statistically significantly loaded onto each of their respective factors defined at the beginning of analysis, as shown in Table 16. That is, when imposing the 5-factor structure implied in PERMA theory onto the data collected through the modified work PERMA Profiler, the results suggest that the data fits the model to an acceptable degree.

Table 15. *Workplace PERMA CFA Indices*

Fit Index	Value
Chi-Square (χ^2)	319.410
Degrees of Freedom (df)	80
p-value	<.001
Comparative Fit Index (CFI)	0.983
Tucker-Lewis Index (TLI)	0.978
Root Mean Square Error of Approximation (RMSEA)	0.050
90% CI for RMSEA	0.044–0.055
Standardized Root Mean Square Residual (SRMR)	0.033

Table 16. *Latent Variable Loadings for Workplace PERMA CFA*

Latent Variable	Indicator	Estimate	Standard Error	Standardized Estimate
pwork	P_W1_1	1.000	—	0.930
pwork	P_W1_2	0.955	0.020	0.886
pwork	P_W1_3	0.969	0.022	0.852
ework	E_W1_1	1.000	—	0.641
ework	E_W1_2	1.664	0.064	0.940
ework	E_W1_3	1.395	0.063	0.743
rwork	R_W1_1	1.000	—	0.780
rwork	R_W1_2	1.148	0.035	0.905
rwork	R_W1_3	1.057	0.034	0.845
mwork	M_W1_1	1.000	—	0.936
mwork	M_W1_2	1.020	0.017	0.941
mwork	M_W1_3	0.897	0.021	0.832
awork	A_W1_1	1.000	—	0.920
awork	A_W1_2	0.914	0.024	0.870
awork	A_W1_3	0.429	0.024	0.485

School CFA. Fit indices for the school PERMA CFA are presented in Table 17. For the school PERMA scale, the CFI was calculated at 0.989, indicating very good fit overall. The RMSEA value returned as 0.041, indicating good fit. Each item was found to be statistically significantly loaded onto each of their respective factors defined at the beginning of analysis, as shown in Table 18. That is, when imposing the 5-factor structure implied in PERMA theory onto the data collected through the school PERMA Profiler, the results suggest that the data fits the model to an acceptable degree.

Table 17. *School PERMA CFA Indices*

Fit Index	Value
Chi-Square (χ^2)	247.032
Degrees of Freedom (df)	80
p-value	<.001
Comparative Fit Index (CFI)	0.989
Tucker-Lewis Index (TLI)	0.985
Root Mean Square Error of Approximation (RMSEA)	0.041
90% CI for RMSEA	0.036–0.047

Standardized Root Mean Square Residual (SRMR)	0.025

Table 18. Latent Variable Loadings for School PERMA CFA

Latent Variable	Indicator	Estimate	Standard Error	Standardized Estimate
pschool	P_S1_1	1.000	—	0.917
pschool	P_S1_2	1.051	0.020	0.922
pschool	P_S1_3	1.019	0.021	0.887
eschool	E_S1_1	1.000	—	0.778
eschool	E_S1_2	1.232	0.038	0.886
eschool	E_S1_3	1.213	0.042	0.799
rschool	R_S1_1	1.000	—	0.849
rschool	R_S1_2	1.154	0.030	0.907
rschool	R_S1_3	1.076	0.030	0.835
mschool	M_S1_1	1.000	—	0.899
mschool	M_S1_2	1.014	0.023	0.899
mschool	M_S1_3	0.977	0.025	0.830
aschool	A_S1_1	1.000	—	0.905
aschool	A_S1_2	0.999	0.023	0.893
aschool	A_S1_3	0.930	0.025	0.809

In summary, when each scale is examined separately, the 5-factor PERMA model seems to fit quite well and to nearly the same extent. This suggests that the modified profilers used in the pilot study behave as expected from the PERMA model they were originally derived from, despite having been made to be measuring two different and separate contexts. Therefore, this provides evidence to suggest that measuring well-being with the PERMA model across separate contexts within the same sample is possible. Further, the PCA results suggest that the PERMA items represent a multifactor construct with items that, although strongly interrelated in a positive direction as seen in the correlational analyses, do seem to measure different things.

The external validity of the context-specific versions of the PERMA scales.

In order to assess the convergent and divergent validity of the different elements of well being across different contexts, correlations between each of the subscales of the PERMA scales

in each context against a number of outcome measures, including satisfaction with life, mental health symptoms and workplace performance were calculated. Results are summarized in Tables 10, 11 and 12 (home, work and school respectively) and discussed in detail below.

The results of the correlation analysis between each contextual PERMA subscale and the outcome measures are presented in Table 19. The correlation coefficients indicate that each PERMA element measured in the home context displayed a significant positive relation to SWLS and work performance scores and a significant negative relation to DASS-21 scores. That is, higher levels of PERMA elements were associated with higher levels of satisfaction with life and work performance and lower levels of mental health symptoms. Results also showed that all coefficients indicated low to moderate associations (e.g., no lower than 0.10 and no higher than 0.50) associations among the home PERMA subscales and the outcome measures according to Cohen's (1988) conventions for interpreting correlation coefficients.

Table 19. *Correlations for contextual PERMA variables and outcome variables*

	Satisfaction with Life	DASS-21	Work Performance
Home-P	0.49**	-0.46**	0.14**
Home-E	0.24**	-0.20**	0.17**
Home-R	0.39**	-0.26**	0.20**
Home-M	0.50**	-0.41**	0.16**
Home-A	0.46**	-0.34**	0.23**
Work-P	0.27**	-0.19**	0.33**
Work-E	0.18**	-0.05	0.32**
Work-R	0.21**	-0.13**	0.33**
Work-M	0.22**	-0.12**	0.30**
Work-A	0.22**	-0.14**	0.36**
School-P	0.41**	-0.37**	0.08**
School-E	0.27**	-0.18**	0.09**
School-R	0.31**	-0.24**	0.09**
School-M	0.34**	-0.23**	0.14**
School-A	0.43**	-0.39**	0.17**

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

The correlation coefficients for the workplace PERMA subscales indicate that each PERMA element measured in the work context, except for engagement, displayed a significant positive relation to SWLS and work performance scores and a significant negative relation to DASS-21 scores. That is, higher levels of PERMA elements were associated with higher levels of satisfaction with life and work performance and lower levels of mental health symptoms. The only exception was the engagement subscale, which had no significant relation to DASS-21 scores. Results also showed that all significant coefficients indicated low to moderate associations (e.g., no lower than 0.10 and no higher than 0.50) associations among the work PERMA subscales and the outcome measures according to Cohen's (1988) conventions for interpreting correlation coefficients.

The correlation coefficients for the home PERMA subscales indicate that each PERMA element measured in the school context displayed a significant positive relation to SWLS and work performance scores and a significant negative relation to DASS-21 scores. That is, higher levels of PERMA elements were associated with higher levels of satisfaction with life and work performance and lower levels of mental health symptoms. Results also showed that all coefficients indicated low to moderate associations (e.g., no lower than 0.10 and no higher than 0.50) associations among the school PERMA subscales and the outcome measures according to Cohen's (1988) conventions for interpreting correlation coefficients. The only exceptions to this pattern were the WPI coefficients, which displayed small relations to positive emotion, engagement and relationships at school.

To summarize, most of the PERMA subscales, work, home and school, displayed evidence of convergent and divergent validity with the outcome measures. That is, higher levels of the PERMA elements were associated with higher levels of satisfaction with life and work

performance (convergent validity) and lower levels of mental health symptoms (divergent validity). The only exception to this was the work engagement subscale which did not have a significant relation to DASS-21 scores, though the home and school versions of the subscale did.

Discrepancies. In addition to examining the relation between PERMA scales and the various outcome measures, discrepancies among the PERMA scales within each context and between the contexts were included in a series of correlation analyses. To reiterate, four discrepancy variables were calculated. Three Within Context Discrepancy scores (WCD) were calculated, one for each contextual scale (e.g., work, home and school). For each context that a Profiler measures well-being within, its respective WCD score represents the level of discrepancy between the elements of well-being that were measured. The WCD score was calculated by taking each of the five PERMA subscale scores within a context and calculating the total absolute difference between each value. This was done for the home, work and school scales. One Between Context Discrepancy score (BCD) was also calculated by determining the absolute differences between each work, home and school PERMA Profiler's subscales and then summing that total of the five absolute difference scores that were created for each PERMA element overall (e.g., (P at home – P at work) + (P at home – P at school) + (P at work – P at school), repeated for each element). This led to one BCD score that represents the overall discrepancy between the levels of well-being experienced across work, home and school contexts.

The results of an intercorrelation analysis between the four discrepancy measures and the outcome measures are summarized in Table 20. It was expected that each type of discrepancy would be negatively related to the SWL and WPI outcome measures and positively related to the DASS-21 scale scores. Results indicated that each type of discrepancy was significantly

negatively correlated with SWL. Conversely, each type of discrepancy was positively correlated with DASS-21 scores. That is, higher levels of discrepancy among PERMA pillars, either between or within contexts, were associated with higher levels of mental health symptoms and problems at work while also being associated with lower levels of satisfaction with life. Work performance scores were not significantly associated with any of the discrepancy metrics, aside from within school discrepancy which had a small but significant positive correlation with work performance scores.

Table 20. *Correlations for discrepancy variables and outcome variables*

	Satisfaction with Life	DASS-21	Work Performance
Within Home	-0.37**	0.30**	-0.03
Within Work	-0.13**	0.11**	-0.02
Within School	-0.10**	0.10**	0.06*
Between Context	-0.20**	0.15**	-0.02

*$p < .05$, **$p < .01$, *all discrepancy scores are calculated using absolute differences*

These results suggest that larger absolute differences between PERMA elements either within or across contexts are associated with higher levels of mental health problems and lower levels of satisfaction with life. Work performance did not seem to be influenced by discrepancy levels in this sample. It is important to note that the discrepancy values are absolute, which means that either direction of difference, positive or negative, between the PERMA scales within or across contexts was associated with the patterns indicated above.

Dominance analysis (DA). To examine the relative importance of each PERMA element, three DAs were conducted. One analysis for each outcome variable (i.e., satisfaction with life, DASS-21 scores, workplace performance) using all 3 versions of each PERMA Profiler subscale as predictors (15 predictors total). These DAs provided the information necessary to rank order the importance of each PERMA element as predictors of each outcome variable. DA calculates an R^2 value, a numerical representation of how much variance a variable predicts in a statistical model,

for every possible combination of predictors in relation to an outcome variable (Azen & Budescu, 2003) and then determines if a predictor has more predictive power compared to another predictor in every possible subset model and the model in which every predictor is present. This would mean that the predictor variable, on its own or in the presence of any/every other predictor accounts for more explained variance in outcome scores no matter the model/solution. This result would indicate that the predictor has displayed complete dominance over the other predictors, also implying that it has achieved conditional and general dominance.

For the following paragraphs, the various predictors will be represented by two letters, with the first representing a PERMA element and the second indicating the context that the element was measured in. For example, PH would refer to positive emotion at home while AS would refer to achievement at school. The average R^2 contributions of each PERMA element measured in the work, home and school context when predicting satisfaction with life are presented in Table 21. When predicting SWL, results from the predictor comparisons for complete dominance indicated that PH dominated the most predictors and had the highest average R^2 contribution, followed by MH and AS. PH dominated EH, RH, all the workplace predictors and all the school predictors except for AS. MH dominated RH, AH, all the workplace predictors, ES and RS. AS dominated EH, all the workplace predictors, ES, RS and MS. In other words, when predicting SWL, positive emotion and meaning measured outside of work and school contexts in addition to achievement measured in the school context were relatively the most important predictors. Generally, the workplace items were relatively unimportant for predicting SWL.

The average R^2 contributions of each PERMA element measured in the work, home and school context when predicting mental health symptoms are presented in Table 21. When

predicting depression, anxiety and stress through the DASS-21, results from the predictor comparisons for complete dominance indicated that PH dominated the most predictors and had the highest average contribution, followed by MH and PS. PH dominated all the other predictors. MH dominated EH, RH, AH, RS, MS, AS and all the workplace predictors except for PW and EW. PS dominated RH, RW, MW, AW, ES, RS and MS. In other words, when predicting depression, anxiety and stress levels, positive emotion at home, at school and meaning at home were relatively the most important predictors. In particular, PH was clearly the most dominant predictor over every other possible predictor. Generally, the workplace items were relatively unimportant for predicting depression, anxiety and stress.

The average R^2 contributions of each PERMA element measured in the work, home and school context when predicting workplace performance are presented in Table 21. When predicting workplace performance, results for the predictor comparisons for complete dominance indicated that AW dominated the most predictors and had the highest average contribution, followed by RW and PW. AW dominated all other predictors. RW dominated all the home predictors, all the school predictors and MW. PW did not demonstrate complete dominance over any other predictors, only general and conditional dominance which are not displayed. In other words, when predicting workplace performance, achievement, relationships and positive emotion at work were relatively the most important predictors. In particular, achievement at work was clearly the most dominant predictor over every other possible predictor. Generally, the home and school predictors were relatively unimportant for predicting workplace performance.

The patterns seen in Table 21 suggest several things. First, positive emotion measured outside of work and school is, relatively, a very important predictor for most outcomes relating to well-being and the presence of mental health related issues like depression, anxiety and stress

levels. Second, PERMA pillars measured specifically in the workplace context are relatively unimportant for predicting wellbeing and DASS symptoms, at least in a student sample. Third, when the outcome is workplace specific, the workplace PERMA predictors become much more important relative to PERMA predictors measured in other contexts for predicting outcomes like workplace performance. This final point also suggests that the participants were able to differentiate their levels of PERMA across contexts; at least enough that a dominance analysis approach was able to detect a relative difference in predictive power across outcomes.

Table 21. *Average R^2 Contribution of PERMA Elements Across Outcomes*

Predictor	DASS-21 Contribution	SWL Contribution	WPI Contribution
PH	0.088	0.071	0.002
MH	0.051	0.063	0.004
PS	0.043	0.035	0.003
AH	0.022	0.045	0.012
AS	0.018	0.047	0.005
PW	0.010	0.016	0.026
RH	0.011	0.032	0.008
AW	0.002	0.005	0.042
RW	0.002	0.005	0.033
EW	0.007	0.004	0.026
MS	0.008	0.018	0.003
MW	0.002	0.006	0.019
EH	0.008	0.011	0.006
RS	0.008	0.013	0.003
ES	0.009	0.011	0.001

Random Forests. To explore the added predictive utility of the within and between discrepancy scores for various outcomes, a series of random forests analyses were conducted. Random forests analysis is a machine learning approach that is useful for model testing with strongly interrelated predictors when examining the relative importance of those predictors (Mizumoto, 2022), much like the PERMA subscales seen in the present study. Multicollinearity is associated with model overfitting, a situation in which model testing analysis provides a final

model result that, although usually significant, is capturing the idiosyncrasies of the dataset being used rather than the underlying relationships between the predictors and outcomes that we actually want to understand (Hawkins, 2004). Essentially, the results become hyper specific to the sample and cannot be generalized to the population of interest.

