

THE FRESHMAN PROJECT: ADOLESCENT WELL-BEING
DURING THE TRANSITION TO COLLEGE

by

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DISSERTATION ABSTRACT

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Adolescence is a critical period of development during which myriad biological and ecological changes converge with youths' burgeoning sense of self-awareness. Despite enduring views of this convergence as one of only stress and strife, scientists increasingly consider the degree to which it also presents opportunities for positive growth. One such opportunity is rooted in adolescents' own evaluations of their positive feelings and functioning, commonly referred to in the scientific literature as *well-being*. While research points toward the importance of well-being for positive development, there is much yet unknown about its precise form and function, especially during later stages of adolescence. Advancing this science may enable us to better understand and support positive developmental trajectories into adulthood.

The current dissertation is organized into two main sections. In the first section (Chapter I), recent research on the effects of digital technology provides the basis upon which to highlight common methodological and theoretical limitations in the existing science of adolescent well-being. Situated within a broader review, I discuss ways in which improved conceptual precision and stronger theory can help to propel the field forward. The second section (Chapters II-V) presents an empirical study of a relatively understudied area: well-being during the transition to college. Previous research has explored the effects of college on well-being; however, studies have generally ignored the ways in which the unique developmental tasks of this period may correspond to a set of criteria for being well that differs from that of younger

adolescents and older adults. To help address this gap, the structure of well-being in college-aged adolescents (N = 573) was investigated using exploratory factor analyses and then confirmed in a sample of incoming college students (N = 274) within a structural equation modeling framework. The best-fitting model consisted of eight facets nested within two superordinate factors which correspond, respectively, to hedonic and eudaimonic dimensions of well-being. Developmental trajectories of well-being were then examined longitudinally. Second-order latent growth curve models showed significant decreases in well-being during the first year of college. Together, this dissertation contributes to the scientific understanding of the structure and development of well-being during adolescence.

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- Barendse, M. E., Vijayakumar, N., Byrne, M. L., Flannery, J. E., Cheng, T. W., Flournoy, J. C., Mobasser, A., ... & Pfeifer, J. H. (2020). Study Protocol: Transitions in Adolescent Girls (TAG). *Frontiers in psychiatry*, 10, 1018.
- Cosme, D., Mobasser, A., Zeithamova, D., Berkman, E. T., & Pfeifer, J. H. (2018). Choosing to regulate: does choice enhance craving regulation?. *Social cognitive and affective neuroscience*, 13(3), 300-309.
- de Macks, Z. A. O., Flannery, J. E., Peake, S. J., Flournoy, J. C., Mobasser, A., ... & Pfeifer, J. H. (2018). Novel insights from the Yellow Light Game: Safe and risky decisions differentially impact adolescent outcome-related brain function. *NeuroImage*.
- Measelle, J. R., Mobasser, A., Fong, M., Soulalay, C. S., & Nijssen-Jordan, C. (2016). Developmental neuroscience and stunting: A strong case for action in the first 1000 days. *Annals of Global Health*, 82(3), 514.
- Fong, M., Measelle, J. R., Mobasser, A., Soulalay, S., Einstein, S., Niles, J., & Nijssen-Jordan, C. (2016). Prevalence and determinants of childhood diarrheal disease in Lao PDR. *Annals of Global Health*, 82(3), 387.
- Wright, D. B., Measelle, J., Fong, M., Einstein, S., Niles, J., Mobasser, A., ... & Nijssen-Jordan, C. (2016). Malnutrition in Lao PDR: Does maternal health knowledge buffer the negative effects of environmental risk factors on child stunting?. *Annals of Global Health*, 82(3), 572.
- Fong, M. C., Measelle, J. R., Dwyer, J. L., Taylor, Y. K., Mobasser, A., Strong, T. M., ... & Sittiphone, D. (2015). Rates of motorcycle helmet use and reasons for non-use among adults and children in Luang Prabang, Lao People's Democratic Republic. *BMC public health*, 15(1), 970.

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CHAPTER I
LITERATURE REVIEW: TOWARD A STRONGER SCIENCE
OF ADOLESCENT WELL-BEING

Throughout human history, society has allocated an immense amount of attention and resources to ensuring the positive development of youth. Adolescence, in particular, is recognized in both the sphere of public opinion as well as in scholarly research as a period in which individual developmental trajectories can diverge toward adulthood in significant, meaningful, and lasting ways. Because so much remains unknown about the relevant causes and contributors to adolescent well-being, a critical role is granted to the field of developmental science. This responsibility is perhaps no more apparent than from ongoing debate (and confusion) around recent research on the effects of digital technology on adolescent well-being. Thankfully, closer examination of these studies may help to identify so-called “areas of improvement” through which the field can become better equipped to support parents, practitioners, and policymakers.

Two important issues become apparent from examining these examples. The first issue is one of conceptual clarity. Whereas the term “well-being” is often used colloquially to include a wide range of psychological experiences and outcomes, prior research supports the importance of making clear distinctions between negative and positive (i.e., well-being) dimensions of mental health. A second issue is rooted in theoretical advances generated by increasingly interdisciplinary research in the field of developmental science. Research suggests that while it may be tempting to isolate the effects of single variables such as digital technology, trajectories of adolescent well-being are better understood within a theoretical framework that encompasses the many multidirectional relations among various levels of the developmental system.

Over the past 25 years, the combination of increased conceptual clarity and advanced theory with a renewed interest in the positive dimensions of psychological functioning have led to substantial strides toward a greater understanding of well-being during adolescence. Specifically, two models - *thriving* and *flourishing* - have emerged from this synthesis. While not without their

limitations, these models provide the foundation upon which there exists a growing body of empirical evidence for what it means for adolescents to be well. Ultimately, these research present the field with its own opportunity for growth toward a stronger science of adolescent well-being that encompasses the whole of adolescents' developmental potentialities.

Adolescent Well-Being and Digital Technology: An Illustrative Example

The implications of conceptual clarity and cogent theory for the science of adolescent well-being are exemplified by recent research on the effects of digital technology. A recent study of American high-schoolers found that the well-being of adolescents had decreased since 2012, and that those who spent more time on electronic communication and screens exhibited lower levels of psychological well-being (Jean M. Twenge, Martin, & Campbell, 2018). From these results, the authors concluded that “the most likely culprit for a cultural force leading to lower well-being among adolescents since 2012 is the increase in electronic communication” (Twenge et al., 2018). Shortly thereafter, a study by Orben & Przybylski (2019) found conflicting results. Using some of the same public data as Twenge et al. (2018), results indicated that the effects of digital technology explain at most 0.4% of the variation in well-being. Furthermore, compared to a broad range of theoretically justified specifications, the effect of technology use on well-being was substantially less than many other related factors such as binge-drinking and marijuana use, as well as positive factors such as eating vegetables and getting enough sleep. With so much of the public's attention turned toward the field, developmental scientists scrambled to make sense of the seemingly contradictory findings.

Closer examination of these studies suggests that inferential faux pas aside, discrepant findings on the relationship between digital technology and adolescent well-being may be related to notable conceptual and theoretical inconsistencies reflective of the field more generally. For instance, using three separate large-scale datasets, Orben & Przybylski's (2019) operationalized well-being across a wide range of outcomes including indicators of conduct problems, prosocial

behaviors, suicidal ideation and attempts, negative mood, depressive symptoms, happiness and self-esteem. Whereas lay theorists of adolescent development may readily combine these measures into a single ‘good/bad’ dimension, research suggests that mental health indicators which differ in valence confer distinct and sometimes divergent implications for a complete picture of mental health. For their part, Twenge et al. (2018) examine the unidirectional effects of digital communication in isolation from all other possible variables, effectively reducing the theoretical landscape of adolescent well-being to a static and overly simplistic unidimensional model. The disparate findings in these studies (and subsequent public reaction) highlight the importance of conceptual and theoretical consistency across studies of adolescent well-being. In the forthcoming discussion, each of these issues is discussed in more detail and contextualized within the broader body of extant research.

Common Issues: Same Name, Different Concept

One source of confusion in the aforementioned studies derives from the authors’ disparate definitions of well-being. The study by Twenge et al. (2018) defines well-being in terms of positively valenced indicators of happiness, self-esteem, and life satisfaction. Orben & Przybylski (2019), on the other hand, employ a definition of well-being which excludes measures of life satisfaction; instead, they include a variety of measures related to problem behaviors, negative mood, and indicators of mental illness such as depressive symptoms, suicidal ideation and attempts. Whereas an everyday lexicon may find these conceptualizations of well-being to be interchangeable, over 70 years of scholarly research suggest that these differences are not merely semantic, but rather reflect meaningful conceptual distinctions. Understanding the implications of these distinctions for adolescent mental health necessitates a more thorough discussion of the concept of well-being.

Well-Being: Historical Context. In its founding documents, the World Health Organization (1948) echoed earlier work of Austrian medical historian, Henry Sigerist (1941), declaring that a state of complete health includes more than merely the absence of illness. A

decade later, Marie Jahoda published her book, *Current Concepts of Positive Mental Health* (1958), in which she criticized *de facto* conceptions of mental health derived from traditional medical models, in which individuals are either mentally ill or presumed mentally healthy. Jahoda argued that “the absence of mental illness is not a sufficient indicator of mental health,” and advanced six concepts associated with positive mental health: integration of psychological functions, autonomy, accurate perceptions of the self and outside world, positive attitudes towards self, adaption to or mastery of environment, and a developing sense of personal growth and development. Jahoda’s sentiments echoed those of other psychologists that focused on individual pursuits of “higher order” needs such as happiness, love and belonging, esteem, and self-actualization (Gurin, Veroff, & Feld, 1960; Maslow, 1943). Despite a lack of empirical evidence for these concepts at the time, this early work provided the basis upon which subsequent research would investigate previously neglected positive dimensions of mental health.

In an article that effectively marked the beginning of a new subfield of psychology - *positive psychology* - Seligman and Csikszentmihalyi (2000) formally challenged social and behavioral scientists to correct an imbalance of scientific knowledge caused by decades of empirical research focused almost exclusively on psychopathology. “Psychology is not just the study of pathology, weakness, and damage; it is also the study of strength and virtue” (Seligman & Csikszentmihalyi, 2000). Highlighting generative early works on giftedness (Terman, 1939), marital happiness (Terman, Buttenwieser, Ferguson, Johnson, & Wilson, 1938), effective parenting (J. Watson, 1928), and work on discovering meaning in life (Jung, 1933), Seligman and Csikszentmihalyi argued that a renewed science of human strengths could lead the path toward improved quality of life and prevention of psychological illness. Furthermore, a science of positive subjective experiences and positive individual skills, strengths and routines could have compelling implications for understanding and supporting healthy youth development. Citing prevention research on the buffering effects of positive functioning against mental illness (e.g., Seligman, Schulman, DeRubeis, & Hollon, 1999) the authors visioned a concomitant mission “to

understand and learn how to foster these virtues in young people.” Equipped with a strong vision, this new subfield of psychology embarked upon the scholarly inquiry of positive dimensions of mental health broadly labeled, “*well-being*.”

Philosophical Distinctions. The positive psychology perspective undergirds the core of a prevailing, albeit complex framework of well-being consisting of two distinct philosophical traditions: hedonic and eudaimonic well-being (e.g., Ryan & Deci, 2001). Hedonic, or emotional, well-being refers to feelings of pleasure or happiness (e.g., Kahneman, Diener, & Schwarz, 1999), and emphasizes an individual’s avowed sense of life as an essential component of their well-being (E. Diener & Lucas, 1999; J. S. Larson, 1996). Measures of hedonic well-being typically include evaluations of life and domain satisfaction, and the balance of positive to negative affect (e.g., Bradburn, 1969; Cantril, 1965; Diener, Emmons, Larsen, & Griffin, S., 1985; Lucas, Diener, & Suh, 1996). Eudaimonic well-being, on the other hand, follows from Aristotle’s denigration of temporary subjective pleasures as compared to activities and qualities which contribute, objectively, to actualization, or the realization of one’s true potential (e.g., Diener et al., 1985; Fromm, 1978; Waterman, 1993). These philosophical orientations have been both the source of rigorous debate, and also the basis for conceptually distinct, but related streams of well-being.

Integrating early concepts of self-actualization (Maslow, 1968), individuation (Jung, 1933), maturity (Allport, 1961), full functioning (Rogers, 1961), and the realization of virtues (Erikson, 1959), Carol Ryff proposed a multidimensional model consistent with the eudaimonic tradition. This model, labeled *psychological well-being*, consists of six dimensions: personal growth, self-acceptance, autonomy, mastery, life purpose, and positive relatedness (1989; C. D. Ryff & Keyes, 1995). Some have criticized the eudaimonic perspective for shifting the criteria for “a good life” from individuals’ own values, emotions, and evaluations to the judgements of behavioral experts (Diener, Sapyta, & Suh, 1998). Proponents of the eudaimonic approach, for their part, are concerned with “bringing empirical defense to the argument that some kinds of

human goods are perhaps better than others” (C. D. Ryff & Singer, 1998). Another dimension, *social well-being*, recognizes that the quality of an individual’s relationships to, and functioning in, society and social groups remains a relatively understudied aspect of individuals’ health (Keyes, 2006). Together, this tripartite structure of “feeling good and functioning well” (Keyes & Annas, 2009) - emotional, psychological, and social well-being - have provided a strong theoretical basis upon which to investigate positive dimensions of psychological functioning U.S. adults (Gallagher, Lopez, & Preacher, 2009), college students (Robitschek & Keyes, 2009), and adolescents (Keyes, 2006). Most pertinent to apparent conceptual differences in the studies of adolescents described in the introduction above, research supports a model of well-being that is conceptually distinct from mental illness.

Well-Being ≠ Absence of Illness. While it may be tempting to aggregate mental health into a single ‘good/bad’ dimension, research suggests that well-being and mental illness are not opposite poles of a single continuum, but rather two separate and distinct factors along two different continua (e.g., Keyes, 2006; Keyes, 2005; Ryff et al., 2006; Westerhof & Keyes, 2010). Early empirical evidence for the separability of positive and negative dimensions of mental health can be found in the field of affective science. In a study of national samples, Bradburn found that pleasant and unpleasant affect correlated at low levels with each other and showed different patterns of associations with external variables; unpleasant affect was related to common indicators of mental illness, whereas pleasant affect was relatively more associated with indicators of social context (1969; Bradburn & Caplovitz, 1965). Similarly, personality psychologists Costa and Mcrae (1980) found that extraversion was related to positive affect, but not with negative affect, and that neuroticism was more strongly related with negative affect than with positive affect. Many other studies have found that positive and negative emotions often show low correlations with each other (e.g., Diener & Emmons, 1985; Watson, 1988; Watson, Clark, & Tellegen, 1984; Watson & Tellegen, 1985; Zevon & Tellegen, 1982). Furthermore, pleasant and unpleasant moods show distinct patterns across days of the week (Kennedy-Moore,

Greenberg, Newman, & Stone, 1992). More recently, structural equation modeling approaches have found that latent traits of pleasant and unpleasant affect are correlated, but that a two-factor model accounted for significantly more variance than a one-factor model (Diener, Smith, & Fujita, 1995). Taken together, this evidence for the separability of positive and negative affect has served as antecedent for subsequent empirical inquiry into Jahoda's early suggestions about the importance of positive mental health indicators.

Research from the burgeoning field of positive psychology has found empirical support for the premise that similar to affect, mental health consists of separable positive and negative dimensions. Ryff and Keyes (1995) found that dimensions of psychological well-being (i.e., self-acceptance, personal growth, autonomy, etc.) correlated, on average, with the Zung depression inventory, $r = -0.51$ and the Center for Epidemiological Studies Depression (CES-D) scale, $r = -0.55$. Emotional wellbeing (i.e., happiness and life satisfaction) has been shown to correlate with depressive symptoms, on average, around -0.40 to -0.50 (Frisch et al., 1992). In a series of papers based on the data gathered from the Midlife in the United States (MIDUS) Survey ($N = 3,032$), confirmatory factor analyses indicated that latent factors of well-being and mental illness correlated at -0.53 ; 28.1% of the variance between measures of well-being and mental illness was shared variance, while the remaining 71.9% was unshared (Keyes, 2005), thus providing support for the separability of positive and negative dimensions of mental health.

In another study, Keyes (2002) found substantial intra-individual variability in profiles of well-being across 13 measures of positive emotional, psychological and social functioning. Based on this variability, Keyes adopted a diagnostic scheme for well-being that mirrors those used to diagnose mental health disorders wherein individuals must exhibit just over half of the total symptoms to meet criteria. According to this scheme, those with high levels of well-being (high = upper tertile) were considered to be *flourishing*. *Languishing* referred to individuals who exhibited low levels of well-being (low = lower tertile). Those who were neither flourishing or languishing in life were considered to be of *moderate mental health*, or well-being. Of the

sample, 85.9% of American adults aged 25 to 74 reported not having experienced a major depressive episode (MDE) in the past year. However, only 17.2% of adults who did not have an episode of depression were classified as flourishing in life; 12.1% were languishing, while over half (56.6%) showed only moderate levels of well-being. Importantly, of the 14.1% of adults who had experienced an episode of depression in the past year, only 33.3% were both depressed and languishing, whereas 60.4% had moderate well-being, and 6.3% were flourishing. In other words, over 66% of adults who had experienced depression had moderate or flourishing levels of well-being. Taken together, these evidence suggest that the absence of mental illness does not mean the presence of well-being, nor does the presence of mental illness imply the absence of some level of well-being.

Complete Model of Mental Health in Adolescence. Some research has examined the extent to which separable dimensions of mental health and mental illness can be extended to younger age groups. Greenspoon and Saklofske (2001), for example, found that not all middle schoolers in their sample (N = 407) with high levels of mental illness report low levels of well-being, nor do those with low levels of mental illness report high levels of well-being. In a study of 1,245 undergraduate students (mean age = 20.0), Peter et al. (2011) found that measures of well-being and mental illness were inversely correlated at moderate levels (-0.58). Using a diagnostic approach similar to that of Keyes (2002, 2005, 2007), Eklund et al. (2011) tested the discriminant validity of positive and negative dimensions of mental health. In their study, 240 college students (18-25 years-old) were classified into one of four groups represented by high and low well-being (i.e., life and domain satisfaction) crossed with high and low mental illness (i.e. symptoms of stress, anxiety, depression, and negative self-perceptions). The authors found that whereas students with low well-being/low mental illness did not significantly differ from students with low well-being/high mental illness in attention problems, students who demonstrated complete mental health (high well-being/low mental illness) had lower attention problems compared to all remaining groups.

In a test of his diagnostic model of flourishing/languishing, Keyes (2006) found that in a national sample of 1,234 adolescents ages 12-18, profiles of well-being differed across age groups. In younger adolescents (12-14 years-old), 48.8% of youth were flourishing, 45.2% exhibited moderate well-being, while 6% were classified as languishing. Older adolescents (15-18 years-old) demonstrated similar levels of languishing (5.6%), but were less likely to be flourishing (39.9%) than of moderate well-being (54.5%). Furthermore, whereas the estimated prevalence of mental disorders among the general adolescent population is about 20% (Shaffer et al., 1996), results indicated that fewer adolescents - nearly 40% - can be classified as flourishing. As in studies with adults, however, flourishing adolescents demonstrated the best psychosocial outcomes, including fewer depressive symptoms and conduct problems, and higher levels of global self-concept and feelings of closeness with people.

In another examination of mixed profiles of mental health, Suldo and Shaffer (2008) assessed mental health and illness among 349 adolescents (ages 10-16) using measures of affect, life satisfaction, and mental illness. Of the participants, 17% were classified as *troubled* (i.e., high mental illness and low well-being). But, whereas 57% of the sample was classified as having *complete mental health* (i.e. low mental illness and high well-being), 26% exhibited a mixed profile of mental health that was characterized by either low well-being and low mental illness or high well-being and high mental illness. Compared to adolescents with low mental illness and low well-being, adolescents with complete mental health demonstrated more adaptive outcomes as measured by school attendance, social problems, and physical limitations. Taken together, these evidence suggest that there both exist mixed profiles of positive and negative mental health dimensions within individuals, and that these profiles can have unique relationships to related behaviors and psychosocial outcomes.

Longitudinal Effects of Well-Being in Adolescence. The inclusion of well-being in a complete model of mental health may have implications for developmental trajectories. In a follow-up study of middle school students from Suldo and Shaffer's (2008) study, Suldo, Thalji,

and Ferron (2011) examined the dissociable effects of baseline well-being on longitudinal outcomes related to academic achievement and in-school behaviors the following year. As expected, the GPAs of students who were classified as *troubled* (i.e., high mental illness and low well-being) declined significantly faster than those in the *complete mental health* (i.e., low mental illness and average-to-high well-being) and *vulnerable* (i.e., low mental illness and low well-being) groups. Notably, changes in GPA for students with high mental illness and average-to-high well-being at baseline were not significantly lower than the other groups and were similar to vulnerable students, suggesting that despite having clinical levels of mental illness, students with high well-being performed at approximately the same level as peers without mental illness. Buffering effects of baseline well-being were also found with regard to subsequent math scores, such that students in the symptomatic but content group again performed similarly to students who were without clinical levels of mental illness, but with low well-being. Furthermore, among students with high mental illness, those with high well-being received significantly fewer disciplinary referrals than those with low well-being. One potential limitation of this study is the absence of well-being and mental illness measures at follow-up, as it is possible that longitudinal changes in students' mental illness or well-being between baseline and follow-up may have contributed to the results. Nevertheless, these findings demonstrated that measures of well-being predict longitudinal outcomes above and beyond measures of mental illness.

In a sample of 10,146 participants in grades 7 through 11 drawn from a nationally representative study of U.S. adolescents, Hoyt et al. (2012) examined the longitudinal effects of well-being on perceived general health and risky health behaviors approximately 5 years later (ages 18-27). In this study, well-being was operationalized as positive affect and positive views of self-esteem or self-image. Risky health behaviors included fast food consumption, low physical activity, binge drinking, cigarette smoking, marijuana use, and other illicit drug use. Controlling for the effects of depressive symptoms, baseline health, and demographic characteristics (i.e., age, gender, race/ethnicity, parental marital status, and mean parental education, health insurance, and

neighborhood SES), every one standard deviation increase in positive well-being scores during adolescence increased the odds of reporting excellent general health as compared to all lower categories of general health combined (very good/good/fair-poor health) by nearly 30%. Of note, the authors found that for every one standard deviation increase in depressive symptoms, the odds of reporting excellent health was less than all lower categories of general health by 8%, after adding covariates. The relationship between well-being and future risky health behaviors displayed similar associations. Controlling for adolescent risky health behaviors and all covariates, every one standard deviation increase in adolescents' positive well-being scores corresponded to a 17% decrease in the odds of reporting four or more risky health behaviors versus all lower categories combined (three or fewer risky behaviors). Notably, the authors of this study caution against over-interpreting longitudinal effects of well-being as they did not control for any unknown number of unmeasured characteristics. Taken together, these studies suggest that mixed profiles of positive and negative mental health dimensions may also have meaningful implications for developmental trajectories across time.

Summary: Conceptual Clarity. Despite early calls to action, the field of psychology was relatively slow to engage empirical investigations of positive dimensions of mental health with the same vigor it had allocated to the study of psychological pathology. During the past two decades, however, research from the field of positive psychology has made substantial contributions toward validating a model of complete mental health that includes the positive dimension of psychological functioning, well-being. Furthermore, evidence suggests that contrary to early conceptions, mental illness and well-being are not opposite poles of a single bipolar dimension, but rather constitute a dual-factor structure within which mental illness and well-being make unique contributions toward explaining a complete picture of an individual's mental health. With myriad implications for education, parenting, policy and public opinion, scholarly efforts to identify the causes and consequences of positive adolescent development should take better care

to ensure that measurement and communication of these concepts are consistent and clearly defined.

Common Issues: Cartesian-Mechanistic-Split Meta-Theory

Another central source of confusion between the studies described in the opening section are the discrepant interpretations of the effects of digital technology use on adolescent mental health. The study by Twenge et al. (2018) found that, controlling for sex, race, socioeconomic status, and grade, adolescents who spent more time on electronic communication and screens (e.g., social media, texting, electronic games, Internet) were less happy, less satisfied with their lives, and had lower self-esteem. In their discussion of the results, the authors state, “electronic communication was the only adolescent activity negatively correlated with psychological well-being that increased at the same time psychological well-being declined...given the data and theory we have, the most likely culprit for a cultural force leading to lower well-being among adolescents since 2012 is the increase in electronic communication” (p.12).

