



Towards a University of Virtue—The Wellbeing Assessment Project at Wake Forest University

Eranda Jayawickreme

This is an unpublished conference paper for the 6th Annual Jubilee Centre for Character and Virtues conference at Oriel College, Oxford University, Thursday 4th – Saturday 6th January 2018.

Jubilee Centre for Character and Virtues

University of Birmingham, Edgbaston, Birmingham, B15 2TT United Kingdom

T: +44 (0) 121 414 3602 F: +44 (0) 121 414 4865

E: jubileecentre@contacts.bham.ac.uk W: www.jubileecentre.ac.uk



Towards a University of Virtue—The Wellbeing Assessment Project at Wake Forest University

Eranda Jayawickreme
Wake Forest University

Correspondence concerning this article should be addressed to Eranda Jayawickreme, Wake Forest University, Department of Psychology, 415 Greene Hall, P.O. Box 7778, Winston-Salem, NC, 27109. E-mail: jayawide@wfu.edu

Abstract

In this paper, I introduce the Engine Model of Well-Being (Jayawickreme, Forgeard, & Seligman, 2012); a theoretical framework for assessing the resources and skills required to achieve lifelong eudaemonic well-being. This model includes dimensions of moral (e.g. trust and identification with all humanity), civic (e.g. commitment to lifelong service), performance (e.g. conscientiousness) and intellectual (e.g. intellectual curiosity) character. I present data demonstrating the psychometric properties of a measure based on this model and illustrate substantive findings and consider the translation of these results into interventions designed to support the development of well-being and character in the university context.

Introduction

The tension between the goals of educating for character and more traditional approaches echoes that between competing goals of education identified by Aristotle in the *Poetics*: the development of the intellect, “virtue” or accomplishment (VIII, ii, 1337a33), as well as the debate between the progressive and formal educational traditions (Thomas, 2013). The progressive educational tradition emphasizes “development from within” as opposed to “formation from without” (Dewey, 1938). Activity, freedom and personal growth of the student are paramount, with teachers and students operating in a mentor-apprentice relationship, as opposed to the teacher operating purely in an instructional capacity. Such growth-focused goals are broadly concordant with eudaemonic approaches, yet the question of which “virtues” should be developed in the education context remains unclear.

Indeed, a wide range of traits, skills and abilities that arguably count as eudaemonic youth outcomes have been identified as important “non-academic” youth outcomes. These constructs have been variously termed skills that promote or constitute "character", "character virtue development", "social emotional learning", "pro-social behavior", "positive youth development", "learning mindsets and skills", "capacity for accomplishment", "thriving", "non-cognitive skills" and "personal success skills". As Berkowitz & Bier (2004) note when discussing definitions of research-based character education, “service learning, social-emotional learning, and prevention programs all share significant features with character education and could be considered forms of character education” (p.74; see also Jayawickreme & Dahill-Brown, 2016, p. 474).

Given that eudaemonic notions of well-being (with its emphasis on character, morality,

meaning and spiritual concerns) may be defined, presented, and encouraged differently for different student populations, part of the challenge is thus to understand whether a conceptualization of eudaemonic well-being can be specified that successfully promotes the education of the whole student while helping to ensure that no single aspect of well-being or character are lost in the shuffle or subverted to other ends. The Wellbeing Assessment Project at Wake Forest University attempts to achieve this through the development of a model of undergraduate eudaemonic well-being that incorporates assessments of moral, civic, performance and intellectual character.

A. Project history

At Wake Forest we deeply value the education of the whole person. We believe that whole-person education includes helping students develop their personal wellness so that they can thrive both in and out of the classroom. Research on interventions to support wellbeing in nonclinical undergraduate student populations is limited and in its infancy, leaving an urgent need for additional research and tools to help universities better understand and improve student wellbeing.

In 2014, Wake Forest University received a large grant to improve our campus wellness facilities and programming. That funding established our Office of Wellbeing and our applied Thrive programming, and it also funded a renovation of our recreation facilities. We realized then that we needed a way to measure the benefits of students' improved access to wellbeing. We wanted that assessment to provide: (a) an understanding of how well students were, and b) detailed and concrete information that could directly inform programming and support efforts. A review of existing wellbeing research yielded measures that were close to our needs, but we could not find a comprehensive measure that met both of these goals. Therefore, with some

foundation support from the Reynolds American Foundation, we began developing our own measure under a project called the Wellbeing Assessment.

B. The Engine Model of Well-being¹

Jayawickreme, Forgeard, and Seligman (2012) proposed a model of well-being that draws from integrative work found in research both within and outside psychology. This model provides a parsimonious framework for both the pathway of well-being and the different categories of well-being. The foundation of this model, the pathways leading to well-being achievement, is an adaption of a systems-informed model (the “engine” model) in which well-being is parsimoniously defined in terms of inputs, processes, and outcomes. In doing so, the Engine model attempts a complimentary integration of two main perspectives on well-being in psychology— the subjective well-being (SWB) and psychological well-being (PWB) models, as well as other theoretical perspectives from other disciplines.

In brief, Veenhoven (1991) and Cummins and colleagues (1998) have proposed a systems-theory approach to understanding well-being². In an extensive review of quality-of-life measures, Hagerty and colleagues (2001) argued that none of the 22 quality-of-life scales that they evaluated were based on a well-established theory (that is, an empirically supported “nomological net” of concepts and causal paths that specify how quality-of-life is related to exogenous and endogenous variables), and they proposed a systems-theory approach as a potential solution.