Random forests analysis was also used to verify the results of the dominance analyses seen above, an effective use of it as illustrated by Mizumoto (2022). Although DA is an effective approach for examining relative predictor importance, it does not have many ways to explicitly address model overfitting when multicollinearity is present. Random forests analysis involves random sampling of predictors at various stages in subset models that then have their results aggregated. This is a type of cross-validation approach in which the full dataset is split randomly into smaller parts to see how the overall model performs across various groups of participants. Further, by using the Boruta package in RStudio (Kursa & Rudnicki, 2010; RStudio Team, 2020), it is possible to supplement random forests analysis with a full cross-validation approach that the random forests cross-validation is nested within, making the overfitting issue less impactful.

By including each PERMA subscale from each context and the discrepancy variables into a series of random forests analysis, the relative importance of the PERMA elements in predicting outcomes can be assessed in tandem with the added predictive utility of the discrepancy metrics. This is because random forests analysis provides detailed information on the relative predictive performance of predictors while also being explicit if any are deemed unimportant in the overall model after aggregation of cross-validated results.

The results of a random forests analysis of PERMA and discrepancy predictor performance for predicting SWL scores are presented in Table 22. All predictors were deemed

important. Positive emotion, meaning and achievement both in school and at home were relatively more important for predicting SWL than any of the work PERMA items, replicating the results seen in the dominance analyses. Discrepancy across PERMA elements in the home context was a relatively important predictor overall in the model while the other discrepancy metrics were not.

Table 22. *SWL Random Forests Analysis Results*

	Mean Importance	medianImp	minImp	maxImp	normHits	decision
P home	25.39	25.32	22.64	27.88	1.00	Confirmed
M home	23.20	23.16	21.16	25.60	1.00	Confirmed
A school	18.05	18.04	15.30	20.37	1.00	Confirmed
P School	15.81	15.84	13.68	18.28	1.00	Confirmed
A home	15.18	15.16	12.52	17.86	1.00	Confirmed
Within home discrep	13.56	13.55	11.07	15.72	1.00	Confirmed
R home	11.90	11.88	9.46	15.04	1.00	Confirmed
M School	9.90	9.92	7.59	12.47	1.00	Confirmed
P work	7.63	7.56	5.46	9.84	1.00	Confirmed
Between discrep	6.08	6.12	3.54	8.31	1.00	Confirmed
R school	5.38	5.38	2.85	8.34	1.00	Confirmed
A work	4.41	4.44	1.83	7.01	0.95	Confirmed
E school	4.11	4.15	2.04	6.41	0.94	Confirmed
E home	4.02	4.03	1.17	6.45	0.90	Confirmed
R work	3.97	3.89	1.43	6.80	0.92	Confirmed
E work	3.28	3.24	0.57	5.76	0.80	Confirmed
M work	2.79	2.78	0.21	6.22	0.63	Confirmed
Within school discrep	2.71	2.69	0.05	5.37	0.65	Confirmed
Within work discrep	2.63	2.60	0.37	5.18	0.63	Confirmed

The results of a random forests analysis of PERMA and discrepancy predictor performance for predicting DASS-21 scores are presented in Table 23. All predictors were deemed important except for within school and work discrepancy which were considered

tentative. This means that, when interpreting the confidence intervals, they may not be important predictors in the model. Positive emotion, meaning and achievement in the home and school contexts were relatively the most important predictors, with positive emotion at home being a very important predictor. Again, these results were mostly in line with what was seen in the dominance analyses. Discrepancy across PERMA elements in the home context, again, was a relatively important predictor in the model, with between context discrepancy being somewhat important.

Table 23. *DASS-21 Random Forests Analysis Results*

	Mean Importance	medianImp	minImp	maxImp	normHits	decision
P home	28.92	28.86	25.99	33.26	1.00	Confirmed
M home	17.39	17.34	14.97	20.12	1.00	Confirmed
P School	15.02	15.02	12.60	17.35	1.00	Confirmed
A school	10.24	10.24	6.56	12.88	1.00	Confirmed
A home	9.72	9.79	7.24	12.39	1.00	Confirmed
Within home discrep	9.10	9.01	6.38	12.48	1.00	Confirmed
P work	7.65	7.71	4.88	9.72	1.00	Confirmed
Between discrep	6.55	6.57	3.85	9.28	1.00	Confirmed
R home	5.46	5.39	2.59	8.82	0.99	Confirmed
R work	5.25	5.26	2.58	7.48	0.98	Confirmed
R school	5.18	5.15	1.60	8.19	0.97	Confirmed
E school	5.16	5.18	2.56	7.33	0.97	Confirmed
E home	4.74	4.84	2.58	7.41	0.97	Confirmed
E work	4.02	4.06	1.80	6.92	0.90	Confirmed
M School	3.71	3.69	0.78	6.08	0.86	Confirmed
A work	3.61	3.72	0.58	6.19	0.84	Confirmed
M work	2.76	2.77	-0.02	5.62	0.62	Confirmed
Within school discrep	2.60	2.75	0.02	5.10	0.53	Tentative
Within work discrep	2.14	2.19	-0.65	4.56	0.47	Tentative

The results of a random forests analysis of PERMA and discrepancy predictor performance for predicting WPI scores are presented in Table 24. Engagement at home was considered unimportant and both engagement and relationships at school were labelled as

tentative. In the case of predicting work performance, PERMA elements at work were clearly the most important predictors compared to the same elements measured at home or school, similar to the dominance analyses. Further, discrepancies across PERMA elements in the workplace context were relatively important, achieving similar levels of relative importance to the workplace PERMA elements.

Table 24. *WPI Random Forests Analysis Results*

	Mean Importance	medianImp	minImp	maxImp	normHits	decision
A work	14.10	14.16	10.30	16.98	1.00	Confirmed
R work	11.22	11.26	8.99	14.04	1.00	Confirmed
Within work discrep	10.82	10.78	8.59	13.35	1.00	Confirmed
P work	9.31	9.28	7.14	12.06	1.00	Confirmed
E work	8.12	8.05	5.48	11.31	1.00	Confirmed
M work	7.52	7.56	3.47	10.70	1.00	Confirmed
Between discrep	4.82	4.79	2.03	7.00	0.97	Confirmed
A home	4.59	4.50	2.00	7.60	0.96	Confirmed
M school	4.16	4.15	0.45	6.62	0.91	Confirmed
R home	4.04	4.05	0.82	6.71	0.92	Confirmed
P home	3.89	3.88	1.21	7.12	0.88	Confirmed
Within home discrep	3.74	3.76	0.87	5.86	0.89	Confirmed
M home	3.51	3.59	1.14	6.24	0.86	Confirmed
A school	3.21	3.24	0.61	6.03	0.78	Confirmed
Within school discrep	3.03	3.06	0.33	6.11	0.76	Confirmed
P school	3.03	3.02	0.35	6.04	0.72	Confirmed
R school	2.31	2.33	-0.62	5.37	0.53	Tentative
E school	1.97	1.95	-0.37	4.34	0.42	Tentative
E home	1.86	1.88	0.26	4.03	0.07	Rejected

To summarize, there seems to be different patterns of how important various PERMA elements are depending on the outcome being measured and the context within which the PERMA element was measured. Similarly, the discrepancy metrics did seem able to provide at least some added predictive value, though this also depended on the outcome in question.

Discussion

The purpose of the present study was threefold. First, a PERMA measurement approach that assessed PERMA elements across 3 contexts (work, home, school) was validated. Second, the relative importance of the PERMA elements as predictors of important outcomes was assessed, incorporating the various contextual versions of each element. Third, the discrepancies seen across the PERMA elements were also assessed in terms of relative importance compared to the PERMA element scales the discrepancy scores were derived from. To summarize, the results indicated that the contextual measurement approach was effective for the PERMA elements, suggesting that participants can differentiate between how much they get of each PERMA element across work, home and school contexts. Regarding relative importance, various patterns of relative importance between the PERMA elements were found that differed significantly depending on the outcome and context in question. Finally, although not always strong predictors, the discrepancy between PERMA elements within contexts was a consistently strong predictor of outcomes relative to the PERMA elements themselves.

Measurement. Due to the modifications to the original PERMA Profiler to be context specific and the usage of three different PERMA Profilers within the same sample, many psychometric issues needed to be addressed. The modified profilers, school items included, all displayed expected convergent and divergent validity with each other and the outcome measures. Further, structural analysis shown through the CFA and PCA results indicated that the factor structure and item loadings of the profilers followed a general pattern implied by the overall PERMA model. However, although the CFA results confirmed a good fit to the 5-factor PERMA model in the case of each contextual scale, only a 4-factor solution was returned in the PCA results. This is not unexpected, as past research has shown that a pure 5-factor solution is not always the case when

using the PERMA Profilers (e.g., Ryan et al., 2019; Kern et al., 2015; Cabrera & Donaldson, 2024). Furthermore, the loadings of the items on each factor in the PCA analysis showed relatively minimal cross-loading and did show distinct groupings of items based on context. Multicollinearity is always going to be a factor when dealing with PERMA measurement due to the interrelated nature of the elements. Overall, the results suggest that the PERMA Profilers used in the present study are valid and reliable instruments for measuring their intended constructs of interest, though the measurement issues seen in past research with these scales persist.

In addition, the issue of measuring well-being across distinct contexts (e.g., work, home, school) in general was also addressed. The results of the PCA summarized above and the distinct patterns of results seen in model testing that will be addressed in detail below suggest that there is enough difference between the contextual PERMA scales to show a difference in loadings on latent factors and differences in relative predictive importance for various outcomes. This suggests that the participants were able to differentiate between their levels of each element across contexts enough for these results to be discovered. This measurement invariance across contexts replicates similar findings from Rice (2024) and provides additional support for the usage of multiple contexts when measuring well-being and gives insight into how humans experience well-being elements across the various contexts within which they spend their lives. This also expands upon the multifactorial nature of PERMA as the PERMA items loaded on to distinct factors according to element and context rather than just element.

Relative importance. From a relative importance perspective and based off the overall patterns seen in the model testing results, it seems that there is no clear “best” combination of PERMA elements for a wide range of outcomes, though generally positive emotion seems to play a large

role, though not always as seen in the case of the WPI models. The relative importance results in the random forests analysis seem to generally follow the pattern seen in the dominance analyses. Specifically, the home and school PERMA elements become far less important than the workplace elements when examining workplace performance, with the opposite being true when predicting mental health symptoms or overall life satisfaction. From a theoretical perspective, this suggests that there are different pathways to positive outcomes associated with PERMA, with context and the outcome in question being important distinctions to make. Unless one can guarantee high levels across each element and all contexts no matter what, which is likely unrealistic in most cases, it may be best to focus on specific combinations of elements and contexts depending on the end goal of the individual who is exploring these pathways to flourishing. However, this matters much less for overall mental health and well-being as measured through SWL. In these cases, a less specific approach to promoting elements may be appropriate, though positive emotion stands as a stronger predictor of these outcomes compared to the other elements.

Added value of discrepancy and context. Results of the discrepancy metrics were mixed. On one hand, random forests analysis did provide some evidence of relative importance for the discrepancy metrics, though mainly the context specific ones. This suggests that, at least for the outcomes examined in our student sample, discrepancy within contexts matters more than between. Overall, discrepancy across PERMA elements within a context was important in predicting outcomes that are directly related to that context. For example, when predicting workplace performance, within context discrepancy at work was ranked highly in relative importance while the home and school discrepancy metrics did not. For satisfaction with life and mental health symptoms, within context discrepancy at home was ranked highly instead. Further,

the correlation results also indicated that higher levels of discrepancy, in either the positive or negative direction since only absolute values were used to calculate discrepancy scores, were associated with lower SWL and higher degrees of mental health symptoms. Implications of these results are discussed below. Although the usage of these discrepancy metrics may or may not be useful in all cases, the concept of discrepancy seems to be very important for understanding well-being, especially with the addition of multiple contexts.

When random forests analysis is used with multiple contexts for the PERMA elements and with multiple outcomes instead of just quantifying discrepancy and using it as a new variable, random forests analysis examines the discrepancy in predictive power across the various PERMA scales, within and across contexts. Relative importance analyses like random forests combined with the contextual measurement approach allows for these questions of discrepancy in predictive power to be examined in depth. This suggests that, although individual discrepancy metrics may only sometimes be useful to incorporate, the concept of discrepancy can apply to predictive power differences across elements, contexts and outcomes all within the same sample. That is, the discrepancies in how important certain PERMA elements are based on the outcome in question, the context that the element was measured within and the context that the outcome is most associated with seem to be meaningful enough to provide added value to our understanding of well-being.

Implications

Measurement. As explained prior, the present study, in addition to the results seen in Rice (2024), suggest that the same PERMA elements can be meaningfully measured as separate constructs across contexts. Participants are seemingly able to differentiate enough between how they experience the elements across various contexts in a way that leads to measurement

invariance, and in the case of the present study, various patterns of relative importance depending on context. The existence of context-specific measures of PERMA like the Workplace PERMA Profiler (Kern, 2014) always implied that well-being elements were able to be measured across contexts, but to date the literature has minimal examples of explicit investigations into this subject. From a theoretical perspective, it may be effective to avoid making assumptions regarding the cognitive ability that people have to differentiate between various well-being elements, contextually or otherwise. More investigations into the fundamental ways in which people are able to evaluate their well-being may be warranted rather than establishing additional models or scale validations.

Relative importance. We suggest that maximizing all PERMA elements should not necessarily be the goal of well-being interventions. Our results indicated that, depending on the context or outcome in question, some PERMA elements are potentially much less important than others. For example, if an employer wishes to foster PERMA elements in their workplace for the purposes of increasing individual employee performance, elements like achievement could be much more impactful compared to ones like meaning, at least in a part-time context as seen in the participants of our study. Building off of the maximization issue, these patterns of relative importance that can inform PERMA interventions to be more efficient are only observable if context is added in to the assessment process. Our results showing that the same PERMA elements could have wide differences in predictive importance depending on their respective context attest to this. This also means that PERMA interventions may want to shift their focus to fostering the elements within specific contexts if possible or necessary.

Discrepancy. From a discrepancy perspective, it is important to note that the discrepancy values, between or within contexts, were calculated as absolute values. This means that there was not an

opportunity to examine how the direction of discrepancy impacted the results. However, the fact that there was always one within context discrepancy metric ranked highly for predictive importance in each random forests model, this WCD score always outperformed the single BCD score in predictive power, and discrepancy was associated with negative outcomes has several implications. First, depending on the outcome in question, discrepancy seen across the PERMA elements may only matter if it occurs in specific contexts. Based on what was seen in the present study, undergraduate students may not feel particularly impacted by discrepancy in their well-being elements at work in terms of mental health, but discrepancy in the home context can matter quite a bit. Balancing the elements may be worth doing, but attempting to do this balancing across a wide range of contexts may not make as much sense for those designing interventions.

Second, the fact that discrepancy could rank highly in importance at all, in any form, provides some support for the idea that seeking a balance between the elements, perhaps even maximizing them, is good practice. The issue though is that based on the first implication listed above, one may need to have a clear understanding of how well-being is experienced across various contexts in order to engage in this balancing process effectively.