Readers should note that rather than focusing on the methodological concerns with making causal inferences from correlational data which has been discussed by others (e.g., Altman & Krzywinski, 2015; Blalock Jr, 2018), the current review is focused on the importance of strong, cogent theory. Specifically, the investigation by Twenge et al. (2018) is inherently flawed on the basis that it is conducted without regard to critical, well-established meta-theories related to adolescent development and well-being. Specifically, Twenge and colleagues ignore decades of scholarly research suggesting that individual-context relationships are situated within dynamic, complex, self-organizing systems of associations spanning multiple different levels of analysis. In other words, prior research suggests that investigations of the relationships between environmental forces (e.g., digital technology) and adolescent well-being should be situated within a relational developmental systems (RDS) framework. In the following section, a review of the prior research on these theories will provide a framework within which to interpret Twenge

et al.'s findings, and, if done well, demonstrate the value of such a framework for better understanding the potential causes and consequences of adolescent well-being.

Relational Developmental Systems. Over the past 20 years, developmental psychology has been transformed into a developmental science (Richard M. Lerner, 2006). The emergence of this new identity is accompanied by a general trend in the field toward greater interdisciplinary collaboration, for example, in the study of epigenetics (e.g., Gottlieb, 1996, 1997; Gottlieb, Wahlsten, & Lickliter, 2006; Joseph, 2010; Keller, 2010), science application and child advocacy (e.g., Bronfenbrenner, 1974; Eccles & Gootman, 2002; Zigler, 1998), or adolescent development (e.g., Boivin, Piekarski, Thomas, & Wilbrecht, 2018; Mendle, 2014; Moore et al., 2012). Another central shift in the transformation of the field is characterized by widespread adoption of contemporary relational developmental systems theories of human development (e.g., Lerner, 2006, 2011; Lerner & Overton, 2008; Overton, 2006, 2010, 2012; Overton & Lerner, 2012). The defining features of this theoretical framework is (a) relationism, or the integration of levels of organization; (b) historical embeddedness; (c) relative plasticity; and (d) diversity (e.g., Lerner, 2004). A detailed understanding of these features may have important implications for cogent investigation of adolescent well-being.

The emergence of the relational developmental systems framework in contemporary developmental science can be seen as a return to old ideas (e.g., Maier, 1935; Novikoff, 1945b, 1945a; von Bertalanffy, 1933). Generally, these views are characterized by a rejection of classical Cartesian-era worldviews that conceptualize development in terms of bipolar divisions between the ecological components of development (e.g., nature versus nurture), between stability and instability, and between self and other (e.g., Garcia Coll, Bearer, Lerner, Bearer, & Lerner, 2014; Lerner, 2001; Lerner & Overton, 2008). Overton (2013) explains that dichotomous splitting, or reductionism, assumes that deconstructing components of a whole into mutually exclusive pure forms or elements preserves their identity regardless of context. Reconstituting the whole, then, is necessarily based on a principle of conjunctive (i.e. additive) plurality, or mechanical cause-effect

sequences that proceed in a single direction (e.g., Bunge, 1962; Overton & Reese, 1973). The implications of this framework for the study of adolescent development, then, include minimal concern for intervening processes such as culture, worldviews, or other forms of continuous person-environment interactions.

Overton (2007) explains that an alternative to the split-model worldview is *relationalism* (Latour, 1993, 2004). Relationalism offers basic units of reality in *process-substance* rather than split-off pure forms (Bickhard, 2008). In place of dichotomous splits, relationalism installs *holism* as the overarching epistemological principle, which assumes that the identities of objects and events derive from the relational context in which they are embedded. In other words, the whole is not an additive plurality of discrete elements, but rather an organized system of parts that are each defined by their relations to other parts and to the whole. Accordingly, decomposing elements into additive sequences of mechanistic cause-effect relations are, by definition, rejected as overly simplistic approaches to analysis. Importantly, Overton (2013) clarifies here that this principle of nondecomposability does not mean that analysis itself is rejected; rather, it means that analysis of parts must occur in the context of the parts' functioning in the whole. He further elaborates that context-free specifications of any object, event, or process - whether it be DNA, brain, culture, or positive development - is illegitimate within a holistic system. Finally, Overton (2013) provides an illustrative example of these overarching principles from the writings of Bunge (2003):

At first sight, the discovery that genetic material is composed of DNA molecules proves that genetics has been reduced to chemistry However, chemistry only accounts for DNA chemistry: it tells us nothing about the biological functions of DNA – for instance that it controls morphogenesis and protein synthesis. In other words, DNA does not perform any such functions when

outside a cell, anymore than a stray screw holds anything together. (Besides, DNA does nothing by itself: it is at the mercy of the enzymes and RNAs that determine which genes are to be expressed or silenced. In other words, the genetic code is not the prime motor it was once believed to be. This is what epigenesis is all about). (p. 138)

Within an RDS framework, then, a mechanistic, cause-effect claim such as the one made by Twenge et al. (2018) ignores that adolescents are situated within a dynamic system of essentially interrelated parts.

Within an RDS framework, causality is emphasized as reciprocal bi- or multi-directional or circular (positive and negative feedback loops); that is, all facets of the individual and its context exist in mutually influential relations (e.g., Elder, 1998; Molenaar, 2008). These relations are also referred to as “developmental regulations” (e.g., Brandtstädter, 1998, 1999, 2006; Heckhausen, 1999; Lerner & Overton, 2008). Within a specific system, developmental regulations are horizontally or vertically coordinated in mutual co-action such that the organism’s integrity is preserved in both current ongoing processes, as well as in processes of developmental change. Magnusson (2003) provides the example of the cardiovascular system in which none of the operating components (e.g., systolic blood pressure, diastolic blood pressure, heart rate) function and develop independently of the others. Another example on the level of the individual is the biopsychosocial model of development (Greenberg & Partridge, 2010), wherein development of an individual organism is situated within a tripartite structure of biological, psychological, and sociocultural parts. Each of these parts co-constructs, co-regulates, and co-evolves with each other part across time.

Given that development essentially entails the temporal level of organization (history; e.g., Elder, 1998; Elder & Shanahan, 2007), another key principle of RDS is plasticity, or systemic changes within the developmental system and across the life span (e.g., Baltes,

Lindenberger, & Staudinger, 2007; Gottlieb, 1997; Lerner, 1984). To illustrate, Lerner & Overton (2008) give an example of developmental regulations between an adolescent's self-regulatory processes (e.g., as operationalized through the assessment of selection, optimization, and compensation processes; Freund & Baltes, 2002) and the external resources and/or support available to them through families, schools, and communities across the period of adolescence (e.g., Gestsdottir & Lerner, 2008; Lerner, 2005). Here, plasticity across time - in the adolescent's neurobiology, their social context, and the combinations of these variables, for example - provides the basis for the enormous amount of inter- and intra-individual variability inherent to developmental systems.

Implementing an RDS Framework. According to Overton (2013), the effects of shifting from classical Cartesian split-models toward principles of relationalism and holism have reverberated across many sub-fields of developmental science. The study of genetics and development, for example, has moved rapidly toward a position in which variations in individual development have become an integral part of evolutionary trajectories (e.g., Gottlieb, 2002; Jablonka & Lamb, 2005; Laubichler, 2010; West-Eberhard, 2003). The field of cognition and cognitive development increasingly espouses a view that mental processes are not located exclusively in the brain, but are rather *enacted* through bidirectional brain-body and brain-environment co-action (e.g., Menary, 2010; Rowlands, 2010; Stewart, Stewart, Gapenne, & Paolo, 2010). In the area of socio-cultural development, researchers increasingly eschew conceptualizations of culture as a unidirectional force on individuals in favor of positions that recognize their relations as mutually constitutive (e.g., Mistry, Contreras, & Dutta, 2012). In addition, the RDS framework has served as a critical foundation for investigations of positive development during adolescence.

Positive Youth Development. Perhaps the most prototypical of these approaches is the research tradition of positive youth development (PYD; e.g., Benson, Scales, Hamilton, & Sesma, 2006; Geldhof & Johnson, 2014; Lerner, Phelps, Forman, & Bowers, 2009; Lerner, Lerner, &

Benson, 2011). As previously noted, all levels of the developmental system are integrated within RDS (e.g., biological, psychological, ecological, cultural). PYD, however, situates itself strongly within the RDS framework at the organizational level of individual \longleftrightarrow context relations. Bearing the influence of Bronfenbrenner's (1979) ecological systems theory of human development, PYD positions the adolescent within multiple levels of ecology. The central question of PYD research can be summarized as the following: under what conditions of the adolescent's ecology (e.g., across family, neighborhood, social policy, economic, and historical contexts), and in relation to what unique personal characteristics of the adolescent (e.g., positive values, social skills, and positive identity) are developmental regulations "adaptive," or mutually beneficial (Brandtstädter, 1998). Accordingly, PYD is essentially a model of *optimal* development (e.g., Benson et al., 2006; Lerner, 2005, 2006).

Consistent with the emphasis of RDS on plasticity, PYD is focused on the opportunities that exist within developmental systems to affect positive change. Indeed, the beginnings of PYD can be traced back to increased collaboration not only among developmental scientists (e.g., Benson et al., 2006; Damon, 2004; R. M. Lerner, 2004), but also with practitioners in the field of youth development programs (e.g., Floyd & McKenna, 2003; Pittman, Irby, & Ferber, 2001; Wheeler, 2003), and policymakers concerned with improving the developmental trajectories of diverse youth and their families (e.g., Cummings, 2003; Gore, 2003). Rather than simply 'describing what is,' PYD follows Bronfenbrenner's (1979) call for more "transforming experiments" by investigating the effects of actual alterations to adolescents' immediate ecological contexts. One such approach, for example, is a national initiative that links PYD researchers with YMCA leaders in the community. By implementing a hypothesized set of ecological changes, communities become laboratories for advancing knowledge about the processes and dynamics of positive adolescent development (Peter L. Benson, 2007). In this way, PYD is further instantiation of the RDS framework through which another classical split - between basic and applied science - is explicitly resolved.

Finally, PYD is faithful to RDS principles of bi- and multi-dimensional causality such that an individual adolescent is conceptualized as a critical and capable co-constructor of their ecology. The practical implication of this principle is that, consistent with Karen Pittman's (2001) assertion that "problem-free is not fully prepared," the PYD perspective views youth as resources to be developed rather than problems to be managed (e.g., Roth & Brooks-Gunn, 1998; Roth & Brooks-Gunn, 2003). Accordingly, researchers and practitioners of community youth development programs, once focused solely on prevention and remediation of problem behaviors such as substance use, delinquency, and violence have shifted attention to a more positive, strengths-based view that "emphasizes the manifest potentialities rather than the supposed incapacities of young people" (William Damon, 2004).

The Historical Deficit Model of Adolescence. The emergence of PYD's strength-based model of adolescence can be seen as a rebuttal to long-standing characterizations of adolescence as a period of "storm and stress" (Hall, 1904). A view that is classical in the most literal sense, Aristotle described youth as "heated by Nature as drunken men by wine" while Socrates characterized youth as inclined to "contradict their parents" and "tyrannize their teachers" (J. J. Arnett, 1999). Rousseau (1762/1979) poetically warned, "as the roaring of the waves precedes the tempest, so the murmur of rising passions announces the tumultuous change...keep your hand upon the helm...or all is lost." These views characterized adolescence as a necessarily stressful period, and suggested at least implicitly, that disturbances and upheaval during the transition to adulthood were universal. Others were more explicit, represented for example by Anna Freud's (1969) assertion that "to be normal during the adolescent period is by itself abnormal, or Erik Erikson's (1950, 1968) characterization of adolescence as a stage of identity development marked by confusion and crisis. Simply put, adolescents have long been perceived as inherently "broken."

These classical views were perpetuated by scientific evidence that adolescence *is* more difficult than other periods of life insofar as it is associated with greater incidence of conflict with parents, mood disruptions, and risk behavior (J. J. Arnett, 1999; Christy Miller Buchanan et al.,

1990), as well as with increased risk for an onset of a variety of psychopathology and behavioral problems, including depression, anxiety, violent delinquency, and substance abuse (e.g., Kessler et al., 2005; Steinberg et al., 2006). Furthermore, early evidence from the field of developmental neuroscience supported assertions about the biological bases of storm and stress during adolescence. Specifically, dual systems or imbalance models attributed emotional dysregulation and risk-taking behaviors to a temporal disjunction between rapid rises in dopaminergic activity during puberty and more gradual maturation of the prefrontal cortex (e.g., Bechara, 2005; Casey, Jones, & Somerville, 2011; Steinberg, 2010). Taken together, such evidence served to sustain the focus of research on deficit models of adolescent development.

Unsurprisingly, deficit models of adolescence extended from scholarly circles to public perception as depictions of adolescent tumult struck a chord, as parents tend to perceive adolescence as the most difficult stage of their children's development (e.g., Buchanan et al., 1990; Pasley & Gecas, 1984). Furthermore, the above research on imbalances in “the teenage brain” is often appropriated in the media to warn parents and teachers about the potential dangers of adolescent behaviors (e.g., Dobbs, 2011; Wallis & Dell, 2004). These stereotypes are further exacerbated by common portrayals of adolescents across media engaging in extreme behaviors such as violent crime and risky sexual behavior (e.g., Gilliam & Bales, 2001; Nichols & Good, 2004; Strange, 2007). Unfortunately, these stereotypes can be especially harmful insofar as they serve as self-fulfilling prophecies that guide adolescents’ behaviors (Buchanan & Hughes, 2009; Meece et al., 1990). Studies have found, for example, that youths that hold stereotypes of teens as irresponsible in the family context (i.e., ignoring family obligations) are less engaged in school and more involved with risk-taking (Qu, Pomerantz, McCormick, & Telzer, 2018; Qu, Pomerantz, & Wu, 2018).

Moving Beyond the Deficit Model of Adolescence. Incidentally, these views ignore decades of evidence that contradict the alleged ubiquity of storm and stress. In an anthropological study, Schlegel and Barry (1991) found that adolescents of many pre-industrial cultures around

the world exhibit minimally disruptive behavior as compared to those growing up in the West, thus providing counter-evidence for the universality of adolescent storm and stress. Moreover, research on emotional volatility (Larson & Richards, 1994), negative affect (Brooks-Gunn & Warren, 1989; C. M. Buchanan, Eccles, & Becker, 1992; Petersen et al., 1993), and risk behavior (Arnett, 1992; Moffitt, 1993) has found weak support for the claim that these behaviors are biologically based. With respect to neurobiological development, more recent research suggests that dual system and imbalance models of adolescent brain development may represent an oversimplification of complex systems of interactions across different biological functions (Pfeifer & Allen, 2012), and that activity in early-developing dopaminergic reward systems is also related to positive developmental trajectories such as decreased risk-taking and depressive symptoms (Telzer, 2016). Indeed, the previously noted findings that about 40 - 49% of adolescents experience high levels of well-being (e.g., Keyes, 2006) are consistent with early research on non-clinical samples indicating that only about one-fourth of non-clinical samples of adolescents experience notable mental health problems (Offer, 1969). In addition to casting doubt onto the universality of adolescent storm and stress, these evidence suggest that developmental trajectories during adolescence are often positive.

Loosening long-standing negative biases toward adolescent development has made space for exciting new programs of research. Despite continued alarmism among some researchers that “adolescents are more miserable than ever before” (Twenge, 2006), others have turned toward understanding how variability in developmental trajectories relates to positive outcomes during adolescence. As noted in prior sections, increased focus on historically neglected dimensions of positive psychological functioning may help to develop a more complete model of mental health during adolescence.

A New Inquiry of Positive Development: Well-Being. To date, models of adolescent well-being have been almost exclusively nondevelopmental; that is, they are based on measures from adult models that are either used as is or slightly adapted for younger populations. One such

example is Keyes' tripartite model of subjective well-being (2002) that was modified slightly for youth (Keyes, 2006a). In a sample of 2,907 adolescents ages 12-18, CFA indicated that the best fitting model of subjective well-being in youth was a three-factor model that mirrored the structure of subjective well-being in adulthood. Another common model of well-being that has been applied to adolescents is the model of *subjective well-being, or happiness* (Diener & Fujita, 1995; Diener et al., 1998). There are many examples of investigations of the causes and consequences of happiness. However, very few of these, if any, were designed and conducted within the relational developmental systems framework, and thus will not be discussed within the limited scope of this paper. Instead, two models that are more closely situated within a developmental framework - *thriving* and *flourishing* - are discussed in further detail.

Contemporary Models of Adolescent Well-Being

Thriving: A Model of Optimal Development. As noted in a prior section, one conceptualization of adolescent well-being that is strongly situated within the RDS framework follows the research tradition of PYD, and is labeled *thriving*. Search Institute director, Peter Benson (1990), first used the term “thriving” to refer to a set of positive “vital signs” in adolescence (e.g., academic success, caring for others and their communities, the affirmation of cultural and ethnic diversity, commitment to healthy lifestyles). Subsequent efforts to operationalize thriving empirically were conducted using a well-established conceptual framework of development assets, which refer to a wide range of “key relationships, opportunities, values, skills, and self-perceptions that help young people limit their engagement in high-risk behaviors, enjoy resilience in the face of adversity, and thrive” (Peter L. Benson & C. Scales, 2009). A total of forty developmental assets were derived through extensive reviews of existing research on risk and protective factors, resilience, and competence during adolescence (e.g., Scales, 1999; P. Scales & Leffert, 2004). These assets, termed 40 Developmental Assets, were grouped into eight categories. *Support, Empowerment, Boundaries, and Expectations* constitute ‘external’, or assets provided to youth by their ecologies of parents, peers, schools, and

communities. 'Internal' assets - values, skills, and other self-processes developed by youth themselves - are composed of *Commitment to Learning*, *Positive Values*, *Social Competencies*, and *Positive Identity* (Benson, 2007). Within these categories, examples of external assets include '*Community Values Youth*,' '*Positive Peer Influence*,' '*Religious Community*,' and '*Caring Neighborhood*;' examples of internal assets include '*Cultural Competence*,' '*Resistance Skills*,' '*Integrity*,' and '*Self-Esteem*.'

Developing a Model of Thriving. Drawing from a larger sample of 6th-12th grade U.S. youth (N = 1,000), Scales et al. (2000) constructed a composite measure of what they labeled "thriving outcomes" from an existing survey known as the Search Institute Profiles of Student Life: Attitudes and Behaviors (PSL-AB). The authors then constructed a "thriving index" from adolescents' self-reports of engagement in the following behaviors and individual characteristics: (a) *school success*, (b) *leadership*, (c) *helping others*, (d) *maintenance of physical health*, (e) *delay of gratification*, (f) *valuing diversity*, and (g) *overcoming adversity*. Each of these behaviors was measured by one item. According to the authors, the basis for selecting these categories of thriving was that they are "generally related to other positive outcomes" and "collectively reflect some of the developmental tasks of adolescence" (p.28). Cross-sectional, correlational analyses indicated that controlling for demographic variables (i.e., gender, grade, and maternal education), these measures appeared to covary with specific clusters of developmental assets. Results indicated that developmental assets explained from 47%-54% of variance explained in the thriving index, and 10%-43% of variance in individual thriving indicators. School success, for example, was significantly related to a combination of achievement motivation and school engagement (internal assets) and time spent in youth programs (external asset) after controlling for demographic variables.

In a subsequent study, Theokas et al. (2005) extended the findings from Scale et al. (2000) by exploring the factor structure of the 40 Developmental Assets and their relations with thriving behaviors. The findings indicated that 80% of the items used to measure the assets loaded

significantly onto one of 14 factors for middle-school youth and 16 for high-school youth; these factors echoed the conceptual arrangement of developmental assets into internal and external categories. Though, the authors note that given that all items are self-report and thus represent perceived assets, “it is difficult to conceptually distinguish exclusively internal or external processes” (p. 126). Additional analyses indicated that these factors accounted for unique variance in predicting the indicators of thriving, both by themselves, as well as in aggregate. In other words, on average, adolescents who demonstrated more developmental assets reported greater levels of thriving. Furthermore, those high in *either* internal or external assets were also more likely to be thriving, regardless of the number of assets in the other factor. These studies provided evidence that the indicators of thriving chosen by Scales and colleagues (2000) were closely related to the developmental assets identified just one year prior (Scales, 1999).

Recognizing ecological validity as a key requirement of translating developmental science into policies and programs (e.g., Bronfenbrenner, 2001; Bronfenbrenner, 2005), King et al. (2005) investigated the extent to which scholarly conceptions of thriving corresponded with generic conceptions of thriving in the community. Using a sample of 173 participants comprised of youth development program practitioners (n=50), adolescents nominated by youth development practitioners (n=71), and their parents (n=52), researchers conducted interviews that included four questions: (a) How can you tell if a young person is thriving or doing really well? (b) What skills, competencies, and/or qualities indicate that a young person will probably thrive in the future, as an adult? (c) Are there any things about thriving that apply to all young people, no matter who they are? If yes, what are they? And (d) Are there any questions that I left out? What else would you like to add on the subject? More than 1,500 thriving-related terms used by interviewees were consolidated into 77 indicators of thriving based on consensus among expert raters about similar semantics (e.g., critical thinking, active thinker, independent thinking) and categories (e.g., perceived support, feel loved, feel valued). The final set of indicators clustered onto eight thriving categories: *character, competence, confidence, connection, caring, assets,*

self-control and regulation, and *positive emotions*. Notably, however, despite the relative homogeneity of the sample (e.g., predominantly European Americans affiliated with youth development programs concerned with the promotion of PYD), none of the 77 indicators were reported in the majority of any of the interview groups. In only one of the three groups (practitioners) was one indicator - connected with others - used a percentage of the time (68%) that exceeded chance. No other indicator in any of the three groups was mentioned by a significant majority of the participants, suggesting little convergence between the vocabulary of PYD scholars and the perspectives of youth, parents, and practitioners.

Revised Models of Thriving. Many other models of thriving have emerged from the PYD tradition, albeit with relatively little empirical support. In a comprehensive national report on youth development, Eccles and Gootman (2002) conceptualized thriving as “development that is headed along a positive trajectory toward finding a meaningful and productive place in one’s cultural milieu” (p.66), presenting a list of personal and social assets across an array of four categories: *social development*, *psychological and emotional development*, *intellectual development*, and *physical development*. Whereas these categories are described as having resulted from “review of theory, practical wisdom, and empirical research” (p. 78), there are no known empirical tests of this model of thriving in the subsequent research. In one of the few validation studies of thriving indicators, Schultz, Wagener, and King (2006) found a significant relationship between an established group of developmental resources (i.e., parent involvement, positive school orientation, adult support, neighborhood resources, and social ties with peers), and found significant associations to a four-factor set of thriving indicators that include *future orientation*, *positive values*, *resourcefulness*, and *fulfillment of potential*. In a series of studies (Dowling, Gestsdottir, Anderson, Eye, & Lerner, 2003; Dowling et al., 2004), results of factor analyses found spirituality and religiosity to be indirectly related to the seven thriving outcomes conceptualized by Scales et al. (2000) through a mediating factor, though it remains unclear whether either or both of them should be considered indicators of thriving. While empirical

support for these models thus remains relatively sparse, a review of PYD programs by Heck and Subramaniam (2009) suggested that the most empirically supported model of thriving to date is The “Five Cs” - *Competence, Confidence, Connection, Character, and Caring* (e.g., Eccles & Gootman, 2002; Lerner, 2004; Roth & Brooks-Gunn, 2003), including the addition of a sixth C - *Contribution* (to the greater good) - as a key outcome of thriving.

Much of the empirical support for the Five C model of thriving is based on data from the 4-H Study. Launched in 2002, the 4-H Study features eight waves of data including approximately 7,000 youth and about 3,500 parents (e.g., Lerner, 2005, 2009, 2011). About half of these youth were assessed two or more times. Using these data, the Five C model is shown to be internally consistent (Lerner et al., 2005), and relatively stable across early and middle adolescence (5th to 10th grade; Bowers et al., 2010; Jelicic, Bobek, Phelps, Lerner, & Lerner, 2007; Phelps et al., 2009). Longitudinal investigations of the 4-H data have found that the Five C model of thriving in fifth grade predicts lower levels of problem behaviors (i.e., substance use and delinquent behaviors) and depressive symptoms in sixth grade (Jelicic et al., 2007). In cross-sectional analyses of 7,071 4-H youth across all eight waves, Geldhof et al. (2014) found that while the general thriving factor (as operationalized by all Five Cs) was relatively stable, there was moderate intra-individual variability in individual Cs (i.e., Competence, Confidence, and Connection) across time, suggesting that the qualitative meaning of these constructs changed slightly as adolescents enter high school. Correlation analyses with criterion variables indicated that thriving correlated negatively with indices of negative development (i.e., depressive symptoms and problem behaviors) and correlated positively with the key outcome of PYD (i.e. contribution). Examination of residual Cs - covariance among items that were not related to global thriving - revealed interesting results. Across all waves, residual Competence and Confidence displayed weak to moderate correlations with contribution and problem behaviors, but increasingly strong negative correlations with depressive symptoms. Meanwhile, residual Character and Caring (above and beyond what would be predicted by PYD) were positively

correlated with Contribution *and* with depressive symptoms, while being generally unrelated with problem behaviors. Furthermore, whereas residual Connection factor was not correlated with problem behaviors, it displayed negative correlations with depressive symptoms that sharply increased in magnitude from 9th to 12th grade. Taken together, these evidence have shown the Five C model of thriving to be a valuable step toward understanding optimal development across adolescence.