¹ Authors vary in their use of the spellings *wellbeing* and *well-being*. We have preserved the original authors' usages, and use *wellbeing* in our own original work.

² This summary is adapted from Jayawickreme, Forgeard, & Seligman, 2012, p.329.

This approach distinguished between *inputs*, *throughputs* and *outputs*. In Hagerty et al.'s (2001) account, input variables are environmental factors that influence quality-of-life, such as Gross Domestic Product (GDP), political freedom and health services. Throughput variables refer to an individual's reactions and choices in this environment. Quality-of-life measures typically use objective measures as throughput variables, such as achieved education and personal health. Finally, output variables measure the results of the input and throughput variables. Veenhoven (2000) cites domain-specific and overall SWB, personal survival, and "contribution to the human heritage" as examples of output variables. It is important to note that output variables can have causal feedback effects on both input and throughput variables, influencing them either positively or negatively.

Jayawickreme et al. (2012) adopts their framework as a direct antecedent, which distinguishes between *inputs*, *processes* and *outcomes* for individual well-being. What goes into the three classes of variables, however, distinguishes this framework from theirs. The relevant concepts are summarized under the appropriate heading below.

Input variables

This model includes as input variables two kinds of influences: exogenous and endogenous predictors of well-being. First, exogenous predictors include environmental variables such as income, education, and genetics. These input variables, such as income, green space, and clean water, fulfill exogenous needs and predict outcomes associated with well-being. The objective-list approach (below) consists of a compilation of exogenous input variables. These variables including resources and income—afford the opportunity to engage in valuable activities—and so contribute towards an individual's well-being. Second, we also add personality variables—these are traits that predict well-being (Ryan & Deci, 2000). These

endogenous variables are traits that include optimism, neuroticism, curiosity, abiding values, strengths and talents, and the trait of positive affectivity, which are all related to well-being.

Process variables

Process variables are internal states that influence the *choices* that individuals make; the outcomes of these choices are the behaviors that constitute the outcome variables. Following Carver and Scheier's (1981) self-regulatory model, individuals respond to their environment by engaging in activities to achieve their goals. This is equivalent, utilizing Sen's (1999) language below, to their choosing between different capabilities in order to achieve functionings. These choices can be affected by a number of variables, including specific beliefs or cognitions that they may have regarding their choices, the explanations they make, moods, emotional states that are consequences and correlates of the choices. Importantly the engine places the subjective variables, such as mood, positive emotion, and cognitive evaluations in the process part of the model. Note that while Hagerty et al.'s (2001) definition of a throughput focuses on objective measures of choice, the category of process defined here focuses on capabilities and subjective states.

Outcome Variables: Preferences, Behavior, and Goal-Driven Functionings

The outcomes of the engine approach are the voluntary behaviors that characterize well-being: positive relationships, positive accomplishment, engagement in work, love or play, authentic, autonomous behavior, and meaningful activity. Following Seligman (2011) and Sen (1999), the approach defines well-being outcomes in terms of what people, when free from coercion, would choose to do for their own sake. Although individuals may sometimes pursue these outcomes for other ends (e.g., they may for instance think that accomplishment will bring

positive emotion), many choose to do so because these outcomes are intrinsically motivating by themselves. Such an outcome should satisfy three conditions:

1. It contributes to well-being and a life well-lived
2. Many people pursue it for its own sake, not merely to get any of the other elements
3. It is defined and measured independently of the other outcomes

Such behaviors constitute what Sen (1992) and Nussbaum (2011) define as functionings, or valuable doings that grow out of inputs. Such goal-driven functionings in objective list theories are the activities that individuals engage in to fulfill important goals; such goal-motivated activity is indicative of well-being (Brunstein, Schultheiss, & Grassmann, 1998; Hofer, Busch, & Kiessling, 2008).

C. Application of the Engine Model of Well-being to the Wellbeing Assessment

Our application of the Engine Model of Well-being (Jayawickreme et al., 2012) to the Wellbeing Assessment allowed us to create a measure that is distinct from existing measures of wellbeing for two key reasons: (a) it is based on a rich and multi-dimensional conceptualization of wellbeing, and (b) it provides university programming staff with fine-grained, concrete details that will help them develop interventions. We discuss both benefits further in the remainder of this section.

First, the Engine Model of Wellbeing (Jayawickreme et al., 2012) allowed us to develop a rich and multi-dimensional conceptualization of wellbeing. Many other conceptualizations of wellbeing rely primarily on subjective wellbeing as defined by life satisfaction and affective wellbeing. Although we consider subjective wellbeing important, the Engine Model of Well-being allowed us to define wellbeing as the expression of the outcome variables in the model across a range of dimensions that are relevant to young adult undergraduate students, including:

a) sense of meaning and purpose, b) social support networks, c) sense of belonging, d) engagement in campus activities, and e) civic engagement. Because they have a close association with wellbeing, we also evaluate subjective wellbeing, physical health behaviors, substance use, and a range of positive attitudes such as growth mindset, optimism, and grit. We talk further in the next section of this paper about our selection of the wellbeing dimensions.

Second, because we wanted the results from the Wellbeing Assessment to be easily translated into action by university administrative and programming offices, we applied the Engine Model of Well-being at the micro-level so that we could evaluate the pathways to wellbeing within each of the measure's wellbeing dimensions. This application of the model at the micro-level allowed us to evaluate the inputs and processes—or skills, resources, and conditions—that are relevant to each of the wellbeing dimensions.