Third, and perhaps most significant, is that discrepancy calculated between contexts, that is the overall difference seen between the same PERMA elements across work, home and school contexts, was consistently lower in importance across all the models calculated in the present study. Although it still had some degree of significant predictive importance, this result brings up large questions regarding how concepts like work/life balance are discussed. If discrepancy between contexts, in whatever direction, are generally not the most important variables to consider when focusing on the well-being of an individual, this implies that there could be significant flexibility in what sources of well-being a person gets from work versus school versus

home with them still being able to achieve positive outcomes. How this flexibility can be expressed and what impact it has, or does not have, on various outcomes will require additional research and creative measurement approaches, but the idea that people need even sources of well-being across their lives is not being supported by the current research.

Limitations and future directions. It is important to note how the nature of the sample used in this study limits generalizability. The sample consisted of undergraduate students who are working, at most, in a part-time capacity. This makes any generalizations to the broader working population, especially full-time workers, inherently limited. Another sampling issue is that the majority of the participants identified as white women in the age ranges associated with most undergraduates. Similar to the point made above, this is not representative of the broader working population. Future studies should aim to use the context-discrepancy approach with varying populations. Full time workers are an obvious choice, though so long as there are multiple contexts to incorporate then there are many opportunities for other populations to be explored. Home, work, and school may not be the best representations of the contexts that someone experiences the various PERMA elements through. It will be up to researchers to determine what other contexts, and therefore discrepancies, are worth exploring.

Another limitation of the present study is the usage of self-report measurement. Authors like Diener (2009) have recommended the usage self-report measurement in tandem with multiple informants when conducting well-being research as an important methodological advancement. The usage of context and discrepancy in the present study were intended as methods to address analytical issues in PERMA research, so this same critical view should apply to the present study as well. A longitudinal study would be another methodological change that could raise the quality of the data as well. On a related note, the present study collected purely

cross-sectional results, another common issue in well-being research that does not allow for causation to be established.

Chapter 7: General Discussion

At the start of this dissertation, I brought up the process of finding the "good life" of well-being that we all seem to participate in to some extent. We want to maximize what is good for us and our sense of well-being, which is no simple process, as what makes something beneficial can seemingly depend on many factors. Think back to the times when your search for hedonistic pleasures backfired and impacted the other important areas of your life. Conversely, recall the times when your desire to feel accomplished or live a meaningful life hampered your ability to feel pleasure in the moment. While these ideas are well-established, I aimed to explore questions in this dissertation that go beyond the hedonic-eudaimonic distinction.

If we know that well-being is made up of multiple elements, like the PERMA model, what do the inevitable discrepancies between these elements mean for our overall understanding of the "good life"? Are discrepancies always negative and therefore we all need is to be maximizing well-being elements to achieve some sort of balance? I doubted this, since humans lead lives of inconsistencies and constant change and yet seemingly find ways to be happy anyways. When we bring the various contexts that we spend our lives within, like work, school and private life, into the conversation things get even more confusing. What patterns of well-being can I see across contexts, how are these different contexts acting as different sources or avenues of well-being and what do all these patterns tell me about how well-being is experienced and fostered? In this dissertation I aimed to explore these unanswered questions. To do this, I reviewed the existing literature on well-being, identified the lack of information on how context and discrepancy inform

our understanding of well-being and conducted two studies that developed a novel measurement and analytical approach that I used to deepen our current understanding of what well-being is.

My dissertation had four objectives:

1. Review existing research on well-being and its' historical roots to identify gaps in the current approaches to researching well-being (Chapter 1).
2. Develop a novel, contextually specific well-being measurement approach and a corresponding analytical approach that addresses gaps in existing literature (Study 1; Chapter 4)
3. Expand upon existing well-being research by exploring how the importance of various well-being factors changes based on context and the presence of other well-being factors (Study 2; Chapter 5)
4. Propose a new direction that well-being research can take based on my research and discuss relevance for researchers, practitioners, and policy makers (General Discussion; Chapter 6)

In this section, I will review my findings throughout the various chapters of this dissertation and determine if my objectives were met. I will then discuss how my findings can inform theory, practice and policy on well-being.

The purpose of these studies was to expand, examine and test elements of the existing PERMA theoretical models of well-being through the inclusion of concepts like context and discrepancy. Specifically, I went about modifying and validating new contextually specific PERMA measures and calculating various discrepancy metrics. First, these were used to explore the relative importance of various PERMA elements for several outcomes, a topic that has been

largely ignored in past studies. Second, the role of discrepancy across PERMA elements within and across contexts was also explored. In the second point, I was specifically interested in whether or not discrepancy metrics added any predictive value above and beyond the PERMA scores they were derived from. This series of studies has addressed long-existing gaps in the current literature and the findings have revealed a number of important distinctions about PERMA/well-being theory that were not previously available.

Summary of Findings and Relevance to Existing Literature

I have oriented the general discussion around five key findings from the two studies. For each of these findings, I discuss the implications of these findings for theory, method and practice or policy.

Finding 1: Measuring well-being across contexts

Evidence. The studies outlined in this dissertation are some of the first (Rice, 2024) sources of evidence suggesting that well-being elements can be measured across contexts (e.g., home, work, school). Existing research has shown that the PERMA Profiler and Workplace PERMA Profiler, when both given to participants, display evidence of measurement invariance with each other (Rice, 2024). This supports the notion that each PERMA element can be measured in a different context with meaningful differences. Participants seem to experience these elements differently enough across contexts and are able to differentiate enough to lead to this measurement invariance. Across both studies in my dissertation, correlation coefficients were noticeably higher within contexts than between. That is, PERMA elements within a context, like home, were almost always more strongly correlated with other elements within that context compared to elements within another context, like school or work. The PERMA elements also

seemed to be more or less correlated with various outcomes depending on what context they were measured in. For example, correlation coefficients between work performance scores and the workplace PERMA elements ranged from 0.30 to 0.36 while the coefficients between home PERMA elements and the same outcome scores ranged from 0.14 to 0.20 while the school element coefficients ranging from 0.08 to 0.17. These inconsistencies across correlation coefficients for the same elements measured across different contexts suggest that they represent different constructs.

Factor analysis results also generally support the claim that PERMA well-being elements can be measured across contexts like home, work and school. Confirmatory factor analysis results for each contextual PERMA scale yielded CFI and RMSEA values that indicated good fit. Principal components analysis, which did not impose factor structure a-priori, yielded a 4-factor solution. Many of the items tended to load onto these factors based on context and sometimes element, while not completely in line with the 5-factor model implied by PERMA. For example, the achievement items, regardless of context, tended to load on to factor 4 with around half of the relationship items. Overall, CFA results support the generalizability of the factor structure while PCA results are less clear. Future research examining higher order factor structures within the PERMA model may help to explore inconsistencies with PERMA theory and exploratory factor analysis and PCA results.

Model testing results also support the claim that PERMA well-being elements can be measured across contexts in a meaningful way. The variety of patterns seen in the relative importance analyses could only be possible if the contextual PERMA scales did truly measure distinct constructs. As an example of this, refer to the rankings seen in the random forests analyses. Compared to how they predicted SWLS scores and DASS-21 scores, workplace

PERMA elements were far more important in predicting workplace performance scores. This is an example of a meaningful difference in predictive power based on the context that a well-being element was measured in. Overall, the results of each study support the claim that PERMA elements can in fact be measured across contexts within the same sample. Participants were seemingly able to differentiate between how much of a PERMA element they were experiencing across work, home and school contexts.

Theory implications. The implications of PERMA elements being measurable across contexts simultaneously are significant. From a theoretical perspective, well-being elements should be understood as constructs that are rooted in contexts with meaningful implications on outcomes related to these contexts. This is what is implied, in my view, by Seligman's descriptions of PERMA (Seligman, 2013), even if not stated explicitly. As described earlier in this dissertation, a major advancement in the study of well-being occurred when researchers moved towards multi-factor models of well-being. Instead of just adding in more factors, adding in new dimensions or "lenses" to examine existing well-being elements through, like context, deepens our overall understanding of well-being by giving us access to new questions. For example, if we can reliably measure well-being elements across work, home and school, what other contexts can these elements be measured within in a meaningful way? If we start making these comparisons, how are other theoretical frameworks, such as research on work/life balance impacted? Some of these questions will be expanded upon below, but the main point to make here is that these questions are not possible unless context is added as a dimension to well-being research. For example, it is not possible to ask the question "What matters more, feeling positive emotions at home or at work?" unless well-being elements like positive emotion are measured across contexts in the first place. The primary focus of this dissertation was to explore the

underlying mechanics of well-being rather than simply attempting to create a new or improved model of well-being. The natural question now is how we can use the wealth of existing well-being models, tools and findings in creative ways to expand our understanding of how well-being actually functions across the diverse range of experiences we go through as people.

Methodological implications. There are also methodological implications worth discussing. Results of these studies demonstrate that elements of PERMA can be assessed reliably across different contexts in that the measurement of various elements of PERMA appear to be valid in as much as they correlate with meaningful outcomes in each of the context studied in these studies. The most obvious is the importance of developing contextual well-being scales beyond the ones seen in this dissertation. There are other potential contexts in which well-being elements could be measured, which could, in turn, deepen our overall understanding of well-being. For example, time spent within local community settings could be seen as a context, with differential patterns of well-being elements to uncover that differ from contexts like work, home and school. This and any further development of the contextual measurement of well-being could also provide insights into the limits of how much people can effectively differentiate between the same elements across various contexts. As reviewed earlier, a significant development in the field of well-being research involved incorporating the cognitive judgements people make regarding their well-being (Diener, 1984). By involving context in the equation, there could be much to learn regarding individual ability in making judgements about well-being elements. As an example, despite the results in Rice (2024) and my own studies suggesting that participants can differentiate between PERMA elements across contexts, the actual inner workings of the cognitive judgements required to do so are relatively unknown. What are the limits of differentiation between contexts when evaluating one's own well-being elements?

However, as a warning it would be wise to be careful in attempting to split well-being assessment across too many contexts without ample evidence suggesting that participants can actually differentiate to that degree. There is likely no need to have dozens of different contextual PERMA scales and it is doubtful that one could provide the wealth of measurement invariance evidence needed to support having such a large number of scales in the first place. It is up to others to determine the limits of the contextual approach to well-being elements. What are the important contexts to consider? When do we draw the line and decide that there is little added value in examining a new context? These are questions that should be at the forefront of any serious expansion of contextual well-being measurement.

Practice/policy implications. From a practical perspective, the results seen in this dissertation emphasize a measurement approach to well-being that assesses well-being elements within contexts that are meaningful to the person under examination. Again, results showed that the school PERMA Profiler was psychometrically sound and, as will be discussed below, the school PERMA elements displayed predictive performance above and beyond other contextual versions of the elements depending on the outcome in our student sample. For specific groups that deal with different mixes of contexts, this contextual approach allows us to expand our understanding of their well-being while still being able to be rooted in the core elements outlined in PERMA. As summarized earlier, there have been several PERMA-informed interventions targeted at a diverse range of peoples and identifiable groups (see Cabrera & Donaldson, 2024 for a systematic review of such studies). How much more could these interventions benefit from first considering what contexts are most important to their participants and then measuring well-being changes across these contexts? To take this idea further, how much more effective could

well-being interventions be if they were able to directly target well-being elements contextually? In order to do this, it is necessary to measure well-being elements across contexts.

From a broader policy perspective, we already know the importance that policy makers place on effectively measuring the well-being of citizens (Stiglitz et al., 2010). Taking multiple contexts into consideration would naturally deepen the level of information available to policy makers when making decisions. Indeed, a truly accurate and valid assessment of well-being would presumably consider the extent to which each of the elements of well-being actually fulfilled needs within each of the meaningful contexts to an individual. As it stands currently, single context measures of well-being are being utilized and are assumed to generalize from one context to the next without any theoretical understanding of why that may be the case or empirical evidence to justify such an assertion. An important consideration in policy-making that drives many decisions is time and cost. It is noteworthy that the scales used in the present study required minimal modification to successfully measure well-being elements across contexts. It may be the case that the most effective methodology for contextual well-being measurement requires more effort, but aside from asking participants to answer similar questions more times and modifying scale items with contextual prompts there was little work to be done to create a multi-context approach to well-being measurement that yielded interpretable results in the studies outlined in this dissertation. At this point, the gains from a contextual measurement approach regarding informing policymakers could easily outweigh the added costs of using such an approach by a significant margin.

Finding 2: Unbalanced importance of well-being elements

Evidence. The studies presented in this dissertation are some of the first attempts to explore the relative importance of PERMA elements. Past research has demonstrated the

individual importance of each PERMA element (Cabrera & Donaldson, 2024) and even some early relative importance rankings from authors like Jimenez and colleagues (2023). In the case of the former, Cabrera & Donaldson (2024) reviewed 76 basic research studies, 26 scale validation studies and 9 intervention studies that all examined the PERMA elements. One of their findings was that each PERMA element measured individually had significant effect sizes when predicting outcomes like job satisfaction, life satisfaction and affect (positive and negative) across a diverse range of samples (e.g., teachers, adolescents, adults, workers). In the case of Jimenez and colleagues (2023), their dominance analysis approach suggested that the PERMA elements were not weighed equally in their predictive power, with positive emotion dominating other elements in terms of predictive power across outcomes including health, depressive symptoms and overall job performance. My research has been able to show a complex pattern of relative importance that varies across outcome and the home, work and school contexts, with some elements being noticeably better than others depending on various factors. This is directly in contrast with the maximization and balance implications (Butler & Kern, 2016; Seligman, 2013) I discussed earlier.

For now, I will focus on the finding that the PERMA elements, overall, did not show equal levels of predictive power in general. The evidence for this finding is mainly seen in the relative importance analyses: dominance analysis and relative importance analysis. Recall in the first study where the total PERMA element scores were entered into a dominance analysis. In this case, each element score was a total of the work and home items for the respective items for that element (e.g., P-total = P-home + P-work). Satisfaction with Life Scale scores were used as an overall well-being outcome variable, which makes it an effective model for assessing the relative importance of the total PERMA elements as predictors. In this model, positive emotion

displayed dominance over all the other elements while meaning displayed the second highest degree of dominance over the other elements. Comparatively, engagement and relationships did not display dominance over any elements while achievement displayed some but not to the same degree as positive emotion or meaning. The dominance and random forests analyses in study 2 showed a similar pattern, with positive emotion, meaning and achievement elements displaying the highest mean importance scores within the random forests model for SWLS scores. The relative importance models for the other outcomes had their own patterns of relative importance that will be discussed below, but the point here is that the elements do not equally predict outcomes.

Theory implications. The theoretical implications of these findings are, once again, significant. As stated previously, the relative importance of the PERMA elements in predicting various outcomes has gone nearly unexamined. What does exist in literature is the suggestion that all the elements are, in general, equally important. Indeed, Seligman (2013) says as much when he argues that the goal is to maximize the elements in order to flourish, or at the very least he does not deny this. This is an enticing assertion, namely that in order to be fully satisfied and happy in our lives we require all the elements in equal amounts to achieve high levels of well-being. However, as enticing this may be there has been little evidence to date to support or even deny this implicit assumption. As stated above, the results of my studies clearly show that the PERMA elements have different levels of predictive importance. There was not a single outcome that showed evidence of the elements having equal amounts of predictive importance. This focus on maximization is also expressed in recommendations for PERMA-informed interventions to use scales like the PERMA Profiler to identify deficits in PERMA elements so that they can be increased (Butler & Kern, 2016). This implication says that the single pathway to flourishing is

the maximization of each PERMA element. This pathway is almost certainly going to be effective, as all of the PERMA elements have been individually associated with well-being (Cabrera & Donaldson, 2024), but it does little to explore the potential differences in how each element contributes to well-being. The main theoretical implication of my finding is that these implications are likely false. The PERMA elements should not be discussed as factors that equally contribute to, potentially, anything. This naturally means that the theoretical state of flourishing may not necessarily require equal amounts of each well-being element.

