



# Crafting happiness from everyday life: Personality, personal projects, basic psychological need satisfaction, and well-being

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*Introduction: Feeling competent, related, and autonomous promotes well-being through satisfying basic psychological needs, according to self-determination theory's basic psychological need satisfaction mini-theory. Personal projects are personally relevant goal-directed activities that take place over an extended period. The quality of life elicited from pursuing personal projects depends on the degree to which projects provide a sense of relatedness, competence, and autonomy. We expected that, when controlling for perfectionistic standards and discrepancies, achievement striving would lead to the pursuit of projects that provide a sense of competence, which in turn leads to well-being. We also explored autonomy and relatedness as mediators. Methods: The sample (N = 327) was composed of students and the general adult population who provided information on positive mental health, passion, zest for life, life purpose, personality, basic psychological need satisfaction, and personal projects. We used a cross-sectional survey design and tested hypotheses with twelve serial mediation models. Results: Achievement striving and personal standards were positively associated with competence, which in turn predicted well-being in 12 of 12 indirect effects tested. Achievement striving, personal standards and discrepancies contributed to change in well-being through relatedness or autonomy in 9 of 24 of exploratory indirect effects tested. Discussion: Those oriented toward achievement motivation are likely to feel competent in their pursuits (personal projects), which in turn promotes well-being. Pursuing personal projects that suit one's personality (i.e., make it more likely to meet basic psychological needs) may be a tool to boost well-being.*

**Keywords:** personal projects, well-being, basic psychological needs, personality, serial mediation

Feeling competent, related, and autonomous (i.e., satisfying basic psychological needs) is beneficial for well-being. Spending time in a way that facilitates these feelings (need-relevant activities) can be an intentional way in which happiness is increased. Moreover, personality traits may predispose people to meet certain kinds of basic needs, which in turn influences their well-being (high-achieving people might spend their free time learning new skills). The purpose of this project is to identify the relationships between achievement-related personality traits, basic psychological need satisfaction, need-relevant activities (personal projects), and well-being.

## Self-determination theory

Self-determination theory is comprised of six mini theories (1) causality orientations theory, (2) goal contents theory, (3) cognitive evaluation theory, (4) relationships motivation theory, (5) basic psychological needs theory, and (6) organismic integration theory (Legault, 2017). Together they explain personality and human motivation. The premise of self determination theory is that humans come to be innately active, intrinsically motivated, and oriented

toward developing naturally (Deci & Ryan, 2012). Central to the present research is the basic psychological needs (BPN) mini-theory, which proposes that individuals have BPNs, and their associated fulfilment is essential to obtaining well-being (Deci & Ryan, 2000). Both Vansteenkiste et al. (2020) and Deci and Ryan (2000) describe three needs (autonomy, competence, and relatedness) as psychological in nature, as essential for psychological growth, integrity, and wellness, as an inherent part of human functioning, experientially and dynamically distinct from each other, and as universal. *Autonomy* is concerned with one's volition and willingness. When the need for autonomy is satisfied, people may feel free, self-directed, and integrated. *Competence* is achieved when people use their skills and expertise while completing an activity. When the need for competence is fulfilled, people may experience feelings of effectiveness and mastery. *Relatedness* is concerned about feeling connected and important to people, and this results in feeling love, care, and connectedness when achieved. According to the BPN theory, all three needs ought to be satisfied to obtain optimal psychological health while failure to fulfil those needs may lead to negative outcomes such as ill-being and psychopathology.

A fundamental aspect to BPN theory is that social environments can either support or thwart the fulfilment of the three BPNs (Legault, 2017). For instance, autonomy-supportive environments (relationships supportive of the

person's need for autonomy) encourage internalization of motivation as they provide space for choice. Likewise, competence-supportive environments (relationships that offer challenge) allow for skills and abilities to develop while relatedness-supportive environments (accepting relationships) allow for self-acceptance and expression of a person's authentic self. Social environments that support the fulfilment of the three BPNs are associated with positive life outcomes while social environments that thwart the fulfilment of the three BPNs are associated with negative life outcomes (Adams et al., 2017). The necessity and importance of the BPNs have been established as having mediating effects for social contexts and well-being (Deci & Ryan, 2012).

Personal projects are goal-directed activities that are personally relevant, that take place over an extended period of time (American Psychological Association, 2020; Little, 2014), and can serve as a social environment in which BPNs are supported or thwarted (act as need-relevant activities). With personality shaping the types of projects pursued (i.e., personally relevant and goal-directed) and the likelihood of satisfying needs shaped by environmental contexts, there is a pathway from personality to personal project pursuit to psychological needs to well-being that is worth investigating.

### **Well-being**

In the present study, we take a multifaceted approach to measuring well-being, including being enthusiastically engaged with life (i.e., zest), feeling a sense of purpose to one's life, and being passionate about activities one does. Each dimension of well-being is described below.