The adapted model is demonstrated in Figure 1. Our application of the Engine Model at the micro-level is represented by the ovals that encompass the *Inputs & Processes* boxes and the *Outcomes* boxes. Those ovals and their included boxes indicate that we measure inputs and processes that are specific to each of the wellbeing dimensions we evaluate, and we also measure whether wellbeing has been achieved in each dimension. The *Other Variables* box represents the additional measure components that we believe are associated with wellbeing achievement within each of the dimension, such as subjective wellbeing. Because we realize that university programmers, staff, and stakeholders are concerned with the connections between wellbeing and a number of concrete outcomes, this box also includes some of those concrete outcomes: GPA, intent to transfer, services use, and academic engagement.

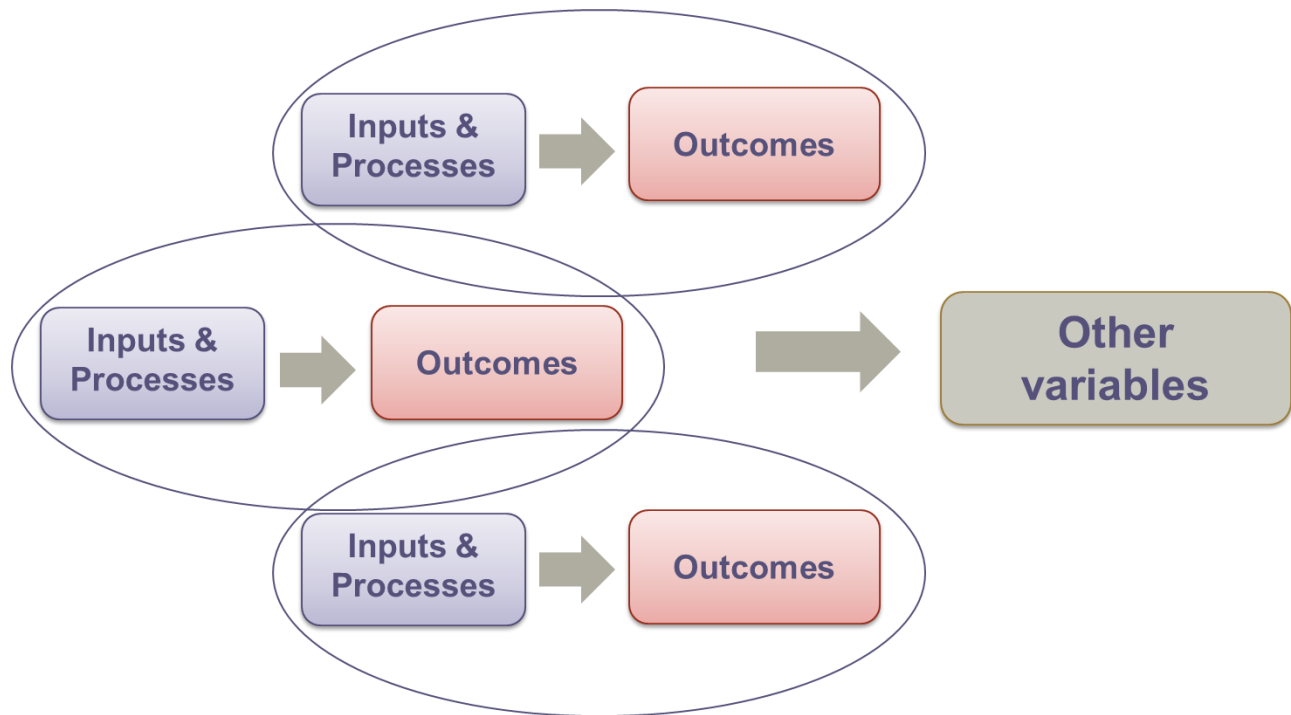


Figure 1. Adaptation of the Engine Model of Well-being for the Wellbeing Assessment

D. Content of the Wellbeing Assessment

In one sense, the focus of this project has been on the outcome of well-being stipulated by the original Engine model: the thoughts, feelings and behaviors that characterize well-being. Through a combination of theorizing and empirical review, we have currently identified a set of dimensions that characterize important manifestations of well-being for college students. In identifying these dimensions, we in part relied on decision rules organically proposed by Dahill-Brown and Jayawickreme (2016) for identifying relevant dimensions of well-being for college students:

- The proposed dimension should have a substantive empirical base of research supporting its successful assessment and utility. Given the significant progress made on research on well-being and personality (“non-cognitive traits”) in the last 20 years, a proposed

dimension should have some identified empirical research base supporting its successful assessment and value in terms of life outcomes.

- The proposed dimension should be *actionable*— i.e. colleges should ideally be able to effect changes on students’ standing on these dimensions. While an identified dimension may be important in of itself or for other valued life outcomes, it should also be *actionable* in the educational setting. In other words, colleges and other educational institutions should be able to effect changes on students’ standing on these dimensions.