It may be more effective for well-being theory to lend some focus to studying the theoretical patterns of well-being elements that are most effective routes to well-being based on various external factors. What factors influence the relative importance of well-being elements? How many combinations of well-being elements exist when observing them in others? Perhaps there are even cases or outcomes in which the elements are equally important. These types of questions are possible when the relative importance of well-being elements is considered.

Another theoretical implication of this dissertation is a sort of replication of past research on the dual importance of having both hedonic and eudaimonic elements of well-being, not just seeing them as being in conflict (Huta & Ryan, 2010). Across both studies in this dissertation, positive emotion and meaning tended to rank highest for most outcomes. This finding is consistent an example of hedonic and eudaimonically oriented well-being elements both displaying similar levels of predictive power and relative importance compared to other well-being elements while also being consistent with past research that has noted the importance of having high levels of both eudaimonic and hedonic well-being for the best outcomes (Huta & Ryan, 2010). This is another example in the field of well-being research where the most effective "balance" of elements does not necessarily mean equal amounts of everything that is measurable,

only that seemingly disparate well-being elements can be similar in importance compared to other elements.

As a final note on the theoretical implications of this dissertation, attention should be brought to the finding that various well-being elements were noticeably less important than others. For example, the random forests analysis results in study two for DASS-21 scores indicated that, regardless of context, engagement was much lower with regards to mean importance scores compared to other elements. There was even a case where engagement at home was designated as unimportant by the random forests model for predicting workplace performance and some cases where at least one of the versions of the elements were deemed tentative. These results go against the balance and maximization implications in a significant way. What if there are cases in which certain core well-being elements become unimportant? Again, this is a theoretical question that is not possible unless the relative importance of the elements is explicitly examined.

Methodological implications. The finding that the relative importance of the PERMA elements was unbalanced has some implications for methodological issues moving forwards. The most important one is the need for future well-being researchers to incorporate relative importance analysis methods into their studies. Aside from the investment of time needed to understand the tests and metrics at play, dominance and random forests analysis, used in tandem as recommended by Mizumoto (2022), provide relatively simple to interpret metrics and rankings of importance with minimal cost. Although dominance analysis does take significant processing time depending on the amount of predictors entered into the model, confirming these results with random forests analysis is very simple to accomplish using free software and statistics packages. Further, the ability for these two methods to cover parametric and non-

parametric tests makes them incredibly flexible for datasets that do not meet the traditional assumptions required for regression. The amount of cross-sectional data available for PERMA predictive models is vast, so adding a couple more analyses would provide a large amount of depth to the relative importance issue.

Practice and policy implications. From a practical and policy perspective, the unbalanced importance of the PERMA elements suggests that PERMA interventions could benefit greatly from becoming aware of what elements are most efficient to focus on. The cost of designing interventions that maximize all the PERMA elements may not be cost effective or even feasible for many. Instead, depending on the desired effect, well-being interventions that focus on models with multiple elements like PERMA may be more effective if they begin the process by identifying which elements are most likely to have the greatest effect. At the very least, it should not be assumed that all the elements are equally important, and therefore equally likely to yield positive results. Using my results as an example, if it is the case that positive emotion and meaning are particularly important for students across a range of outcomes, the implication for those designing interventions would be to focus on managing mental health in a way that boosts positive emotion while also helping students find purpose in their studies. Given that these are the two most important, it would be much easier to design these interventions so that positive emotion and meaning are mutually fostered rather than assuming that all PERMA elements are important. In the case of assuming each PERMA element was equally important for the students in this example, the intervention would be forced to try and incorporate each element equally, likely making it much harder to design intervention activities that benefit multiple elements at the same time. Being able to focus on smaller amounts of elements is not just more efficient because there are less elements to consider; it is also possibly more efficient because it is easier

to make the interventions more synergistic when less elements are being balanced at a given time.

While a wider range of relative importance models with different outcomes are needed, the results from this dissertation do suggest that certain elements like positive emotion and meaning are going to generally be important (though not always, as discussed below). This means that, when in doubt, and especially when overall well-being is the goal like in the case of SWLS scores seen in the results above, positive emotion and meaning are going to often be the best elements to focus on.

Finding 3: Relative importance of elements varies across context and outcome

Evidence. Contextual measurement of PERMA elements within the same sample (Rice, 2024) and relative importance analysis of PERMA elements (Jimenez et al., 2023) are both just beginning to be examined and the current studies represent some of the few early examples to study these issues in tandem. Results showed that the relative importance of the PERMA elements varied significantly depending on context and outcome. For example, in the relative importance rankings that broke down elements across contexts in study 2, workplace elements tended to be lower in importance when predicting SWLS and DASS-21 scores, but when predicting workplace performance, they became the most important and suddenly positive emotion and meaning were not nearly as important as before. Instead, achievement and relationships at work were the most important. This shows two things. First, depending on the outcome, previously very important elements like positive emotion and meaning can become much less important. Second, this same effect can also occur with the context of the elements, as the workplace elements overall did not rank very highly until workplace performance was the outcome in question. This second point suggests that the context of the outcome matters when it

comes to what context the well-being element comes from. That is, if one wants to measure a well-being element with the goal of predicting an outcome specific to a context like the workplace, they will want to measure the element from that same context to maximize predictive power.

Theory implications. Like the implications of the first finding reviewed above, once again the importance of moving somewhat away from well-being model development that emphasizes finding the optimal number of factors and the "best-fitting" definition of well-being is clear. Current theories do not at present accommodate the notion that certain elements of well-being are likely to be relatively more or less important depending on the context. In fairness to Seligman's (2013) discussion of PERMA does not preclude this possibility but it does not explicitly attempt to explain why different elements of well-being might be more or less important in different contexts. One post hoc explanation would simply assert that, in their day-to-day lives, people find meaning in different contexts throughout their lives; it may be at work or may be at home. Given the importance of meaning, which is predicted by the general model of well-being, it is not surprising that certain contexts lean more so to different elements of well-being. Theoretically this means that it is possible for people to find purpose and meaning almost anywhere in their lives, but it is incumbent upon our theories of what well-being is to accommodate this inevitability rather than prescribe it. Finding meaning and purpose in all activities is neither likely nor necessarily crucial. But it does mean that educators, parents, therapists, and policy makers should acknowledge the variability in which purpose and meaning can be found. The implication of these results is that perhaps purpose and meaning can be found in almost any context. It may be easy for us to impose our values on what counts as meaningful and in particular what context or activity is necessarily meaningful. This finding also expands

upon the theoretical implications of the last finding raised. Not only does theory need to account for the unbalanced network of importance that the well-being elements can have, but it also needs to account for how these networks shift based on outcome and context.

The last finding revealed that, due to the unbalanced importance of the PERMA elements, the balance and maximization recommendations/assumptions seen in current theory are not fully supported. The current finding that the relative importance of the elements depends greatly on context and outcome expands theoretical implications. It is not just the case that the elements vary in predictive power, but that the same element measured across contexts can display entirely different levels of predictive power. It is not just that positive emotion, in general, was most important for predicting SWLS scores, but rather that positive emotion at school and home were most important while positive emotion at work was noticeably less important. Current PERMA theory, due largely to a lack of examining issues like relative importance and context, has not accounted for these potentially important differences.

Methodological implications. One of the most important methodological implications to take away from this dissertation is the importance of taking a contextual approach to well-being elements. The Workplace PERMA Profiler (Kern, 2014) was an important step forwards but did not go far enough. Measuring well-being elements across contexts within the same sample can demonstrably yield added information on what elements are important and what context they need to be sourced from. This recommendation should be added alongside other recommendations like the importance of multiple informants and longitudinal measurement (Cabrera & Donaldson, 2024) for well-being research. By using small changes to pre-existing scales and simple validation tests combined with easy to access analytical methods, the studies in this dissertation were able to find meaningful differences in how well-being elements behave

across outcomes and context. If these methods become more widely used, what other findings could be discovered?

Practice and policy implications. Building off the point made prior that well-being interventions may want to shift focus on promoting elements since some may be relatively unimportant, the current finding suggests that both outcome and context could also inform this process. Assuming my results were replicated and verified appropriately, a workplace intervention working with part-time student employees, the sample I worked with, should not take a general approach to promoting well-being elements in order to increase workplace performance. If workplace performance is the goal, not only should achievement and relationships be focused on, but specifically these elements at work. Asking employees to focus on promoting relationships or achievement outside of work, aside from being much harder to do as an employer since your scope is limited, may not be necessary or relatively important if the outcome desired is just workplace performance on an individual level. The specificity involved with this recommendation has increased compared to general approaches to promoting well-being, and could potentially be much simpler to promote. Taking a context and outcome specific approach to well-being interventions allows for much more efficient and cost-effective approaches to be used. This strikes a balance between the bloated simplicity of overly general approaches to well-being promotion and the expensive, bespoke nature of individualized well-being promotion. A small amount of information on what elements and what contexts those elements come from matter depending on desired outcome can potentially go a long way.

From a policy perspective, starting a policy approach with a clear focus on desired outcomes is likely the best approach based on my results. This, in turn, would inform what elements and what contexts to focus on when promoting those elements. For example, if life

satisfaction is the goal, positive emotion and meaning in life outside of work and school becomes more important. Policymakers, and anyone designing interventions, should also consider the qualities of the people they are trying to understand the well-being of. My samples involved students who worked jobs while completing their studies. Meaning at work did not seem to matter much to them relative to other elements, but perhaps for full-time workers that are in the careers they trained for the meaning of their work will matter much more. This group-level of relative importance requires more research and likely has significant implications for policy and practice.

Finding 4: Within context discrepancies matter more than between context discrepancies

As described in my review of the literature, there is no real explicit example to date of creating discrepancy metrics from the PERMA elements, let alone examining discrepancies across contexts. From a general perspective, I found that within-context discrepancy (WCD) scores performed better as predictors of various outcomes more so than between-context discrepancy (BCD) scores. That is, the level of discrepancy between PERMA elements within a context like work, home or school was more important than the level of discrepancy between PERMA elements across contexts.

Evidence. This finding is most clearly seen in the random forests relative importance rankings. To reestablish my metrics, Within Context Discrepancy (WCD) was calculated by determining the absolute difference between each participants' scores on the five PERMA subscales used in the PERMA Profiler (Butler & Kern, 2016) and then summing them together. The Between Context Discrepancy (BCD) metric was calculated in a similar manner instead using absolute differences in PERMA elements across contexts instead to calculate final scores in which for each element, the differences in scores between each of the 3 contextual versions of that element

were added together. In each model, between context discrepancy tended to rank relatively low compared to at least one within context discrepancy score. A random forests model was run for each outcome: satisfaction with life (SWLS), mental health (DASS-21), and workplace performance (WPI). For each model, within context discrepancy scores and between context discrepancy scores were entered as predictors alongside the various PERMA elements. A rank ordered list of each predictor was generated, with those ranked higher being identified as the most important predictors relative to the others. For the satisfaction with life and mental health models, within context discrepancy at home ranked above between context discrepancy, with within context discrepancy at school and at work ranking at the bottom of the model overall. The results were essentially the same in the workplace performance model. Only one WCD score would ever rank highly, with the two other counterparts ranking very low.

Theory implications. The patterns of relative importance seen across the discrepancy metrics have some notable implications for well-being theory. First, examining the discrepancy between well-being elements as a separate metric is a relatively novel addition to the PERMA literature. The fact that the discrepancy scores showed noteworthy degrees of relative importance as seen in at least one of them ranking somewhat high in each random forests model, even levels of importance above and beyond some of the scales they were calculated from like in the case of within work discrepancy in the WPI model, indicates that discrepancies between well-being elements should be a consideration in the literature. The degree to which well-being elements differ from each other seems to have meaningful implications for important outcomes like mental health, satisfaction with life and workplace performance.

Discrepancy between contexts, interestingly, did not seem to rank very highly in importance. This builds upon existing research by showing us that not only does discrepancy

matter, but that there may not need to be a balance of the same elements across contexts. Perhaps we are able to achieve flourishing if we get enough of an element from one or more contexts and can focus less on the same element in another context once acceptable levels are achieved. The very concept of flourishing becomes more complicated now as the degree to which elements vary across contexts like work, home and school can, in the case of the samples used in my studies, do not seem to always be particularly important.

Methodological implications. The current finding suggests that measuring discrepancies across well-being elements within a given context is likely worthwhile for anyone that wants to predict well-being related outcomes. This also supports the implication of contextual well-being measurement being a worthwhile pursuit. The results of my studies don't just emphasise the measurement of well-being elements in specific contexts, but also emphasizes the potential importance of measuring the different layers of discrepancy across these contextual measurements. It was not just within context discrepancy overall that was an important predictor in the random forests models, it was usually one within context discrepancy specific to a context that matched up with the outcome (e.g., workplace discrepancy predicted workplace performance the best compared to other WCD scores from the home and school contexts).

Practice and policy implications. Discrepancy seen across well-being elements is a relatively simple metric to calculate based off well-being scores that are likely already being collected by those running interventions. Assuming my recommendation of taking a contextual measurement approach is taken, also making sure to calculate discrepancies within contexts across the well-being elements being targeted could add another datapoint for those designing and evaluating the efficacy of various well-being interventions. Future research will be needed to determine exactly what kind of discrepancies (e.g., high versus low etc.…) lead to different types

of outcomes. Policymakers will be able to inform best practices based off what discrepancies are present and how they are impacting relevant outcomes on a broader scale. At this stage, it will be important for those hoping to intervene in well-being outcome to measure and understand the impact of discrepancies across well-being elements.

Clinical implications

From a clinical psychology perspective, my findings provide some valuable insights. As discussed earlier in this dissertation, outcome monitoring is an important aspect of clinical practice that allows both clinicians and clients to receive feedback on therapeutic progress and symptom levels. I argued at first that the PERMA Profilers would be well-suited to measuring clinical outcomes, but with the findings of study 1 and study 2 in mind there are other issues to consider.

Whether or not the PERMA Profiler is used for outcome monitoring in a clinical setting, the issues of context and discrepancy could be incorporated. My findings indicated that for outcomes like mental health, the relative importance of well-being elements differed depending on the context and/or element in question with discrepancy also being a potentially important factor to consider, even more so than some of the PERMA elements. These findings suggest that, from a clinical perspective, we could deepen our understanding of how the mental health of our clients is being impacted by understanding which well-being elements are most important relative to the outcomes we are aiming for. Future research could be more specific in measuring the relative importance of various well-being elements in predicting clinically relevant outcomes. For example, study 2 measured depression, anxiety and stress levels in tandem using the DASS-21 (Henry & Crawford, 2005), whereas future research could be more specific and compare relative

importance of predictors across specific symptom scales that do not incorporate all of the symptoms into a general measure.