Thriving: Concluding Remarks. To date, the Five Cs model of thriving represents the best supported and most faithful implementation of the RDS framework in the study of positive adolescent development. By accounting for many bidirectional relations between and among individual and ecological assets, thriving appropriately positions the adolescent's optimal functioning within the developmental system. Based on the findings described herein, however, I point to three areas that may warrant particular attention in future research. First, while the Five C model of thriving has shown to be relatively stable across time, developmental changes in factor loadings in individual Cs, mixed associations with other theoretically related outcomes suggest there may be meaningful intra-individual variability across adolescent development that is not being sufficiently captured by the current model. Second, there is some evidence that the vocabulary used to describe optimal development by scholars may not be well-matched to that of parents, practitioners, and adolescents themselves. To the extent that a model of thriving is expected to resolve the basic-applied science split, future research should investigate whether these discrepancies reflect meaningful issues of external validity among theorized constructs. Notably, other studies have found that conceptualizations of well-being among adolescents vary somewhat between same-aged adolescents, and also across age (Navarro et al., 2017). Finally, subjective or emotional well-being - adolescents' avowed sense of satisfaction or positive affect - is notably omitted from this model of thriving. Future studies should examine the extent to which thriving accounts for positive trajectories toward idealized citizenship at the exclusion of adolescents' own felt sense of happiness. Indeed, thriving's strong orientation toward *future*

functioning has prompted some to wonder whether such models are far less about well-being than they are about well-*becoming* (Ben-Arieh, 2008; Casas, 2011).

An Alternative Model of Positive Development: Flourishing. Another model of positive development that has been developed specifically for youth is the EPOCH model of adolescent well-being (Kern, Benson, Steinberg, & Steinberg, 2016). Given that EPOCH is based on Seligman's PERMA theory of well-being (2011), I provide further detail about the development of the PERMA model and its measurement. According to Seligman (2011), PERMA represents an integration of hedonic and eudaimonic streams, and forms a model of optimal psychological functioning that arises from five pillars of well-being: *Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment* (2011). Each of these dimensions are described as being intrinsically rewarding in and of themselves, and in combination, give rise to human *flourishing*. It is worth noting that Seligman's model of flourishing differs from Keyes model of flourishing/languishing (Keyes, 2002, 2006) described in prior sections.

Butler and Kern (2016) developed the PERMA-Profiler as a measure of Seligman's model of flourishing from an initial item bank with over 700 items. Redundant items were removed, and face validity was determined through consensus by a panel of positive psychology experts. The items were revised for wording consistency and distilled into a final item bank of 109 questions theoretically related to each of the PERMA factors (33 emotion, 23 engagement, 21 relationships, 17 accomplishment). The authors tested a final 15-item measure across eight validation studies (N = 31,966), the PERMA-Profiler demonstrates, In tests of convergent and divergent validity, PERMA was found to be positively related to measures of physical health, loneliness, depression, life satisfaction. Based on feedback from the research community over three years, the final measure added 3 items for negative emotion, 1 item for loneliness, and 3 items for physical health.

PERMA has been shown to correlate strongly with a composite measure of SWB. In a study of 153 Australian adults, each component of PERMA loaded onto its own factor (Kern,

Waters, Adler, & White, 2014). In a larger online community sample, Coffey et al. (2016) found that PERMA converged onto a higher-order well-being construct, which in turn demonstrated a latent correlation of 0.80 with a measure of life satisfaction. In another sample of 517 adults, Goodman et al. (2017) found that flourishing and happiness are highly overlapping constructs ($r = 0.98$).

The EPOCH measure of adolescent well-being is comprised of five factors: *Engagement*, *Perseverance*, *Optimism*, *Connectedness*, and *Happiness* (Kern et al., 2016). The theoretical basis for selecting these factors (and excluding others) is somewhat unclear, though the authors state that possessing these qualities during adolescence “will foster PERMA, physical health, and other positive outcomes in adulthood, and therefore, are valuable to measure and cultivate” (p.587). Notably, Kern et al. highlight that EPOCH differs from the PYD model of thriving insofar as it is 1) focused on individual strengths rather than a systems perspective, 2) deliberately nondevelopmental such that normative immaturity is not analogous with lower well-being, 3) focused on characteristics that promote well-being (as operationalized by PERMA) during adulthood, and 4) ignores context specificity. Whereas PYD differentiates between relationships in family, or at school, or with friends, the EPOCH measure of adolescent well-being takes all of them together as one index of an adolescent’s avowed sense of satisfaction (i.e., feelings that one is cared for, loved, esteemed, and providing support to others) in their relationships to others.

Tests of the final 20-item measure across diverse samples of U.S. and Australian adolescents demonstrated good model fit ($N = 852$, $RMSEA = .053$ [.048, .058], $SRMR = .038$, $\chi^2(160) = 545$) and internal consistency (Cronbach’s $\alpha = .95$). The individual factors varied in reliability across time. The authors note that test-retest pearson correlation ranging from $r = .25$ for Perseverance and $r = 0.71$ for Happiness, suggesting that adolescents’ interpretation of these items change. As expected, the measure was related to other measures of positive well-being such as life satisfaction (with Optimism, $r = .64$; Happiness, $r = .83$), personal growth (with Connectedness, $r = .20$; Optimism, $r = .25$), grit (with Perseverance, $r = .78$), growth mindset

(with Perseverance, $r = .28$). EPOCH dimensions were also negatively related to psychopathological symptoms such as depressive symptoms (with Optimism and Connectedness, $r = -.41$; Happiness, $r = -.53$), anxiety (with Optimism, $r = -.29$; Happiness, $r = -.36$), as well as to behavior problems such as aggression (with Optimism, $r = -.34$; Connectedness = $-.32$; Happiness, $r = -.44$).

In a different study, Kern et al. (2015) conducted confirmatory factor analyses of a battery of well-being measures to test whether PERMA dimensions would be recovered in a sample of Australian adolescents (ages 13-18). Results indicated that the Meaning factor was not recovered; items theoretically reflecting Meaning seemed instead to overlap with the Relationship items. The authors interpret this finding to be consistent with prior research suggesting that whereas purpose in life and meaning tend to be overlapping constructs in adulthood, purpose in life tends to contain specific prosocial goals in youth (Damon et al., 2003; Hill et al., 2010). Taken together, further investigations of EPOCH may be necessary to elucidate the extent to which it measures the developmental antecedents for PERMA in adulthood.

Flourishing: Concluding Remarks. Despite its limitations, the EPOCH model is one of the only widely validated measures of well-being developed specifically for adolescents. Importantly, rather than an assessment of objective individual and ecological strengths, EPOCH centers the adolescent's subjective evaluation about positive dimensions of their lives. It should be noted, however, that while the PERMA model of flourishing in adults is strongly informed by prevailing theories of well-being, the development of the EPOCH model may not be adequately positioned within the RDS framework. It is difficult to discern its theoretical orientation, however, as these considerations are not well described in the research.

Conclusion and Future Directions

As demonstrated by the continuing debate on the potential effects of digital technology use on adolescent well-being, we are, as a society, tremendously concerned with ensuring the positive development of our youth. The swift and strong reactions to claims made by Twenge et

al. (2018) may also, however, reflect vestiges of a deficit model of development that conceptualizes adolescents as essentially fraught with tumult and vulnerable to a host of dangers. Indeed, within the broader context of dramatic social changes characterized by adolescents increased access to media, decreased community cohesion, reductions in shared ideals, and prevalence of negative stereotypes about youth (e.g., Benson, 1997; Damon, 1997; Dryfoos, 1991; Furstenberg, 2000; Garbarino, 1998; Lerner, 1994; Mortimer & Larson, 2002; Scales, 1991, 2001), parents, teachers, practitioners, and policymakers increasingly look to the scientific community to help youth adapt to the fast-changing environment. Whereas some have been slower to turn away from pathological models of mental health, other scholars have eagerly advanced models of development that more fully feature the adolescent's profound capacity for positive growth and adaptation. Led by the field of positive psychology, old ideas about the pursuit of happiness, self-actualization, and "the good life" have been vaulted from mere platitudes into more tractable foci of contemporary empirical investigation.

In the current discussion, I have drawn attention to two "areas for improvement," so to speak, through which the science of positive adolescent development can better take advantage of this opportunity. First, the translation of research findings into effective practice and policy is predicated on researchers' use of clear definitions of well-being, and its separability from negative dimensions of mental health. Furthermore, research should move beyond classical Cartesian approaches which artificially isolate developmental factors from the relational system of bi- and multi-directional regulations within which they reside. Rather, research questions and the methods with which they are explored should join various subfields of developmental science in advancing a theoretical framework that better captures the principles of relationism, holism, and dynamism that are essential to development systems. By following the lead of the PYD research tradition, for example, researchers can finally move beyond oversimplified mechanistic splits. As noted by psychologist Gordon Allport, "our task is to study what is, and not what is immediately convenient" (1960).

Another important effect of advancing an RDS framework is to highlight the importance of modeling inter-individual heterogeneity. Returning to the topic of digital technology use, for example, a series of subsequent research has demonstrated that the relationship between digital technology use and adolescent well-being varies across a number of individual differences, including gender, self-esteem, body image, social comparison behaviors, sleep, and perceived social isolation (Kelly et al., 2019; Robinson et al., 2019; Faelens et al. 2019). Taken together, these findings demonstrate the importance of studying multiple parts of the developmental system in concert.

Finally, research within the RDS framework increasingly suggests that the key to studying developmental processes is by modeling intra-individual variability. While this approach is referred to by some life-span developmentalists as *person-centered* versus *variable-centered* (Berkman et al., 2003; Magnusson, 1997, 2003), Nesselroade and Molenaar (2010) remind us one cannot study persons without using variables, nor study variables without using persons. Instead, Nesselroade and Molenaar (2010) explain that the study of developmental processes should feature three main emphases 1) recognize that the appropriate unit of analysis in the study of development is the individual, 2) define patterns of intraindividual variation using multivariate measurement models that emphasize for closer scrutiny unmeasured latent variables, and 3) identify similarities and differences among patterns of intra-individual variation. By using some version of time-series designs within the RDS framework, future research may be better able to understand (and support) positive developmental trajectories during adolescence

CHAPTER II

AN EMPIRICAL STUDY: THE FRESHMAN PROJECT

The transition to college is a major event in the lives of many American adolescents. In 2018, 69 percent of recent high school graduates - approximately 2.2 million youth - were enrolled in college by the following October (National Center for Education Statistics). This period is characterized by normative ecological and developmental shifts as adolescents enter unfamiliar college settings in which they must navigate increased academic demands (Levitz & Noel, 1989), new social networks (Rice, 1992), and the task of becoming more emotionally and practically self-sufficient (Arnett, 2000; 2007). Whereas such changes are frequently associated with a myriad of negative behavioral, psychological, and emotional concerns such as substance abuse, anxiety, and depression (e.g., Hammen, 1980; Wintre & Yaffe, 2000; Gall, Evans, & Bellerose, 2000; American College Health Association, 2016), greater attention is now directed toward adolescents' immense potential for positive development (Pratt, 2000; Pittman & Richmond, 2008). In particular, a burgeoning body of research suggests that psychological *well-being* - an avowed sense of one's own state of positive feeling and psychological functioning - may be a critical indicator of adolescents' psychological health. Independent of the effects of *negative* feelings and functioning, well-being is shown to be concurrently and longitudinally associated with various other indicators of positive development. To date, however, the developmental effects of well-being during the college transition are not well understood. Furthermore, while previous research has investigated trajectories of adjustment to life on campus, the potential effects of this specific development period on the *structure* of well-being has been largely ignored; that is, few studies have explored the ways in which the unique developmental tasks characteristic of the transition from adolescence to adulthood might translate into a model of well-being that differs from that of younger adolescents and adults. The overarching goals of the present study are to identify a model of well-being that is more

specifically targeted toward older adolescents, and to use such a model to investigate the effects of the college transition on developmental trajectories of well-being.

Two-Continua Model of Adolescent Health. In a recent report from the National Academies of Sciences, Engineering and Medicine (2019), a committee of leading experts underscore that while also challenging, adolescence is a period of immense opportunities for positive development. Indeed, catalyzed in part by the emergent field of positive psychology (Seligman and Csikszentmihalyi, 2000), the science of adolescent development has increasingly adopted the premise that psychological health includes more than merely the absence of illness (World Health Organization, 1948), and that the effects of well-being — feeling good and functioning well — are separable from those of negative psychological health, or ill-being. Rather than opposite poles of a single continuum, well-being and ill-being are distinct factors along two different dimensions, or continua, and are shown in research on adults to be differentially associated (concurrently and longitudinally) with a variety of other indicators of health and functioning (e.g., Keyes, 2005; 2006; Ryff et al., 2006; Westerhof & Keyes, 2010). In research on youth as well, studies have shown that controlling for the effects of ill-being, younger adolescents (age 9-16) who report high levels of well-being experience greater academic success, and fewer social and physical health problems (Greenspoon & Saklofske, 2001; Suldo and Shaffer, 2008). Among undergraduate college students (age 18-26) with low levels of clinical symptoms, higher levels of well-being are associated with fewer attention problems (Eklund, Dowdy, Jones, & Furlong, 2011).

Discriminant effects of well-being and ill-being are also shown longitudinally. Among adolescents (7th to 11th grade), self-reports of excellent health, and risky health behaviors such as smoking and binge drinking three to five years later (Hoyt et al., 2012; Griffin et al., 2001) were predicted by baseline levels and changes in dimensions of well-being, but not by those of depressive symptoms and negative emotions. Well-being may also help to buffer against the negative longitudinal effects of ill-being. Among adolescents (age 11-14) with average to high

levels of mental illness, Suldo and colleagues (2011) found that one year later, those with high baseline levels of well-being received fewer disciplinary referrals, and achieved academic grades and math scores similar to peers with low levels of mental illness. Whereas many researchers continue to consider those without mental health problems as healthy, evidence for the two-continua model suggests that helping adolescents to truly flourish depends on advancing the relatively nascent science of adolescent well-being.

Correlates of Well-Being. Beyond its separability from ill-being, research has found that the theoretical elements of well-being are related to important outcomes at all stages of adolescence. Among middle and high school students, measures of well-being are negatively associated with concurrent and later levels of internalizing disorders such as anxiety and depression (Adelman et al., 1989; Huebner, Funk & Gilman, 2000; Gullone and Cummins, 1999; McKnight et al., 2002), as well as externalizing behavior such as delinquency (e.g., substance use; Zullig et al., 2001), aggression (e.g., fighting, carrying a weapon; Valois et al., 2001), and other conduct disorders (Huebner & Alderman, 1993). Well-being is also associated with positive outcomes such as greater participation in extracurricular activities (Gilman, 2001), stronger peer relationships (Dew & Huebner, 1994), and improvements in quality of life (Gillison, Standage, & Skevington, 2008). Among older adolescents, those who maintain or increase their well-being from age 18 to 26 are more likely to find full-time employment, develop stable romantic relationships, and participate more in their communities (Schulenberg, Bryant, & O'Malley, 2004). For those who pursue higher education, well-being during the first-year of college is concurrently related to academic achievement (DeBerard, Spielmans, & Julka, 2004) and persistence (Gloria & Ho, 2003), loneliness (Mounts, 2004), stress (Morton et al., 2014), and psychological health problems such as depression and anxiety (e.g., Tao et al., 2000; Bouteyre et al., 2007; Ruthig et al., 2009; Pritchard, Wilson & Yamnitz, 2007; Compas et al., 1986).

A More Complete Model of Adolescent Well-Being. Notably, while research points toward the importance of well-being in positive development, broader implications of this

research are somewhat limited by a general lack of cogent theory. For instance, whereas well-being researchers generally agree on the inherent multidimensionality of well-being (e.g., Diener et al., 1985; Ryff & Keyes, 1995; Keyes & Waterman, 2003; Park, Peterson, & Seligman, 2004), most of the studies described above operationalize well-being as just one or two of its theoretical facets (e.g., satisfaction with life; self-esteem). As discussed in an earlier chapter of this dissertation, an additional effect of this approach is that aspects of adolescent well-being are artificially dissociated from the developmental systems in which they reside; that is, examining individual facets in isolation from others may obscure meaningful patterns of interrelations among them. With respect to the focus of the present study, the ability to support adolescents as they adjust to the myriad challenges of college life may be especially dependent on understanding of these patterns. To do so, however, requires specification of a model of adolescent well-being that adequately explains what it means to be well in the first place.

Well-Being: A Tale of Two Types. Efforts to advance the science of adolescent well-being may have been slowed by years of disagreement among researchers about its basic structure. Derived largely from a tension between two distinct philosophical perspectives, one approach conceptualizes well-being as hedonic pleasure, or *hedonia*. According to the hedonic view, well-being consists of subjective evaluations of the conditions of one's life in terms of pleasure versus displeasure (Kahneman, et al., 1999). Hedonia is most commonly operationalized in contemporary psychological research as *subjective well-being* (SWB; Diener & Lucas, 1999), which consists of three components: satisfaction with life, the presence of positive affect (e.g., joy, cheerfulness, pride), and the absence of negative affect (e.g., sadness, anger, anxiety); together, these are often summarized as *happiness*. An alternative approach, broadly labeled *eudaimonia*, follows from Aristotelian philosophy that "some kinds of human goods are perhaps better than others" (Ryff & Singer, 2008). Whereas hedonic well-being is oriented toward specific thoughts or feelings about one's life, eudaimonic well-being often refers to activities, qualities, or outcomes which contribute to actualization, or the realization of one's true potential

(e.g., Fromm, 1978; Waterman, 1993). Accordingly, eudaimonic models of well-being span a broad range of dimensions, or facets, including hypothesized “psychological needs” such as a sense of autonomy, competence, or positive relations with others (Ryan & Deci, 2000; Deci & Ryan, 2008), “character strengths” such as curiosity, spirituality, or persistence (Park, Peterson & Seligman, 2004; Park & Peterson, 2005), or other indicators of positive psychological functioning such as life purpose and self-acceptance (Ryff, 1989; Ryff & Keyes, 1995), among many others (see Linton, Dieppe, & Medina-Lara, 2016, for a review).

Ancient philosophical distinctions between hedonia and eudaimonia have shaped the contemporary scientific discourse for over 20 years. Critics of the hedonic view argue that happiness is an insufficient measure of well-being, noting that certain behaviors, qualities, and outcomes that produce pleasure (e.g., use of drugs, mania, wealth, materialism) do not necessarily promote wellness (Kasser & Ryan, 1993; 1996; Ryan et al., 1999). Moreover, many important strivings are inherently unpleasant, such as the frustration and anxiety one might feel while pursuing a personally important goal, or the search for a sense of meaning amid moments of extraordinary distress and despair (Frankl, 1959). In rebuttal, proponents of the hedonic view argue that insofar as emotions are considered indicators of organismic valuation processes (e.g., Rogers, 1963; Carver & Scheier 1981; 2012), feeling good in and about one’s life is an integral part of being well. Furthermore, the eudaimonic perspective has been accused of shifting the criteria for “a good life” from individuals’ own values, emotions, and evaluations to the external judgments of experts (Diener, Sapyta, & Suh, 1998). Indeed, as will be discussed, prevailing models of child and adolescent well-being often ignore the role of hedonic facets of affect and life satisfaction altogether (Ben Arieh, 2008; 2010; Casas, 2011). While the validity of these points are duly noted, continued preoccupation with demarcating empirical differences between hedonia and eudaimonia may undermine more generative advancements in the theory of well-being (see Kashdan et al., 2008; Ryan & Huta, 2009). In particular, there remains relatively little research on

development and/or extension of current theory to specific developmental periods such as adolescence.

Rather than siding with one view or the other, some researchers have considered that hedonia and eudaimonia may in fact represent two sides of the same coin (e.g., Ryan & Deci, 2001; Seligman, 2002; Peterson, C., Park, N., & Seligman, M. E. P., 2005). In a series of studies with college undergraduate students, Huta & Ryan (2010) found that hedonic and eudaimonic motives were complementary; compared to those who pursued one or the other, participants who pursued feelings of pleasure (i.e., hedonia) *and* a sense of excellence and growth (i.e., eudaimonia) reported higher levels of other indicators of well-being such as positive affect, life satisfaction, subjective vitality (i.e., energy and aliveness), and a sense of meaning (i.e., valuing and resonating with one's activities and experiences). Indeed, cross-sectional and longitudinal studies have found evidence of reciprocal associations between hedonic and eudaimonic facets (e.g., Sheldon & Niemiec, 2006; Batson & Powell, 2003; Hicks & King, 2007). Using structural equation modeling, research in adults has shown that latent factors corresponding to hedonia and eudaimonia are highly correlated, and exhibit negligible amounts of discriminant validity (Longo et al., 2016; Disabato et al., 2016; Goodman, et al., 2017). Whereas some have interpreted these findings as evidence for violations of parsimony (Goodman et al., 2017), research suggests that multidimensional models that integrate a variety of hedonic and eudaimonic facets can help to better understand meaningful interrelations among them (e.g., Emmons, 1986; McAdams and de St. Aubin, 1992; Csikszentmihalyi & Wong, 1991), as well to identify specific areas of strength and weakness that can aid in the development of more targeted interventions and programs (e.g., Lerner, 2000; Zeng & Kern, 2019; Seligman, 2018).

As discussed in the prior chapter, one such integrative model is Seligman's theory of flourishing, or PERMA (2011). According to PERMA, well-being is composed of five facets: Positive emotions, Engagement, Relationships, Meaning in life, and Accomplishments. Positive emotions refers to feelings such as joy and contentment. Engagement reflects a state of "flow," or

an extreme level of psychological immersion characterized by intense concentration, absorption, and focus (Csikszentmihalyi, 1990). Relationships refers to positive interpersonal connections that invoke a sense of reciprocal caring and support. Meaning reflects a sense of that one's life is valuable and worthwhile, and functions in service of some greater purpose. Finally, Accomplishment captures a sense of competence or self-efficacy in pursuing and progressing toward one's goals. Across several studies ($n = 31,966$), Butler and Kern (2016) developed a measure of PERMA that demonstrated adequate fit for its hypothesized five-factor structure, as well as convergent validity with a variety of other common measures of well-being.

Structure of Well-Being Across Development

It is of particular relevance to the present study, however, that while PERMA and other adult models of well-being are often developed and tested in convenience samples that include college students, there has been little attention to the extent to which the criteria for being well during the *transition* to adulthood might differ from that of adults. Whereas psychological research most commonly refers to college students as “young adults,” developmental scientists increasingly consider the ways in which young people tend not to adopt long-term adult roles until after their early 20s (e.g., Cohen, Kasen, Chen, Hartmark, & Gordon, 2003). Many American adolescents leave their parental homes after high-school (Goldscheider & Goldscheider, 1999), but few of them — about one-fourth — think of themselves as adults (Arnett, 1994). They stay unmarried for longer and change jobs more frequently than previous generations (Kins & Beyers, 2010), and as American society moves away from a manufacturing-based economy, most of them — over 60% — pursue postsecondary education (Hamilton and Hamilton, 2006). For many, this period is characterized by considerable self-focus and self-discovery, as adolescents explore the emotional, cognitive, and legal implications of a burgeoning sense of autonomy (Arnett, 2014). In light of these trends, some researchers have adopted a perspective that defines the period of transition after high-school as a development stage distinct from both adulthood *and* adolescence, called “emerging adulthood” (e.g., Arnett, 2000; 2014). A

more extensive discussion of the research on the specific developmental tasks of emerging adulthood is not within the scope of the present study; however, we are interested in the extent to which these tasks might translate into a model of well-being that is unique to the period of transition to college.

Evidence of developmental differences in the structure of well-being is found in the study of so-called “character strengths,” positive traits that are shown to enable well-being (e.g., Ruch et al., 2014; Shoshani & Slone, 2013; Gillham, Adams-Deutsch, Werner, et al., 2011). For example, personal qualities of teamwork and prudence (i.e., care to avoid doing or saying things that may be regrettable) are more powerful predictors of life satisfaction in adolescents (age 10-17) than in adults; conversely, spirituality and curiosity are better predictors of life satisfaction for adults than for adolescents (Park & Peterson, 2006). Using exploratory factor analysis, other research has shown that the structure of character strengths in adolescents (age 10-17) includes a factor — a sense of engagement in the world — that does not emerge in adults (Mcgrath & Walker, 2016). Support for developmental differences in well-being models is also found from research on the opposite end of the lifespan. Compared to groups of younger people (i.e., age 18 to 25 and 36 to 59), life satisfaction of older adults (age 60 and above) was uniquely predicted by facets which reflect hope, citizenship, and capacity for loving relationships (Isaacowitz et al., 2003). Furthermore, recent research on the psychometric properties of the PERMA-Profiler found its factor structure to vary across studies (Ryan et al., 2019), leading its authors to speculate about the possibility of differential bias according to the age of participants. To date, however, there have been few empirical investigations of age-related effects on factor structure for adolescents during the transition to college. empirical investigations of potential age-related effects on factor structure in this age range, nor the extent to which adult models of well-being generalize to adolescents during the transition to college.