*Zest for life* (George et al., 2016) represents a will to live, linked to both higher well-being (Park, Peterson, & Seligman, 2004) and lower ill-being (Harrison et al., 2014). *Zest for life* is theorized to counteract feeling a lack of belonging which can be a precursor to suicidal ideation (Collins, 2018; George et al., 2016). A key component of zest is having a positive future outlook; however, zest is a broader construct than optimism as it also captures current engagement with and enthusiasm about life (Collins et al., 2018). Trait-level zest has been identified as one of the character strengths most strongly linked to hedonic well-being (Park et al., 2004; Peterson et al., 2007), and it has been linked to persistence in life (Hausler et al., 2017).

Eudaimonic well-being, commonly measured through the proxy of *purpose in life*, reflects the extent to which people pursue a life of virtue and their full human potential (Ryan & Deci, 2001; Scheier et al., 2006). Experiencing intrinsic motivation (i.e., authentic and generated from the self; Deci & Ryan, 2000) may result in finding value in activities (Vansteenkiste et al., 2020), which can then lead to a feeling of purpose to people's life.

*Passion*, a strong feeling toward a personally important activity that motivates intentions and behaviors to pursue that activity (Sigmundsson, 2020), is beneficial to well-being when it is considered harmonious. That is, when an activity becomes part of an individual's identity without any constraints or contingencies associated with it (i.e., autonomous internalization of an activity; Vallerand, Pelletier, &

Koestner, 2008), it can enhance well-being and give meaning to everyday life, constituting one avenue toward a more fulfilling life (Carpentier, Mageau, & Vallerand, 2012). For example, individuals who use their signature strengths (i.e., utilize their talent or virtues) tend to experience harmonious passion, which boosts well-being (Forest et al., 2012). Experiencing strong harmonious passion can lead to the experience of flow (i.e., when pursuing that passion), which then leads to higher well-being (Carpentier et al., 2012). Overall, passion has distinct consequences for well-being, and is conceptualized as being closely intertwined with the BPN of autonomy.

### **Personal projects**

Little (1989) coined the concept of personal projects, which refers to goal-directed activities that are personally relevant and that take place over an extended period (American Psychological Association, 2020; Little, 2014). Personal projects encompass activities that range from daily routine tasks to important commitments and aspirations. Personal projects are extended sets (i.e., composed of interrelated actions that occur over a sequence of time and space) of personally salient (i.e., represents an important aspect of the actor's life), action-oriented (i.e., intentional on behalf of the actor and requires cognitive, affective, conative, and volitional processes), and contextual (i.e., project occurs in physical, social, cultural, and temporal contexts that can encourage or undermine it; Little & Coulombe, 2015) ways to use one's time. Personal projects fall somewhere between people's routine on a Tuesday morning and grander life pursuits.

Like BPNs, research suggests that the quality of life elicited from pursuing personal projects depends on the degree to which personal projects provide a sense of *relatedness*, *competence*, and *autonomy*. Personal projects that promote well-being also tend to be meaningful, manageable, not overly stressful, supported by others, and they have the potential to improve people's lives (Little, 1989). When examining the role of need-fulfilment across six life domains (i.e., family, friends, relationships, school, work, and activities) with regards to well-being, Milyavskaya and Koestner (2011) found that individuals experienced greater well-being across life domains when they lead to need-fulfilment. General need-fulfilment, as proposed by the self-determination theory, has been established to influence well-being, and we propose that pursuing need-relevant activities is a unique way to increase happiness.

### **Perfectionism and achievement-oriented personality traits**

The Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001) is a multidimensional model of perfectionism comprised of three dimensions: personal standards, discrepancies, and order.<sup>1,2</sup> Using the APS-R model, *personal standards* entail aiming and striving to be perfect but to a degree beyond the typical demanding standards of achievement-striving individuals (Gaudreau, 2019). When those with high personal standards feel their performance is not meeting their stringent standards, a discrepancy exists between

standards and perceived performance. *Discrepancy* (i.e., feeling that one's performance is not meeting their standards) is what characterizes this often-distressing dimension of perfectionism (Rice & Ashby, 2007). Discrepancies are generally associated with lower well-being, such as life satisfaction (Rice & Ashby, 2007) and shame (Fedewa et al., 2005).

Having high personal standards has been linked to well-being, such as through correlations between domain-specific personal standards (i.e., academic achievement) and well-being (Levine & Milyavskaya, 2018). Adaptive perfectionists (i.e., those with high personal standards and relatively low discrepancies) generally report feeling happy and satisfied in life (Chan, 2012); the standards subscale of the APS-R (Slaney et al., 2001) generally shows small negative correlations with maladaptive outcomes (mental ill-health) and small positive correlations with adaptive outcomes (life satisfaction; Lo & Abbott 2013; Wang et al., 2009). Suh et al. (2017) found that adaptive perfectionists reported the highest levels of presence of meaning, subjective happiness, and life satisfaction, all of which were significantly higher than the corresponding scores of maladaptive perfectionists. Correspondingly, the discrepancy subscale tends to negatively correlate with well-being (life satisfaction; Rice et al., 2019).