Limitations and Future Directions

The primary limitations of these studies are found in the issues with generalizability due to the nature of the sample. The majority of the participants were white, female young adults completing undergraduate degrees in the social sciences while also holding a part-time job. From a diversity perspective, this does very little to tell us about how any of the results may differ based on various minority factors like ableness, gender identity and race, among others. Much of this demographic information was collected but very little of it was able to be used for comparisons across distinct groups as there were simply not enough participants falling into other categories to make any effective comparisons.

The findings of my studies could have been different for distinct groups in a number of ways. One thing to consider is the impact of discrimination in the workplace. How do the well-being breakdowns across each PERMA element differ in groups of people who tend to experience significantly increased rates of discrimination in the workplace? If these are distinctly lower, these groups could also show increased between-context discrepancy compared to able-bodied, straight, cis-gendered, people of the racial majority. Consequently, the relative importance of the discrepancy in predicting important outcome for these groups of people could change from the results I found. These are the kind of important distinctions that can occur when diversity variables are taken into consideration and can have meaningful implications on how findings are presented and, consequently, integrated into practice and policy in addition to theory.

Further, future research will need to determine how these patterns of relative importance and discrepancy change with full-time employees. Since these individuals spend much more time and investment in that context compared to a student who is splitting their time between work and school, with school likely being the most important of the two for that demographic, the findings could change significantly.

The use of a student sample across my studies also creates limitations. Due to the nature of undergraduate studies, the student sample included people who mainly worked part-time jobs. It is natural to assume that these jobs are being used to support studies that will eventually lead to full-time careers, so the degree to which they impact the well-being and various outcomes of students is likely significantly different than some of the patterns of results one would find with full-time workers when using the same types of analytical models I incorporated. The use of a student sample also, naturally, restricted the age range of the sample significantly which also limits the generalizability of the results. However, this sample was still uniquely suited to assess PERMA elements and resulting discrepancies across home, work and school contexts, which is a novel addition to the literature and should not be overlooked. Future research should aim to avoid focusing entirely on convenient student samples, as the usage of other more broad samples will require/allow for discrepancies in well-being across more distinct contexts to be examined. The information that can be gained from this wider approach to sampling could be invaluable and more broadly applicable to those attempting to inform policy and practice.

Future research should also aim to find more ways to operationalize discrepancy and to incorporate the concept of discrepancy into their analyses when studying PERMA and well-being elements in general. Much could likely be learned by using the relatively simplistic discrepancy approach seen in Emery, Toste and Heath (2015) and there could still be better ways to measure

discrepancy. As it stands, the relatively simple approach to operationalizing discrepancy used in my studies, still useful for testing the concept, is limited and could be expanded upon. For example, perhaps even through asking participants to directly comment on the discrepancies they notice rather than just calculating absolute difference scores from pre-existing element scores, a more useful measure of discrepancy could be created. This approach could be done qualitatively or quantitively, with the focus being on capturing the degree to which the individual experiences significant differences between elements within and across contexts. It would be interesting in and of itself to see how effective people are at noticing and reporting on well-being discrepancies as well.

Future studies could also benefit greatly from finding new contexts to examine. Between the present study's context-specific versions of the PERMA Profiler, past versions of the PERMA Profiler that incorporated the workplace and the increasing amount of PERMA scale modifications (see Cabrera and Donaldson, 2024 for a summary) designed for certain groups, it seems that the core PERMA elements lend themselves well to being examined in specific contexts. Many of the items are easy to make general or specific, and the elements are defined clearly enough that scales not using the Profiler items could still be able to capture the elements. Instead of making many different PERMA Profilers for various groups of people, it may be more efficient to focus on measuring these elements across more contexts that people find themselves in instead.

Finally, as addressed by Cabrera and Donaldson (2024), most PERMA studies use cross-sectional, correlational data that is entirely self-report. Incorporating multiple informant sources for well-being elements and using longitudinal methodologies will allow for the elements to be

explored in more depth while also being to establish more causal relationships between the elements and important outcomes.

Conclusion

Well-being is a perfect example of a common issue we come across in the study of psychology. This issue being that regardless of how ubiquitous and seemingly apparent a concept like well-being is to each of us, when we start to ask questions about the actual underpinnings and mechanics of the concept, we start to realize how complex and unclear things can be. Through the usage of new approaches to measurement, analysis and thinking about well-being, I hope that this dissertation and the research that it has built will help us to collectively expand our understanding of how well-being works, not just what exactly it is or should be. Beyond the contributions to measurement and analytical approaches I have attempted to promote in this work, what I want to instill most is a sense of curiosity in the different avenues available to us when we seek well-being that I hope will guide some future research in a direction of growth.

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Appendix A: Study 1 Questionnaire

Measuring the Mental Health/Wellbeing in Your Workplace and at Home

Introduction: The goal of this survey is to examine the different characteristics of an organization that are related to fostering mental health in the workplace, such as the culture of the organization, the amount of psychological and social support you received, or the civility and respect you received from others. The online survey takes about 60-90 minutes to complete. Responses to the survey are confidential and anonymous. Results of the online survey will be shared and published but will be presented in a manner that protects the anonymity of individuals, departments and organizations. You will not be asked to provide your name or be required to identify the name of your organization in the study. You are eligible for this study if you have been working at your current workplace for at least 6 months.

Informed Consent

DESCRIPTION OF THE STUDY: In 2013, the Canadian Mental Health Commission, developed in partnership with Canadian Standards Association (operating as "CSA Group") and Bureau de normalisation du Québec (BNQ) workplace standards for mental health. These voluntary standards are now being adopted and implemented by organizations throughout Canada.

The standards describe 13 factors that have been identified as essential to fostering mental health in the workplace. These include the culture of the organization, psychological and social support, civility and respect, psychological demands, as well as workload management and many more. This survey will also be asking you about your wellbeing both at and outside of work. To accomplish this, you will be asked questions about various sources of wellbeing in your life. Following Martin Seligman's PERMA theory of wellbeing, you will be asked about positive emotions, engagement, relationships, meaning and achievement in your life in and outside of work. Although well-defined, no single comprehensive method has been developed and validated to date. Further, we know of no studies that have provided an in-depth analysis of the discrepancies between wellbeing at work vs. outside of work. The goal of this survey is to develop and validate elements of the standards and examine how wellbeing in and outside of work interact.

You are eligible for this study if you have been **working at your current workplace for at least 6 months**.

The online survey takes about 60-90 minutes to complete. Responses to the survey are confidential and anonymous. Results of the online survey will be shared and published but will be presented in a manner that protects the anonymity of individuals, departments and organizations. You will not be asked to provide your name or be required to identify the name of your organization in the study.

If you are not participating as a student through the ISPR system, you will be provided with a 6-digit code (e.g., 472290) that will be used to group your responses for the purpose of producing a summary report for your organization. Summary statistics for everyone entering the code you have been provided will be tabulated as a group and those statistics will be included in a report that will be provided to your organization. This is how we will let your organization know how employees are doing. Entering the code is optional but it is necessary if you wish your responses to be included in the anonymous report generated for your organization.

RISKS: You will be asked to report about how your employer has addressed mental health difficulties in your workplace. You will also be asked about your experiences with mental health and about the impact that health and mental health difficulties have had on your well-being and ability to work to the best of your abilities. Answering questions of this kind may cause some people to feel distressed, worried, or experience other negative emotions. You are free to withdraw from the study at any time without

consequence by simply closing the web browser. If you are experiencing any negative reactions and would like to seek some support, you can refer to the list of mental health resources that are currently available to employees in Ontario.
BENEFITS: Despite the research that has been conducted examining mental health in the workplace, almost no studies exist that have systematically investigated the 13 factors that have been identified as essential to fostering mental health in the workplace by the Mental Health Commission of Canada. Further, we know of no studies that have provided an in-depth analysis of the discrepancies between wellbeing at work vs. outside of work. Although there may not be any benefit to you directly, we believe that comprehensive information regarding the employees' experiences with these different factors and the relationship between these factors and mental health of employees will be of benefit to employers, stakeholders and researchers in the workplace. Upon completion of the study, you will be provided a summary of our results of the study if you desire. The summary will provide you more information about employees' experiences with these different factors and the relationship between these factors and mental health of employees. To receive a copy of the report, you will be required to provide us your email address. Upon completion of the survey, you will be redirected to a separate webpage where you can provide us with your email address. Your address will not be linked to your survey results in any way.
COMPENSATION: To thank you for your contribution to the research project, individuals who participate can enter a raffle for Tim Horton's Gift Cards, or receive course credit if they are students participating through the ISPR system at UOttawa.

Students participating through the ISPR system will receive 1 point for their participation. Participants who do not participate through the ISPR system will be entered into a draw to win 1 of 25 Tim Horton's cards values at $10 each. On August 1st, 2022, a name will be randomly selected amongst those who have entered, and the person whose name is drawn will be informed by Dr. Santor via Email. To win the prize, the person must correctly answer a skill-testing question. If the person cannot be reached within 14 days from the date of the draw, the prize will be awarded to the second name that is randomly selected and so on until the prize has been awarded. The odds of winning a prize will be determined based on the number of participants in this study. The prize must be accepted as awarded or forfeited and cannot be redeemed for cash.

CONFIDENTIALITY AND ANONYMITY: All information you share in the questionnaire and any correspondence (e.g., e-mail) with the principal investigator will be kept confidential. No other identifying information is collected that may identify who you are. No other identifying information has been collected that may identify who you are. Questionnaire responses will be stored on password protected memory sticks in a locked laboratory. The information collected through this questionnaire will be analyzed under the supervision of Dr. Santor. No individual's answers will ever be identified in any report. Only group data will be reported. In order to minimize the risk of security breaches and to help ensure your confidentiality, we recommend that you use standard safety measures such as signing out of your account, closing your browser and locking your screen or device when you are no longer using them / when you have completed the study.
CONTACT: If you have questions at any time about the study or the procedures, or you experience any adverse effects as a result of participating in this study you may contact the primary investigator, Dr. Darcy Santor, at the Psychology Department, University of Ottawa, at (613) 562-5800, extension 4814 or **********.
This project has been reviewed and has received ethics approval from the University Research Ethics Board. If you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5. Tel.: (613) 562-5387. Email: ethics@uottawa.ca
PARTICIPATION: Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. However, once the survey is submitted,

participants will be unable to withdraw their data from the study as the researchers will be unable to identify individuals in the dataset. Data from the survey will be kept indefinitely.
FEEDBACK AND PUBLICATION: The data obtained from this study may be used to create a peer-reviewed publication and/or to be presented at a scholarly conference of professionals. When examining regional differences, a minimum 100 responses is required before a regional difference (e.g., urban versus rural) is reported. This is done to ensure that no individual could ever be identified indirectly.

Section 1 – Demographic questions

The goal of the demographics section is to enable us to conduct a number of analyses involving meaningful subgroups, e.g., men versus women, managers versus employees, etc., within your organization.

Q1. How do you wish to be identified?
Male | Female | Other
Q2. What is your age?
24 and under | 25-34 | 35-44 | 45-54 | 55-64 | 65-70 | 71+
Q3. In what region is the office, branch, or workplace located?
Atlantic Canada | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Nunavut | Northwest Territories | Yukon
Q4. To what employee group do you belong?
General or regular employee | Manager or supervisor | Senior manager or supervisor | Executive or director | Other
Q4_B. Since you indicated "other" in the previous question, please describe what employee group you belong to.
Q5. Please describe what you do in a sentence or two.
Q6. What is your employment status?
Permanent (full time) | Contract (full time) | Permanent (part time) | Contract (part time) | On a medical leave of absence | On a non-medical leave of absence | Other
Q7. How many managers, supervisors, or directors do you directly report to?
One | Two | Three | Four or more | Not applicable
Q8. How many employees are directly reportable to you?
1-5 | 6-9 | 10-19 | 20-29 | 30 or more | Not applicable
Q9. How large is your organization?
Less than 50 employees | 50 to 200 employees | 201 to 500 employees | More than 500 employees
Q10. Do you belong to a union in this workplace?
Yes | No
Q11. Are you provided extended benefits through your employer (e.g., medications, dental or psychological coverage)?
Yes | No | Yes, but not adequate

Section 2 – Functioning and impairment

In the past month, how often have you experienced the following difficulties?

Q1. Feeling nervous, anxious, or on edge
Not at all | Somewhat | A lot | Almost all the time
Q2. Not being able to control your worries or fears
Not at all | Somewhat | A lot | Almost all the time
Q3. Little interest or pleasure in doing activities (either at work or in your personal life)

Not at all | Somewhat | A lot | Almost all the time

Q4. Feeling down, depressed, or hopeless

Not at all | Somewhat | A lot | Almost all the time

Q5. Trouble falling, staying asleep or sleeping too much

Not at all | Somewhat | A lot | Almost all the time

Q6. Feeling bad about yourself, feeling like a failure, or that you have let yourself or your family down

Not at all | Somewhat | A lot | Almost all the time

Q7. Feeling stressed out and overwhelmed at work

Not at all | Somewhat | A lot | Almost all the time

Q8. Did not sleep well because of your worries, stresses, or pressures at work

Not at all | Somewhat | A lot | Almost all the time

Q9. Feeling stuck and unable to deal with your current situation at work

Not at all | Somewhat | A lot | Almost all the time

Q10. Difficulties concentrating and / or making decisions

Not at all | Somewhat | A lot | Almost all the time

Q11. Difficulties completing tasks

Not at all | Somewhat | A lot | Almost all the time

Q12. Feeling tired at work

Not at all | Somewhat | A lot | Almost all the time

Q13. Being unpleasant / irritable / uncooperative with co-workers, managers and / or clients

Not at all | Somewhat | A lot | Almost all the time

Q14. Missing days of work

Not at all | Somewhat | A lot | Almost all the time

Q15. Being unproductive

Not at all | Somewhat | A lot | Almost all the time

Q16. Missing deadlines

Not at all | Somewhat | A lot | Almost all the time

Q17. Making mistakes

Not at all | Somewhat | A lot | Almost all the time

Have you sought help for these difficulties in the past three months? (Check one of the following options)

I have not experienced any difficulties in the past three months. | I did not think these difficulties required professional help. | I would like to / wanted to see a health or mental professional but haven't done that yet. | I have talked to a health professional. | I had difficulties but did not want to seek help.

What is your own personal experience with mental illness? (Check all that apply)

I am currently dealing with mental illness (or significant mental health difficulty). | I had mental illness (or significant mental health difficulty) earlier in my work career. | I had a mental illness (or significant mental health difficulty) before I started working fulltime. | I have never had a mental illness. | I prefer not to answer.

How long have you been dealing or have dealt with mental health difficulties?

I do not have mental health difficulties | < 3 months | 4-6 months | 7-11 months | 1-2 years | 3-5 years | more than 5 years

Section 3 – PERMA and Outcome Variables

In this section of the survey, we will be asking various questions about your wellbeing across different areas of your life. Specifically, we will be asking questions about how you feel at work and outside of

work. Make sure to read each question carefully and try to differentiate how you can feel about the same subjects when you are and are not at work.