We have additionally examined the inputs and processes for each of these outcome dimensions. As noted earlier, the inputs associated with each dimension include both distal, extrapersonal inputs such as SES, genes and cultural influences that have contributed to conditioned/instinctive/automatic tendencies, as well as intrapersonal inputs such as schemas about the world (we note that the term “schema” carries the implication that there is a lot of unconscious learned behavior that may be hard to change (some may be harder to move than others). Processes associated with these dimensions involve social-cognitive processes (or *skillsets*) that are arguably more malleable and amenable to intervention. The main goal of the well-being assessment being developed here is to identify the relevant schemas and processes related to the identified dimensions.

1. Meaning

Meaning has come to be understood as distinct from happiness (Baumeister, 1992; Ryan & Deci, 2000; Kasser & Ryan, 1993; King & Hicks, 2007; Ryff & Keyes, 1995; Seligman, 2002).and was demonstrated as such by factor analysis (McGregor & Little, 1998). Researchers

increasingly argue that while happiness is an aspect of *subjective well-being* and thus contributes to *hedonia*, the facet of human well-being involving the pursuit of pleasure, meaning is more intimately connected with *eudaimonia*, well-being derived not from pursuing momentary desires but those experiences that promote growth and wellness (Ryan & Deci, 2001).

Meaning is not entirely isolated from measures of subjective well-being, however; it is positively related to life satisfaction (Zika & Chamberlain, 1992), and pursuing meaningful goals is associated with subjective well-being (Locke & Latham, 2002; Seligman, 2002). Moreover, positive affect may predispose individuals to feel that their lives are meaningful, and thus may increase one's sensitivity to the potential relevance of a particular situation for building meaning (King, Hicks, Krull, & Del Gaiso, 2006). Meaning is linked to both subjective well-being and PWB in the literature (e.g., Zika & Chamberlain, 1992; Ryff & Singer, 1998; Ryff & Singer, 2008; Vella-Brodrick, Park, & Peterson, 2009). Having high meaning in life is characteristic of social activists who exhibit high moral excellence in their work (Colby & Damon, 1992). College may be the first context in which individuals begin to answer the question “what does my life mean?” (Baumeister, 1992), and address hitherto unexamined existential questions that have a bearing on their future well-being. Promoting such existential development has been stated frequently as a purpose of liberal higher education.

2. *Purpose*

The *psychological well-being* construct (PWB; Ryff & Keyes, 1995), arose as a complementary approach to subjective well-being, defining specific dimensions of well-being where the subjective well-being perspective does not. One of these dimensions is Purpose in Life, defined as “having beliefs that give the individual the feeling that there is purpose in and

meaning to life” (Ryff, 1989). Purpose may be related to having a passion in life. Recent research has shown that people who frequently engage in activities that they are passionate about experience positive emotions during task engagement (Vallerand, 2008), and have higher levels of zest and meaning in their life than people who are not passionate about their daily life activities. Passion here is defined as a strong inclination toward an activity that people like, that they find important, and in which they invest time and energy (Vallerand et al., 2003). Moreover, Vallerand and colleagues (Guay et al., 2003) make a distinction between two forms of passion. Obsessive passion (OP) refers to a controlled internalization of an activity in one’s identity that creates an internal pressure to engage in the activity that the person likes. Harmonious passion (HP) refers to an autonomous internalization that leads individuals to choose to engage in the activity that they like. HP promotes healthy adaptation whereas OP thwarts it by causing negative affect and rigid persistence. Additionally, being harmoniously (but not obsessively) passionate for an activity has been shown to be positively associated with both subjective and eudaimonic well-being (Phillippe, Vallerand, & Lavigne, 2009).

3. Engagement – activities

The broad personality trait of Conscientiousness had been associated with multiple important life outcomes, including educational achievement and job performance across a wide range of occupations (Almlund, Duckworth, Heckman, & Kautz, 2011). Moreover, successful completion of high school is predicted by specific facets (specific sub-traits) encompassed by Conscientiousness. More recent research has focused on the specific Conscientiousness-related trait of grit, defined as perseverance and passion for long-term goals (Duckworth, Peterson, Matthews & Kelly, 2007). People high in grit are more likely to persist in achieving long-term

goals, and “maintain effort and interest over years despite failure, adversity and plateaus in progress” (p. 1088), meaning that fostering this trait could have positive long-term effects.. Recent research has focused on the importance for grit and factors such as optimism and having a “growth mindset,” or believing that the ability to learn can be improved through effort, and efforts are being made to develop interventions that can successfully increase grit among student populations (Duckworth & Carlson, 2013). It should be noted, however, that the correlation between grit and the broader trait of conscientiousness is very high (Duckworth & Quinn, 2009), which points to either grit being a subcomponent of conscientiousness, or even a direct measure of the broader trait (Roberts et al., 2014).

4. Positive attitudes

The subjective well-being (SWB) approach is the most ubiquitous method to assessing well-being in psychology, and much of the research discussed earlier derives from this tradition. SWB accounts in psychology center on subjective reports of positive emotions and life-satisfaction, and assess how people feel and think about their quality of life. SWB accounts incorporate both hedonic experiences (momentary positive and negative emotions) and cognitive evaluations of how well life is going more generally. Since both of these elements are subjective (the first being affective and the second cognitive in nature) this kind of account is termed subjective well-being, an umbrella term combining how we think plus how we feel about our lives (Diener et al., 1999). Given the benefits of positivity, promoting it among college students is a worthwhile goal.