*Achievement striving* is one of the most criterion-valid facets of conscientiousness (Dudley et al., 2006). Those who strive for achievement are characterized as hard working, ambitious, and resourceful (Drasgow et al., 2012), which manifests in behaviors associated with working toward goals and other positive outcomes. Achievement striving (and its higher-order factor conscientiousness) is characterized by the ability to delay gratification in the pursuit of goals (Roberts et al., 2009), and it has been identified as a major personality determinant of human health and well-being at a magnitude comparable to major health determinants such as socio-economic status (Roberts et al., 2009). A meta-analysis by Smith et al. (2019) reported a strong correlation ( $r = .49$ ) between personal standards and conscientiousness across 77 studies. In Rice and Ashby's (2007) model of perfectionism, the APS-R is sometimes used to identify perfectionists, and it further distinguishes between adaptive (i.e., high standards without discrepancy) and maladaptive (i.e., high standards with discrepancies) perfectionism. This latter distinction stems from the early work of Hamachek (1978) who identified the distinction between normal and neurotic forms of perfectionism. Adaptive perfectionism entails holding high personal standards coupled with the ability to feel accomplished and satisfied when those standards are met. That is, a small margin for minor errors in their performance is allowed; this flexibility acts as a buffer against distress when errors are made (c.f. Lo & Abbot, 2013). On the other hand, holding rigidly high personal standards with no room for mistakes can lead to discrepancies when mistakes do happen (Slaney et al., 2001). Stoeber et al. (2006) argue that having high personal standards can be adaptive, while other researchers believe that high personal standards are not truly expressions of perfectionism (Blasberg et al., 2016). For example, the Canadian perfectionism experts Flett and Hewitt (2006) previously called for high personal standards to be conceptualized as a healthy dimension of conscientiousness (as achievement

striving is) rather than an adaptive dimension of perfectionism. A repercussion of this argument is that any positive relationship between personal standards and well-being could be attributed to the conceptual overlap that personal standards share with achievement striving, which is known to be a healthy personality trait. Though we hold the view that personal standards as measured by the APS-R are conceptually distinct from achievement striving and that they form a psychological construct of potential interest for well-being, we hold no strong view on whether it should be considered a measure of "perfectionism." Nonetheless, the debates described above make it clear that a model including APS-R standards should simultaneously incorporate discrepancies and achievement striving to disentangle the conceptual overlap between all three constructs.

The relationships between achievement striving, personal standards, discrepancies, and well-being can be tested in the context of personal projects. Considering personal projects as a unit of analysis which uniquely capture features of both individuals and the contexts in which they act (Little, 2007), the basic psychological need competence can be satisfied or thwarted at the psychological (i.e., general BPN) and situational (i.e., specific personal project) level. People with high personal standards likely occupy social environments in which there is ample opportunity to achieve and meet their competence needs. Thus, people high in personal standards (after controlling for discrepancies) will tend to meet their competence needs more frequently, in turn leading to increased well-being. Achievement-oriented individuals tend to spend their time in a way that supports their personal strivings (high academic performance), which elicit feelings of efficacy and achievement (Little et al., 1992). Overall, both achievement striving and personal standards should be positively related to well-being through competence at the psychological (i.e., general BPN) and situational (i.e., specific personal project) level. Similarly, discrepancies should be negatively related to well-being by thwarting basic psychological needs. Discrepancies may be particularly detrimental for the basic psychological need relatedness, as perfectionism can facilitate social disconnection via negative social behaviors, cognitions, and outcomes (Sherry et al., 2015). That is, when discrepancies exist, interpersonal conflict and subjective social disconnection arise, which impedes relatedness.

### The present study

Given the literature review above (Adams et al., 2017; Deci & Ryan, 2012; Little, 1989; Rice & Ashby, 2007; Vansteenkiste et al., 2020), we first predict that the two dimensions of the APS-R, personal standards and discrepancies, will be related to well-being in opposite directions.

H1: Discrepancies will be negatively related to well-being when controlling for personal standards and achievement striving.

H2: Personal standards will be positively related to well-being when controlling for discrepancies and achievement striving.