Positive emotions (in the workplace)

Q1. At work, how often do you feel joyful?
0-10 (Not at all/never – completely/always)
Q2. At work, how often do you feel positive?
0-10 (Not at all/never – completely/always)
Q3. At work, to what extent do you feel contented?
0-10 (Not at all/never – completely/always)

Positive emotions (in your life outside of work)

Q1. In your daily life outside of work, how often do you feel joyful?
0-10 (Not at all/never – completely/always)
Q2. In your daily life outside of work, how often do you feel positive?
0-10 (Not at all/never – completely/always)
Q3. In your daily life outside of work, to what extent do you feel contented?
0-10 (Not at all/never – completely/always)

Engagement (in the workplace)

Q1. At work, how often do you become absorbed in what you are doing?
0-10 (Not at all/never – completely/always)
Q2. To what extent do you feel excited and interested in your work?
0-10 (Not at all/never – completely/always)
Q3. At work, how often do you lose track of time doing something you enjoy? ()
0-10 (Not at all/never – completely/always)

Engagement (in your daily life outside of work)

Q1. In your daily life outside of work, how often do you become absorbed in what you are doing?
0-10 (Not at all/never – completely/always)
Q2. To what extent do you feel excited and interested in things not associated with your work?
0-10 (Not at all/never – completely/always)
Q3. In your daily life outside of work, how often do you lose track of time while doing something you enjoy?
0-10 (Not at all/never – completely/always)

Relationships (in the workplace)

Q1. To what extent do you receive help and support from your coworkers?
0-10 (Not at all/never – completely/always)
Q2. To what extent do you feel appreciated by your coworkers?
0-10 (Not at all/never – completely/always)
Q3. How satisfied are you with your professional relationships?
0-10 (Not at all/never – completely/always)

Relationships (in your daily life outside of work)

Q1. To what extent do you receive help and support from people you know outside of work?
0-10 (Not at all/never – completely/always)
Q2. To what extent do you feel appreciated by people you know outside of work?
0-10 (Not at all/never – completely/always)
Q3. How satisfied are you with your personal relationships, outside of those you work with?
0-10 (Not at all/never – completely/always)

Meaning (in the workplace)

Q1. To what extent is your work purposeful and meaningful?
0-10 (Not at all/never – completely/always)
Q2. In general, to what extent do you feel that what you do at work is valuable and worthwhile?
0-10 (Not at all/never – completely/always)
Q3. To what extent do you generally feel that you have a sense of direction in your work?
0-10 (Not at all/never – completely/always)

Meaning (in your daily life outside of work)

Q1. To what extent do you lead a purposeful and meaningful life outside of work?
0-10 (Not at all/never – completely/always)
Q2. To what extent do you generally feel that what you do in your life outside of work is valuable and worthwhile?
0-10 (Not at all/never – completely/always)
Q3. To what extent do you generally feel you have a sense of direction in your life outside of work?
0-10 (Not at all/never – completely/always)

Accomplishment (in the workplace)

Q1. How often do you feel you are making progress towards accomplishing your work-related goals?
0-10 (Not at all/never – completely/always)
Q2. How often do you achieve the important work goals you have set for yourself?
0-10 (Not at all/never – completely/always)
Q3. How often are you able to handle your work-related responsibilities?
0-10 (Not at all/never – completely/always)

Accomplishment (in your daily life outside of work)

Q1. How often do you feel you are making progress towards accomplishing your goals in your daily life outside of work?
0-10 (Not at all/never – completely/always)
Q2. Not including work-related goals, how often do you achieve the important goals you have set for yourself?
0-10 (Not at all/never – completely/always)
Q3. How often are you able to handle your responsibilities in your daily life outside of work?
0-10 (Not at all/never – completely/always)

Overlap and importance

Q1. When answering these questions, how difficult was it to differentiate your life at work vs. your daily life outside of work?

0-10 (Very easy/minimal overlap – very difficult/a lot of overlap)

Q2. How important is your work life as a source of positive emotions?
0-10 (Not at all – somewhat important – very important)

Q3. How important is your work as a source of engagement in your life?
0-10 (Not at all – somewhat important – very important)

Q4. How important are the relationships you have in your work life?
0-10 (Not at all – somewhat important – very important)

Q5. How important is your work life as a source of meaning?
0-10 (Not at all – somewhat important – very important)

Q6. How important is the sense of achievement you can get from your work?
0-10 (Not at all – somewhat important – very important)

Q7. How important is your life outside of work as a source of positive emotions?
0-10 (Not at all – somewhat important – very important)

Q8. How important is your life outside of work as a source of engagement?
0-10 (Not at all – somewhat important – very important)

Q9. How important are the relationships you have in your life outside of work?
0-10 (Not at all – somewhat important – very important)

Q10. How important is your life outside of work as a source of meaning?
0-10 (Not at all – somewhat important – very important)

Q11. How important is the sense of achievement you can get from your non-work life?
0-10 (Not at all – somewhat important – very important)

Desire to change

Q1. I would like to change the level of well-being I get from my work.
Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Q2. It would be feasible to change the level of well-being I get from my work.
Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Q3. I would like to change the level of well-being I get from my daily life outside of work.
Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Q4. It would be feasible to change the level of well-being I get from my daily life outside of work.
Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Satisfaction with Life Scale

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

Q1. In most ways my life is close to ideal.
Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q2. The conditions of my life are excellent.
Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q3. I am satisfied with my life.
Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q4. So far I have gotten the important things I want in life.
Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q5. If I could live my life over, I would change almost nothing.
Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Work life balance scale

When I reflect over my work and non-work activities (your regular activities outside of work such as family, friends, sports, study, etc.), over the past three months I conclude that:

Q1. I currently have a good balance between the time I spend at work and the time I have available for non-work activities.
Strongly disagree | Disagree | Neutral | Agree | Strongly Agree
Q2. I have difficulty balancing my work and non-work activities.
Strongly disagree | Disagree | Neutral | Agree | Strongly Agree
Q3. I feel that the balance between my work demands and non-work activities is currently about right.
Strongly disagree | Disagree | Neutral | Agree | Strongly Agree
Q4. Overall, I believe that my work and non-work life are balanced.
Strongly disagree | Disagree | Neutral | Agree | Strongly Agree

Section 4 - Performance at Work

How much you work

In this section of the survey, we would like to know about how much you worked and how much work you missed for a variety of reasons. Looking over the past four weeks, how many hours did you work, **on average, each week**?

0-70 (sliding scale)

Expected to work

About how many **hours** does your employer expect you to work **in a typical 7-day week**? (If it varies, please estimate the average. If there is no fixed expectation, type in "00".)

[Open text response]

Extra hours of work

In the past month, how many **additional hours** did you work outside of your typical work shift or day (e.g., working through lunches, stayed past the end of the workday, worked home evenings and weekends)?

[Open text response]

Intensity of work

Please rate the intensity of your typical workday.

Very low intensity -- I have a number of breaks and a number of slow times during the day

Low intensity - I can take breaks or interrupt my work as often as I need to during my day

Moderate intensity -- I have breaks throughout my day but work is very steady during the rest of it

High intensity -- I have a hard time keeping up with the volume of things to do during the day

Excessive intensity -- I work at a fast pace throughout the day, with no breaks or downtime

Managing the intensity of your work

To what degree is the intensity of your work **negatively affecting** your health or well-being?

Not at all

Somewhat

A lot

Extremely

Please rate the repetitiveness of your entire job.

Low repetitiveness -- My job is not repetitive at all. I have a variety of tasks to do throughout the week and a reasonable amount of flexibility in how I go about them. If I wanted to ask for some new responsibilities or tasks, my organization would provide me with that opportunity.

A little bit repetitive

Somewhat repetitive

Very repetitive

Extremely repetitive -- My work has become extremely repetitive. I have a small number of tasks that I do over and over again, with no flexibility in how they get done. I have little to no opportunity to do new things.

How long have you felt that your job has become repetitive?

Not applicable

< 1 year

1-2 years

3-5 years

6-10 years

11-15 years

16-20 years

More than 20 years

How much has the repetitiveness of your job affect your job?

Rating scale: Not at all | a little | somewhat | a lot | completely/extremely

Physical health

Mental health

Ability to do your job

Missing FULL Days of work

This question asks you to estimate, as best you can, how many FULL days of work you missed in the past 30 days. You will be asked about missing PART days on the next page.

In the **past 30 days**, how many full days of work did you **miss**, because of **mental health difficulties**, such as sadness, worry, substance abuse?

[Open text response]

In the **past 30 days**, how many full days of work did you **miss**, because of **physical health difficulties**, such as pain, fatigue, headaches?

[Open text response]

In the **past 30 days**, how many full days of work did you **miss**, because of a **planned vacation or holiday**?

[Open text response]

In the **past 30 days**, how many full days of work did you **miss**, for **no reason at all**?

[Open text response]

Missing PART Days of work

This question asks you to estimate, as best you can, how many PART days of work you missed in the past 30 days.

In the **past 30 days**, how many part days of work did you **miss**, because of **mental health difficulties**, such as sadness, worry, substance abuse?

[Open text response]

In the **past 30 days**, how many part days of work did you **miss**, because of **physical health difficulties**, such as pain, fatigue, headaches?

[Open text response]

In the **past 30 days**, how many part days of work did you **miss**, because of a **planned vacation or holiday**?

[Open text response]

In the **past 30 days**, how many part days of work did you **miss**, for **no reason at all**?

[Open text response]

Working to your capacity

In this question, we are interested in how well you were able to work **during the past 30 days that you went to work**. You may have missed a few days in the past week or month. We are interested in the days that you were there. On how many of those days were you completely unable, significantly unable, or

partially unable to work because of **mental health difficulties** (such as sadness, worry, substance abuse, etc.)?

On how many of your past 30 days were you **completely unable** to work? : _____

On how many of your past 30 days were you **significantly unable** to work? : _____

On how many of your past 30 days were you **partially unable** to work? : _____

On how many of your past 30 days did you have **no difficulties at all** working? : _____

Total : _____

In this question, we are interested in how well you were able to work **during the past 30 days that you went to work**. You may have missed a few days in the past week or month. We are interested in the days that you were there. On how many of those days were you completely unable, significantly unable, or partially unable to work because of **physical health difficulties**, such as pain, fatigue, headaches, etc.?

On how many of your past 30 days were you **completely unable** to work? : _____

On how many of your past 30 days were you **significantly unable** to work? : _____

On how many of your past 30 days were you **partially unable** to work? : _____

On how many of your past 30 days did you have **no difficulties at all** working? : _____

Total : _____

Performance at work

In this section, we would like you to rate your performance in the **past 6 months**. Over the past **6 months**, rate how well you have been performing (e.g., if you are performing at 75% of your ability, enter 75%). Response options: 0 to 100%

0-100% (sliding scale)

What level of burnout, if any, are you experiencing?

Rating scale: Not at all | a little | somewhat | a lot | completely/extremely

Feeling tired or exhausted at work.

Feeling uninterested or disengaged from the work you do.

Feeling negative or cynical about the work that you do.

Being less effective or less productive at work.

Section 5 - The Thirteen Factors

The health of your workplace

In this next section, we will ask you about the health of your workplace. We are interested in the extent to which workplace possess the qualities and characteristics judge to make a workplace healthy and safe.

These factors were selected from the Strategic Framework developed by the Mental Health Commission of Canada.

1) Organizational Culture

The first factor is about the *culture of your organization*.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

Within the past year, my manager has reviewed the demands, expectations and responsibilities of my position with me and reviewed my ability to meet those demands.

There is an effective system for reporting concerns, errors, or issues that I may have about my work, my manager, my colleagues, clients or consumers.

My organization solicits and values the input of employees on how the organization works, particularly during periods of change and high volumes of work.

I have been offered opportunities to improve my skills, level of knowledge and ability to work effectively with others.

My organization has taken concrete actions to monitor and reduce high levels of stress and conflict among employees.

2) Psychological and social support

The next factor is about the *psychological and social support* you get from your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I feel comfortable asking **my manager** for help for any work-related difficulties or challenges.

I feel comfortable asking a **co-worker** for help for any work-related difficulties or challenges.

I work with a group of people in which colleagues help each other manage workloads.

My manager is supportive of the need to take a leave of absence (or sick days) for a few days or longer for mental health, personal or family reasons.

If I was having difficulty dealing with stress, anxiety or some other mental health problem affecting my performance at work, I would feel comfortable discussing it with my manager.

If I was having difficulty dealing with some other physical health problem affecting my performance at work, I would feel comfortable discussing it with my manager.

My organization provides adequate accommodations in the workplace for employees with mental health difficulties (e.g., modified work hours, telework, etc.).

My organization provides an adequate number of services to assist employees dealing with mental health difficulties and concerns (e.g., employee assistance programs, workshops on mental health, onsite wellness activities, such fitness classes, yoga, gym, etc.).

Providing support

This next question is about providing support for a co-worker or employee who is struggling with stress or a mental health difficulty.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

If a co-worker or an employee I supervise reported to me that he or she is struggling with high levels of workplace stress, I would feel comfortable discussing this and helping him/her with this difficulty.

If a co-worker or an employee I supervise reported to me that he or she was being bothered, bullied or treated unfairly by another employee, I would feel comfortable discussing this and helping him/her with this difficulty.

If one of the employees that I supervise or co-worker I work with reported having a mental health issue (e.g., anxiety, depression, etc.), I would feel comfortable discussing this and helping him/her with this difficulty.

3) Clear leadership and expectations

This factor is about the leadership and expectations of *your organization*.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I have a clear idea of what my manager or supervisor expects of me on a day-to-day basis.

I have been provided with regular, concrete feedback on how my performance is and is not meeting expectations.

My manager has been successful in helping me become effective and productive in my position.

My manager has been successful in managing difficult and stressful periods of time in my workplace.

My manager has been effective in fostering respect and civility in the workplace.

My manager has been effective in fostering a high level of productivity among all staff in my department.

4) Civility and respect

This factor is about civility and respect in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

Employees from all backgrounds are treated fairly.

Employees with different mental and physical needs are treated fairly.

My managers and supervisors treat staff with politeness, respect and consideration.

My managers, supervisors and directors are able to resolve conflict among employees, clients and customers effectively.

My managers, supervisors and directors have effective ways of addressing inappropriate behaviour.

Managers and / or employees spread unfavourable rumours about each other.

Managers and / or employees have been critical of each other either behind their backs or openly in front of others.

Managers and / or employees have tried to sabotage or claim the work of others as their own.

Managers and / or employees spend a lot of time gossiping about the personal lives of others.

Managers and / or employees have excluded me from emails, activities, and meetings.

5) Psychological Demands

This factor is about the psychological demands that you experience working in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I am unable to meet the demands and expectations of my employer, managers, or co-workers.

I am bored and / or frustrated with the nature of my work.

I spend too much time worrying about whether or not I will meet the goals and performance targets I am expected to meet.

My manager adequately reviews the demands of my job, how my performance is evaluated and manner in which I go about meeting my goals and expectations.

My manager exerts an excessive amount of control and scrutiny over my day-to-day work and activities.

My organization has an effective system for discussing concerns that I may have with my manager.

My organization values input from employees, particularly during periods of stress and / or change.