Existing Models of Adolescent Well-Being. Research to identify an appropriate structure of well-being prior to adulthood has focused primarily on younger adolescents, led to a great

extent by the research tradition of positive youth development (PYD). Consistent with the definition of well-being presented here, PYD is a theory of *optimal* development (e.g., Benson et al., 2006; Lerner, 2005, 2006), wherein youth are seen as resources to be developed rather than problems to be managed (e.g., Roth & Brooks-Gunn, 1998; Roth & Brooks-Gunn, 2003). The most common measurement model of PYD is the Five Cs (e.g., Lerner et al., 2005), which operationalizes positive development via five facets: Competence, Confidence, Character, Connection and Caring. Whereas some of these facets overlap with concepts of self-efficacy and social connectedness common to adult models of well-being (e.g., Competence, Connection), others reflect developmental processes related to formation of identity (i.e., Confidence) and moral standards (i.e., Character) that are commonly seen as more unique to adolescents than adults. There are also theoretical facets of well-being in adults that are notably absent from PYD perspective, the most glaring of which is a felt sense of happiness; that is, unlike adult models, PYD does not explicitly consider an adolescent's own affective and cognitive evaluation of their own life as central to their well-being. Indeed, PYD's strong orientation toward future functioning has prompted some to wonder whether such models are less about well-being than they are about well-*becoming* (Ben-Arieh, 2008; Qvortrup, 2009; Casas, 2011). Nevertheless, the PYD framework has arguably produced the most cogent model of well-being specifically designed to reflect developmental processes unique to pre-adult populations.

Another model of well-being designed specifically for adolescents is the EPOCH (Kern et al., 2016). Following closely from Seligman's theory of flourishing (2011), the EPOCH assesses five positive psychological characteristics (Engagement, Perseverance, Optimism, Connectedness, and Happiness), which are assumed to foster well-being (as defined by PERMA) in adulthood. Consistent with theories of "basic" psychological needs that span the entire life course (e.g., Ryan & Deci, 2000), several of the facets described in EPOCH are conceptually equivalent to those of the PERMA — Happiness corresponds to Positive emotions, Connectedness to Relationships; Engagement is called by the same name in both models. Similar

to the PYD approach, the EPOCH includes facets that are relatively more future-oriented — Perseverance refers to the ability to sustain effort in pursuing one’s goals, even in the face of adversity; Optimism is the tendency to expect positive outcomes. In tests of convergent and divergent validity, the facets defined in EPOCH demonstrated moderate negative associations with depression and anxiety, and positive associations with self-rated academic performance and physical health, as well as other indices of well-being such as life satisfaction and personal growth (Kern et al., 2016). Notably, however, whereas the EPOCH model is predicted to lead to well-being in adulthood, the specificity of its developmental time-course is not yet known. In other words, the developmental stage at which well-being during adolescence (as measured by the EPOCH) is better explained by the PERMA model remains unclear. To our knowledge, there have not yet been studies that investigate theoretical facets of EPOCH and PERMA specifically during the transition from adolescence to adulthood, nor in the same sample.

Developmental Trajectories of Well-Being

A developmentally appropriate model of well-being would provide a stronger basis upon which to investigate developmental trajectories during the transition to college. Despite early conceptualizations of well-being as a stable, trait-like construct (e.g., Diener, 1996), major life events can have sustained effects on individuals’ levels of well-being (e.g., Lucas, 2004; 2007; Diener, Lucas, & Scollon, 2006). The transition to college is considered to be one such major event (Anderson, Goodman & Schlossberg, 2012), wherein adolescents navigate departures from previous roles, social networks and living arrangements (e.g., Shaver et al., 1985; Cooke et al., 2006; Gall et al., 2000) of such magnitude and significance as to lead researchers to suggest the potential for permanent alterations in life-course trajectories (Schulenberg, Sameroff, and Cicchetti, 2004). Indeed, maladaptive adjustment to these ecological and practical changes can lead to downstream difficulties such as substance use-problems (Schulenberg & Maggs, 2002) and mental illness (Masten et al., 2005). On the other hand, adolescents who experience these changes more positively are shown to have better physical health, more positive self-perceptions,

greater academic achievement, and lower levels of internalizing problems (e.g., Pittman & Richmond, 2008; Walton & Cohen, 2007). Thus, the ability to better understand and support trajectories of positive development may hinge on closer examination of changes in well-being and related facets during the transition to college.

Longitudinal research on the effects of the college transition on adolescents' sense of well-being have shown mixed findings. Using a panel sample consisting of nineteen consecutive cohorts from 1977 through 1995, Schulenberg et al., (2005) found that those who attended college immediately after high school experienced increased levels of self-esteem, self-efficacy, and social support. Other studies have found similar increases in social support, life purpose, self-efficacy, and self-acceptance (Bowman, 2010; Tao et al., 2000; Pittman & Richmond, 2008), as well as in aspects of happiness (i.e., life satisfaction; Gall et al., 2000; Salmela-Aro & Tuominen-Soini, 2010). Conversely, many studies have found evidence of decreasing trajectories in self-esteem (Shim et al., 2012), as well as in positive affect (Rogers et al., 2018). In a study of Swiss students, Perren et al., (2010) found decreases in happiness upon entering college that were not recovered up to 16 weeks later. Other studies have found no changes in evaluations of well-being related to social relationships (Compas et al., 1986; Hausmann, 2007), despite increases in the size of adolescents' social networks (Gall et al., 2000). Chung et al., (2014) found that self-esteem dropped at the end of the first term, but recovered to baseline levels by the end of the first year of college. Although the results of these studies are mixed, the varied trajectories of longitudinal change suggest the transition to college and adolescents' sense of well-being are likely interrelated.

While prior research provides a valuable basis for future investigation, there are several limitations among the aforementioned studies. For instance, most of the studies do not include pre-transition baseline assessments (Pittman & Richmond, 2008; Gall, 2000; Tao et al., 2000; Shim et al., 2012; Chung et al., 2014), or fail to capture the full change during the first year (Tao et al., 2000; Compas et al., 1986; Perren et al., 2010). In addition, most of the change estimates in

these studies are traditional growth models based on composite scores or manifest variables, which are generally unreliable and prone to measurement error across time (Bowman, 2010; Pittman & Richmond, 2008; Gall, 2000; Compas et al., 1986; Perren et al., 2010); few of them use structural equation modeling methods such as first- or second-order latent growth curve modeling, which can attenuate the longitudinal effects of measurement error, and enable more precise estimates of the relation between change and its correlates (see Rast & Hofer, 2014; Hertzog, Lindenberger, Ghisletta, & Oertzen, 2006). Finally, with few exceptions (Bowman, 2010; Conley et al., 2014), the studies generally neglect to position their investigations within the context of broader theories of well-being theory; that is, they include facets of eudaimonia and hedonia but rarely both. Furthermore, like the cross-sectional studies of well-being discussed above, most of these studies fail to consider the inherent multidimensionality of well-being by examining just one or two facets in isolation.

Correlated Change. Another potential advantage of concurrent examination of multiple facets is related to the concept of correlated change. In research on well-being development, change is often modeled by estimating mean levels of individual facets over time. However, to our knowledge, little attention has been given to the extent to which facets of well-being work together as a “system” to produce particular developmental trajectories. Research from the field of personality psychology has conducted such investigations by correlating intraindividual longitudinal changes scores across different dimensions of personality (Allemand, Zimprich, & Hertzog, 2007; Allemand & Martin, 2016), or between personality and quality of social relationships (Deventer et al., 2019). Analogously, if changes in well-being shared similar causes, intraindividual change among different facets of well-being would be highly correlated (e.g., an adolescent with pronounced longitudinal change in happiness should show similarly pronounced change in all other well-being facets). Conversely, if changes in well-being were isolated and specific, we would expect low to moderate correlations in intraindividual change between different facets (e.g., an adolescent with minimal longitudinal change in happiness should show

longitudinal changes of different magnitudes in other facets). Rather than examining facets in isolation, a more holistic approach such as this may help to identify meaningful patterns of co-development during the transition to college, and to direct future interventions toward facets that may promote improvements across other related facets.

Research Aims

The present study will extend the existing research via two main research aims. The first aim is to identify the structure of well-being in college-bound adolescents. Using self-report indicators from previously validated well-being measures, we will use a combination of exploratory and confirmatory factor analyses to construct an initial model of well-being in a sample of matriculated college students (Aim 1a). Based on prior research, we expect the best-fitting model to be: 1) a single higher-order latent factor (i.e., well-being) with multiple subfactors, or facets, or 2) two higher-order latent factors that reflect theoretical models of hedonia and eudaimonia, respectively, each composed of its corresponding facets. It is worth noting that exploratory analyses may result in a structure of well-being that deviates from the expected models above. Fit indices of expected (and unexpected) models will be compared, and the best-fitting model will be selected for subsequent analyses. The selected model will then be tested for goodness-of-fit in a separate sample of incoming first-year college students, or freshmen, the summer *prior* to their matriculation to college (Aim 1b). We expect that the model will demonstrate adequate fit, and will not be significantly different for incoming freshmen than for matriculated students¹. Structural continuity will also be tested (Aim 1c); that is, we will investigate the extent to which the selected model of well-being demonstrates invariance across the transition to college. Longitudinal models for each individual facet will also be tested, and any models found to be noninvariant will be excluded from subsequent longitudinal analyses. The window of development under investigation may be too limited to expect evidence of changes in

¹ If the model does not meet the criteria for invariance between samples, the sample of incoming freshmen will be split. One half of the data will be used to construct a new model using EFA; using CFA, the model will then be tested for goodness-of-fit in the other half.

structure. However, given the extent of immense flux of this period, we do not make any predictions regarding structural continuity of well-being during the transition. Finally, assuming adequate fit to the data, the two-factor solution will be used to estimate the latent correlation between hedonia and eudaimonia (Aim 1d). Based on recent research, we expect to add to the increasing body of evidence that hedonia and eudaimonia are indeed overlapping forms of well-being.

The second aim of the study is to investigate the effects of the college transition on developmental trajectories of well-being. Assuming longitudinal invariance of the selected model, we will assess developmental trajectories of well-being during the transition to college using structural equation modeling (Aim 2a). Based on mixed findings in the existing research, we expected that some facets would decrease while others would increase or stay consistent across time. Finally, we will explore the intercorrelations of longitudinal change among facets (Aim 2b). Low-to-moderate correlations between latent slopes would suggest lower degrees of interdependence. Conversely, high correlations between latent slopes would provide evidence of a systems model of well-being, and imply that interventions that promote improvement (or buffer against worsening) in one facet might result in similar effects in other related facets.

CHAPTER III

METHODS

PARTICIPANTS

Matriculated College Students

Participants include a sample of 573 undergraduate students at the University of Oregon at various stages of their academic careers (54.1% first-year [7.2% first-term, 19.5% second-term, 27.4% third-term], 24.4% second-year, 14.0% third-year, 7.2% fourth-year or above). Of the total sample, 92.7% had completed at least one academic term of college (i.e., 10 weeks) prior to completing the survey. The sample was 66.7% female, as defined by self-reported biological sex; 65.8% female and 1% non-binary, as defined by gender. Average age was 19.3 years ($SD = 1.24$). Self-reported ethnic representation was 62.0% White, 16.1% Hispanic or Latino, 11.3% Asian, 3.9% Black or African American, 1.0% Native Hawaiian or other Pacific Islander, 0.5% American Indian or Alaskan Native, and 4.5% two or more ethnicities.

The sample was a subset from a larger pool of 636 participants, recruited via an online research participation pool associated with enrollment in psychology or linguistics courses. Participants consented to enroll in this study by clicking a button to continue the survey and received course credit for their participation. The study was approved by the University of Oregon Institutional Review Board.

Matriculated students completed the questionnaires at only one measurement occasion at various times throughout the academic year. Forty participants appeared to have not completed the surveys in good faith and were excluded; specifically, these were participants who completed 2% or less of the survey, provided incomplete or duplicate responses, or completed surveys significantly faster or slower than reasonably expected (i.e., more than two standard deviations from average time to completion). Given the developmental focus of the current study, 23 participants whose reported age exceeded that of a “traditional” undergraduate student (i.e. >23

years-old) were also excluded. In sum, a total of 63 participants were excluded from the sample of matriculated college students, resulting in a final sample of 573.

Incoming Freshmen

Participants also include a sample of 274 incoming college freshmen as part of a larger longitudinal study on health and well-being during the transition to college. The sample was 66.7% female, as defined by self-reported biological sex; 69.7% female and 0.3% non-binary, as defined by gender. Average age was 18.0 years ($SD = 0.29$). Self-reported ethnic representation was 60.1% White, 15.5% Hispanic or Latino, 12.0% Asian, 2.1% Black or African American, 0.7% Native Hawaiian or other Pacific Islander, 0.3% American Indian or Alaskan Native, and 7.1% two or more ethnicities.

This sample was recruited in collaboration with the University of Oregon's summer orientation program. During the three-month period preceding the first term of the academic year, we extended online and in-person invitations to adolescents who reported plans to enroll at the University. Those who were older than 18 or 19 years-old, had not graduated from high school the preceding spring, or who planned to live off-campus were ineligible to participate. A subset of participants were concurrently enrolled in an MRI study; thus, some participants were excluded from the present study on the basis of MRI-related exclusion criteria (i.e., left handedness; pregnancy; presence of neurological, mood, or eating disorders; presence of MRI contraindications). Informed consent was provided in-person or online; the study was approved by the University of Oregon Institutional Review Board.

Incoming freshmen completed the questionnaires at four measurement occasions. To fully capture the effects of transitioning to college, baseline measures were collected within 12 weeks prior to participants' first academic term of college (63.6% 0-4 weeks, 19.4% 4-8 weeks, 14.5% 8-12 weeks); two participants completed baseline surveys during the first week of the academic term. Finally, 30.0% of incoming freshmen completed baseline surveys in the research lab; the remainder of the sample completed them online.

Each of the three subsequent measurement occasions occurred within the last two weeks of each of three academic terms (i.e., fall, winter, spring). To maintain relative consistency in time intervals across the sample, approximately 7-10 days was allowed for completion of each follow-up survey. Participants were provided financial compensation for their participation at each measurement occasion; those who completed the questionnaires at all four measurement occasions were provided a small bonus payment. Retention was excellent; 86.2% of the sample (n = 238) completed the surveys at all four measurement occasions, and 89.8% (n = 248) completed three or more. Treatment of missing data is described in the data analysis plan section below.

MEASURES

Questionnaires were administered using the web-based platform, Qualtrics (Qualtrics, Provo, UT). At each measurement occasion, participants of both samples were presented with a series of previously validated questionnaires designed to assess various dimensions of their well-being. Included measures are as follows (see Table 4 for full list of items):

EPOCH. The EPOCH is a 20-item measure (Kern et al., 2015) developed for use with adolescent populations that assesses five psychological characteristics that are theorized to foster well-being in adulthood. These characteristics are labeled Engagement, Perseverance, Optimism, Connectedness, and Happiness. Participants were asked to indicate how much each statement described them. Items were scored on a 1 to 5 scale (almost never = 1; almost always = 5), with higher scores corresponding to greater well-being. There were no reverse-scored items. In the samples of matriculated college students and first-year students, cronbach's alpha was .940 and .917 respectively.

PERMA. The PERMA profiler (Butler & Kern, 2016) is a measure of well-being based on Seligman's theory of flourishing in adults (2011). PERMA measures well-being using three items from each of five domains: Positive emotions, Engagement, Relationships, Meaning, and Accomplishment. Items were scored on a 0 to 10 scale, with two different sets of response anchors (Not at all/Never = 0; Completely/Always = 10), depending on whether the item was

stated in terms of frequency (e.g., “How often do you feel joyful?”) or extent (e.g., To what extent do you feel loved?); there were no reverse-coded items. The original 23-item measure includes several “filler” items related to loneliness and physical health. However, these items were excluded from analyses because they are theoretically distinct from psychological well-being as defined in the current study. Furthermore, a single item about happiness was also removed to eliminate redundancy with the happiness item from the EPOCH, resulting in a total of 15 items. In the samples of matriculated college students and first-year students, cronbach’s alpha was .886 and .789, respectively.

Positive Youth Development (PYD). Four indicators from a PYD measure (Benson, 2007) were used to assess positive evaluations of one’s sense of identity. For two of the items, participants indicated which of two types of people they are most like (e.g., “some people are very happy being the way they are” and “other people wish they were different”), followed by whether that description is “sort of true” or “really true” for them. These items were scored on a 1 to 4 scale, with higher scores corresponding to greater self-esteem, or a more positive sense of identity. For the other two items, participants were asked to report how much they agree or disagree with positive worded statements about themselves (e.g., “All in all, I am glad I am me”); these items were scored on a 1 to 5 scale (Strongly agree = 1; Strongly disagree = 5). In the samples of matriculated college students and first-year students, cronbach’s alpha for the PYD items were .675 and .639, respectively.

Satisfaction with Life Scale (SWLS). The SWLS (Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S., 1985) includes 5 items designed to assess global cognitive judgments of satisfaction with one's life. Participants rated the extent of their agreement with such statements as “*I am satisfied with my life*” and “*the conditions of my life are excellent.*” Items were scored on a 1 to 7 scale (strongly disagree = 1; strongly agree = 7); there were no reverse-coded items. In the samples of matriculated college students and incoming freshmen, cronbach’s alpha was .875 and .832, respectively.

Positive and Negative Affect Scale (PANAS). The PANAS (Watson et al., 1988) was used to measure the extent to which participants had felt each of 20 emotion-related experiences during the week prior to completing the survey. Half of the items are positive emotions, including such examples as *excited*, *enthusiastic*, and *proud*; the other half are negative items such as *scared*, *hostile*, and *nervous*. Participants were asked about the extent to which they felt each emotion over the past week. Items were scored on a 1 to 5 scale (Very slightly or not at all = 1; Extremely = 5); there were no reverse-coded items. In the samples of matriculated college students and first-year students, cronbach's alpha was .864 and .851, respectively.

DATA ANALYTIC OVERVIEW

All analyses were conducted in R (version 3.6.3; R Development Core Team, 2014). Exploratory factor analyses were conducted using the psych (Revelle, 2016) package; lavaan (Rosseel, 2012), and semTools (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2019) packages were used to conduct confirmatory factor analyses and latent growth curve modeling. The MVN (Korkmaz, Goksuluk, & Zararsiz, 2014) package was used to conduct tests of univariate and multivariate normality.

Consistent with prior research, preliminary examination of the data indicated significant univariate and multivariate deviations from normality. Variables were negatively skewed (except for negative affect, which was positively skewed), and exceeded conventional thresholds of normality for kurtosis and skew, Mardia's statistic of multivariate kurtosis > 5 , $p < .001$; skewness > 200 , $p < .001$. Violations of normality assumptions have been shown to bias estimation in factor analysis. Specifically, kurtosis can be problematic for covariance structure analysis; skew is an issue when modeling means (Yuan & Bentler, 1999; 2000; Bentler, 2004). Robust estimation methods to attenuate biases due to nonnormality of the data are described in further detail below.

For all SEM analyses, model fit was evaluated using conventional global fit indices (e.g., Kline, 2015), comparative fit index (CFI), root mean square error of approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Based on commonly used cutoff values,

the following criteria were used to indicate goodness-of-fit: $CFI \geq .95$, $RMSEA \leq .06$, and $SRMR \leq .08$ was “good,” $CFI \geq .90$, $.05 < RMSEA \leq .10$, and $SRMR \leq .08$ was “adequate” (e.g., Hu & Bentler, 1999, McDonald & Ho, 2002, Brown, 2015). Of note, the Yuan-Bentler chi-square (YB χ^2) was not used to evaluate model fit due to its sensitivity to large samples (as in the present study; Bentler and Bonnet, 1980; Jöreskog and Sörbom, 1993); however, it will still be reported in accordance with common best practices (e.g., Kline, 2015; Hayduk et al, 2007; Mueller & Hancock, 2008). Difference of fit between competing models was assessed using the Akaike information criterion (AIC). Lower values of AIC indicate a better fit (Burnham & Anderson, 2004).

The measures used in this study included various response scales. To more easily interpret and compare estimates in the longitudinal analyses, raw scores were standardized using a modified Percent of Maximum Possible (POMP) approach (Moeller, 2015). POMP scores are calculated by recoding variables to reflect a percentage of the maximum possible score for their respective scales. To further aid with interpretability and visual presentation, scores were adjusted to a 10-point scale, rounded to two decimal places.

STRUCTURE OF WELL-BEING (AIM 1)

Exploratory factor analysis. To address the first aim of this study, we sought to identify an appropriate model of well-being in incoming freshmen by first conducting exploratory factor analysis (EFA) in the sample of matriculated college students. Compared to some models that specify well-being constructs a priori, EFA represents a more bottom-up approach to modeling well-being using participants’ actual data. Of note, data used in the EFA include responses to items included in a battery of previously validated well-being measures described above, thus constraining the range of possible outcomes. Nevertheless, EFA allows us to identify a structure of well-being that may differ from the theoretical models upon which the original measures are based. Items were scored in accordance with the guidelines specified by their corresponding

measures, but were then examined individually for purposes of the EFA. The final data included a total of 64 items.

Prior to conducting EFA, we examined the suitability of the data for factor analysis by conducting two separate tests - the Kaiser-Meyer-Olkin (KMO) test and Barlett's Test of Sphericity. These tests assess the proportion of variance in the data that may be caused by common underlying factors. Given that these items were extracted from previously validated measures of well-being, we expected the results of these tests to indicate a substantial proportion of shared variance among the items, thus verifying the pool of items as appropriate for factor analysis.

The number of latent factors to extract from the data was approximated using several methods, including visual examination of the scree plot for "elbows" or points of inflection, as well as of the eigenvalues and eigenvectors of a correlation matrix of the items (Kaiser, 1960). Furthermore, we conducted parallel analysis (Horn, 1965; Glorfeld, 1995), which compares the eigenvalues of our data to the eigenvalues of a Monte-Carlo simulated matrix created from random data of the same size. According to this approach, the number of factors to retain is indicated by the point at which the eigenvalues of the randomly generated matrix exceeds those of the actual data.

Using the R package, stats (R Core Team, 2014), EFA was conducted using maximum likelihood estimation. A Minimum Covariance Determinant (MCD) estimator was used to compensate for nonnormality of the data by reducing the influence of outliers on estimation of factor loadings and uniqueness (Treiblmaier & Filzmoser, 2009). Participants with missing data were excluded from the EFA. Given the inherent multicollinearity of items from validated well-being measures, we allowed factors to covary by using an oblique rotation method (i.e. promax), and extracted an initial number of factors according to the results of the methods described above. In the interest of parsimony and subsequent interpretation, we ultimately attempted to explain a

sufficient proportion of variance using the fewest possible number of latent factors (Henson & Roberts, 2006).

EFA was conducted in stepwise fashion, beginning with the entire pool of items. After each iteration, we examined the cumulative variance explained by the model. Consistent with prior psychological research, explained variance of approximately 50% was deemed adequate (e.g., Streiner, 2005, Hair et al., 2010). Pattern coefficients — also referred to as “loadings” — were also examined. Items with pattern coefficients that were exceedingly low, or of similar magnitude with two or more factors were removed from each subsequent step of the EFA. Thresholds were designated a priori in accordance with conventional standards; items with pattern coefficients of less than .400, or of less than .200 difference on two or more factors were removed (e.g., Guadagnoli & Velicer, 1988; Worthington & Whittaker, 2006). We also examined estimates of communality to assess each item’s respective contribution to common variance in the model; items with communality scores of less than 0.2 were removed from subsequent iterations (Child, 2006). Finally, developing a model stable enough for use in subsequent analyses required there to be a sufficient number of indicators to estimate each latent factor. As such, factors with fewer than three items were not retained (Tabachnick & Fidell, 2001). Furthermore, despite our expectation of multicollinearity among factors, we inspected factor intercorrelations to ensure that factors were reasonably distinct ($r < .700$; Tabachnick & Fidell, 2001), and consistent with theoretically derived expectations.

In summary, the EFA was deemed sufficient if the following six criteria were satisfied by the resulting model: 1) explains a sufficient proportion of variance in the data, 2) excludes items with exceedingly low or “cross-loaded” pattern coefficients, 3) excludes items with low communality, 4) includes a minimum of 3 items in each factor, 5) demonstrates reasonable correlations among retained factors, and 6) is consistent with principles of parsimony.