The predictions of the self-determination theory hold that a social context conducive of meeting basic psychological needs (a personal project that is more likely to meet competence needs) will result in basic psychological needs

Table 1. Demographic characteristics

Variables	<i>N</i>	%
Ethnicity		
White	227	69.42%
Black	10	3.06%
Asian	58	17.74%
Prefer not to answer	32	9.78%
Student status		
Full-time student	251	76.76%
Part-time student	21	6.42%
Not a student	55	16.82%
Occupation status		
Full-time employee	42	12.88%
Part-time employee	130	39.76%
Unemployed	154	47.09%
Prefer not to answer	1	.03%
Gender		
Woman	265	81.04%
Man	57	17.43%
Non-binary	4	1.22%
Prefer not to answer	1	0.30%

being met, which in turn leads to well-being (Deci & Ryan, 2012). Thus, combining this with predictions made in H1 and H2 we also predict a serial mediation model:

H3: The total effects in H1 and H2 will be serially mediated by pursuit of personal projects that provide a sense of project competence and meet the basic psychological need of competence.

Finally, though our hypotheses focus primarily on the competence dimension, we also ran exploratory models exploring the role of relatedness and autonomy, given their centrality to well-being in the self-determination theory. As per the social disconnection model (Sherry et al., 2015), interpersonal conflict generated by experiencing discrepancies inherent in maladaptive perfectionism likely thwarts relatedness. Thus, a broad research question was also:

RQ1: What relationships are observed when competence is replaced with autonomy and relatedness, respectively?

## METHOD

### Participants

The sample size was determined with a precision analysis. Assuming a correlation of  $r = .21$ , and a desired 95% confidence interval width of  $\pm .10$ , we planned to recruit a sample size of  $N = 352$ . Due to a lack of established correlations between personal projects and well-being, the average correlation in social psychology research ( $r = 0.21$ ) was used (Richard et al., 2003). A total of 367 participants were recruited. Out of the 367 participants, data entries from 40 were removed because they either did not complete the survey in full or filled out the survey more than once with the same answers. This yielded a total sample size of 327 participants, slightly under our target sample size but still within acceptable tolerance, and resulting in a precision of

$\pm 0.1035$ .<sup>3</sup> The sample was divided into two groups: undergraduate psychology students at a large Atlantic Canadian university ( $N = 214$ ) and adults from an Atlantic Canadian community sample ( $N = 113$ ). The undergraduate psychology students were recruited via the SONA system, which is Dalhousie University's online platform housing the undergraduate student participant pool. Students were granted 0.5 bonus points to their course grade following the completion of the online survey. The SONA recruitment began in January of 2021 and finished at the end of the winter term (i.e., April 2021). Participants from the community sample were recruited through flyers and online advertisements in exchange for entering a lottery for a \$50 gift card. The community recruitment began in January 2021 and finished in February 2022. Because the processes under study likely generalize to both populations, the two samples were merged into a single dataset, using sample (SONA vs. community) as a covariate.

The participants' age ranged between 17 and 72, with an average age of 24.95 ( $SD = 10.49$ ). Further demographic statistics are given in Table 1.

### Measures

Descriptive statistics on key study variables, including internal reliability for each measure, are displayed in Table 2. Copies of all materials and measures used in this study, including measures not examined in the present paper, can be found on our OSF page <https://osf.io/f4stj/>.

### Personal Project Analysis

The Personal Project Analysis (Little & Coulombe, 2015) was used to measure an individual's pursuit of, and feelings toward, personal projects. It begins with project elicitation where participants identify their personal projects with an open-ended text field. The next step requires participants to identify their attitudes about their personal projects (Little & Coulombe, 2015). In our study, participants were asked to list up to three personal projects they deemed most important with regards to their everyday life. Next, they rated their projects on a 10-point unipolar scale from Little's (1983) original Personal Project Analysis workbook. In relation to need satisfaction at the personal project level, we used three relevant items: autonomy, competence, and relatedness (Table 2, under "project need satisfaction"). The *autonomy* dimension refers to the level to which people feel like they are freely engaging in the personal project (Little, 1983). The *competence* dimension refers to the level to which people feel competent enough to carry out the personal project. The *relatedness* dimension refers to the level to which people feel their personal project is supported (emotionally, financially, or practically) by others.

In this study, the ratings were averaged across each personal project for each of the three respective dimensions. The Personal Project Analysis has been identified as having a moderate test-retest reliability, which is qualified as satisfying considering the possible fluctuation in personal projects (Little & Coulombe, 2015). A moderate alpha coefficient (median  $\alpha$  across all project dimensions = 0.70) has previously been found in other research (Little et al., 1992),

Table 2. Descriptive statistics of key study scales

Variable (N of items)	M (SD)	Range	$\alpha$
Personal project need satisfaction			
Autonomy (3)	8.22 (1.90)	0-10	.64
Competence (3)	7.61 (1.93)	0-10	.68
Relatedness (3)	4.63 (1.65)	0-10	.71
Basic psychological need satisfaction			
Autonomy (2)	5.39 (1.28)	1-7	.86
Competence (2)	5.09 (1.30)	1-7	.86
Relatedness (2)	4.63 (1.65)	1-7	.84
Well-being measures			
Positive mental health (14)	3.88 (1.03)	1-6	.92
Passion (8)	4.17 (0.81)	1-5	.90
Zest for Life (12)	4.56 (1.21)	1-7	.92
Life Engagement (6)	4.05 (0.56)	1-5	.82
Personality variables			
Personal standards (7)	5.81 (1.03)	1-7	.89
Perfectionistic discrepancies (12)	4.23 (1.43)	1-7	.95
Achievement striving (10)	5.45 (0.99)	1-7	.89

Note. The personal project need satisfaction measures include one item per need, alpha is calculated for the item across three projects.

indicating adequate internal consistency. The personal project dimensions are also generally positively related with well-being, demonstrating criterion validity (Little, 2011).