5. Relationships: friendships & romantic relationships

Ryan and Deci (2000) identify relatedness--the importance of feeling a close connection to and being cared for by others-- as one of three psychological needs that are principal *predictors* of well-being, along with autonomy and competence. These needs have been shown to be cross-culturally valued (Sheldon, Elliot, Kim & Kasser, 2001) and relate to measures of life satisfaction (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996). More recent work points to belongingness as a significant predictor of important outcomes, including academic achievement (see below).

6. *Sense of Belonging*

Belonging uncertainty has been shown to be harmful in a variety ways, from academic outcomes to health outcomes. More recent work points to belongingness as a multi-dimensional and malleable construct that is sensitive to factors such as social identity and social environment, and as a significant predictor of important outcomes, including academic achievement and health outcomes.

7. *Commitment to lifelong service/ Standing up to discriminatory behavior/ Volunteerism*

Aristotle's (350BC/1998) flourishing account of well-being proposed a perfectionist version in which the well-being of an individual is judged by considering how close they are to reaching the full potential of humankind. Aristotle's term for this, *eudaimonia*, has been translated variously as flourishing, happiness or well-being. Defining this "good" or "full" life has been a central concern of psychologists, political philosophers and human development researchers, and multiple accounts have been advocated over the last sixty years (Ranis, Stewart, & Samman, 2006).

Maslow's (1954, 1971) hierarchy of needs approach represents one of the earliest attempts in psychology to differentiate between subsistence and flourishing. The hierarchy of different needs emphasizes the importance of fulfilling one set of needs before progressing to other, higher-order needs. Maslow saw his list of needs as important motivators of human behavior and moreover distinguished between *growth* or higher-level and *deficiency* or lower-level needs (Wahbah & Bridwell, 1976). While satisfying deficiency needs helps avoid unpleasant consequences, satisfying growth needs helps an individual achieve a state of flourishing, which Maslow termed *self-actualization*. One component of a self-actualized individual on this account is her commitment to others and even an identification and concern for all humanity. Recent research has shown that people who identify strongly with all humanity are high in dispositional empathy, moral reasoning, moral identity and universalist values (McFarland, Webb & Brown, 2013). The growth of a sense of commitment to others represents a manifestation of mature civic citizenship, the development of which is arguably one goal of higher education.

8. *Intellectual curiosity*

As Jayawickreme & Dahill-Brown (2016) noted, in reviewing this tripartite distinction, Baehr (2015) suggested the addition of the fourth category of intellectual character (traits that foster lifelong learning like critical thinking and open-mindedness) to Seider's (2012) distinction between moral character ("character of a good neighbor," including traits such as compassion, trust and kindness), civil character ("character of a good citizen," including traits such as tolerance, respect and civic-mindedness), and performance character ("achievement traits," including traits such as conscientiousness and grit). These four dimensions arguably represent a

model of eudaemonic well-being that captures all the important dimensions without prioritizing one dimension (such as traits associated with performance character, for example) over another. Intellectual curiosity is a key dimension of intellectual character that on this view forms part of a comprehensive model of life-long well-being (Leary et al., 2017)

E. Development methods

To guide our development methods, we are relying on a synthesis of Messick's (1995) and Kane's (D. A. Cook, Brydges, Ginsburg, & Hatala, 2015; Kane, 2013) validity frameworks. Combined, these frameworks thoroughly outline relevant validity components and provide guidance regarding the types of evidence needed to evaluate each component of validity. The details of these frameworks and their evidentiary requirements are too specific for review here, but can be summarized as requiring that validity evidentiary catalogs include: (a) reference to relevant literature and substantive experts to ensure that the measure includes all relevant content, (b) demonstrations that a measure's tasks elicit the intended information, (c) evidence that scoring methods are appropriate at the individual and aggregate level across laboratory and applied settings, (d) evaluations of a measure's fairness across groups, settings, and tasks, (e) tests of a measure's performance relative to other measures, (f) and evidence that a measure functions in applied settings as intended and without unfair consequences.

Such a large evidentiary catalog requires multi-method, longitudinal, and applied research that is treated as an ongoing effort over the working life of a measure. This work cannot be treated as a limited-term research project that provides clear and indisputable evidence. Although we have spent several years evaluating the measure's validity, we plan to continually re-evaluate validity over the lifespan of the project.

To evaluate whether the measure encompasses relevant content, our validity research program has thus far drawn on extant research associated with measuring and defining each of the wellbeing dimensions in the measure. As discussed above, we have also relied as much as possible on intervention literature to identify the associated precursors for each dimension, although the relative newness of the field limits the range of available research. The program has also received ongoing input from a multi-disciplinary team of substantive experts in both faculty and administrative departments.

We have also conducted three rounds of cognitive process interviews and three pilot administrations to help us evaluate whether the measure's items elicit the intended information. The cognitive process interviews were conducted using concurrent think aloud probes (Beatty & Willis, 2007; Willis, 2005; Willis & Artino, 2013). We administered the pilots using planned missing data designs to reduce respondent burden and increase the likelihood that missing data would be missing completely at random rather than missing at random or missing not at random (Graham, Taylor, Olchowski, & Cumsille, 2006; Harel, Stratton, & Aseltine, 2015; Little & Rhemtulla, 2013; Raghunathan & Grizzle, 1995). The samples for the interviews were drawn from Wake Forest University and two other private institutions; a total of approximately 70 students participated in the interviews. The samples for the first two pilots were drawn from Wake Forest University; the sample for the third pilot was drawn from 11 public and private schools across the country for a total sample size of 3,684.