6) Growth and development

This factor is about growth and development in your organization.

In terms of career advancement:

I have advanced as far as I expected.

I have not advanced as far as I expected.

I have advanced further than I expected.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

There are opportunities for promotion and advancement within my department and organization that are based on merit.

There are opportunities within my current position to take on new roles, duties or projects.

My supervisors provide me with feedback on how I can grow and develop within the organization.

Employees have relatively easy access to training programs to upgrade, maintain and enhance their skills and knowledge in variety of areas (e.g., technical, interpersonal, knowledge-base).

My organization makes adequate investments in employee growth and development.

7) Recognition and reward

This factor is about the recognition and reward that you experience in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I do not feel that my efforts at work are valued by my organization.

I have not been adequately praised or given adequate recognition for the work I do.

I have been unfairly passed over for projects, opportunities, or advancement.

The feedback I have been given on my performance has not been fair.

Managers and employees have tried to take credit for work the others have done.

I do not get paid the same as others who do similar or equivalent work.

My organization recognizes extraordinary efforts of employees in some fashion (e.g., production bonuses, piece work, time-off, perks, etc.).

8) Involvement and influence

This factor is how much involvement and influence you have in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I feel comfortable expressing my concerns about my work and workload with my immediate supervisor.

Employees who express concerns or criticism of projects, policies or the direction that the organization is taking are treated badly (e.g., criticized, punished, excluded from opportunities, demoted, and / or fired).

Employees are expected to accept whatever amount of work they are given, even if it means working through lunches or staying later to complete it.

Managers encourage active employee participation and decision-making.

I have an adequate say in how I organize and do my work.

I would feel comfortable making suggestions or voicing criticism about projects, policies or the direction of my organization.

9) Workload management

How much time do you spend on average on the following activities each week?

Rating scale: Less than 1 hour | 1-2 | 3-4 | 5-10 | 11-15 | 16-20 | 21-25 | 26-30 | 30+

going to meetings

reading and answering emails

helping colleagues with their work

helping colleagues deal with personal or staff-related difficulties

resolving unexpected problems of any kind that take you away from your principal duties

doing the work you were primarily hired to do (e.g., building, writing, designing, installing, analyzing.)

Rating scale: Never | Rarely | Some-times | Half the time | Frequently | Almost always or always | Not applicable

How often were you given work deadlines or tasks that could not possibly be completed in the time allotted?

How often have felt that you do not have the skills and abilities to do the job you are being expected to do?

How often have you felt like you did not have the tools or resources to deal with all of the stress, demands and expectations you are facing?

How often did you leave some work undone, cut corners, or did work of lesser quality due to lack of time allocated to the task?

How often are you expected to work overtime (e g, beyond the end of the workday or at lunch)?

My manager is willing to re-prioritize and / or re-distribute work when my workload becomes excessive.

I have an appropriate amount of control over prioritizing tasks and responsibilities when I am facing multiple demands.

10) Engagement

This factor is about how engaged and committed you feel to your organization.

I intend on remaining with my current employer for the next:

1-2 months

3-12 months

13-23 months

2-5 years

6-10 years

until I retire

as long as I am able to

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I enjoy the work that I do.

I feel proud of the role that I have in my organization.

If my organization asked me to work more or take on different duties in a time of need, I would be willing to do it.

I would leave this organization, if I could maintain my level of pay and benefits.

I would leave this organization, even if it meant taking a cut in pay.

11) Balance

This factor is about work-life balance in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

Managers encourage employees to take all of their entitled breaks (e.g., lunchtime, sick time, vacation time, earned days off, parental leave).

Managers frequently expect employees to work through lunch or past the end of the work day.

Managers respect the obligations that employees have outside of work.

My manager is open to discussing ways to find a better work-life balance.

The demands of my work interfere with my personal and family life.

12) Psychological protection

This factor is about the level of psychological protection you have in your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

My manager intervenes immediately and effectively when there are incidents of bullying or harassment, or mistreatment towards staff.

My chances at a promotion in my organization would be negatively affected if management knew that I experienced a mental health issue.

If I disclosed to my manager that I was experiencing high levels of stress, anxiety or worry, it would be held against me in some way.

The confidentiality of mental health information is NOT treated seriously at my workplace.

My organization is committed to minimizing unnecessary stress at work.

My organization has taken effective measures to address harassment, bullying, discrimination, violence, and stigma in the workplace.

My supervisor has done a good job of supporting employees returning to work after an absence due to a mental health issue.

13) Protection of physical safety

This factor is about the level of physical and health safety of your organization.

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I have no concerns about the safety of my workplace.

I am allowed to take a sufficient number of breaks through day, when I need them.

I would have difficulty saying no if my manager asked me to work under dangerous conditions.

I have been asked to do or been given work that was unsafe.

I have received the appropriate training I need to do my job safely.

Have you ever taken a leave of absence?

Yes

No

How long was your leave of absence (in months)?

[Open text response]

Why did you take this leave of absence (Check all that apply):

work-related stress

family-or-personal related stress

mental health difficulties

physical illness or health condition

physical injury

other

Section 6 - Disclosing

Disclosing a mental illness at work

In this next question, we are interested in knowing how your workplace treats employees **after disclosing** that they are dealing with mental illness. These questions are only for employees who developed a mental illness after starting at their current workplace.

Please select one of the following options:

Since starting at my current workplace, I have told my current employer that I have had or have a mental illness

I do not have a mental illness OR have not told my current employer

I prefer not to answer

After my workplace discovered that I had/have a mental illness:

Rating scale: Strongly agree | Somewhat agree | Not sure/don't know | Disagree | Strongly disagree

It was suggested directly or indirectly that I should consider leaving the organization.

I experienced limited possible advancement.

I received smaller salary increases and / or bonuses than I would have had otherwise.

My competence and ability to do the job was questioned.

I was given fewer opportunities, assignments, jobs than I used to have.

I was given less important roles and / or jobs.

I was assigned to different projects and / or work.

Section 7 - Needs

Needs

In this final section, we ask about what you need more of in your workplace.

In your opinion, what would you like or need more of in your workplace?

Rating scale: Strongly Disagree | Disagree | Not sure/Don't know | Agree | Strongly Agree

I would like more dedicated quiet work space than I have.

I would like more face to face contact with others.

I would like more uninterrupted time to focus/think/work on projects or tasks.

I would like more feedback on how well I am doing.

I would like more variety in what I do at work.

I would like more opportunity to update my skills.

I would like more opportunity to advance, take on new challenges.

I would like less repetitiveness in my work.

I would like more opportunity to work from home.

I would like more opportunity to collaborate and talk to others about projects, difficulties and different ways of doing things.

I would like to feel more a part of my team than I do.

I would like more opportunities to take breaks during the workday.

I would like more politeness, civility and respect in the workplace.

I would like to feel more valued than I currently do (i.e., the work I do is valued by my colleagues, manager and organization).

I would like more information / training on (Check all that apply):

what services and programs are offered through the workplace

the procedures or guidelines on what to do if an employee has a mental health issue

how to have conversations with employees / managers regarding mental health concerns

how to deal with stress in the workplace

how to deal with procrastination and poor productivity in the workplace

how to deal with bullying and harassment in the workplace

how to document and report a mental health issue / bullying / harassment

how to manage and assist an employee returning from a leave of absence

how to support / accommodate an employee struggling with difficulties (before considering a leave of absence)

how to best utilize performance analytics in the workplace

when to consider a leave of absence for a mental health difficulty

I would **not** like information on any of these topics.

Appendix B: Study 2 Questionnaire

Well-being at Home and at Work Research Project

Introduction: The goal of this survey is to examine the different characteristics your well-being at school, at work and outside of work. The online survey takes about 45-60 minutes to complete. Responses to the survey are confidential and anonymous. Results of the online survey will be shared and published but will be presented in a manner that protects the anonymity of individuals, departments and organizations. You will not be asked to provide your name or be required to identify the name of your organization in the study. You are eligible for this study if you have been working at your current workplace **for at least 6 months**.

Informed Consent

DESCRIPTION OF THE STUDY: This survey will ask you about your well-being at school, at work and outside of work. To accomplish this, you will be asked questions about various sources of wellbeing in your life. Following Martin Seligman's PERMA theory of wellbeing, you will be asked about positive emotions, engagement, relationships, meaning and achievement in your life in and outside of work and school. The goal of this survey is to determine if well-being can be measured across these contexts simultaneously and, if possible, to see what can be learnt from the discrepancies between various domains of well-being across work, school and non-work contexts. We hope that this study will help to deepen our understanding of well-being and allow us to explore this topic in novel ways.
You are eligible for this study if you have been working at your current workplace for at least 6 months.

The online survey takes about 30-60 minutes to complete. Responses to the survey are confidential and anonymous. Results of the online survey will be shared and published but will be presented in a manner that protects the anonymity of individuals, departments and organizations. **You will not be asked to provide your name.**

RISKS
You will be asked to report about how your employer has addressed mental health difficulties in your workplace. You will also be asked about your experiences with mental health and about the impact that health and mental health difficulties have had on your well-being and ability to work to the best of your abilities. Answering questions of this kind may cause some people to feel distressed, worried, or experience other negative emotions. You are free to withdraw from the study at any time without consequence by simply closing the web browser. If you are experiencing any negative reactions and would like to seek some support, you can refer to the list of mental health resources that are currently available to employees in Ontario.

BENEFITS
We know of no studies that have provided an in-depth analysis of the discrepancies between wellbeing at work vs. outside of work Although there may not be any benefit to you directly, we believe that comprehensive information regarding the employees' experiences with these different factors and the relationship between these factors and mental health of employees will be of benefit to employers, stakeholders and researchers in the workplace.

COMPENSATION
As this study is being completed through ISPR, any students who participate will receive 1 point of

course credit as compensation.

CONFIDENTIALITY AND ANONYMITY
All information you share in the questionnaire and any correspondence (e.g., e-mail) with the principal investigator will be kept confidential. No other identifying information is collected that may identify who you are. No other identifying information has been collected that may identify who you are. Questionnaire responses will be stored on password protected memory sticks in a locked laboratory. The information collected through this questionnaire will be analyzed under the supervision of Dr. Santor. No individual's answers will ever be identified in any report. Only group data will be reported. In order to minimize the risk of security breaches and to help ensure your confidentiality we recommend that you use standard safety measures such as signing out of your account, closing your browser and locking your screen or device when you are no longer using them / when you have completed the study.

CONTACT
If you have questions at any time about the study or the procedures, or you experience any adverse effects as a result of participating in this study you may contact the primary investigator, Kyle McBride, at *********, or his supervisor, Dr. Santor at **********

This project has been reviewed and has received ethics approval from the University Research Ethics Board. If you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5. Tel.: (613) 562-5387. Email: ethics@uottawa.ca

PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. However, once the survey is submitted, participants will be unable to withdraw their data from the study as the researchers will be unable to identify individuals in the dataset. Data from the survey will be kept indefinitely.

FEEDBACK AND PUBLICATION
The data obtained from this study may be used to create a peer-reviewed publication and/or to be presented at a scholarly conference of professionals. Only analyzed findings from aggregated data will ever be presented. Individual responses will not be provided in any publications or presentations.

Section 1 – Demographic questions

The goal of the demographics section is to enable us to conduct a number of analyses involving meaningful subgroups, e.g., men versus women, managers versus employees, etc., within your organization.

Q1. How do you wish to be identified?
Male | Female | Non-binary | Other (please describe if you wish below) | I choose not to disclose
Q1_2. If the previous question's choices were not sufficient to describe your identity, how would you describe your identity?
Q2. What is your age?
24 and under | 25-34 | 35-44 | 45-54 | 55-64 | 65-70 | 71+
Q3. To what employee group do you belong?
General or regular employee | Manager or supervisor | Senior manager or supervisor | Executive or director | Other

Q3_2. Since you indicated "other" in the previous question, please describe what employee group you belong to.
Q4. Please describe what you do in a sentence or two.
Q5. What is your employment status?
Permanent (full time) | Contract (full time) | Permanent (part time) | Contract (part time) | On a medical leave of absence | On a non-medical leave of absence | Other
Q6. With what racial groups do you identify?
Indigenous (e.g., Inuit, Métis, First Nations) | Middle Eastern (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan) | Black (e.g., African, Haitian, Jamaican, Somali) | Asian (e.g., Chinese, Filipino, Japanese, Korean, south Asian, South East Asian) | Latin American | White | I prefer not to answer | Other
Q6_2. Since you indicated "other" in the previous question, what racial groups do you identify with that were not on the list?
Q7. Do you identify as having a disability?
Yes | No | Prefer not to answer
Q8. Do you belong to the LGBTQ+ community?
Yes | No | Prefer not to answer
Q9. Do you make enough income to support yourself and your dependents?
Yes | No | Just enough to get by | Prefer not to answer
Q10. On average, how many hours do you spend working your current job per week (not including any time spent on school-related tasks)?
Q11. School hours On average, how many hours do you spend on your school-related tasks per week (not including the time you spend working the job you are employed in)?

Section 2 – PERMA and Outcome Variables

In this section of the survey, we will be asking various questions about your wellbeing across different areas of your life. Specifically, we will be asking questions about how you feel at work, at school and in your daily life outside of work and school. Make sure to read each question carefully and try to differentiate how you feel about the same subjects when you are and are not at work or school.

Positive Emotions (in the workplace)

Q1. At work, to what extent do you feel joyful?
0-10 (Not at all/never – completely/always)
Q2. At work, to what extent do you feel positive?
0-10 (Not at all/never – completely/always)
Q3. At work, to what extent do you feel contented?
0-10 (Not at all/never – completely/always)

Positive Emotions (in your life outside of work)

Q1. In your daily life outside of work, to what extent do you feel joyful?
0-10 (Not at all/never – completely/always)
Q2. In your daily life outside of work, to what extent do you feel positive?
0-10 (Not at all/never – completely/always)
Q3. In your daily life outside of work, to what extent do you feel contented?
0-10 (Not at all/never – completely/always)

Positive Emotions (in your life at school)

Q1. At school, to what extent do you feel joyful?
0-10 (Not at all/never – completely/always)
Q2. At school, to what extent do you feel positive?
0-10 (Not at all/never – completely/always)
Q3. At school, to what extent do you feel contented?
0-10 (Not at all/never – completely/always)

Engagement (in the workplace)

Q1. At work, to what extent do you become absorbed in what you are doing?
0-10 (Not at all – completely)
Q2. To what extent do you feel excited and interested in your work?
0-10 (Not at all – completely)
Q3. At work, to what extent do you lose track of time doing something you enjoy?
0-10 (Not at all – completely)

Engagement (in your daily life outside of work)

Q1. In your daily life outside of work and school, to what extent do you become absorbed in what you are doing?
0-10 (Not at all – completely)
Q2. To what extent do you feel excited and interested in things not associated with your work or school?
0-10 (Not at all – completely)
Q3. In your daily life outside of work and school, to what extent do you lose track of time while doing something you enjoy?
0-10 (Not at all – completely)

Engagement (in your life at school)

Q1. At school, to what extent do you become absorbed in what you are doing?
0-10 (Not at all – completely)
Q2. To what extent do you feel excited and interested in your school work?
0-10 (Not at all – completely)
Q3. At school, to what extent do you lose track of time doing something you enjoy?
0-10 (Not at all – completely)

Relationships (in the workplace)

Q1. To what extent do you receive help and support from your coworkers when you need it?
0-10 (Not at all – completely)
Q2. To what extent do you feel appreciated by your coworkers?
0-10 (Not at all – completely)

Q3. To what extent are you satisfied with your professional relationships?
0-10 (Not at all – completely)

Relationships (in your daily life outside of work)

Q1. To what extent do you receive help and support from people you know outside of work and school when you need it?
0-10 (Not at all – completely)
Q2. To what extent do you feel appreciated by people you know outside of work and school?
0-10 (Not at all – completely)
Q3. To what extent are you satisfied with your personal relationships, outside of those you work with or know from school?
0-10 (Not at all – completely)

Relationships (in your daily life at school)

Q1. To what extent do you receive help and support from your teachers and fellow students when you need it?
0-10 (Not at all – completely)
Q2. To what extent do you feel appreciated by your teachers and fellow students?
0-10 (Not at all – completely)
Q3. To what extent are you satisfied with your school-based relationships?
0-10 (Not at all – completely)

Meaning (in the workplace)

Q1. To what extent is your work purposeful and meaningful?
0-10 (Not at all – completely)
Q2. To what extent do you feel that what you do at work is valuable and worthwhile?
0-10 (Not at all – completely)
Q3. To what extent do you generally feel that you have a sense of direction in your work?
0-10 (Not at all – completely)

Effort Test

Are you paying attention? Please set the sliders to the correct positions as requested

Q1. Set this slider to 7
0-10 (Not at all – completely)
Q2. Set this slider to 4
0-10 (Not at all – completely)
Q3. Set this slider to 1
0-10 (Not at all – completely)

Meaning (in your daily life outside of work)

Q1. To what extent do you lead a purposeful and meaningful life outside of work and school?