There is little information published on the psychometric properties of the three dimensions (i.e., autonomy, competence, and relatedness) used in this study; the findings from this study hopefully provide insight into their psychometric characteristics.

### Modified BPN Satisfaction Scale

The Modified BPN Satisfaction Scale (Hadden & Smith, 2019) measures satisfaction of the three BPNs (i.e., autonomy, competence, and relatedness) within BPN theory (Legault, 2017) and it is a shortened measure based on Sheldon et al.'s (2001) original BPN Satisfaction Scale. The revised scale is composed of six items with which participants had to indicate their level of agreement on a 7-point scale (i.e., how true the statements were in the past week; 1 = not true at all, to 7 = very true). Items one and two measure feelings of autonomy (sample item: "I felt that my choices were based on my own interests and values"). Items three and four measure feelings of competence (e.g., "I felt very capable in what I did"). Items five and six measure feelings of relatedness (e.g., "I felt close and connected with other people"). Hadden and Smith (2019) previously indicated internal consistencies of  $\alpha = 0.82$  for the autonomy component,  $\alpha = 0.62$  for the competence component, and 0.83 for the relatedness component. The three components were also identified as predictors for meaning in life (Hadden & Smith, 2019).

### Well-being measures

Well-being was measured in four ways: positive mental health, passion, zest for life, and life purpose.

### Mental Health Continuum-Short Form

This scale is used to measure positive mental health, covering emotional, social, and psychological well-being through subscales (Keyes, 2007). It is composed of 14 items; participants had to rate each item on a 5-point scale (0 = never, 1 = once or twice, 2 = about once a week, 3 = a couple times a week, 4 = almost every day, 5 = every day). Participants rated their frequency of experiencing feelings of emotional, social, and psychological well-being in the last month. Items one to three measure feelings of emotional well-being (e.g., "happy"). Items four to eight measure feelings of social well-being (e.g., "that you had something important to contribute to society"). Items nine to fourteen measure feelings of psychological well-being (e.g., "that you liked most parts of your personality"). A total score averaged over the 14 items was used for the analysis, representing positive mental health. The Mental Health Continuum-Short Form scale has previously shown strong convergent validity and good criterion validity (Keyes et al., 2008, Petrillo et al., 2014).

### Zest for Life Scale

This scale measures general engagement with and enthusiasm for life (George et al., 2016) with 12 items (sample item: "I try to enjoy life no matter what") and has previously shown excellent internal consistency (0.96) and good convergent validity (Collins et al., 2016).

### Life Engagement Test

This scale measures purpose in life, conceptualized as the extent to which an individual engages in activities that are personally valued (Scheier et al., 2006). Participants rated agreement on items of purpose (e.g., "I have a lot of reasons for living"). The Life Engagement Test has previously shown moderate test-retest reliability and convergent validity (Scheier et al., 2006).

### Passion scale

Passion is quantified using a newly established, 8-item scale that assesses passion toward achieving a skill (Sigmundsson et al., 2020). Participants rated the level of passion and interest in a general theme or skill (e.g., "I use a lot of time on the projects I like"). The Passion scale has previously shown high content validity, test re-rest reliability (0.92) and internal consistency (0.86; Taylan et al., 2020).

### Personality variables

Three personality traits were measured: achievement striving, personal standards, and perfectionistic discrepancies.

### Achievement Striving Facet Scale

This scale measures the facet achievement striving from the conscientiousness factor of the Five Factor Model (McCrae & John, 1992). Goldberg et al. (1999) created the International Personality Item Pool (IPIP)<sup>8</sup> to conceptually duplicate Costa and McCrae's (1992) items measuring the Five Factor Model. Participants rated agreement on 10 items (e.g., "Set high standards for myself and others"). The Achievement Striving Facet Scale has previously shown moderate test-retest reliability ( $\alpha = 0.78$ ; Goldberg et al., 1999).