Confirmatory Factor Analyses. To further examine the fit of the well-being model to the data, we conducted confirmatory factor analysis (CFA) within a structural equation modeling

(SEM) framework. Given that the model was identified using the same sample of matriculate students, we expected the model to fit well to the data; however, translating the model within an SEM framework enables closer examination of variance and covariance structures in the model, and allows for direct comparisons of alternative models. Parameter estimates were obtained using maximum likelihood estimation, and full information maximum likelihood (FIML) estimation for missing data; robust standard errors and the adjusted (Yuan-Bentler) chi-square were used to account for non-normality.

In addition to testing the model resulting from the EFA, we investigated alternative models for goodness of fit. Specification of alternative models was informed by prevailing theories of well-being so as to help position the results of our study in closer context with the current state of research. In particular, we were interested a priori in the difference of fit between a model featuring a single higher-order factor of well-being with various sub-factors, or facets, and a model comprised of two higher-order factors: happiness, also referred to as subjective well-being (i.e. positive affect, negative affect, satisfaction with life), and a multidimensional factor comprised of the remaining “eudaimonic” facets that emerged from the EFA. Goodness of fit indices for each of these models were compared, and the best-fitting model(s) were selected for use in subsequent analyses.

Finally, the selected model from the CFA of matriculated college students was tested in the sample of incoming freshmen. Model fit was examined, and any substantial differences in fit were further investigated.

Measurement Invariance. In addition to visual inspection of fit indices, differences in model fit between the samples were assessed using formal tests of measurement invariance. In this approach, a series of nested models with increasing constraints are compared for invariance across groups; significant changes in model fit between subsequent levels of constraint indicate non-invariance of the model between groups. Measurement invariance is tested by assessing change in fit by comparing each subsequent model to the prior model.

The first level model — configural invariance — requires that the factor structure represented by the items remain the same between groups. The second level model — metric (or weak) invariance — requires that the factor loading matrix remain the same between groups. The third level model — strong invariance — requires that the observed variable intercepts remain the same between groups. The final model — strict invariance — adds an additional requirement that residual variances of observed variables remain the same between groups. Invariance in factor means was not relevant for the current aim, and was thus excluded from these analyses.

We examined common fit indices as recommended by research, including chi-square and change in CFI (e.g., Bollen, 1989; Hu & Bentler, 1998, 1999). Consistent with the discussion above about the criteria for evaluating model fit, however, chi-square tests are extremely sensitive to minor deviations in between groups' sample covariance matrices (Bollen & Long, 1993; Hu & Bentler, 1993) and were thus not considered as necessary criterion for invariance. At each level of constraint, the model was deemed invariant if the absolute value of the observed difference in goodness-of-fit index, CFI, was equal or less than .01 (Cheung & Rensvold, 2002). Measurement invariance was tested using the referent loading identification method, in which the loading of the first indicator specified within each factor is set equal to 1; remaining items are then tested for invariance. (e.g., Newsom, 2015).

TRAJECTORIES OF WELL-BEING (AIM 2)

To characterize changes in well-being and related facets during incoming freshmen's transition to college, the best-fitting model of well-being was used to construct a multivariate latent growth model (LGM). Specifically, we used a second-order growth model, or curve of factors model (CUFFS; McArdle, 1988). Compared to first-order LGMs which use single composite scores to assess growth, the advantage of second-order models is that they preserve the relations between indicators and their underlying constructs at each measurement occasion. Accordingly, this approach allows assessment of important data characteristics such as measurement invariance, partitioning of time-specific and item-residual variance, and

examination of item residual covariance patterns (Sayer & Cumsille, 2001; Bishop, Geiser, & Cole, 2015). Furthermore, second-order models provide greater reliability and precision in the estimates of slope and intercepts, leading to beneficial effects for standard error estimation and power (Wänström, 2009; von Oertzen, Hertzog, Lindenberger, & Ghisletta, 2010).

Prior to specifying the growth model, another series of measurement invariance tests were conducted to assess invariance of the model across measurement occasions. Greater measurement invariance increases confidence that estimates of latent growth reflect actual change rather than inaccuracy or imprecision in the measurement model (Horn & McArdle, 1992). Research indicates that a minimum of “strong” invariance (i.e., invariance in the intercepts of observed variables) leads to sufficiently reliable estimates of latent means (and growth) across time (Meredith, 1964, 1993). Measurement invariance tests were conducted on the full model; additional tests of measurement invariance were conducted with each individual well-being facet to assess reliability of their respective growth factor estimates, and to enable comparison of growth factors across facets.

In the full model, latent growth was characterized by an intercept (i.e. level of well-being prior to beginning college) and a slope parameter (i.e., change in well-being at the end of each academic term); the model specified a linear growth trajectory. Within each facet, model parameters were constrained in accordance with results of their respective measurement invariance tests so as to allow longitudinal fluctuations in measured variables to be more fully reflected in the latent growth estimates. Assuming strong invariance, for example, factor loadings and intercepts of each item were constrained to equality across measurement occasions. In cases of strict measurement invariance, residual variances of items were also constrained to equality across time; factor means were set to zero.

Finally, we conducted an exploratory investigation of relationships between the latent growth parameters among well-being facets; specifically, we were interested in the extent to which there were differential patterns of correlated change among certain facets compared to

others. To investigate this question, the model was additionally specified to estimate covariance between the latent growth parameters of each of the well-being facets.

CHAPTER IV

RESULTS

RESULTS, STRUCTURE OF WELL-BEING (AIM 1)

Exploratory factor analysis. To identify an appropriate model of well-being in incoming freshmen, we conducted EFA using data from the sample of matriculated college students. Results of the Kaiser-Meyer-Olkin test and Barlett's Test of Sphericity indicated that the amount of shared variance among the variables was sufficient for factor analysis, $KMO = .958$; $\chi^2(2211) = 3725.866, p < .001$. Three different methods were used to assess the appropriate number of factors to extract from the data. Visual inspection of the scree plot indicated one "elbow" or point of inflection at three factors, and a second potential elbow at fourteen factors. According to the matrix of eigenvalues, there were eleven factors with eigenvalues above 1.0. The results of parallel analysis recommended a total of 13 factors for extraction. Taking these evidence together, the initial EFA was specified to include a total of 12 factors.

Results of the initial EFA suggested that while the 12-factor model explained a substantial proportion of variance ($R^2 = .571$), factors may have reflected differences in measurement instruments rather than of well-being facets. For example, despite prior evidence of multidimensionality in the PERMA profiler, nearly all of its items loaded onto a single factor. Items from the PYD that were theoretically related to self-esteem and positive self-identity also loaded onto their own respective factors, exhibiting communality estimates below threshold ($h^2 < .200$). The item from the EPOCH measure — "I feel happy" — failed to load onto a factor composed of "positive affect" items from the PANAS. Furthermore, items from the PANAS — which presumably measures positively and negatively-valenced dimensions of affect — were shown to load onto three distinct factors, providing additional evidence that the initial model may have been problematic.

To address these issues, we removed PANAS items from the data, and conducted another series of EFA. After several iterations, analyses resulted in a model of well-being composed of 31

items and eight factors that satisfied a priori criteria (see Methods). The model explained a substantial proportion of the total variance, $R^2 = .578$. Retained factors were relatively consistent with theoretical expectations with one exception: items that were conceptually associated with a sense of meaning loaded onto the same factor as items associated with accomplishment.

Together, the factors corresponded to the following theoretical constructs, or facets of well-being, and will henceforth be referred to as such: positive affect, negative affect, satisfaction with life, accomplishment/meaning, relationships, engagement, optimism, and perseverance. Detailed results of the final EFA are presented in Table 1; an alternative visualization is presented in Figure 1. See Table 2 for item text.

Confirmatory factor analysis: Matriculated Students. To assess the fit of the model of well-being in the sample of matriculated college students, we conducted confirmatory factor analyses using an SEM framework. Based on the results of the EFA, well-being was modeled as a single higher-order factor with eight lower-order factors, or facets. The model yielded acceptable goodness of fit statistics: YB $\chi^2(426) = 1,065.387, p < .001$; CFI = .934; RMSEA = .055, 90% CI [.051, .060]; SRMR = .052; AIC: 73,904.077 (Figure 2(A)). Six of the eight facets loaded onto the higher-order well-being factor with standardized loadings above 0.70. Negative affect demonstrated the lowest standardized loading of -0.56.

We additionally tested the alternative model of well-being with two higher-order factors. One factor reflects happiness, which, consistent with a theoretical framework of subjective well-being, is measured by Positive Affect, Negative Affect, and Satisfaction with Life. The other factor includes facets of well-being that follow from philosophies of eudaimonia, and is measured by facets of well-being: Accomplishment/Meaning, Relationships, Engagement, Optimism, and Perseverance. According to fit indices, the two factor model demonstrated better fit than the one-factor model: YB $\chi^2(425) = 1,037.207, p < .001$; CFI = .937; RMSEA = .054, 90% CI [.050, .058]; SRMR = .052; AIC = 73,872.957; Δ AIC = -31.120 (Figure 2(B)). Notably, the model explained approximately 97% of the variability in Positive Affect ($R^2 = .985$), which includes

Table 1. Results of the final EFA.

Factor Label (Facet)	Scale Item #	% Var.	Factor							
			1	2	3	4	5	6	7	8
1. Accomplishment/Meaning	PERMA_6	9.7	0.837					0.170		
	PERMA_2		0.787							0.146
	PERMA_11		0.769						0.156	
	PERMA_13		0.718					-0.107		0.108
	PERMA_10		0.647					0.338	-0.113	
2. Satisfaction with Life	SWLS_1	9.7		0.849						
	SWLS_2			0.809						
	SWLS_3		0.139	0.724						
	SWLS_4			0.767	0.122					
	SWLS_5			0.627						
3. Relationships	EPOCH_14	8.3			0.891					
	EPOCH_10			0.100	0.749					
	EPOCH_16		-0.108		0.739		0.130			
	EPOCH_1				0.701					-0.127
4. Engagement	EPOCH_11	8.1				0.842				
	EPOCH_12					0.819			-0.194	0.121
	EPOCH_7		-0.100			0.723			0.177	
	EPOCH_5				0.155	0.707			0.112	
5. Perseverance	EPOCH_17	7.7					0.777			0.193
	EPOCH_2						0.730		0.106	-0.142
	EPOCH_19				-0.104		0.716		0.105	
	EPOCH_9				0.118		0.703		-0.112	

Table 1. (continued).

Factor Label (Facet)	Scale_ Item #	% Var.	Factor							
			1	2	3	4	5	6	7	8
6. Negative Emotions	PERMA_19	4.9						0.911		
	PERMA_9		0.113					0.599		
	PERMA_17				-0.174			0.502	0.136	
7. Positive Emotions	EPOCH_20	4.8							0.678	0.205
	EPOCH_4			0.139				-0.126	0.660	
	EPOCH_8			0.136					0.599	0.130
8. Optimism	EPOCH_15	4.7	0.232		0.164					0.658
	EPOCH_13		-0.108		-0.145	0.240				0.644
	EPOCH_18						0.162			0.621

such items as “I feel happy” and “I love life.” Furthermore, the two factors (i.e. happiness and other facets) demonstrated a high degree of overlap, sharing 84.4% of their variance ($r = 0.919$).

To further investigate overlap between concepts of accomplishment and a sense of meaning, we tested an additional model in which their respective items were specified as conceptually distinct facets. The one- and two-factor model demonstrated adequate fit (one-factor model: $\chi^2(425) = 1,161.895, p < .001$; CFI = .924; RMSEA = .060, 90% CI [.055, .064]; SRMR = .053; AIC = 74,020.907; two-factor model: $\chi^2(454) = 1,116.093, p < .001$; CFI = .928; RMSEA = .058, 90% CI [.054, .062]; SRMR = .053; AIC = 73,968.893; Δ AIC = -52.014). Consistent with the results of EFA analyses, however, these models yielded worse fit indices than those that combine accomplishment and meaning into a single facet. See Table 3 for a more detailed comparison of these models.

Table 2. Item text.

Facet	Scale Item #	Item Text
Accomplishment/Meaning	PERMA_6	How much of the time do you feel you are making progress towards accomplishing your goals?
	PERMA_2	To what extent do you generally feel you have a sense of direction in your life?
	PERMA_11	To what extent do you lead a purposeful and meaningful life?
	PERMA_13	To what extent do you feel that what you do in your life is valuable and worthwhile?
	PERMA_10	How often do you achieve the important goals you have set for yourself?
Satisfaction with Life	SWLS_1	In most ways my life is close to my ideal.
	SWLS_2	The conditions of my life are excellent.
	SWLS_3	I am satisfied with my life.
	SWLS_4	So far I have gotten the important things I want in life.
	SWLS_5	If I could live my life over, I would change almost nothing.
Relationships	EPOCH_14	There are people in my life who really care about me.
	EPOCH_10	When I have a problem, I have someone who will be there for me.
	EPOCH_16	I have friends that I really care about.
	EPOCH_1	When something good happens to me, I have people who I like to share the good news with.
Engagement	EPOCH_11	I get so involved in activities that I forget about everything.
	EPOCH_12	When I am learning something new, I lose track of how much time has passed.
	EPOCH_7	I get completely absorbed in what I am doing.
	EPOCH_5	When I do an activity, I enjoy it so much that I lose track of time.
Perseverance	EPOCH_17	Once I make a plan to get something done, I stick to it.
	EPOCH_2	I finish whatever I begin.
	EPOCH_19	I am a hard worker.
	EPOCH_9	I keep at my schoolwork until I am done with it.

Table 2. (continued).

Facet	Scale Item #	Item Text
Negative Emotions	PERMA_19	How often do you feel sad?
	PERMA_9	How often do you feel anxious?
	PERMA_17	How often do you feel angry?
Positive Emotions	EPOCH_20	I am a cheerful person.
	EPOCH_4	I feel happy.
	EPOCH_8	I love life.
Optimism	EPOCH_15	I think good things are going to happen to me.
	EPOCH_13	In uncertain times, I expect the best.
	EPOCH_18	I believe that things will work out, no matter how difficult they seem.

Confirmatory factor analysis: Incoming Freshmen. To assess the model of well-being in the sample of incoming freshmen, we tested the best-fitting one-factor and two-factor CFA models. The one-factor model showed adequate fit in the sample of incoming freshmen: $\chi^2(455) = 4,230.018, p < .001$; CFI = .921; RMSEA = .051, 90% CI [.045, .057]; SRMR = .062; AIC = 35,453.702. As in the sample of matriculated students, however, the correlated two-factor model fit slightly better than the one-factor model, $\chi^2(425) = 721.036, p < .001$; CFI = .924; RMSEA = .053, 90% CI [.046, .059]; SRMR = .062; AIC = 35,442.249; $\Delta AIC = -11.453$. Notably, the optimal solution contained a Heywood case, such that the standardized loading of Positive Affect with the Happiness factor was greater than 1 (standardized coefficient = 1.026). Prior research has shown that for cases in which the model is not misspecified, constraining a negative error variance to zero will have minimal effects on overall model fit and other loadings (Gerbing & Anderson, 1987). The negative variance of positive affect was constrained to zero, and the model was re-estimated. As expected, model fit indices of the constrained model were nearly identical to

Figure 1. Visualization of final EFA results.

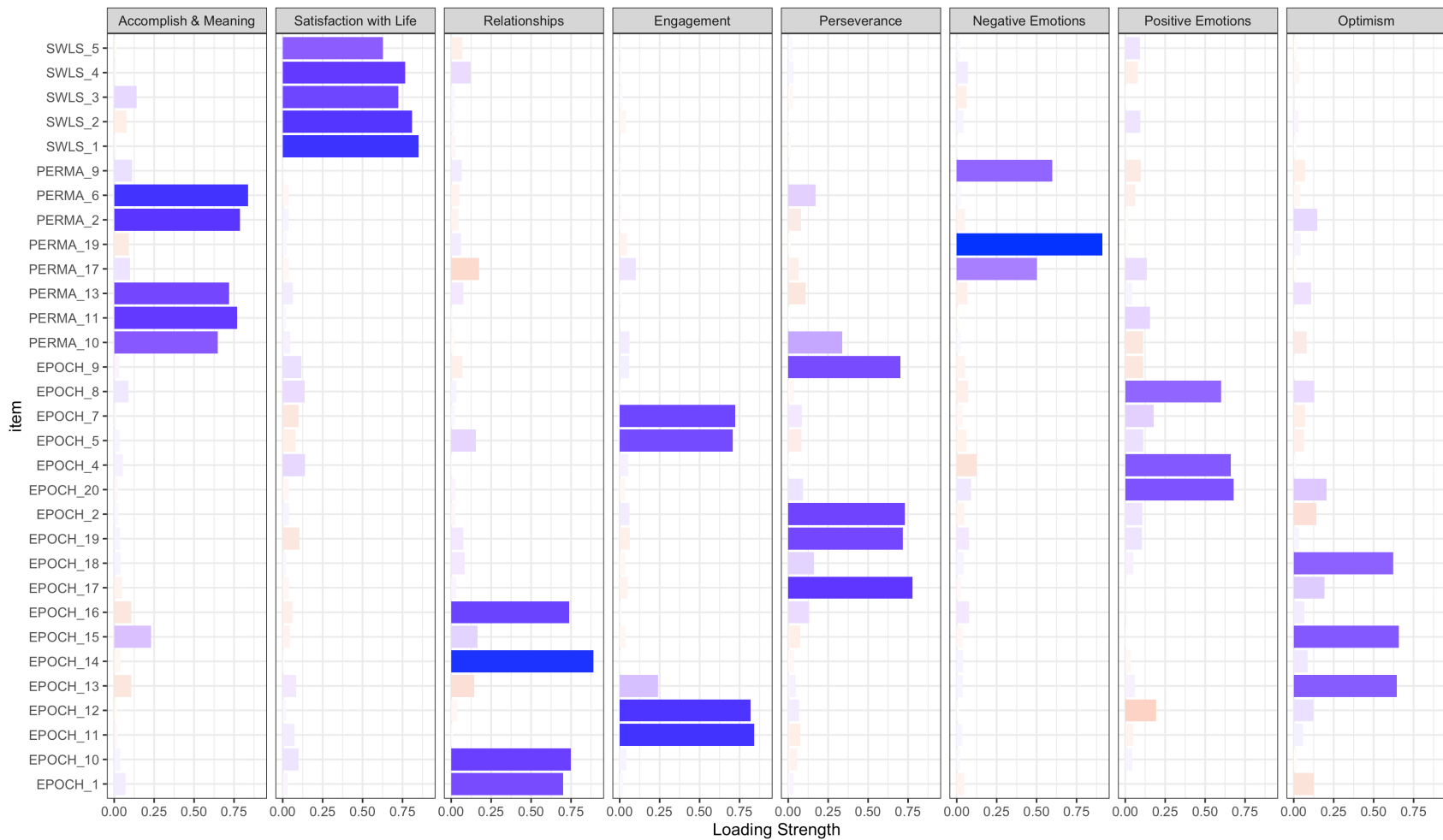


Table 3. Models fit indices.

Model	χ^2	df	CFI	RMSEA	SRMR	AIC	Δ AIC
Two-factor	1037.207***	425	.935	.050	.052	73872.96	-
One-factor	1065.387***	426	.932	.051	.052	73904.08	31.12
Two-factor, meaning separated	1116.093***	424	.926	.053	.053	73968.89	64.81
One-factor, meaning separated	1161.895***	425	.932	.055	.053	74020.91	52.02

*** $p < .001$

those of the unconstrained model, $\chi^2(426) = 722.228$, $p < .001$; CFI = .924; RMSEA = .053, 90% CI [.046, .059]; SRMR = .061; AIC = 35,441.383 ($\Delta\chi^2 = -1.192$; Δ CFI = .000; Δ RMSEA = .000, Δ 90% CI [.000, .000]; Δ SRMR = .000; Δ AIC = 0.866). Changes in facet loadings were also relatively small, providing further evidence that the model was correctly specified; the standardized loading of Satisfaction with Life increased by .016; no other loading changed more than .05. As in the sample of matriculated students, for incoming freshmen, Happiness was very highly correlated to the latent factor composed of all other facets ($r = 0.927$).

Measurement Invariance Across Samples. Despite the appearance of similar fit indices, the two-factor model was formally tested for invariance between samples of matriculated students and incoming freshmen. The change in fit indices for each increasing level of constraints were below the recommended cutoff (Δ CFA = .01), Δ CFA < .005), suggesting that the measurement model met the assumptions of strict invariance between samples. In other words, the tests indicated that the two-factor model of well-being fit equally well for both matriculated students and incoming freshmen.

RESULTS, TRAJECTORIES OF WELL-BEING (AIM 2)

Measurement Invariance Across Time. The viability of the two-factor model to assess longitudinal change was examined by conducting tests of invariance across measurement occasions. Changes in fit indices for each increasing level of constraints were small, Δ CFA < .01,

suggesting that the two-factor model demonstrated strict invariance across time. Given the exploratory aim of comparing growth trajectories among facets, we conducted additional tests of longitudinal measurement invariance for each of the constructs separately. At each increasing level of constraints, changes in fit indices for all but one of the models were below the recommended cutoff. Assumptions of strict invariance were met for models of Happiness ($\Delta\text{CFA} < .01$), accomplishment/Meaning ($\Delta\text{CFA} < .01$), Relationships ($\Delta\text{CFA} < .005$), Engagement ($\Delta\text{CFA} < .01$), and Optimism ($\Delta\text{CFA} < .005$), suggesting that these models' respective growth factors could be meaningfully interpreted and compared in the longitudinal analyses. Notably, the model of perseverance failed to demonstrate measurement invariance. Specifically, longitudinal measurement of intercepts (i.e., item means) was noninvariant ($\Delta\text{CFA} = -.018$), suggesting that freshmen's interpretation of survey items related to perseverance changed across measurement occasions. According to prior research, partial invariance may be sufficient for making valid inferences about changes in latent means (Byrne, Shavelson & Munthen, 1989). We attempted to establish partial invariance by conducting a series of post-hoc measurement invariance tests. First, an item which asked specifically about perseverance in school was removed from the model to test whether invariance was due to administration of baseline measures during the summer, a period in which participants were not typically in school. According to the results, the measurement of intercepts remained noninvariant, $\Delta\text{CFA} = -.022$. This procedure was replicated for each other item in the perseverance factor. However, each iteration yielded similar fit indices ($\Delta\text{CFA} > .01$), suggesting that the model of perseverance was noninvariant across time. Given the implications of compromised interpretability of latent growth factors from these results, the model of perseverance was excluded from further longitudinal analyses.

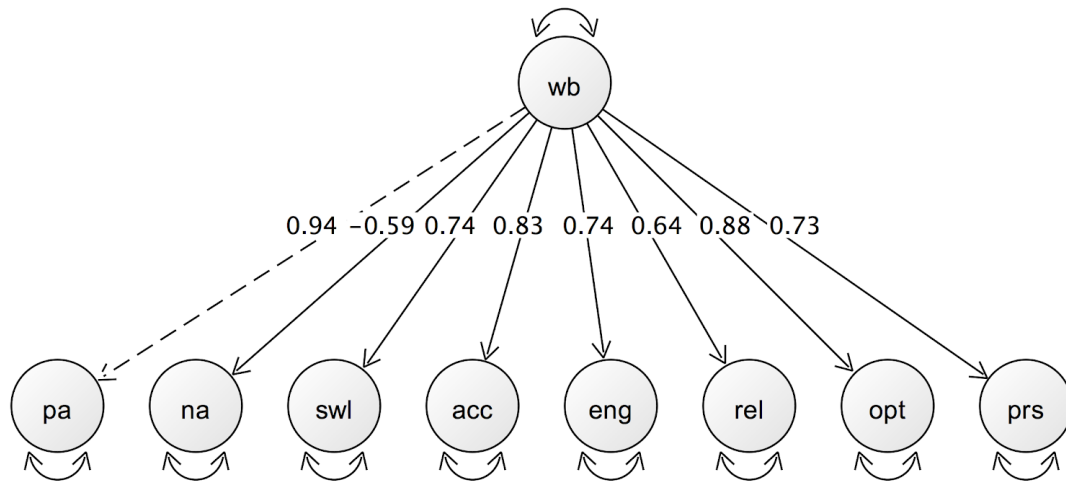
To assess the change in well-being and related facets during the transition to college, we constructed a multivariate second-order latent growth curve model. The full model included

Happiness, as well as each of the other remaining facets (excluding Perseverance). Model fit indices suggested mixed results, $\chi^2(5652) = 9,080.366, p < .001$; CFI = .849; RMSEA = .047, 90% CI [.045, .049]; SRMR = .080. Despite a CFI that suggests less than adequate fit; the values of RMSEA and SRMR were consistent with a model of good fit. We examined the means of the various slope factors indicating the average magnitude and direction of change. At the 95% confidence level, all means were significantly different from zero and negative, suggesting a decreasing trajectory of change across every facet of well-being. According to z-statistics, the change of greatest magnitude was in Happiness ($\beta = -.206, z = -5.274, p < .001$), which by the end of freshmen year, decreased 9.2% from average levels prior to beginning college. Declines in Achievement/Meaning ($\beta = -.115, z = -3.065, p < .01$), Engagement ($\beta = -.181, z = -3.734, p < .001$), Optimism ($\beta = -.206, z = 5.274, p < .01$), and Relationships ($\beta = -.115, z = -2.108, p = .035$). were also significantly different from zero.