0-10 (Not at all – completely)

Q2. To what extent do you feel that what you do in your life outside of work and school is valuable and worthwhile?

0-10 (Not at all – completely)

Q3. To what extent do you generally feel you have a sense of direction in your life outside of work and school?

0-10 (Not at all – completely)

Meaning (in your daily life at school)

Q1. To what extent is your school work purposeful and meaningful?

0-10 (Not at all – completely)

Q2. To what extent do you feel that what you do at school is valuable and worthwhile?

0-10 (Not at all – completely)

Q3. To what extent do you generally feel you have a sense of direction in your school work?

0-10 (Not at all – completely)

Accomplishment (in the workplace)

Q1. To what extent do you feel you are making progress towards accomplishing your work-related goals?

0-10 (Not at all – completely)

Q2. To what extent do you achieve the important work goals you have set for yourself?

0-10 (Not at all – completely)

Q3. To what extent are you able to handle your work-related responsibilities?

0-10 (Not at all – completely)

Accomplishment (in your daily life outside of work)

Q1. To what extent do you feel you are making progress towards accomplishing your goals in your daily life outside of work and school?

0-10 (Not at all – completely)

Q2. Not including work or school-related goals, to what extent do you achieve the important goals you have set for yourself?

0-10 (Not at all – completely)

Q3. To what extent are you able to handle your responsibilities in your daily life outside of work and school?

0-10 (Not at all – completely)

Accomplishment (in your daily life at school)

Q1. To what extent do you feel you are making progress towards accomplishing your school-related goals?

0-10 (Not at all – completely)

Q2. To what extent do you achieve the important school goals you have set for yourself?

0-10 (Not at all – completely)

Q3. To what extent are you able to handle your school-related responsibilities?

0-10 (Not at all – completely)

Health (in general, don't worry about specific contexts)

Q1. In general, how would you say your health is?

0-10 (Not at all – completely)

Q2. How satisfied are you with your current physical health?

0-10 (Not at all – completely)

Q3. Compared to others of your same age and sex, how is your health?

0-10 (Not at all – completely)

Importance and overlap

Q1. When answering these questions, how difficult was it to differentiate your life at work vs. your daily life outside of work?

0-10 (Very easy/minimal overlap – very difficult/a lot of overlap)

Q2. Please rank order these contexts based on how important they are to your overall sense of well-being (1 is most important, etc...). You can drag and drop the options to order them.

Work | school | life outside of school and work

Desire to change

Q1. I would like to change the level of well-being I get from my work.

Not at all | a little | a lot | a great deal

Q2. It would be feasible to change the level of well-being I get from my work.

Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Q3. I would like to change the level of well-being I get from my daily life outside of work.

Not at all | a little | a lot | a great deal

Q4. It would be feasible to change the level of well-being I get from my daily life outside of work.

Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Q5. I would like to change the level of well-being I get from school.

Not at all | a little | a lot | a great deal

Q6. It would be feasible to change the level of well-being I get from school.

Strongly disagree | Disagree | Neither agree or disagree | Agree | Strongly Agree

Satisfaction with Life Scale

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

Q1. In most ways my life is close to ideal.

Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q2. The conditions of my life are excellent.

Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q3. I am satisfied with my life.

Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q4. So far I have gotten the important things I want in life.

Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Q5. If I could live my life over, I would change almost nothing.

Strongly disagree | Disagree | Slightly disagree | Neither agree or disagree | Slightly agree | Agree | Strongly agree

Work life balance scale

When I reflect over my work and non-work activities (your regular activities outside of work such as family, friends, sports, study, etc.), over the past three months I conclude that:

Q1. I currently have a good balance between the time I spend at work and the time I have available for non-work activities.

Strongly disagree | Disagree | Neutral | Agree | Strongly Agree

Q2. I have difficulty balancing my work and non-work activities.

Strongly disagree | Disagree | Neutral | Agree | Strongly Agree

Q3. I feel that the balance between my work demands and non-work activities is currently about right.

Strongly disagree | Disagree | Neutral | Agree | Strongly Agree

Q4. Overall, I believe that my work and non-work life are balanced.

Strongly disagree | Disagree | Neutral | Agree | Strongly Agree

Depression, anxiety, stress scale – 21

Please read each statement and select a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the **past week**. There are no right or wrong answers. Do not spend too much time on any statement.

Q1. I found it hard to wind down.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q2. I was aware of dryness in my mouth.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q3. I couldn't seem to experience any positive feeling at all.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q4. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion).

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q5. I found it difficult to work up the initiative to do things.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q6. I tended to over-react to situations.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q7. I experienced trembling (e.g., in the hands).

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q8. I felt that I was using a lot of nervous energy.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q9. I was worried about situations in which I might panic and make a fool of myself.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q10. I felt that I had nothing to look forward to.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q11. I found myself getting agitated.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q12. I found it difficult to relax.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q13. I felt down-hearted and blue.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q14. I was intolerant of anything that kept me from getting on with what I was doing.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q15. I felt I was close to panic.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q16. I was unable to become enthusiastic about anything.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q17. I felt I wasn't worth much as a person.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q18. I felt that I was rather touchy.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q20. I felt scared without any good reason.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q21. I felt that life was meaningless.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Academic burnout

Please read each statement and select a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the **past semester (not this current one)**. There are no right or wrong answers. Do not spend too much time on any statement.

Q1. I am tired of school.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q2. I have no energy for my studies.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q3. My performance at school is far less than my potential.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q4. I have been submitting incomplete and/or low quality work.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q5. I don’t see the value of going to school.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Q6. I have a negative attitude towards my studies.

Did not apply to me at all | Applied to me to some degree, or some of the time | Applied to me to a considerable degree or a good part of the time | Applied to me very much or most of the time

Section 3 - Functioning and Impairment

In the past month, how often have you experienced the following difficulties?

Rating scale: Not at all | Somewhat | A lot | Almost all the time

Feeling nervous, anxious, or on edge
Not being able to control your worries or fears
Little interest or pleasure in doing activities (either at work or in your personal life)
Feeling down, depressed, or hopeless
Trouble falling, staying asleep or sleeping too much
Feeling bad about yourself, feeling like a failure, or that you have let yourself or your family down
Feeling stressed out and overwhelmed at work
Did not sleep well because of your worries, stresses, or pressures at work
Feeling stuck and unable to deal with your current situation at work

Continued... In the past month, how often have you experienced the following difficulties?

Rating scale: Not at all | Somewhat | A lot | Almost all the time

Difficulties concentrating and / or making decisions
Difficulties completing tasks
Feeling tired at work
Being unpleasant / irritable / uncooperative with co-workers, managers and / or clients
Missing days of work
Being unproductive
Missing deadlines
Making mistakes

Have you sought help for these difficulties in the past three months? (Check one of the following options)

I have not experienced any difficulties in the past three months.
I did not think these difficulties required professional help.
I would like to / wanted to see a health or mental professional but haven't done that yet.
I have talked to a health professional.
I had difficulties but did not want to seek help.

What is your own personal experience with mental illness? (Check all that apply)

I am currently dealing with mental illness (or significant mental health difficulty).
I had mental illness (or significant mental health difficulty) earlier in my work career.
I had a mental illness (or significant mental health difficulty) before I started working fulltime.
I have never had a mental illness.
I prefer not to answer.

How long have you been dealing or have dealt with mental health difficulties?

I do not have mental health difficulties
< 3 months
4-6 months
7-11 months
1-2 years
3-5 years
more than 5 years

Section 4 - Performance at Work

How much you work

In this section of the survey, we would like to know about how much you worked and how much work you missed for a variety of reasons. Looking over the past four weeks, how many hours did you work, **on average, each week**?

0-70 (sliding scale)

Expected to work
About how many **hours** does your employer expect you to work **in a typical 7-day week**? (If it varies, please estimate the average. If there is no fixed expectation, type in "00".)
[Open text response]
Extra hours of work
In the past month, how many **additional hours** did you work outside of your typical work shift or day (e.g., working through lunches, stayed past the end of the workday, worked home evenings and weekends)?
[Open text response]
Intensity of work
Please rate the intensity of your typical workday.
Very low intensity – I have a number of breaks and a number of slow times during the day
Low intensity - I can take breaks or interrupt my work as often as I need to during my day
Moderate intensity – I have breaks throughout my day but work is very steady during the rest of it
High intensity – I have a hard time keeping up with the volume of things to do during the day
Excessive intensity – I work at a fast pace throughout the day, with no breaks or downtime
Managing the intensity of your work
To what degree is the intensity of your work **negatively affecting** your health or well-being?
Not at all
Somewhat
A lot
Extremely
Please rate the repetitiveness of your entire job.
Low repetitiveness – My job is not repetitive at all. I have a variety of tasks to do throughout the week and a reasonable amount of flexibility in how I go about them. If I wanted to ask for some new responsibilities or tasks, my organization would provide me with that opportunity.
A little bit repetitive
Somewhat repetitive
Very repetitive
Extremely repetitive – My work has become extremely repetitive. I have a small number of tasks that I do over and over again, with no flexibility in how they get done. I have little to no opportunity to do new tasks or take on new responsibilities.
How long have you felt that your job has become repetitive?
Not applicable
< 1 year
1-2 years
3-5 years
6-10 years
11-15 years
16-20 years
More than 20 years
How much has the repetitiveness of your job affected the following?
Rating scale: Not at all | a little | somewhat | a lot | completely/extremely
Physical health
Mental health
Ability to do your job
Missing FULL Days of work
This question asks you to estimate, as best you can, how many FULL days of work you missed in the past 30 days. You will be asked about missing PART days on the next page.
In the **past 30 days**, how many full days of work did you **miss**, because of **mental health difficulties**, such as sadness, worry, substance abuse?

[Open text response]
In the **past 30 days**, how many full days of work did you **miss**, because of **physical health difficulties**, such as pain, fatigue, headaches?
[Open text response]
In the **past 30 days**, how many full days of work did you **miss**, because of a **planned vacation or holiday**?
[Open text response]
In the **past 30 days**, how many full days of work did you **miss**, for **no reason at all**?
[Open text response]
Missing PART Days of work
This question asks you to estimate, as best you can, how many PART days of work you missed in the past 30 days.
In the **past 30 days**, how many part days of work did you **miss**, because of **mental health difficulties**, such as sadness, worry, substance abuse?
[Open text response]
In the **past 30 days**, how many part days of work did you **miss**, because of **physical health difficulties**, such as pain, fatigue, headaches?
[Open text response]
In the **past 30 days**, how many part days of work did you **miss**, because of a **planned vacation or holiday**?
[Open text response]
In the **past 30 days**, how many part days of work did you **miss**, for **no reason at all**?
[Open text response]
Working to your capacity
In this question, we are interested in how well you were able to work **during the past 30 days that you went to work**. You may have missed a few days in the past week or month. We are interested in the days that you were there. On how many of those days were you completely unable, significantly unable, or partially unable to work because of **mental health difficulties** (such as sadness, worry, substance abuse, etc.)?
On how many of your past 30 days were you **completely unable** to work? : _____
On how many of your past 30 days were you **significantly unable** to work? : _____
On how many of your past 30 days were you **partially unable** to work? : _____
On how many of your past 30 days did you have **no difficulties at all** working? : _____
Total : _____
In this question, we are interested in how well you were able to work **during the past 30 days that you went to work**. You may have missed a few days in the past week or month. We are interested in the days that you were there. On how many of those days were you completely unable, significantly unable, or partially unable to work because of **physical health difficulties**, such as pain, fatigue, headaches, etc.?
On how many of your past 30 days were you **completely unable** to work? : _____
On how many of your past 30 days were you **significantly unable** to work? : _____
On how many of your past 30 days were you **partially unable** to work? : _____
On how many of your past 30 days did you have **no difficulties at all** working? : _____
Total : _____

Section 4: Performance at work

Performance at work
In this section, we would like you to rate your performance in the **past 6 months**. Over the past **6 months**, rate how well you have been performing (e.g., if you are performing at 75% of your ability, enter 75%). Response options: 0 to 100%
0-100% (sliding scale)

What level of burnout, if any, are you experiencing?
Rating scale: Not at all | a little | somewhat | a lot | completely/extremely
Feeling tired or exhausted at work.
Feeling uninterested or disengaged from the work you do.
Feeling negative or cynical about the work that you do.
Being less effective or less productive at work.
Work Performance Index
This section assess the way that you perform the core tasks associated with your job. Your core tasks are the tasks that would be outlined in your position description. Thinking about how you have carried out your core job over the past 6 months, to what extent have you:
Rating scale: 1 = very little to 5 = A great deal
Carried out the core parts of your job well
Completed your core tasks well using the standard procedures
Ensured your tasks were completed properly
Avoided mistakes and errors when completing core tasks
Adapted well to changes in core tasks
Adjusted to new equipment, processes or procedures in your core tasks
Coped well with changes to the way you have to do your core tasks
Initiated better ways of doing your core tasks
Come up with ideas to improve the way in which your core tasks are done
Made changes to the way your core tasks are done
Section 6 - Disclosing
Disclosing a mental illness at work
In this next question, we are interested in knowing how your workplace treats employees **after disclosing** that they are dealing with mental illness. These questions are only for employees who developed a mental illness after starting at their current workplace.
Please select one of the following options:
Since starting at my current workplace, I have told my current employer that I have had or have a mental illness
I do not have a mental illness OR have not told my current employer
I prefer not to answer