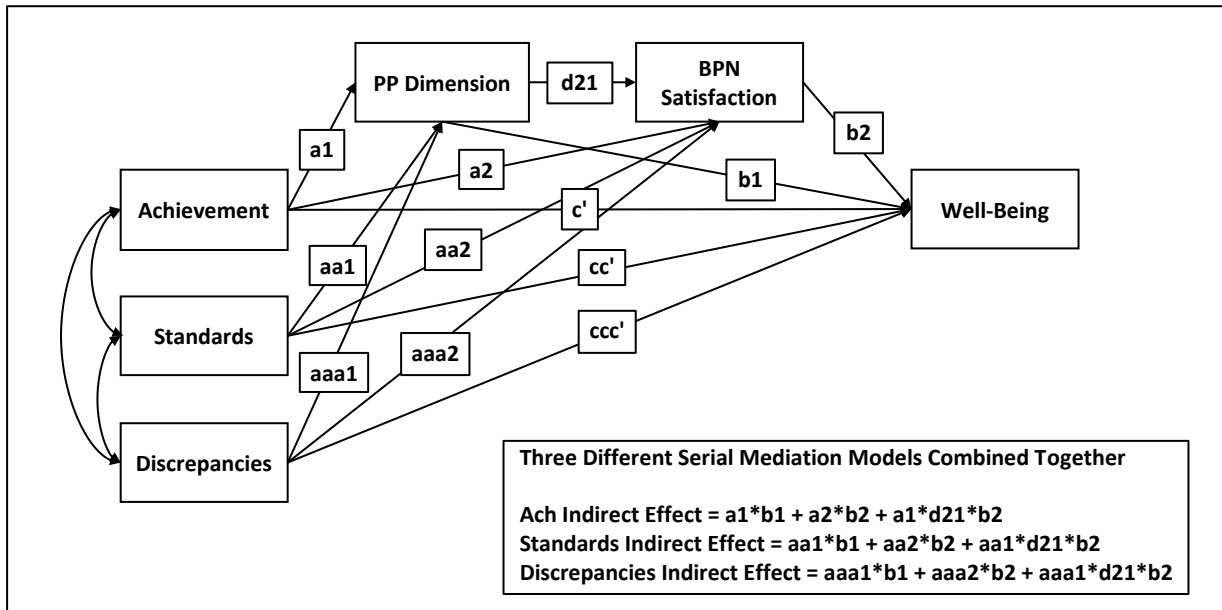


Figure 1. Serial mediation model tested. Achievement/Ach = Achievement Striving, Standards = personal standards.  $a_1/aa_1/aaa_1$  = path from personality trait (independent variable) to personal project dimension (first mediator).  $d_{21}$  = mediation path from personal project dimension (first mediator) to basic psychological need satisfaction (second mediator).  $b_1$  = direct path from personal project dimension (first mediator) to well-being (outcome variable).  $b_2$  = final path from basic psychological need satisfaction (second mediator) to well-being (outcome variable).  $a_2/aa_2/aaa_2$  = path from personality trait (independent variable) to basic psychological need satisfaction (second mediator).  $b_2$  = second direct mediation path from personal project dimension.  $c'/cc'/ccc'$  = direct path from personality trait (independent variable) to well-being (outcome variable).

### Personal standards and perfectionistic discrepancies

We used two subscales from the Almost Perfection Scale-Revised (APS-R; Slaney et al., 2001) that measure personal standards (aiming and striving to be perfect) and perfectionistic discrepancies (feeling that one's performance is not meeting their standards). Participants rated agreement on 7 items for personal standards (e.g., "Set high standards for myself and others") and 12 items for perfectionistic discrepancies (e.g., "I often feel frustrated because I can't meet my goals"). Both subscales have previously shown high test-retest reliability (Personal standards:  $\alpha = 0.85$ ; perfectionistic discrepancies:  $\alpha = 0.92$ ) and evidence for convergent validity (Slaney et al., 2001).

### Procedure

The research was approved by the Institutional Research Ethics Board (2020-5376). The undergraduate psychology students who registered for this study via the SONA system were required to log onto the SONA platform using their university account, where they were given a link to the survey. The survey was administered through SurveyMonkey, a paid online survey platform. The order of the questionnaires was administered as follows: Modified BPN Satisfaction Scale (Hadden & Smith, 2019), Mental Health Continuum Short-Form (Keyes, 2007), Passion scale (Sigmundsson et al., 2020), Zest for Life (George et al., 2016), Life Engagement Test (Scheier et al., 2006), and Personal Project Analysis (Little, 1983). Since the Personal Project Analysis requires more time, it was administered last so that participants would not be overwhelmed and fail to complete the

whole questionnaire. Participants needed access to the internet and to an electronic device (i.e., computer, mobile phone, or tablet) to complete the survey. Participants from the general population either a) saw a flyer in the community and emailed the principal investigator for the survey link, or b) saw an advertisement online with a direct link to the survey. The questionnaire took about 25 minutes to complete. At the end of the questionnaire, a link was provided to enter an email address for the \$50 gift card draw.