Because our conceptual model treats the achievement of wellbeing as being dependent on a set of inputs and processes that are the skills, conditions, and resources necessary for wellbeing, we modeled the dimensions using structural equation modeling using *Mplus* software (Muthén & Muthén, 1998). Each wellbeing dimension includes several items that represent a

latent factor of wellbeing achievement in that dimension (the *Outcomes* box in Figure 1). That latent factor is then regressed on the input and process items that are specific to that dimension (the *Inputs and Processes* box in Figure 1). Before evaluating whether this structure holds within each of the individual dimensions, the total set of items that forms latent factors in all dimensions is evaluated for simple structure using exploratory structural equation modeling (T. Asparouhov & Muthén, 2009; Marsh, Morin, Parker, & Kaur, 2014). Next, the individual dimensions are evaluated using confirmatory structural equation modeling to determine whether the precursor items are associated with the latent factor (i.e., of wellbeing achievement) in that dimension. For all analyses, the data are weighted and analyzed using methods appropriate for ordinal and missing data (Bandalos, 2014; Enders, 2010; Rhemtulla, Brosseau-Liard, & Savalei, 2012).

F. Future plans

Our next steps are to: (a) evaluate concurrent validity, (b) assess fairness using measurement invariance studies, (c) develop aggregate scoring methods, and (d) develop methods for evaluating the extent to which we have identified the correct precursor items.

Items (a) through (c) will be achieved through further annual administrations of the measure as a large-scale survey and further statistical modeling. We will evaluate concurrent validity by administering the Wellbeing Assessment along with other measures and examining the degree to which the measures are associated. For instance, we expect that if we administer the items from our Meaning dimension along with another self-report measure of meaning, we would expect that the items on these measures would form the same factor. To evaluate measurement invariance, we plan to use longstanding methods such as iterative confirmatory modeling and individual item analyses (Kim & Yoon, 2011; Meade, 2010; Sass, Schmitt, & Marsh, 2014; Vandenberg & Lance, 2000) as well as newer alignment methods (Tihomir

Asparouhov & Muthén, 2014; Marsh et al., 2017). To develop scoring methods, we will first begin by generating factor scoring rubrics based on our structural equation models. We will then evaluate whether these scores can be translated into simpler scoring approaches that are more user-friendly for our audience, such as summed scores or weighted summed scores (Brown & Croudace, 2015; Kolen, 2006). If the results from the measurement invariance studies yield evidence of significant and non-correctable non-invariance, we may also develop scoring methods that are specific to sub-populations.

Item (d) requires the development of small-trial intervention research. Although we have mentioned earlier that little research with non-clinical undergraduate populations exists, intervention research does exist for many of the dimensions in the Wellbeing Assessment. We hope to adapt those existing intervention strategies for small trial research programs will allow us the opportunity to employ qualitative methods and design-thinking methods (Razzouk & Shute, 2012). We can use those methods to ask student participants whether they found the interventions helpful, which will in turn allow us to evaluate whether we have identified the right precursor items for the measure. Those qualitative methods will also allow to examine issues of *magnitude*, or how much scores on a measure must change in order to feel meaningful to participants. Research on intervention effectiveness is typically evaluated using statistical tests of change scores. However, statistical significance does not necessarily reflect practical significance (Houle & Stump, 2008). Qualitative methods will allow us to talk with students about their change experiences and compare those qualitative data to their quantitative measure counterparts.

Summary

Wake Forest's Wellbeing Assessment is a dynamic, multi-dimensional assessment of holistic wellbeing that is tailored to the needs of young adult undergraduate students and designed to inform university wellbeing programming. Across a range of dimensions, the measure evaluates both whether students have achieved wellbeing and whether they have the skills, resources, and conditions needed to achieve wellbeing. This detailed information about the achievement of and precursors for wellbeing will allow university programming and administrative offices to develop targeted, evidence-based interventions to support student wellbeing. We have gathered several rounds of qualitative and quantitative data in support of the measure's validity, and have plans to pursue measurement invariance studies, develop aggregate scoring methods, and use multimethod research to continue refining our selection of measure items. Over the long term, we hope to use our measure-refinement research to develop an intervention research program.

References

- Allen, K., Kern, M. L., Vella-Brodrick, D., Hattie, J., & Waters, L. (2016). What Schools Need to Know About Fostering School Belonging: A meta-analysis. *Educational Psychology Review*, 1–34. <https://doi.org/10.1007/s10648-016-9389-8>
- Almlund, M., Duckworth, A. L., Heckman, J. J., & Kautz, T. D. (2011). *Personality psychology and economics*. National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w16822>
- Asparouhov, T., & Muthén, B. (2014). Multiple-group factor analysis alignment. *Structural Equation Modeling: A Multidisciplinary Journal*, 21(4), 495–508. <https://doi.org/10.1080/10705511.2014.919210>
- Asparouhov, T., & Muthén, B. O. (2009). Exploratory structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 16, 397–438.
- Baehr, J. (2015). Appendix A: Varieties of character: Moral, civic, performance, and intellectual. In *Cultivating good minds: A philosophical and practical resource guide for educating for intellectual virtues*. Retrieved from <http://intellectualvirtues.org/why-should-we-educate-for-intellectual-virtues-2/>
- Bandalos, D. (2014). Relative performance of categorical diagonally weighted least squares and robust maximum likelihood estimation. *Structural Equation Modeling: A Multidisciplinary Journal*, 21, 101–116.
- Baumeister, R. (1991). *Meanings of life*. New York, NY: The Guilford Press.
- Beatty, P. C., & Willis, G. B. (2007). Research synthesis: The practice of cognitive interviewing. *Public Opinion Quarterly*, 71(2), 287–311. <https://doi.org/10.1093/poq/nfm006>