We investigated inter-individual variability in baseline levels and changes in well-being by examining variance estimates of the latent growth factors for each of the facets. Variance in latent intercepts was significantly different from zero for all facets, indicating that freshmen differed from one another in their levels of well-being at baseline. For latent slopes, there was statistically significant variability in the Happiness ($p = .04$) and Relationships ($p < .01$), indicating that individuals varied in their growth trajectories of these facets; inter-individual variability in latent slopes was non-significant for each other facet. A complete description of latent growth estimates is displayed in Table 4.

To assess the exploratory aim of the extent to which growth trajectories of facets were interrelated, we examined covariance estimates between latent slope estimates. According to these estimates (see Table 5), growth trajectories of all facets were significantly correlated to one another ($p < .001$).

(A) One-factor model.



(B) Two-factor model.

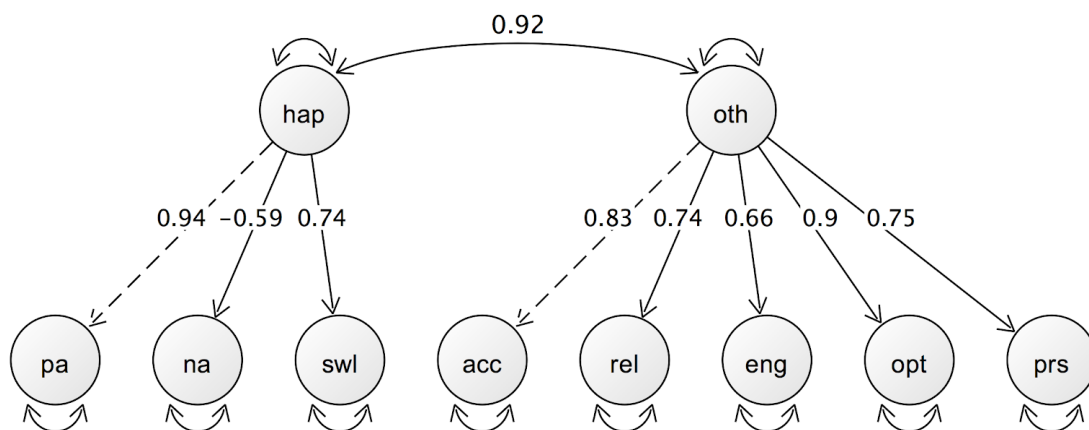


Figure 2. Standardized factor loadings for the one- and two-factor models of well-being in the sample of matriculated college students. pa = positive affect; na = negative affect; swl = satisfaction with life; acc = accomplishment/meaning; rel = relationships; eng = engagement; opt = optimism; prs = perseverance; hap = happiness; oth = other facets. Manifest variables and their respective loadings onto lower-order factors are not shown.

Table 4. Estimates of latent growth and variance.

Facet			Estimate	SE	t(Z)	% Change
Happiness	Fixed-effects	Initial Level	6.74	0.13	51.19***	
		Growth Rate	-0.21	0.04	-5.27***	-9.2%
	Variance	Initial Level	3.62	0.34	10.81***	
		Growth Rate	.09	0.04	2.05*	
Accomplishment/ Meaning	Fixed-effects	Initial Level	7.55	0.11	70.79***	
		Growth Rate	-0.12	0.04	-3.07**	-4.6%
	Variance	Initial Level	1.98	0.32	6.15***	
		Growth Rate	.08	0.05	1.69	
Relationships	Fixed-effects	Initial Level	7.44	0.15	49.74***	
		Growth Rate	-0.12	0.05	-2.11*	-4.6%
	Variance	Initial Level	3.77	0.54	6.95***	
		Growth Rate	.27	0.08	3.22**	
Engagement	Fixed-effects	Initial Level	4.77	0.14	33.43***	
		Growth Rate	-0.18	0.05	-3.73***	-11.4%
	Variance	Initial Level	2.34	0.42	5.58***	
		Growth Rate	0.08	0.06	1.27	
Optimism	Fixed-effects	Initial Level	4.40	0.15	28.85***	
		Growth Rate	-0.14	0.04	-3.29**	-9.2%
	Variance	Initial Level	2.31	0.41	5.62***	
		Growth Rate	0.06	0.05	1.20	

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

Table 5. Correlations among latent slope estimates.

	1	2	3	4	5
1. hap.b1	--				
2. acc.b1	2.59***	--			
3. rel.b1	1.58***	1.47***	--		
4. eng.b1	2.77***	2.21***	1.50***	--	
5. opt.b1	3.21***	2.86***	1.68***	3.71***	--

*** $p < .001$

CHAPTER V

DISCUSSION

The overarching goals of the present study were to identify an appropriate model of well-being in college freshmen, and to examine the developmental trajectories of well-being and related facets during the transition to college. In a series of exploratory and confirmatory analyses with data from a sample of matriculated college students, the best-fitting model was composed of two highly correlated superordinate factors: i) happiness, composed of indicators of positive affect, negative affect, and satisfaction with life, and ii) another factor composed of eudaimonic facets associated with relationships, engagement, optimism, perseverance, and a combination of accomplishment with a sense of meaning. This model demonstrated adequate fit in the sample of incoming freshmen just prior to beginning their first academic term of college, and was shown to be invariant between samples. In addition, the model demonstrated longitudinal invariance across the transition to college (i.e., four measurement occasions, once before matriculation and again at the end of each of three academic terms). Developmental trajectories of well-being were modeled using second-order latent growth curve models. Results indicated that the transition to college was associated with significant declines in each of the well-being facets examined. Patterns of correlated change were also investigated. Results of these analyses provided strong evidence of interrelatedness; that is, longitudinal changes in individual facets were strongly and similarly associated to one another.

DISCUSSION, STRUCTURE OF WELL-BEING (AIM 1)

There are several interesting findings in the present study, including support for a multifaceted model of well-being among college students. Using indicators from a set of previously validated well-being measures, results of the EFA suggested that participants' data was best explained by a model composed of eight facets. These facets included feelings of positivity and satisfaction about one's life, as well as dimensions of personal growth in caring interpersonal relationships, successful goal pursuit, and positive expectations about the future.

Notably, despite theoretical overlap of certain facets among measurement instruments, each facet in the selected model was composed exclusively of indicators from just one of the measures. For instance, whereas both the PERMA-Profilier and EPOCH include items theorized to measure evaluations of positive interpersonal relationships, only those indicators from the EPOCH were retained. The same pattern of retention was found for Engagement and Positive emotions. While instrument effects may simply reflect differences in the psychometric properties of the EPOCH and PERMA-Profilier, another possible explanation is related to the target populations for which these measures were designed. The PERMA-Profilier was developed for use in adults, using 11 samples in which a majority of participants were at least 25 years-old. The EPOCH, on the other hand, is a theoretical model of adolescent well-being, and was designed using 10 samples of participants with average ages ranging from 13.03 to 15.5 years-old. As such, a reasonable interpretation of this finding is that for some facets (i.e., engagement, relationships, positive emotions), the structure of well-being in college students may be more alike to that of adolescents than of adults.

Meaning and Accomplishment

Further evidence of differentiation was found in the factor structure of well-being. According to the results of the EFA and CFA, the best-fitting model was one in which indicators of a sense of meaning were loaded onto a common factor with those of accomplishment. This finding is surprising, as researchers typically consider meaning and accomplishment to be theoretically distinct constructs (e.g., Ryff, 1989; Ryff & Singer, 1998; Crumbaugh & Maholick, 1967; Recker & Wong, 1988). Interestingly, however, whereas at least one study has confirmed the theoretical factor structure of PERMA using CFA (Giangrasso, 2018), the use of EFA has similarly resulted in a failure to retain a distinct meaning factor across several other studies. Research using samples of student veterans (mean age = 29.41), adults with significant physical disabilities (mean age = 39.0), and Australian adolescents (age 13-18) found indicators of meaning to overlap instead with those of Positive relationships (Umucu et al., 2019; Kern,

Waters, Adler, & White, 2015; Arvig, 2006). Findings from studies on Malaysian and Australian adults are consistent with those of the present study (Khaw & Kern, 2015; Ryan et al., 2019). Interestingly, the sample of Australian adults who showed overlap between meaning and accomplishment also reported significantly lower PERMA well-being compared to population norms (Ryan et al., 2019).

Evidence of structural overlap between meaning and other aspects of well-being represents a promising line of future research. According to Chickering & Reisser's theory of identity development (1993), one of seven vectors of developmental tasks during the college years is the formation of life purpose, or alignment of activities with one's inner self. Adolescents and college students strive for such alignment through a variety of pursuits, including those of occupational or financial goals, happiness, prosocial behavior, and religion, among others (Hill et al., 2010; Schluckebier, 2013). Which of these pursuits adolescents choose may have important implications for their well-being. Compared to occupational and financial goals, efforts to bolster emotional intimacy, personal growth, and community contribution are more positively related to well-being (Sheldon et al., 2004). Accordingly, future studies can investigate the extent to which structural overlap between meaning and positive interpersonal relationships (versus accomplishment, for example) relates to adolescents' levels of well-being or other important outcomes.

An additional effect of this unexpected finding is to underscore the importance of exploratory data analyses for this research; that is, exploratory analyses such as EFA can reveal relationships that might otherwise be obscured by research goals of merely demonstrating adequate fit of existing models. With much yet unknown, greater attention to exploratory analyses in future research may help to advance scientific understanding of adolescent well-being in unforeseen and generative directions.

Model Invariance

The present study found the selected model of well-being to be invariant between incoming freshmen and matriculated college students, suggesting that the structure of well-being (as measured herein) does not differ pre- and post-matriculation. While the primary goal of these analyses was to confirm the adequacy of the model for incoming freshmen, evidence of invariance can also be interpreted to mean that the structure of well-being was not substantially changed by matriculation. Of note, however, whereas the entire sample of matriculated students had experienced at least 10 weeks of the college transition (73.3% had completed at least two academic terms), 54.1% of them were still freshmen, and the difference in mean age of the samples was relatively small (i.e., 1.3 years). An interesting direction for future research would be to test the measurement invariance of the well-being model between incoming freshmen and more senior college students; evidence of noninvariance may point to important clues about structural and temporal effects of the college experience on young peoples' criteria for what it means to be well.

Structural Continuity

The selected model was also found to be longitudinally invariant during the transition to college. Additional tests of measurement invariance indicated that longitudinal invariance was similarly demonstrated in models of each individual facet, with one exception: perseverance. This result is somewhat surprising, as we would expect to have found concurrent evidence of noninvariance in the full model (which includes perseverance). Recent research points toward some possible reasons for the discrepant findings. In a methodological study about measurement invariance, Counsell, Cribbie & Florida (2019) note that because the null hypothesis of commonly used tests (as used in the present study) is the absence of a difference, failure to reject the null does not necessarily imply that model parameters are equivalent across time. Furthermore, the authors point to inconsistencies in recommended cutoff values, and suggest that changes in common goodness-of-fit indices may not be optimal indicators of measurement

invariance. Accordingly, we note that the removal of perseverance from the longitudinal model includes an inherent degree of subjectivity. Future research should attempt to replicate evidence of noninvariance in perseverance, and more closely examine the implications of choosing between different recommended cutoff values.

We consider that this finding may nevertheless have meaningful implications for future research. Caveats notwithstanding, tests of longitudinal invariance specifically indicated that the mode of perseverance did not meet criteria for scalar invariance; that is, participants' baseline interpretations of the perseverance indicators changed after beginning college. Indeed, research has shown that the increased rigor of college courses catches many adolescents by surprise (e.g., Levitz & Noel, 1989). Follow-up studies should examine the ways in which adolescents' definitions of working hard and overcoming adversity differ before and after transitioning to college, and the extent to which these differences (and/or adolescents' ability to cope with them) relate to subsequent academic success.

More broadly, these findings underscore the importance of testing for measurement invariance in longitudinal investigations. Had we not tested for measurement invariance, latent growth parameters would be contaminated by inconsistency in the relations between perseverance and its indicators across time. In a review of research best practices, Vandenberg & Lance (2000) note that measurement invariance had received surprisingly little attention in longitudinal research. Unfortunately, the message seems not to have been received by many well-being researchers. Whereas studies have examined measurement invariance of PERMA and EPOCH across genders, cultures, and languages (e.g., Wammerl, Jaunig, Mairunteregger, Streit, 2019; Pezirkianidis, Stalikas, Lakioti, Yotsidi, 2019; Zeng & Kern, 2019; Kern, Zeng, & Hou, 2018), we are unaware of any other studies that have examined longitudinal invariance of the full models and/or their facets across time.

Support for an Integrated Model

Evidence of high latent correlation between hedonic and eudaimonic models of well-being suggest that the two models represent the same general construct of well-being. This finding replicates other recent research (Goodman et al., 2017; Disabato et al., 2016), and further defuses disagreement over whether one or the other form of well-being is correct. The hope is that these findings help guide the arc of empirical inquiry away from “either/or” philosophical debates, and echo previous assertions that the “correctness” of each type of model depends on the application for which the model will be used (e.g., Lerner, 2000; Zeng & Kern, 2018; Seligman, 2018). That is, if the goal is to identify specific targets for intervention, or to understand interrelations among domains of feeling and functioning, a multifaceted model that integrates the different forms and sources of well-being provides a stronger basis upon which to advance these pursuits.

DISCUSSION, TRAJECTORIES OF WELL-BEING (AIM 2)

In the second part of the study, we investigated developmental trajectories of well-being during the transition to college, and explored patterns of correlated change among its facets. Results of latent growth analyses indicated that, for most facets, baseline levels of well-being among freshmen were above the midpoint of their respective maximum possible scores (accomplishment/meaning: 75.5%; social connectedness: 74.4%; happiness: 67.4%). On the other hand, baseline levels of engagement and optimism were slightly below midpoint (47.7% and 44%, respectively). Except for one indicator that was excluded in EFA due to its insufficient loading, engagement and optimism were identical to those of the same name in the EPOCH. In the original development of the EPOCH with nearly 2,900 younger adolescents (age 10-18), average levels of engagement and optimism were 70.4% and 66% of their maximum possible scores, respectively (Kern et al., 2016). Consistent with our overarching hypothesis about the uniqueness of the period of college transition, future studies should investigate the degree (and

causes) of potential differences in average levels of optimism and engagement between younger adolescents and incoming freshmen.

Furthermore, while meaningful interpretation of baseline scores is limited without comparators, the relatively muted level of optimism among incoming freshmen is surprising. Culturally, while stressful for parents (Anderson, 1988; 1990), the transition of American adolescents to college is often associated with feelings of excitement about the experiences that lie ahead. In fact, prior researchers have coined a term — the Freshman Myth — to describe the extent to which adolescents tend to overestimate the positivity of prospective outcomes compared to actual experiences in college (Stern, 1966; 1970; Baker et al., 1985; Smith & Wertlieb, 2005; Keup, 2007). Given the large number of participants who completed baseline measures during the pomp and pageantry of summer orientation events (Freshman IntroDUCKtion, n.d.), one might expect levels of optimism to be even more pronounced. Research suggests that the present finding may reflect a broader generational trend. In a birth cohort study, Twenge et al. (2018) found that well-being (measured by self-esteem, life satisfaction, and happiness) among high school students decreased from 2012-2016 at a rate of change more than twice as large as many previously identified birth cohort differences. In other words, due to a variety of unknown reasons, it may be that adolescents' expectations of positive outcomes are in fact lower than those of prior generations.

In addition to understanding pre-transition levels, further investigation of generational trends may also help to explain the sobering trajectories of well-being found in the present study. Results indicated that the transition to college was negatively associated with well-being, such that freshmen experienced sizable reductions in their levels of well-being across all facets. Compared to baseline, freshmen reported being 9.2% less happy at the end of their first year of college. Each other facet exhibited a similar trajectory of decline. Amid a relatively limited research body of mixed findings, the present study joins those that highlight the significant toll on

positive feelings and functioning that accompanies adolescents' pursuit of higher education (Conley et al., 2014; Perren et al., 2010; Shim et al., 2010; Rogers et al., 2018).

Correlated Change

In a final set of exploratory analyses, multivariate latent growth curve models were used to examine patterns of correlated change among well-being facets during the transition to college. Results indicated a high degree of interrelatedness, such that changes in each facet were significantly positively related to changes in each other facet. Consistent with the relational developmental systems (RDS) perspective discussed in an earlier chapter of this dissertation (e.g., Lerner, 2006, 2011; Lerner & Overton, 2008; Overton, 2006, 2010, 2012; Overton & Lerner, 2012), we suggest that these findings strengthen the basis upon which to move away from models of mechanical cause-effect sequences that proceed in a single direction, and instead toward models that more closely approximate the dynamic developmental systems of interrelations in which adolescent well-being resides.

Limitations and Future Directions

The following section describes aspects of the present study that may limit the inferences drawn from its findings, and suggests potential ways to further the scientific understanding of the structure and development of well-being during the transition to college.

Experimenter Bias. First, while EFA was conducted in accordance with common best-practices, stepwise removal of items from the model includes some inherent degree of subjectivity. For instance, removal of any one item instantaneously affects the communality and pattern coefficients of each other item; thus, when faced with two or more items with similarly insufficient levels of common variance, the order in which items are removed may have implications for subsequent retention or removal of items, as well their associated factors. Future studies should investigate whether results of the EFA would differ if items were removed in a different order.

Conceptual Clarity and Precision. Another potential limitation is that the results of the present study may not be easily comparable to other research in which participants' levels of positive and negative affect is assessed using the PANAS measure. Notably, however, the utility of the PANAS for the study of well-being is strongly debated on the basis that several of its items arguably measure arousal (e.g., "strong", "alert", and "active") rather than the primary focus of well-being — feelings. Furthermore, studies have found that the PANAS may be less suited for studies of well-being such that it explains an average of 11% and 7% less variance in well-being than alternative measures of affect (Li, Bai, & Wong, 2013). One such measure that may be considered for future research is the Scale of Positive and Negative Experience (SPANE; Diener et al., 2010), for instance, was specifically designed to reflect the forms of feelings most closely related to well-being and ill-being, irrespective of their source, arousal level, or cultural context. Like the PANAS, however, the SPANE asks participants to report duration of affect during the previous four weeks, and is thus susceptible to similar issues of memory accuracy. As in the present study, future studies may consider the use of relatively more global measures of affect (e.g., "I am a cheerful person"), or more frequent measurement occasions as discussed in further detail below.

Importantly, well-being facets labeled in the present study are subjective approximations of their underlying phenomena. For instance, whereas social connectedness in the present study corresponds to a general presence of reciprocally caring relationships, it has also been conceptualized in other models to include aspects of social well-being that are not specifically measured in the present study, such as a sense of belonging or acceptance by others, or of feeling vital to one's social network (e.g., Suhlmann et al., 2018; Walton & Cohen, 2011; Keyes, 1998). Furthermore, the indicators with which these facets were operationalized may reflect relatively limited dimensions of the broader range of related phenomena. As in other studies with adolescents, a sense of meaning described in the present study is conflated with that of purpose (e.g., Burrow & Hill, 2011, Burrow, O'Dell & Hill, 2010), evidence suggests that such

experiences may be consequentially separable into three distinct dimensions (Compton, 2001; Martela & Steger, 2016). Empirical investigations of such distinctions and their unique relationships to well-being remain relatively sparse, however, and should be more thoroughly considered in future research.

Model Breadth. Relatedly, a critical next step for advancing this research is to include more extensive coverage of theoretically relevant facets of well-being. In the present study, the range of specifiable models was limited by the measures that were used. For example, a sense of individuation or autonomy is theorized to be an important aspect of adolescents' well-being during the transition to college (Padilla-Walker & Nelson, 2012; Urry, Nelson, & Padilla-Walker, 2011). Given the absence of such indicators among our battery of questionnaires, however, the selected model of well-being was precluded from including such a facet. Similarly, despite strong theoretical predictions, indicators of self-esteem were not retained in the EFA model, due in part to an insufficient number of indicators required to estimate latent constructs in SEM. Accordingly, we suggest that identifying a more complete model of well-being during the transition to college is hinged on broadening the scope of investigation through the use and/or development of more extensive measures.

The suggestion to include additional indicators (and facets) in future research is associated with several potential challenges, such as the effects of increased participant burden on recruitment and retention, as well as analytic and interpretational difficulties associated with concurrent investigation of large numbers of variables and relationships. To these concerns, we underscore the strong rate of participant retention demonstrated in the present study as evidence of feasibility. Furthermore, we encourage researchers to consider that, given the essential complexity of adolescents' developmental systems during the transition to college, the most parsimonious model of well-being may very well necessitate the use of more than just 24 items across five facets (Linton et al., 2016). In the words of one of the founding figures in the science of personality, Gordon Allport, "our task is to study what is, and not what is immediately

convenient” (1960).

Context Effects. Another limitation is that the present study ignores variability in facets that may be accorded to contexts. The indicators do not distinguish, for instance, between an adolescents’ sense of social connectedness with friends or family and with institutional actors such as professors or administrators. Whereas prior research highlights the importance of social connectedness for well-being, regardless of its source, the current model may obscure the existence of more specific causal pathways. Moving forward, a more granular understanding may help to target specific pathways that can generate the biggest improvement in adolescents’ well-being during the transition to college. Furthermore, examination of well-being across contexts may also help to identify important vectors of co-action, or bidirectionality, within the developmental system. Incorporating additional methods such as network analyses may help to reveal the extent to which well-being structure and/or developmental trajectories of incoming freshmen affect and/or are affected by those who share similar social groups, academic classes, or student organizations.

Missing Data. Overall, the study demonstrated very low attrition, with 89.8% of the sample completing the surveys at three or more measurement occasions. Nevertheless, whereas FIML estimation used in this study helps to recapture missing information, it is based on an assumption that data are missing at random. We were unable to test this assumption, and thus cannot be certain that the data were missing not at random; in other words, attrition may be attributable to unmeasured factors (e.g., participants’ physical health) or for reasons related to the constructs of interest (e.g., participants who were experiencing significant declines in well-being).

Relatedly, the study is unable to rule out selection effects that may be associated with the constructs of interest. For instance, it may be reasonable to speculate that freshmen who derive a greater sense of meaning from social relationships (versus accomplishments) may have foregone participation in the study to spend more time connecting with other students. Notably, it is not uncommon for incoming freshmen to complete mandatory surveys and/or training related to

substance use and sexual assault during college orientation; given the troubling developmental patterns of well-being found in this and other studies, it may be mutually beneficial for researchers and college administrators to include measures of well-being as part of these surveys.

Measurement Occasions. Interpretation of the current findings may be limited by the timing and frequency of measurement occasions. While we consider the collection of baseline measures prior to matriculation a significant strength of the present study, we note that freshmen's initial reports of well-being may be uniquely biased by experiences of excitement or nervousness associated with the anticipation of the transition. Furthermore, despite the control afforded by constraining follow-up measurement occasions to be within the last two weeks of each academic term, adolescents' reports of well-being may be influenced by increased levels of stress that are characteristic of these periods. The design of the present study does not allow for disentangling the effects of acute stress from those of the transition to college more broadly.

One way that future research can disentangle these effects is by using more frequent measurement occasions. Specifically, the use of experience sampling methods (ESM) or ecological momentary assessments (EMA) can help to construct models of development that account for temporary fluctuations in covariates such as stress, as well as in core components of well-being. In an EMA study of incoming freshmen, for instance, researchers found that daily frequency and quality of interactions with parents and friends predicted variability in same-day levels *and* longitudinal trajectories of positive and negative affect during the transition to college (Rogers et al., 2018). Furthermore, given the previously discussed susceptibility of common measures of affect to memory errors, ESM or EMA methods would arguably lead to more valid assessments of well-being.