### Analytic plan

The data, syntax, codebook, and questionnaires used in this study can be found on our OSF page (<https://osf.io/f4stj/>). Serial mediation models were tested using the lavaan package in R. This type of model tests the hypothesis that personality predicts the first mediator (personal project need satisfaction), which in turn predicts the second mediator (BPN satisfaction), which in turn predicts the outcome (well-being). Mediation is a statistical term that means that the relationship between personality and well-being gets smaller after accounting for the two need satisfaction variables (see Figure 1 for a conceptual model). There is a total of 12 tests because there are 3 need satisfaction types (relatedness, competence, & autonomy) and 4 well-being measures ( $3 \times 4 = 12$ ). All three personality variables are entered together as predictors in each model (see Table 2 for a list of all variables).<sup>4</sup> Because all models are fully saturated models, there are no fit indices to report. Standard errors for all parameters were estimated using bootstrapping in lavaan with 5000 resamples. Both unstandardized and

Table 3. Bivariate correlations between the study variables

	Perfectionistic standards	Perfectionistic discrepancies	BPN - Autonomy	BPN - Competence	BPN - Relatedness	PP - Autonomy	PP - Competence	PP - Relatedness	Positive mental health	Passion	Zest for life	Life purpose	Sample
Achievement Striving	.70	<i>-.16</i>	.32	.54	.26	.36	.38	.33	.42	.42	.33	.37	.17
Perfectionistic standards		.15	.23	.40	.13	.39	.37	.25	.25	.36	.12	.20	.22
Perfectionistic discrepancies			<i>-.23</i>	<i>-.32</i>	<i>-.35</i>	.02	<i>-.20</i>	<i>-.02</i>	<i>-.42</i>	<i>-.22</i>	<i>-.50</i>	<i>-.46</i>	.15
BPN - Autonomy				.51	.35	.21	.30	.19	.49	.38	.44	.38	.04
BPN - Competence					.42	.23	.43	.16	.56	.41	.44	.45	.02
BPN - Relatedness						.18	.32	.21	.59	.33	.48	.47	<i>-.01</i>
PP - Autonomy							.61	.40	.17	.32	.15	.23	.04
PP - Competence								.50	.39	.40	.30	.39	.09
PP - Relatedness									.28	.24	.19	.22	.15
Positive mental health										.41	.71	.66	<i>-.04</i>
Passion											.40	.46	.04
Zest for life												.75	<i>-.03</i>
Life purpose													<i>-.03</i>

Notes: The participant sample consisted of two groups: a student sample, coded 0, and a community sample, coded 1. Correlations higher than  $\pm 0.12$  are significant at  $p < 0.05$ ; negative correlations are in italics.

standardized ( $\beta$ ) coefficients are reported. For brevity of exposition, we report only the standardized total effects and the total serial indirect effects in the body of the text, which reflect our hypotheses.<sup>6</sup> However, coefficients for all 12 path models (i.e., our main hypothesized models and exploratory models) are presented in the [online supplementary materials in Tables S1-S12](#).

### Missing data

Due to a survey preparation error, the last item on the MHC-SF (psychological well-being subscale: “Confident to think or express your own ideas and opinions”) was not included until about halfway through data collection. The item does not have data from about half of the sample ( $N = 165$ ), primarily those who provided answers to the survey early in the data collection period. When calculating the total score, we omitted the item, resulting in a 13-item measure of overall positive mental health. At the scale total level, missing data ranged from 1.2 – 5.2%. Missing data was handled using a full information maximum likelihood approach for hypothesis testing and using listwise deletion for descriptive statistics.

## RESULTS

Correlations between key study variables are presented in Table 3.<sup>7</sup> Each model tests indirect effects leading from

achievement striving (when controlling for personal standards and perfectionistic discrepancies) to personal project (PP) need satisfaction, through to basic psychological need satisfaction, then to well-being. Models 1-4 represent competence with each well-being measure; indirect effects are displayed in Table 4. Models 5-8 represent relatedness with each well-being measure; indirect effects are displayed in Table 5. Models 9-12 represent autonomy with each well-being measure; indirect effects are displayed in Table 6.

### Model 1: Competence & Positive Mental Health

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies; see the first three rows of the Personality column in Table 4) indirectly predicted positive mental health through PP competence and BPN competence (see the Indirect effect columns in Table 4). Achievement striving had a small serial indirect effect through the two competence variables,  $\beta = .10$ , 95% CI [.03, .17]. Personal standards had a small serial indirect effect through the two competence variables,  $\beta = .14$ , 95% CI [.05, .22]. Finally, discrepancies had a small serial indirect effect through the two competence variables,  $\beta = -.12$ , 95% CI [-.17, -.06].