- Branand, B., Mashek, D., Wray-Lake, L., & Coffey, J. K. (2015). Inclusion of College Community in the Self: A Longitudinal Study of the Role of Self-Expansion in Students' Satisfaction. *Journal of College Student Development; Baltimore*, 56(8), 829–844.
- Brown, A., & Croudace, T. J. (2015). Scoring and estimating score precision using multidimensional IRT. In S. P. Reise & D. A. Revicki (Eds.), *Handbook of item response theory modeling: Applications to typical performance assessment*. New York: Routledge/Taylor & Francis Group.
- Bundick, M. J. (2011). Extracurricular activities, positive youth development, and the role of meaningfulness of engagement. *The Journal of Positive Psychology*, 6(1), 57–74.
<https://doi.org/10.1080/17439760.2010.536775>
- Cook, D. A., Brydges, R., Ginsburg, S., & Hatala, R. (2015). A contemporary approach to validity arguments: A practical guide to Kane's framework. *Medical Education*, 49(6), 560–575. <https://doi.org/10.1111/medu.12678>
- Cook, J. E., Purdie-Vaughns, V., Garcia, J., & Cohen, G. L. (2012). Chronic threat and contingent belonging: Protective benefits of values affirmation on identity development. *Journal of Personality and Social Psychology*, 102(3), 479–496.
<https://doi.org/10.1037/a0026312>
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper & Row.
- Dahill-Brown, S., & Jayawickreme, E. (2016). What constitutes indices of well-being among college students? In D. W. Harward (Ed.), *Well-being and higher education: A strategy for change and the realization of education's greater purposes* (pp. 123–134). Washington, DC: Bringing Theory to Practice.

- Deneui, D. (2003). An investigation of first-year college students' psychological sense of community on campus. *College Student Journal*, 37(2), 224–235.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276–302.
- Doerksen, S. E., Elavsky, S., Rebar, A. L., & Conroy, D. E. (2014). Weekly Fluctuations in College Student Leisure Activities and Well-Being. *Leisure Sciences*, 36(1), 14–34. <https://doi.org/10.1080/01490400.2014.860778>
- Duckworth, A. L., & Carlson, S. M. (2013). Self-regulation and school success. In B. W. Sokol, F. M. E. Grouzet, & U. Müller (Eds.), *Self-regulation and autonomy: Social and developmental dimensions of human conduct* (pp. 208–230). New York: Cambridge University Press.
- Duckworth, A. L., & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment*, 91(2), 166–174. <https://doi.org/10.1080/00223890802634290>
- Enders, C. (2010). *Applied missing data analysis*. New York, NY: The Guilford Press.
- Graham, J., Taylor, B., Olchowski, A., & Cumsille, P. (2006). Planned missing data designs in psychological research. *Psychological Methods*, 11, 323–343.
- Hagerty, M., Cummins, R. A., Ferriss, A. L., Land, K., Michalos, A. C., Peterson, M., ... Vogel, J. (2001). Quality of life indexes for national policy: Review and agenda for research. *Social Indicators Research*, 55, 1–96. <https://doi.org/10.1023/A:1010811312332>
- Harel, O., Stratton, J., & Aseltine, R. (2015). Designed missingness to better estimate efficacy of behavioral studies—Application to suicide prevention trials. *Journal of Medical Statistics and Informatics*, 3, 1–7. <https://doi.org/10.7243/2053-7662-3-2>

- Houle, T. T., & Stump, D. A. (2008). Statistical significance versus clinical significance. *Seminars in Cardiothoracic and Vascular Anesthesia*, *12*(1), 5–6.
<https://doi.org/10.1177/1089253208316440>
- Jayawickreme, E., Forgeard, M. J. C., & Seligman, M. E. P. (2012). The engine of well-being. *Review of General Psychology*, *16*(4), 327–342. <https://doi.org/10.1037/a0027990>
- Kane, M. (2013). The argument-based approach to validation. *School Psychology Review*, *42*(4), 448–457.
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, *65*(2), 410–422.
- Kim, E. S., & Yoon, M. (2011). Testing measurement invariance: A comparison of multiple-group categorical CFA and IRT. *Structural Equation Modeling: A Multidisciplinary Journal*, *18*(2), 212–228. <https://doi.org/10.1080/10705511.2011.557337>
- King, L. A., Hicks, J. A., Krull, J. L., & Del Gaiso, A. K. (2006). Positive affect and the experience of meaning in life. *Journal of Personality and Social Psychology*, *90*(1), 179–196. <https://doi.org/10.1037/0022-3514.90.1.179>
- Kolen, M. J. (2006). Scaling and norming. In R. L. Brennan (Ed.), *Educational measurement* (4th ed.). Westport, CT: Praeger.
- Lester, D. (2013). A review of the student engagement literature. *Focus on Colleges, Universities, and Schools*, *7*(1). Retrieved from <http://www.nationalforum.com/Electronic%20Journal%20Volumes/Lester,%20Derek%20A%20Review%20of%20the%20Student%20Engagement%20Literature%20FOCUS%20V7%20N1%202013.pdf>