A further advantage of additional measurement occasions is that they afford the statistical power to examine structural and developmental patterns of idiographic well-being. The historical focus of well-being research on between-person, nomothetic assessments may obscure considerable and potentially meaningful heterogeneity that exists within each individual person

(e.g., Molenaar, 2004). In the study of personality, for instance, research has combined the use of ESM data with idiographic network analysis to characterize contemporaneous and longitudinal patterns of personality traits (Beck & Jackson, 2019). Research on the transition to college can use similar methods to estimate the centrality, or relative importance, of well-being indicators or facets within individual freshmen at baseline, and to test relationships among indicators and facets across the college transition. Heshmati and colleagues (2020) provide proof of concept in a recent study. Using EMA data from a sample of college undergraduates, the study found that PERMA facets, relationships and positive emotions — were considered by participants to be more important than engagement and meaning. Furthermore, relationships demonstrated the most connections to other facets. Future studies should investigate whether these findings would differ in a sample of incoming freshmen, and explore the extent to which such idiographic patterns of well-being relate to individual trajectories.

Sample Diversity. Generalizability of the current findings may be limited by a relative lack of diversity in ethnic and gender identities represented by participants. In the samples of matriculated students and incoming freshmen, 33.3% and 31.8% of participants, respectively, identified as domestic minorities, a smaller proportion of ethnic-racial minority students than in the United States population of 18- to 24-year-old undergraduate students (2015/2016: 45.2%; Espinosa et al., 2019). Furthermore, less than one-third of participants were men (as defined by biological sex), representing a substantial difference from the proportion of male undergraduate students in the United States (43.5%; Espinosa et al., 2019). Whereas recruitment of representative samples in the present study was likely limited by a relative lack of racial and ethnic diversity of incoming freshmen, reasons for the apparent gender disparity are unknown. Notably, such gender disparities are not uncommon in research of college students. Whereas males comprise 44% of those enrolled in college (National Center for Education Statistics, 2018), a cursory review of the research found that among 18 randomly sampled studies of college students cited in the present study, the average percentage of male representation is only 36.5%

(Bowman, 2010; Burke et al., 2016; Chung et al., 2014; Compas et al., 1986; Conley et al., 2014; DeBerard et al., 2004; Eklund et al., 2011; Gall et al., 2000; Gloria & Ho, 2003; Heshmati et al., 2020; Huta & Ryan, 2010; Isaacowitz et al., 2003; Perren et al., 2010; Pritchard et al., 2007; Ridner et al., 2016; Rogers et al., 2018; Ruthig et al., 2009; Soet & Sevig, 2006). Given prior findings of longitudinal differences in well-being by gender (Gall et al., 2000; Schulenberg et al., 2005), ignoring these sampling disparities may undermine advancement of this research. Future studies should attempt to replicate the present findings in samples with greater racial, ethnic, and gender diversity, as well as explore ways to more effectively recruit and retain male participants.

Finally, whereas the present study is framed in terms of the transition to college, there may be alternative explanations for the developmental effects of well-being. For instance, in addition to the college transition, incoming freshmen may have been affected by concurrent macro-level factors, including increased political tensions (Jervis & Gomez, 2019; Stolberg, 2018); repeated incidence of mass shootings (Holland, 2019; American Psychological Association, 2018), and natural disasters (i.e., wildfires; California wildfire declared 'largest in state's history,' n.d.) in neighboring states. Decreased well-being may have also been related to climate, as seasonal variations typical of the study's geographic location are shown by epidemiological research to be associated with loss of interest, diminished positive affect, and social isolation (Magnusson, 2000). The plausibility of these alternative explanations can be addressed by measuring and controlling for the effects of these factors, or by replicating the present findings in subsequent cohorts and across colleges of varying geographic climates.

Furthermore, future studies should attempt to differentiate whether developmental trajectories of well-being in the present study are representative of the transition to college, or of merely leaving high school. Whereas the proportion of adolescents who attend college has increased during the past 20 years, there remain over 40% of high school graduates that do not attend college immediately after high school (Espinoza et al., 2019). Investigating the well-being trajectories of those in the latter group would serve both to clarify the specificity of these effects

to the transition to college, as well as to help advance the science of well-being in a large, yet understudied population of adolescents.

Additional Directions. Given that well-being is essentially self-evaluative, another approach to advance the field is to direct research to relevant underlying processes. For instance, neuroimaging techniques such as functional magnetic resonance imaging (fMRI) may enable researchers to identify similarities and/or differences in self-evaluative processes among well-being facets, or with other dimensions of psychological health such as ill-being. Using the same sample of incoming freshmen as in the present study, preliminary results of an fMRI study indicated that self-evaluations of well-being and ill-being were associated with differential neural activity in cortical midline structures (i.e., perigenual anterior cingulate cortex, ventromedial prefrontal cortex (vmPFC), and ventral striatum; Cosme, D., Mobasser, A., Ross, G., & Pfeifer, J., 2020). In addition to providing evidence beyond self-report data, investigating the neural correlates of self-evaluation of well-being may help to better understand and predict behavioral changes in well-being during the transition to college.

CONCLUDING REMARKS

The present study makes meaningful contributions to the scientific understanding of well-being and its development during the transition to college. Findings showed that well-being among college students is best represented by a multidimensional integration of hedonic and eudaimonic facets, and highlights the ways in which less commonly used methodological approaches can provide novel insights into developmental effects in the structure of well-being. The present study may help to resolve some of the inconsistency in prior research, showing that for incoming freshmen, the transition to college is associated with significant decreases in well-being. Most importantly, perhaps, the present study serves to bolster an area of relative scarcity in the research; that is, whereas research on well-being has often ignored the potential implications of the unique developmental tasks of the college transition, our findings provide a stronger basis

upon which to advance scientific understanding of this major — and seemingly impactful — shift in the lives of many adolescents.

REFERENCES CITED

- Allport, G. W. (1960). The open system in personality theory. *The Journal of Abnormal and Social Psychology*, 61(3), 301–310. <https://doi.org/10.1037/h0043619>
- Allport, G. W. (1961). *Pattern and growth in personality*. Oxford, England: Holt, Reinhart & Winston.
- Altman, N., & Krzywinski, M. (2015). Points of Significance: Association, correlation and causation. *Nature Methods*, 12, 899–900. <https://doi.org/10.1038/nmeth.3587>
- Arnett, J. (1992). Reckless behavior in adolescence: A developmental perspective. *Developmental Review*, 12(4), 339–373. [https://doi.org/10.1016/0273-2297\(92\)90013-R](https://doi.org/10.1016/0273-2297(92)90013-R)
- Arnett, J. J. (1999). Adolescent storm and stress, reconsidered. *American Psychologist*, 54(5), 317.
- Baltes, P. B., Lindenberger, U., & Staudinger, U. M. (2007). Life Span Theory in Developmental Psychology. In *Handbook of Child Psychology*. <https://doi.org/10.1002/9780470147658.chpsy0111>
- Bechara, A. (2005). Decision making, impulse control and loss of willpower to resist drugs: a neurocognitive perspective. *Nature Neuroscience*, 8(11), 1458–1463. <https://doi.org/10.1038/nn1584>
- Ben-Arieh, A. (2008). The Child Indicators Movement: Past, Present, and Future. *Child Indicators Research*, 1(1), 3–16. <https://doi.org/10.1007/s12187-007-9003-1>
- Benson, Peter L. (2007). Developmental assets: An overview of theory, research, and practice. In R. K. Silbereisen & R. M. Lerner (Eds.), *Approaches to positive youth development*. Thousand Oaks, CA: Sage.
- Benson, Peter L., & C. Scales, P. (2009). The definition and preliminary measurement of thriving in adolescence. *The Journal of Positive Psychology*, 4(1), 85–104. <https://doi.org/10.1080/17439760802399240>
- Benson, Peter L., Scales, P. C., Hamilton, S. F., & Sesma, A. (2006). Positive Youth Development: Theory, Research, and Applications. In *Handbook of Child Psychology*. <https://doi.org/10.1002/9780470147658.chpsy0116>
- Benson, P.L. (1990). *The troubled journey*. Retrieved from <http://pub.search-institute.org/file/archive/1990-Benson-Troubled-Journey.pdf>
- Benson, P.L. (1997). All kids are our kids. *Adolescence*, 32(128), 999. *Adolescence*, 32(128), 999.
- Blalock Jr, H. M. (2018). *Causal Inferences in Nonexperimental Research*. UNC Press Books.

- Boivin, J. R., Piekarski, D. J., Thomas, A. W., & Wilbrecht, L. (2018). Adolescent pruning and stabilization of dendritic spines on cortical layer 5 pyramidal neurons do not depend on gonadal hormones. *Developmental Cognitive Neuroscience*.
<https://doi.org/10.1016/j.dcn.2018.01.007>
- Bowers, E. P., Li, Y., Kiely, M. K., Brittan, A., Lerner, J. V., & Lerner, R. M. (2010). The Five Cs Model of Positive Youth Development: A Longitudinal Analysis of Confirmatory Factor Structure and Measurement Invariance. *Journal of Youth and Adolescence*, *39*(7), 720–735. <https://doi.org/10.1007/s10964-010-9530-9>
- Bowman, N. A. (2010). The Development of Psychological Well-Being Among First-Year College Students. *Journal of College Student Development*, *51*(2), 180–200.
<https://doi.org/10.1353/csd.0.0118>
- Bradburn, N. M. (1969). *The structure of psychological well-being*. Oxford, England: Aldine.
- Bradburn, N. M., & Caplovitz, D. (1965). *Reports on happiness: A pilot study of behavior related to mental health*. Aldine Pub Co.
- Brandtstädter, J. (1998). Action Perspectives on Human Development. In W Damon & R. M. Lerner (Eds.), *Handbook of Child Psychology* (5th ed., pp. 807–863).
<https://doi.org/10.1002/9780470147658.chpsy0110>
- Brandtstädter, J. (1999). *The self in action and development: Cultural, biosocial, and ontogenetic bases of intentional self development*. (R. M. Lerner & J. Brandtstädter, Eds.). Thousand Oaks, CA: SAGE Publications.
- Brandtstädter, J. (2006). Adaptive Resources in Later Life: Tenacious Goal Pursuit and Flexible Goal Adjustment. In *A life worth living: Contributions to positive psychology* (pp. 143–164). New York, NY, US: Oxford University Press.
- Bronfenbrenner, Urie. (2001). Human Development, Bioecological Theory Of. In N. J. Smelser & B. Baltes (Eds.), *International Encyclopedia of the Social and Behavioral Sciences* (pp. 10–6963).
- Bronfenbrenner, Urie. (1974). Developmental Research, Public Policy, and the Ecology of Childhood. *Child Development*, *45*(1), 1–5. <https://doi.org/10.2307/1127743>
- Bronfenbrenner, Urie. (1979). *The ecology of human development: experiments by nature and design*. Cambridge, Mass: Harvard University Press.
- Bronfenbrenner, Urie. (2005). *Making Human Beings Human: Bioecological Perspectives on Human Development*. SAGE.
- Brooks-Gunn, J., & Warren, M. P. (1989). Biological and Social Contributions to Negative Affect in Young Adolescent Girls. *Child Development*, *60*(1), 40–55.
<https://doi.org/10.2307/1131069>

- Buchanan, C. M., Eccles, J. S., & Becker, J. B. (1992). Are adolescents the victims of raging hormones: evidence for activational effects of hormones on moods and behavior at adolescence. *Psychological Bulletin*, *111*(1), 62–107. <https://doi.org/10.1037/0033-2909.111.1.62>
- Buchanan, Christy M., & Hughes, J. L. (2009). Construction of Social Reality During Early Adolescence: Can Expecting Storm and Stress Increase Real or Perceived Storm and Stress? *Journal of Research on Adolescence*, *19*(2), 261–285. <https://doi.org/10.1111/j.1532-7795.2009.00596.x>
- Buchanan, Christy Miller, Eccles, J. S., Flanagan, C., Midgley, C., Feldlaufer, H., & Harold, R. D. (1990). Parents' and teachers' beliefs about adolescents: Effects of sex and experience. *Journal of Youth and Adolescence*, *19*(4), 363–394. <https://doi.org/10.1007/BF01537078>
- Bunge, M. (1962). Causality: A Rejoinder. *Philosophy of Science*, *29*(3), 306–317. Retrieved from JSTOR.
- Bunge, M. (2003). *Emergence and Convergence: Qualitative Novelty and the Unity of Knowledge*. University of Toronto Press.
- Burke, T. J., Ruppel, E. K., & Dinsmore, D. R. (2016). Moving Away and Reaching Out: Young Adults' Relational Maintenance and Psychosocial Well-Being During the Transition to College. *Journal of Family Communication*, *16*(2), 180–187. <https://doi.org/10.1080/15267431.2016.1146724>
- Butler, J., & Kern, M. L. (2016). The PERMA-Profiler: A brief multidimensional measure of flourishing. *International Journal of Wellbeing*, *6*(3). Retrieved from <https://internationaljournalofwellbeing.org/index.php/ijow/article/view/526>
- Cantril, H. (1965). *Pattern of human concerns*.
- Casas, F. (2011). Subjective Social Indicators and Child and Adolescent Well-being. *Child Indicators Research; Dordrecht*, *4*(4), 555–575. <http://dx.doi.org/10.1007/s12187-010-9093-z>
- Casey, B. J., Jones, R. M., & Somerville, L. H. (2011). Braking and Accelerating of the Adolescent Brain. *Journal of Research on Adolescence : The Official Journal of the Society for Research on Adolescence*, *21*(1), 21–33. <https://doi.org/10.1111/j.1532-7795.2010.00712.x>
- Chung, J. M., Robins, R. W., Trzesniewski, K. H., Nofle, E. E., Roberts, B. W., & Widaman, K. F. (2014). Continuity and Change in Self-Esteem During Emerging Adulthood. *Journal of Personality and Social Psychology*, *106*(3), 469–483. <https://doi.org/10.1037/a0035135>
- Coffey, J. K., Wray-Lake, L., Mashek, D., & Branand, B. (2016). A Multi-Study Examination of Well-Being Theory in College and Community Samples. *Journal of Happiness Studies*, *17*(1), 187–211. <https://doi.org/10.1007/s10902-014-9590-8>

- Compas, B. E., Wagner, B. M., Slavin, L. A., & Vannatta, K. (1986). A prospective study of life events, social support, and psychological symptomatology during the transition from high school to college. *American Journal of Community Psychology*, *14*(3), 241–257. <https://doi.org/10.1007/BF00911173>
- Conley, C. S., Kirsch, A. C., Dickson, D. A., & Bryant, F. B. (2014). Negotiating the Transition to College: Developmental Trajectories and Gender Differences in Psychological Functioning, Cognitive-Affective Strategies, and Social Well-Being. *Emerging Adulthood*, *2*(3), 195–210. <https://doi.org/10.1177/2167696814521808>
- Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology*, *38*(4), 668.
- Cummings, E. (2003). Forward. In D. Wertlieb, F. Jacobs, & R. M. Lerner (Eds.), *Promoting positive youth and family development: Community systems, citizenship, and civil society: Vol. 3. Handbook of applied developmental science: Promoting positive child, adolescent, and family development through research, policies, and programs* (pp. ix–xi). Thousand Oaks, CA: SAGE Publications.
- Damon, William. (1997). *The Youth Charter: How Communities Can Work Together To Raise Standards for All Our Children*. Free Press, Division of Simon & Schuster, Inc.
- Damon, William. (2004). What is Positive Youth Development? *The Annals the American Academy of Political and Social Science*, *591*(1), 13–24. <https://doi.org/10.1177/0002716203260092>
- DeBerard, M. S., Spielmans, G. I., & Julka, D. C. (2004). Predictors of Academic Achievement and Retention Amongcollege Freshmen: A Longitudinal Study. *College Student Journal*, *38*(1), 66–80.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71–75.
- Diener, E., & Emmons, R. A. (1985). The independence of positive and negative affect. *Journal of Personality and Social Psychology*, *47*(5), 1105.
- Diener, E., & Fujita, F. (1995). Resources, personal strivings, and subjective well-being: a nomothetic and idiographic approach. *Journal of Personality and Social Psychology*, *68*(5), 926.
- Diener, E., & Lucas, R. E. (1999). Personality and Subjective Well-being. In *Well-being: Foundations of hedonic psychology*.
- Diener, E., Sapyta, J. J., & Suh, E. (1998). Subjective Well-Being Is Essential to Well-Being. *Psychological Inquiry*, *9*(1), 33–37. https://doi.org/10.1207/s15327965pli0901_3
- Diener, E., Smith, H., & Fujita, F. (1995). The Personality Structure of Affect. *Journal of Personality & Social Psychology*, *69*(1), 130–141.
- Dobbs, D. (2011). Beautiful brains. *National Geographic*, *220*(4), 36–59.

- Dowling, E. M., Gestsdottir, S., Anderson, P. M., Eye, A. V., & Lerner, R. M. (2003). *Spirituality, Religiosity, and Thriving Among Adolescence: Identification and Confirmation of Factor Structures*.
- Dowling, E. M., Gestsdottir, S., Anderson, P. M., von Eye, A., Almerigi, J., & Lerner, R. M. (2004). Structural Relations Among Spirituality, Religiosity, and Thriving in Adolescence. *Applied Developmental Science, 8*(1), 7–16. https://doi.org/10.1207/S1532480XADS0801_2
- Dryfoos, J. G. (1991). *Adolescents at Risk: Prevalence and Prevention*. Oxford University Press.
- Eccles, J. S., & Gootman, J. A. (Eds.). (2002). Features of positive developmental settings. *Community Programs to Promote Youth Development, 86–118*.
- Eklund, K., Dowdy, E., Jones, C., & Furlong, M. (2011). Applicability of the Dual-Factor Model of Mental Health for College Students. *Journal of College Student Psychotherapy, 25*(1), 79–92. <https://doi.org/10.1080/87568225.2011.532677>
- Elder, G. H. (1998). The Life Course as Developmental Theory. *Child Development, 69*(1), 1–12. <https://doi.org/10.1111/j.1467-8624.1998.tb06128.x>
- Elder, G. H., & Shanahan, M. J. (2007). The Life Course and Human Development. In *Handbook of Child Psychology*. <https://doi.org/10.1002/9780470147658.chpsy0112>
- Erikson, E. H. (1950). *Childhood and society*. New York: Norton.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.
- Floyd, D. T., & McKenna, L. (2003). National youth serving organizations in the United States: Contributions to Civil Society. In R.M Lerner, F. Jacobs, & D. Wertlieb (Eds.), *Handbook of applied developmental science: Promoting positive child, adolescent, and family development through research, policies, and programs: Vol. 3. Promoting positive youth and family development: Community systems, citizenship, and civil society*. (pp. 11–26). Thousand Oaks, CA: SAGE Publications.
- Freud, A. (1969). Adolescence as a developmental disturbance. In G. Caplan & S. Lebovici (Eds.), *Adolescence: Psychosocial perspectives* (pp. 5–10). New York: Basic Books.
- Freund, A. M., & Baltes, P. B. (2002). Life-Management Strategies of Selection, Optimization, and Compensation: Measurement by Self-Report and Construct Validity. *Journal of Personality and Social Psychology, 82*(4), 642–662.
- Fromm, E. (1978). Primary and secondary process in waking and in altered states of consciousness. *Journal of Altered States of Consciousness*.
- Furstenberg, F. F. (2000). The Sociology of Adolescence and Youth in the 1990s: A Critical Commentary. *Journal of Marriage and Family, 62*(4), 896–910. <https://doi.org/10.1111/j.1741-3737.2000.00896.x>

- Gall, T. L., Evans, D. R., & Bellerose, S. (2000). Transition to First-Year University: Patterns of Change in Adjustment Across Life Domains and Time. *Journal of Social and Clinical Psychology; New York, 19*(4), 544–567. <http://dx.doi.org/10.1521/jscp.2000.19.4.544>
- Gallagher, M. W., Lopez, S. J., & Preacher, K. J. (2009). The Hierarchical Structure of Well-Being. *Journal of Personality, 77*(4), 1025–1050. <https://doi.org/10.1111/j.1467-6494.2009.00573.x>
- Garbarino, J. (1998). *Raising Children in a Socially Toxic Environment*. 3.
- Garcia Coll, C., Bearer, E. L., Lerner, R. M., Bearer, E. L., & Lerner, R. M. (2014). *Nature and Nurture: The Complex Interplay of Genetic and Environmental Influences on Human Behavior and Development*. <https://doi.org/10.4324/9781410609830>
- Geldhof, G. J., Bowers, E. P., Mueller, M. K., Napolitano, C. M., Callina, K. S., & Lerner, R. M. (2014). Longitudinal Analysis of a Very Short Measure of Positive Youth Development. *Journal of Youth and Adolescence, 43*(6), 933–949. <https://doi.org/10.1007/s10964-014-0093-z>
- Geldhof, G. J., & Johnson, S. K. (2014). Relational Developmental Systems Theories of Positive Youth Development. *New York, 29*.
- Gestsdottir, S., & Lerner, R. M. (2008). Positive Development in Adolescence: The Development and Role of Intentional Self-Regulation. *Human Development, 51*(3), 202–224. <https://doi.org/10.1159/000135757>
- Gilliam, F. D., & Bales, S. N. (2001). *Strategic Frame Analysis: Reframing America's Youth*. Retrieved from <https://escholarship.org/uc/item/5sk7r6gk>
- Gloria, A. M., & Ho, T. A. (2003). Environmental, Social, and Psychological Experiences of Asian American Undergraduates: Examining Issues of Academic Persistence. *Journal of Counseling & Development, 81*(1), 93–105. <https://doi.org/10.1002/j.1556-6678.2003.tb00230.x>
- Goodman, F. R., Disabato, D. J., Kashdan, T. B., & Kauffman, S. B. (2017). Measuring well-being: A comparison of subjective well-being and PERMA. *The Journal of Positive Psychology, 13*(4), 321–332. <https://doi.org/10.1080/17439760.2017.1388434>
- Gore, A. (2003). Forward. In R.M. Lerner & P. L. Benson (Eds.), *Developmental assets and asset-building communities: Implications for research, policy, and practice* (pp. xi–xii). Norwell, MA: Kluwer.
- Gottlieb, G. (1996). A systems view of psychobiological development. In D Magnusson (Ed.), *Individual development over the lifespan: Biological and psychosocial perspectives* (pp. 76–103). New York: Cambridge University Press.
- Gottlieb, G. (1997). *Synthesizing nature-nurture*. Hillsdale, NJ: Erlbaum.

- Gottlieb, G., Wahlsten, D., & Lickliter, R. (2006). The significance of biology for human development: A developmental psychobiological systems view. In R.M. Lerner (Ed.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (6th ed., pp. 210–257). Hoboken, N.J: Wiley.
- Gottlieb, Gilbert. (2002). Developmental-behavioral initiation of evolutionary change. *Psychological Review*, *109*(2), 211–218. <https://doi.org/10.1037//0033-295X.109.2.211>
- Greenberg, G., & Partridge, T. (2010). Biology, Evolution, and Psychological Development. In Richard M. Lerner, M. E. Lamb, & A. M. Freund (Eds.), *The Handbook of Life-Span Development*. <https://doi.org/10.1002/9780470880166.hlsd001005>
- Greenspoon, P. J., & Saklofske, D. H. (2001). Toward an Integration of Subjective Well-Being and Psychopathology. *Social Indicators Research*, *54*(1), 81–108.
- Gurin, G., Veroff, J., & Feld, S. (1960). *Americans view their mental health: A nationwide interview survey*. New York, NY: Basic Books.
- Hall, G. S. (1904). *Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education*. Englewood Cliffs, NJ: Prentice-Hall.
- Heck, K. E., & Subramaniam, A. (2009). *Youth development frameworks.[Monograph]*. Davis, CA.
- Heckhausen, J. (1999). *Developmental Regulation in Adulthood: Age-Normative and Sociostructural Constraints as Adaptive Challenges*. Cambridge University Press.
- Heshmati, S., Oravec, Z., Brick, T. R., & Roeser, R. W. (2020). *Assessing psychological well-being in early adulthood: Empirical evidence for the structure of daily well-being via network analysis* [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/6cyfw>
- Holland, K. M. (2019). Characteristics of School-Associated Youth Homicides—United States, 1994–2018. *MMWR. Morbidity and Mortality Weekly Report*, *68*. <https://doi.org/10.15585/mmwr.mm6803a1>
- Hoyt, L. T., Chase-Lansdale, P. L., McDade, T. W., & Adam, E. K. (2012). Positive Youth, Healthy Adults: Does Positive Well-being in Adolescence Predict Better Perceived Health and Fewer Risky Health Behaviors in Young Adulthood? *Journal of Adolescent Health*, *50*(1), 66–73. <https://doi.org/10.1016/j.jadohealth.2011.05.002>
- Huta, V., & Ryan, R. M. (2010). Pursuing Pleasure or Virtue: The Differential and Overlapping Well-Being Benefits of Hedonic and Eudaimonic Motives. *Journal of Happiness Studies*, *11*(6), 735–762. <https://doi.org/10.1007/s10902-009-9171-4>
- Isaacowitz, D. M., Vaillant, G. E., & Seligman, M. E. P. (2003). Strengths and Satisfaction Across the Adult Lifespan. *The International Journal of Aging and Human Development*, *57*(2), 181–201. <https://doi.org/10.2190/61EJ-LDYR-Q55N-UT6E>
- Jablonka, E., & Lamb, M. J. (2005). *Evolution in four dimensions: genetic, epigenetic, behavioral, and symbolic variation in the history of life*. Cambridge, Mass: MIT Press.

- Jahoda, M. (1958). *Current concepts of positive mental health*. New York, NY: Basic Books.
- Jelicic, H., Bobek, D. L., Phelps, E., Lerner, R. M., & Lerner, J. V. (2007). Using positive youth development to predict contribution and risk behaviors in early adolescence: Findings from the first two waves of the 4-H Study of Positive Youth Development. *International Journal of Behavioral Development, 31*(3), 263–273. <https://doi.org/10.1177/0165025407076439>
- Jervis, R., & Gomez, A. (2019). *Immigration: Trump separating migrant families at US-Mexico border*. Usatoday.Com. <https://www.usatoday.com/story/news/nation/2019/05/02/border-family-separations-trump-administration-border-patrol/3563990002/>
- Joseph, J. (2010). Genetic research in psychiatry and psychology: A critical overview. *Handbook of Developmental Science, Behavior, and Genetics, 557–625*.
- Jung, C. (1933). *Modern man in search of a soul*. New York: Harcourt.
- Kahneman, D., Diener, E., & Schwarz, N. (1999). *Well-Being: Foundations of Hedonic Psychology*. Russell Sage Foundation.
- Keller, E. F. (2010). *The Mirage of a Space between Nature and Nurture*. Duke University Press.
- Kennedy-Moore, E., Greenberg, M. A., Newman, M. G., & Stone, A. A. (1992). The relationship between daily events and mood: The mood measure may matter. *Motivation and Emotion, 16*(2), 143–155. <https://doi.org/10.1007/BF00995516>
- Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2016). The EPOCH Measure of Adolescent Well-Being. *Psychological Assessment, 28*(5), 586–597. <https://doi.org/10.1037/pas0000201>
- Kern, M. L., Waters, L., Adler, A., & White, M. (2014). Assessing Employee Wellbeing in Schools Using a Multifaceted Approach: Associations with Physical Health, Life Satisfaction, and Professional Thriving. *Psychology, 05*(06), 500–513. <https://doi.org/10.4236/psych.2014.56060>
- Kern, M. L., Waters, L. E., Adler, A., & White, M. A. (2015). A multidimensional approach to measuring well-being in students: Application of the PERMA framework. *The Journal of Positive Psychology, 10*(3), 262–271. <https://doi.org/10.1080/17439760.2014.936962>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 593. <https://doi.org/10.1001/archpsyc.62.6.593>
- Keyes, C. (2006). The Subjective Well-Being of America's Youth: Toward a Comprehensive Assessment. *Adolescent & Family Health, 4*(1), 3–11.
- Keyes, C., & Annas, J. (2009). Feeling good and functioning well: distinctive concepts in ancient philosophy and contemporary science. *The Journal of Positive Psychology, 4*(3), 197–201.

- Keyes, C. L. M. (2002). The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Behavior*, 43(2), 207. <https://doi.org/10.2307/3090197>
- Keyes, C. L. M. (2005). Mental Illness and/or Mental Health? Investigating Axioms of the Complete State Model of Health. *Journal of Consulting and Clinical Psychology*, 73(3), 539–548. <https://doi.org/10.1037/0022-006X.73.3.539>
- Keyes, C. L. M. (2006a). Mental health in adolescence: Is America's youth flourishing? *American Journal of Orthopsychiatry*, 76(3), 395–402. <https://doi.org/10.1037/0002-9432.76.3.395>
- Keyes, C. L. M. (2006b). Subjective Well-Being in Mental Health and Human Development Research Worldwide: An Introduction. *Social Indicators Research*, 77(1), 1–10. <https://doi.org/10.1007/s11205-005-5550-3>
- Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62(2), 95–108. <https://doi.org/10.1037/0003-066X.62.2.95>
- King, P. E., Dowling, E. M., Mueller, R. A., White, K., Schultz, W., Osborn, P., ... Scales, P. C. (2005). Thriving in Adolescence: The Voices of Youth-Serving Practitioners, Parents, and Early and Late Adolescents. *The Journal of Early Adolescence*, 25(1), 94–112. <https://doi.org/10.1177/0272431604272459>
- Larson, J. S. (1996). The World Health Organization's definition of health: Social versus spiritual health. *Social Indicators Research*, 38(2), 181–192. <https://doi.org/10.1007/BF00300458>
- Larson, R., & Richards, M. H. (1994). *Divergent Realities: The Emotional Lives of Mothers, Fathers, and Adolescents*. New York: BasicBooks.
- Latour, B. (1993). *We have never been modern*. Cambridge, Mass: Harvard University Press.
- Latour, B. (2004). *Politics of nature: how to bring the sciences into democracy*. Cambridge, Mass: Harvard University Press.
- Laubichler, M. D. (2010). Evolutionary Developmental Biology Offers a Significant Challenge to the Neo-Darwinian Paradigm. In F. J. Ayala & R. Arp (Eds.), *Contemporary Debates in Philosophy of Biology*. Wiley-Blackwell.
- Lerner, J. V. (2009). *Handbook of Adolescent Psychology*. 35.
- Lerner, J. V., Phelps, E., Forman, Y. E., & Bowers, E. P. (2009). Positive Youth Development. In *Handbook of Adolescent Psychology*. <https://doi.org/10.1002/9780470479193.adlpsy001016>
- Lerner, Richard M. (1984). *On the Nature of Human Plasticity*. Cambridge University Press.
- Lerner, Richard M. (1994). *America's Youth in Crisis: Challenges and Options for Programs and Policies*. SAGE Publications.
- Lerner, Richard M. (2001). *Concepts and Theories of Human Development*. Psychology Press.

- Lerner, Richard M. (2004). Innovative Methods for Studying Lives in Context: A View of the Issues. *Research in Human Development, 1*(1–2), 5–7. <https://doi.org/10.1080/15427609.2004.9683327>
- Lerner, Richard M. (2005). *Promoting Positive Youth Development: Theoretical and Empirical Bases*. 92.
- Lerner, Richard M. (2006). Developmental Science, Developmental Systems, and Contemporary Theories of Human Development. In William Damon & R. M. Lerner (Eds.), *Handbook of Child Psychology*. <https://doi.org/10.1002/9780470147658.chpsy0101>
- Lerner, Richard M. (2011). Structure and Process in Relational, Developmental Systems Theories: A Commentary on Contemporary Changes in the Understanding of Developmental Change across the Life Span. *Human Development; Basel, 54*(1), 34–43. <http://dx.doi.org/10.1159/000324866>
- Lerner, Richard M., Lerner, J. V., Almerigi, J. B., Theokas, C., Phelps, E., Gestsdottir, S., ... von Eye, A. (2005). Positive Youth Development, Participation in Community Youth Development Programs, and Community Contributions of Fifth-Grade Adolescents: Findings From the First Wave Of the 4-H Study of Positive Youth Development. *The Journal of Early Adolescence, 25*(1), 17–71. <https://doi.org/10.1177/0272431604272461>
- Lerner, Richard M., Lerner, J. V., & Benson, J. B. (2011). Positive youth development: Research and applications for promoting thriving in adolescence. In Richard M. Lerner, J. V. Lerner, & J. B. Benson (Eds.), *Advances in Child Development and Behavior* (pp. 1–17). <https://doi.org/10.1016/B978-0-12-386492-5.00001-4>
- Lerner, Richard M., & Overton, W. F. (2008). Exemplifying the Integrations of the Relational Developmental System: Synthesizing Theory, Research, and Application to Promote Positive Development and Social Justice. *Journal of Adolescent Research, 23*(3), 245–255. <https://doi.org/10.1177/0743558408314385>
- Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology, 71*(3), 616.
- Magnusson, A. (2000). An overview of epidemiological studies on seasonal affective disorder. *Acta Psychiatrica Scandinavica, 101*(3), 176–184. <https://doi.org/10.1034/j.1600-0447.2000.101003176.x>
- Magnusson, David. (2003). The Person Approach: Concepts, Measurement Models, and Research Strategy. *New Directions for Child and Adolescent Development, 2003*(101), 3–23. <https://doi.org/10.1002/cd.79>
- Maier, N. R. F. (1935). *Principles of animal behavior*. New York: Mcgraw-Hill.
- Maslow, A H. (1968). *Toward a psychology of being* (2nd ed.). New York: Van Nostrand.
- Maslow, Abraham H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370.

- Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. *Journal of Educational Psychology, 82*(1), 60–70. <https://doi.org/10.1037/0022-0663.82.1.60>
- Menary, R. (2010). *The Extended Mind*. MIT Press.
- Mendle, J. (2014). Why Puberty Matters for Psychopathology. *Child Development Perspectives, 8*(4), 218–222. <https://doi.org/10.1111/cdep.12092>
- Mistry, J., Contreras, M., & Dutta, R. (2012). Culture and Child Development. In I. Weiner (Ed.), *Handbook of Psychology, Second Edition* (p. hop206011). <https://doi.org/10.1002/9781118133880.hop206011>
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*(4), 674–701. <https://doi.org/10.1037/0033-295X.100.4.674>
- Molenaar, P. C. M. (2008). On the implications of the classical ergodic theorems: Analysis of developmental processes has to focus on intra-individual variation. *Developmental Psychobiology, 50*(1), 60–69. <https://doi.org/10.1002/dev.20262>
- Moore, W. E., Pfeifer, J. H., Masten, C. L., Mazziotta, J. C., Iacoboni, M., & Dapretto, M. (2012). Facing puberty: associations between pubertal development and neural responses to affective facial displays. *Social Cognitive and Affective Neuroscience, 7*(1), 35–43. <https://doi.org/10.1093/scan/nsr066>
- Mortimer, J. T., & Larson, R. W. (2002). *The Changing Adolescent Experience: Societal Trends and the Transition to Adulthood*. Cambridge University Press.
- Navarro, D., Montserrat, C., Malo, S., González, M., Casas, F., & Crous, G. (2017). Subjective well-being: what do adolescents say? *Child & Family Social Work, 22*(1), 175–184. <https://doi.org/10.1111/cfs.12215>
- Nichols, S. L., & Good, T. L. (2004). *America's Teenagers--Myths and Realities : Media Images, Schooling, and the Social Costs of Careless Indifference*. <https://doi.org/10.4324/9781410610409>
- Novikoff, A. B. (1945a). Continuity and Discontinuity in Evolution. *Science, 102*(2651), 405–406. <https://doi.org/10.1126/science.102.2651.405>
- Novikoff, A. B. (1945b). The Concept of Integrative Levels and Biology. *Science, 101*(2618), 209–215. <https://doi.org/10.1126/science.101.2618.209>
- Offer, D. (1969). *The Psychological World of the Teenager: A Study of Normal Adolescent Boys*. Basic Books.
- Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour, 1*. <https://doi.org/10.1038/s41562-018-0506-1>

- Overton, W. F. (2006). Developmental Psychology: Philosophy, Concepts, and Methodology. In Richard M. Lerner (Ed.), *Handbook of child psychology, vol. 1: Theoretical models of human development* (6th ed., pp. 18–88). Hoboken, N.J: John Wiley & Sons.
- Overton, W. F. (2007). A Coherent Metatheory for Dynamic Systems: Relational Organicism-Contextualism. *Human Development, 50*(2–3), 154–159.
<https://doi.org/10.1159/000100944>
- Overton, W. F. (2010). Life-Span Development: Concepts and Issues. In Richard M. Lerner, M. E. Lamb, & A. M. Freund (Eds.), *The Handbook of Life-Span Development*.
<https://doi.org/10.1002/9780470880166.hlsd001001>
- Overton, W. F. (2012). Evolving Scientific Paradigms: Retrospective and Prospective. In L. L'Abate (Ed.), *Paradigms in Theory Construction* (pp. 31–66).
https://doi.org/10.1007/978-1-4614-0914-4_3
- Overton, W. F. (2013). A New Paradigm for Developmental Science: Relationism and Relational-Developmental Systems. *Applied Developmental Science, 17*(2), 94–107.
<https://doi.org/10.1080/10888691.2013.778717>
- Overton, W. F., & Lerner, R. M. (2012). Relational developmental systems: A paradigm for developmental science in the postgenomic era. *Behavioral and Brain Sciences, 35*(5), 375–376. <https://doi.org/10.1017/S0140525X12001082>
- Overton, W. F., & Reese, H. W. (1973). Models of Development: Methodological Implications. In *Life-Span Developmental Psychology* (pp. 65–86). <https://doi.org/10.1016/B978-0-12-515650-9.50010-1>
- Pasley, K., & Gecas, V. (1984). Stresses and Satisfaction of the Parental Role. *The Personnel and Guidance Journal, 62*(7), 400–404. <https://doi.org/10.1111/j.2164-4918.1984.tb00236.x>
- Perren, S., Keller, R., Passardi, M., & Scholz, U. (2010). Well-being curves across transitions: The development of a retrospective measure. *Swiss Journal of Psychology / Schweizerische Zeitschrift Für Psychologie / Revue Suisse de Psychologie, 69*(1), 15.
<https://doi.org/10.1024/1421-0185/a000003>
- Peter, T., Roberts, L. W., & Dengate, J. (2011). Flourishing in Life: An Empirical Test of the Dual Continua Model of Mental Health and Mental Illness among Canadian University Students. *International Journal of Mental Health Promotion, 13*(1), 13–22.
<https://doi.org/10.1080/14623730.2011.9715646>
- Petersen, A. C., Compas, B. E., Brooks-Gunn, J., Stemmler, M., Ey, S., & Grant, K. E. (1993). Depression in adolescence. *American Psychologist, 48*(2), 155–168.
<https://doi.org/10.1037/0003-066X.48.2.155>
- Pfeifer, J. H., & Allen, N. B. (2012). Arrested development? Reconsidering dual-systems models of brain function in adolescence and disorders. *Trends in Cognitive Sciences, 16*(6), 322–329. <https://doi.org/10.1016/j.tics.2012.04.011>

- Phelps, E., Zimmerman, S., Warren, A. E. A., Jeličić, H., von Eye, A., & Lerner, R. M. (2009). The structure and developmental course of Positive Youth Development (PYD) in early adolescence: Implications for theory and practice. *Journal of Applied Developmental Psychology, 30*(5), 571–584. <https://doi.org/10.1016/j.appdev.2009.06.003>
- Pittman, K. J., Irby, M., & Ferber, T. (2001). Unfinished Business: Further Reflections on a Decade of Promoting Youth Development. In K. J. Pittman & P. L. Benson (Eds.), *Trends in youth development: Visions, realities and challenges* (pp. 4–50). Norwell, MA: Kluwer.
- Pritchard, M. E., Wilson, G. S., & Yamnitz, B. (2007). What Predicts Adjustment Among College Students? A Longitudinal Panel Study. *Journal of American College Health, 56*(1), 15–22. <https://doi.org/10.3200/JACH.56.1.15-22>
- Qu, Y., Pomerantz, E. M., McCormick, E., & Telzer, E. H. (2018). Youth's Conceptions of Adolescence Predict Longitudinal Changes in Prefrontal Cortex Activation and Risk Taking During Adolescence. *Child Development, 89*(3), 773–783. <https://doi.org/10.1111/cdev.13017>
- Qu, Y., Pomerantz, E. M., & Wu, G. (2018). Countering Youth's Negative Stereotypes of Teens Fosters Constructive Behavior. *Child Development*. <https://doi.org/10.1111/cdev.13156>
- Ridner, S. L., Newton, K. S., Staten, R. R., Crawford, T. N., & Hall, L. A. (2016). Predictors of well-being among college students. *Journal of American College Health, 64*(2), 116–124. <https://doi.org/10.1080/07448481.2015.1085057>
- Robitschek, C., & Keyes, C. L. M. (2009). Keyes's model of mental health with personal growth initiative as a parsimonious predictor. *Journal of Counseling Psychology, 56*(2), 321.
- Rogers, A. A., Updegraff, K. A., Iida, M., Dishion, T. J., Doane, L. D., Corbin, W. C., Van Lenten, S. A., & Ha, T. (2018). Trajectories of positive and negative affect across the transition to college: The role of daily interactions with parents and friends. *Developmental Psychology, 54*(11), 2181–2192. <https://doi.org/10.1037/dev0000598>
- Rogers, C. R. (1961). *On becoming a person*. Boston: Houghton Mifflin.
- Roth, J., & Brooks-Gunn, J. (1998). Promoting Healthy Adolescents: Synthesis of Youth Development Program Evaluations. *Journal of Research on Adolescence (Lawrence Erlbaum), 8*(4), 423–459.
- Roth, J. L., & Brooks-Gunn, J. (2003). What Exactly Is a Youth Development Program? Answers From Research and Practice. *Applied Developmental Science, 7*(2), 94–111. https://doi.org/10.1207/S1532480XADS0702_6
- Rousseau, J. J. (1979). *Emile*. New York, NY: Basic Books.
- Rowlands, M. (2010). *The New Science of the Mind: From Extended Mind to Embodied Phenomenology*. Bradford.

- Ruthig, J. C., Haynes, T. L., Stupnisky, R. H., & Perry, R. P. (2009). Perceived Academic Control: Mediating the effects of optimism and social support on college students' psychological health. *Social Psychology of Education, 12*(2), 233–249.
<https://doi.org/10.1007/s11218-008-9079-6>
- 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*(1), 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.
- 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., Rosenkranz, M. A., Singer, B., Love, G. D., Friedman, E. M., Urry, H. L., ... Davidson, R. J. (2006). *Psychological Well-Being and Ill-Being: Do They Have Distinct or Mirrored Biological Correlates? a.*
- Scales, P. C. (1991). *A Portrait of Young Adolescents in the 1990s: Implications for Promoting Healthy Growth and Development*. Retrieved from <https://eric.ed.gov/?id=ED346990>
- Scales, P. C. (1999). Reducing Risks and Building Developmental Assets: Essential Actions for Promoting Adolescent Health. *Journal of School Health, 69*(3), 113–119.
<https://doi.org/10.1111/j.1746-1561.1999.tb07219.x>
- Scales, P. C. (2001). The public image of adolescents. *Society, 38*(4), 64–70.
<https://doi.org/10.1007/s12115-001-1025-6>
- Scales, P. C., Benson, P. L., Leffert, N., & Blyth, D. A. (2000). Contribution of Developmental Assets to the Prediction of Thriving Among Adolescents. *Applied Developmental Science, 4*(1), 27–46. https://doi.org/10.1207/S1532480XADS0401_3
- Scales, P., & Leffert, N. (2004). *Developmental assets: A synthesis of the scientific research on adolescent development* (2nd ed.). Minneapolis: Search Institute.
- Schlegel, A., & Barry III, H. (1991). *Adolescence: An anthropological inquiry*. New York, NY, US: Free Press.
- Schulenberg, J., O'Malley, P. M., Backman, J. G., & Johnston, L. D. (2005). Early Adult Transitions and their Relation to Well-being and Substance Use. In R. A. Settersten Jr., F. F. Furstenberg, & R. G. Rumbaut (Eds.), *On the Frontier of Adulthood: Theory, Research, and Public Policy*. University of Chicago Press.
<https://doi.org/10.7208/chicago/9780226748924.001.0001>
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. New York: Free Press.

- Seligman, M. E., Schulman, P., DeRubeis, R. J., & Hollon, S. D. (1999). The prevention of depression and anxiety. *Prevention & Treatment, 2*(1), 8a.
- Seligman, Martin EP, & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5–14.
- Shaffer, D., Fisher, P., Dulcan, M. K., Davies, M., Piacentini, J., Schwab-stone, M. E., ... Regier, D. A. (1996). The NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC-2.3): Description, Acceptability, Prevalence Rates, and Performance in the MECA Study. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(7), 865–877. <https://doi.org/10.1097/00004583-199607000-00012>
- Sigerist, H. E. (1941). Medicine and human welfare. *New Haven*, 134–145.
- Soet, J., & Sevig, T. (2006). Mental Health Issues Facing a Diverse Sample of College Students: Results from the College Student Mental Health Survey. *NASPA Journal, 43*(3), 22.
- Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology*, n/a-n/a. <https://doi.org/10.1002/dev.20445>
- Steinberg, L., Dahl, R., Keating, D., Kupfer, D. J., Masten, A. S., & Pine, D. S. (2006). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context. In *Developmental psychopathology: Developmental neuroscience, Vol. 2, 2nd ed* (pp. 710–741). Hoboken, NJ, US: John Wiley & Sons Inc.
- Stewart, J., Stewart, J. R., Gapenne, O., & Paolo, E. A. D. (2010). *Enaction: Toward a New Paradigm for Cognitive Science*. MIT Press.
- Stolberg, S. G. (2018, October 6). Kavanaugh Is Sworn In After Close Confirmation Vote in Senate. *The New York Times*. <https://www.nytimes.com/2018/10/06/us/politics/brett-kavanaugh-supreme-court.html>
- Strange, J. J. (2007). Adolescents, media portrayals of. In J.J. Arnett (Ed.), *Encyclopedia of children, adolescents, and the media*. Thousand Oaks, CA: Sage.
- Suldo, S. M., & Shaffer, E. J. (2008). Looking Beyond Psychopathology: The Dual-Factor Model of Mental Health in Youth. *School Psychology Review, 37*(1), 52–69.
- Suldo, S., Thalji, A., & Ferron, J. (2011). Longitudinal academic outcomes predicted by early adolescents' subjective well-being, psychopathology, and mental health status yielded from a dual factor model. *The Journal of Positive Psychology, 6*(1), 17–30. <https://doi.org/10.1080/17439760.2010.536774>
- Telzer, E. H. (2016). Dopaminergic reward sensitivity can promote adolescent health: A new perspective on the mechanism of ventral striatum activation. *Developmental Cognitive Neuroscience, 17*, 57–67. <https://doi.org/10.1016/j.dcn.2015.10.010>
- Terman, L. M. (1939). The gifted student and his academic environment. *School and Society, 49*, 65–73.

- Theokas, C., Almerigi, J. B., Lerner, R. M., Dowling, E. M., Benson, P. L., Scales, P. C., & von Eye, A. (2005). Conceptualizing and Modeling Individual and Ecological Asset Components of Thriving in Early Adolescence. *The Journal of Early Adolescence*, 25(1), 113–143. <https://doi.org/10.1177/0272431604272460>
- Twenge, Jean M., Martin, G. N., & Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion*, 18(6), 765–780. <https://doi.org/10.1037/emo0000403>
- Twenge, J.M. (2006). *Generation Me: Why today's young Americans are more confident, assertive, and entitled—and more miserable than ever before*. New York: Free Press.
- von Bertalanffy, L. (1933). *Modern theories of development: An introduction to theoretical biology*. London: Oxford University Press.
- Wallis, C., & Dell, K. (2004). What Makes Teens Tick? *Time Magazine*, 163, 56–65.
- Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology*, 64(4), 678–691. <https://doi.org/10.1037/0022-3514.64.4.678>
- Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relation to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology*, 54(6), 1020.
- Watson, D., Clark, L. A., & Tellegen, A. (1984). Cross-cultural convergence in the structure of mood: A Japanese replication and a comparison with U.S. findings. *Journal of Personality and Social Psychology*, 47(1), 127.
- Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, 98(2), 219.
- Watson, J. (1928). *Psychological care of infant and child*. New York: Norton.
- West-Eberhard, M. J. (2003). *Developmental Plasticity and Evolution*. Oxford University Press.
- Westerhof, G. J., & Keyes, C. L. M. (2010). Mental Illness and Mental Health: The Two Continua Model Across the Lifespan. *Journal of Adult Development*, 17(2), 110–119. <https://doi.org/10.1007/s10804-009-9082-y>
- Wheeler, W. (2003). Youth leadership for development: Civic activism as a component of youth development programming and a strategy for strengthening civil society. In R.M. Lerner, F. Jacobs, & D. Wertlieb (Eds.), *Handbook of applied developmental science: Promoting positive child, adolescent, and family development through research, policies, and programs: Vol. 2. Enhancing the life chances of youth and families: Public service systems and public policy perspectives* (pp. 491–505). Thousand Oaks, CA: SAGE Publications.

- World Health Organization. (1948). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946 ; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. [Http://Www.Who.Int/Governance/Eb/Who_constitution_en.Pdf](http://www.who.int/governance/eb/who_constitution_en.pdf). Retrieved from <https://ci.nii.ac.jp/naid/20000731560/>
- Zevon, M. A., & Tellegen, A. (1982). The structure of mood change: An idiographic/nomothetic analysis. *Journal of Personality and Social Psychology*, *43*(1), 111.
- Zigler, E. (1998). A Place of Value for Applied and Policy Studies. *Child Development*, *69*(2), 532–542. <https://doi.org/10.2307/1132182>