- Little, T., & Rhemtulla, M. (2013). Planned missing data designs for developmental researchers. *Child Development Perspectives, 7*, 199–204.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*(9), 705–717.
<https://doi.org/10.1037//0003-066X.57.9.705>
- Marsh, H. W., Guo, J., Parker, P. D., Nagengast, B., Asparouhov, T., Muthén, B., & Dicke, T. (2017). What to do when scalar invariance fails: The extended alignment method for multi-group factor analysis comparison of latent means across many groups. *Psychological Methods*. <https://doi.org/10.1037/met0000113>
- Marsh, H. W., Morin, A., Parker, P., & Kaur, G. (2014). Exploratory structural equation modeling: An integration of the best features of exploratory and confirmatory factor analysis. *Annual Review of Clinical Psychology, 10*, 85–110.
- Maslow, A. H. (1954). *Motivation and personality*. New York, NY: Harper Press.
- Maslow, A. H. (1971). *The farther reaches of human nature*. New York, NY: Penguin.
- McFarland, S., & Hornsby, W. (2015). An analysis of five measures of global human identification: Measuring global human citizenship. *European Journal of Social Psychology, 45*(7), 806–817. <https://doi.org/10.1002/ejsp.2161>
- McFarland, S., Webb, M., & Brown, D. (2012). All humanity is my ingroup: A measure and studies of identification with all humanity. *Journal of Personality and Social Psychology, 103*(5), 830–853. <https://doi.org/10.1037/a0028724>
- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: on doing well and being yourself. *Journal of Personality and Social Psychology, 74*(2), 494–512.

- Meade, A. W. (2010). A taxonomy of effect size measures for the differential functioning of items and scales. *Journal of Applied Psychology, 95*(4), 728–743.
<https://doi.org/10.1037/a0018966>
- Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*(9), 741–749.
- Miller, W., & Rollnick, S. (2012). *Motivational Interviewing: Helping people change* (3rd ed.). New York, NY: The Guilford Press.
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Philippe, F. L., Vallerand, R. J., & Lavigne, G. L. (2009). Passion does make a difference in people's lives: A look at well-being in passionate and non-passionate individuals. *Applied Psychology: Health and Well-Being, 1*(1), 3–22. <https://doi.org/10.1111/j.1758-0854.2008.01003.x>
- Prochaska, J., & DiClemente, C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Counseling Psychology, 51*(3), 390–395. <https://doi.org/10.1037/h0088437>
- Raghunathan, T., & Grizzle, J. (1995). A split questionnaire design. *Journal of the American Statistical Association, 90*, 54–63.
- Razzouk, R., & Shute, V. (2012). What is design thinking and why is it important? *Review of Educational Research, 82*(3), 330–348.

- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*(4), 419–435.
- Rhemtulla, M., Brosseau-Liard, P. E., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods*, *17*, 354–373.
- Roberts, B. W., Lejuez, C., Krueger, R. F., Richards, J. M., & Hill, P. L. (2014). What is conscientiousness and how can it be assessed? *Developmental Psychology*, *50*(5), 1315–1330. <https://doi.org/10.1037/a0031109>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069.
- Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719–727.
- Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, *9*(1), 1–28. https://doi.org/10.1207/s15327965pli0901_1
- Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies*, *9*, 13–39. <https://doi.org/10.1007/s10902-006-9019-0>

- Sass, D. A., Schmitt, T. A., & Marsh, H. W. (2014). Evaluating model fit with ordered categorical data within a measurement invariance framework: A comparison of estimators. *Structural Equation Modeling: A Multidisciplinary Journal*, 21(2), 167–180. <https://doi.org/10.1080/10705511.2014.882658>
- Seider, S. (2012). *Character compass: How powerful school culture can point students towards success*. Cambridge, MA: Harvard Education Press.
- Seligman, M. E. P. (2011). *Flourish*. New York, NY: The Free Press.
- Sen, A. K. (1999). *Development as freedom*. Oxford, England: Oxford University Press.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology*, 80(2), 325–339.
- Sheldon, K. M., Ryan, R. M., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, 22(12), 1270–1279.
- Slaten, C. D., Yough, M. S., Shemwell, D. A., Scalise, D. A., Elison, Z. M., & Hughes, H. A. (2014). Eat, sleep, breathe, study: Understanding what it means to belong at a university from the student perspective. *Excellence in Higher Education*, 5(1), 1–5. <https://doi.org/10.5195/EHE.2014.117>
- Vallerand, R. (2008). On the psychology of passion: In search of what makes people's lives most worth living. *Canadian Psychology*, 49(1), 1–13.
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations of organizational research. *Organizational Research Methods*, 3(1), 4–70.

- Walton, G. M., & Cohen, G. L. (2011). A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students. *Science*, 331(6023), 1447–1451.
- Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design*. Thousand Oaks, CA: Sage Publications, Inc.
- Willis, G. B., & Artino, A. R. (2013). What do our respondents think we're asking? Using cognitive interviewing to improve medical education surveys. *Journal of Graduate Medical Education*, 5(3), 353–356. <https://doi.org/10.4300/JGME-D-13-00154.1>
- Zika, S., & Chamberlain, K. (1992). On the relation between meaning in life and psychological well-being. *British Journal of Psychology*, 83, 133–145. <https://doi.org/10.1111/j.2044-8295.1992.tb02429.x>