### Model 2: Competence & Zest for Life

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and

Table 4. Tests of indirect and total effects for the serial mediation model with PP Competence, BPN Competence, and Well-Being

Predictor (X)	Total effect			Mediator (M1)	Mediator (M2)	Outcome (Y)	Indirect effect		
	$\beta$	95% CI					$\beta$	95% CI	
Personality				Competence		Well-being			
Achievement Striving	<b>.22</b>	<b>.07</b>	<b>.36</b>	PP Comp.	BPN Comp.	Pos. Mental Health	<b>.10</b>	<b>.03</b>	<b>.17</b>
APS-R Personal Standards	<b>.17</b>	<b>.01</b>	<b>.33</b>	PP Comp.	BPN Comp.	Pos. Mental Health	<b>.14</b>	<b>.05</b>	<b>.22</b>
APS-R Discrepancies	<b>-.38</b>	<b>-.49</b>	<b>-.27</b>	PP Comp.	BPN Comp.	Pos. Mental Health	<b>-.12</b>	<b>-.17</b>	<b>-.06</b>
Achievement Striving	<b>.20</b>	<b>.05</b>	<b>.35</b>	PP Comp.	BPN Comp.	Zest for Life	<b>.06</b>	<b>.001</b>	<b>.12</b>
APS-R Personal Standards	<b>.05</b>	<b>-.09</b>	<b>.19</b>	PP Comp.	BPN Comp.	Zest for Life	<b>.09</b>	<b>.02</b>	<b>.15</b>
APS-R Discrepancies	<b>-.47</b>	<b>-.57</b>	<b>-.37</b>	PP Comp.	BPN Comp.	Zest for Life	<b>-.07</b>	<b>-.13</b>	<b>-.02</b>
Achievement Striving	<b>.21</b>	<b>.05</b>	<b>.36</b>	PP Comp.	BPN Comp.	Life Purpose	<b>.09</b>	<b>.03</b>	<b>.15</b>
APS-R Personal Standards	<b>.15</b>	<b>-.02</b>	<b>.31</b>	PP Comp.	BPN Comp.	Life Purpose	<b>.10</b>	<b>.03</b>	<b>.16</b>
APS-R Discrepancies	<b>-.45</b>	<b>-.56</b>	<b>-.35</b>	PP Comp.	BPN Comp.	Life Purpose	<b>-.09</b>	<b>-.15</b>	<b>-.04</b>
Achievement Striving	<b>.23</b>	<b>.09</b>	<b>.37</b>	PP Comp.	BPN Comp.	Passion	<b>.09</b>	<b>.03</b>	<b>.14</b>
APS-R Personal Standards	<b>.25</b>	<b>.08</b>	<b>.42</b>	PP Comp.	BPN Comp.	Passion	<b>.09</b>	<b>.02</b>	<b>.15</b>
APS-R Discrepancies	<b>-.22</b>	<b>-.33</b>	<b>-.12</b>	PP Comp.	BPN Comp.	Passion	<b>-.09</b>	<b>-.14</b>	<b>-.04</b>

Note: Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients ( $\beta$ ). Comp = competence; PP = Personal Projects; BPN = Basic Psychological Needs; APS-R = Almost Perfect Scale – Revised. Statistically significant coefficients bolded.

discrepancies) indirectly predicted zest for life through PP competence and BPN competence (see second set of three rows in Table 4). Achievement striving had a small serial indirect effect through the two competence variables,  $\beta = .06$ , 95% CI [.001, .12]. Personal standards had a small serial indirect effect through the two competence variables,  $\beta = .09$ , 95% CI [.03, .15]. Finally, discrepancies had a small serial indirect effect through the two competence variables,  $\beta = -.07$ , 95% CI [-.13, -.02].

### Model 3: Competence & Life Purpose

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies) indirectly predicted life purpose through PP competence and BPN competence (third set of three rows in Table 4). Achievement striving had a small serial indirect effect through the two competence variables,  $\beta = .09$ , 95% CI [.03, .15]. Personal standards had a small serial indirect effect through the two competence variables,  $\beta = .10$ , 95% CI [.03, .16]. Finally, discrepancies had a small serial indirect effect through the two competence variables,  $\beta = -.09$ , 95% CI [-.15, -.04].

### Model 4: Competence & Passion

We found three serial indirect effects, wherein personality traits (i.e., achievement striving, personal standards, and discrepancies) indirectly predicted passion through PP competence and BPN competence (fourth set of three rows in Table 4). Achievement striving had a small serial indirect effect through the two competence variables,  $\beta = .09$ , 95% CI [.03, .14]. Personal standards had a small serial indirect effect through the two competence variables,  $\beta = .09$ , 95%

CI [.02, .15]. Finally, discrepancies had a small serial indirect effect through the two competence variables,  $\beta = -.09$ , 95% CI [-.14, -.04].

### Model 5: Relatedness & Positive Mental Health

We found one serial indirect effect, wherein achievement striving indirectly predicted positive mental health through PP relatedness and BPN relatedness, but personal standards and discrepancies did not (first set of three rows in Table 5). Achievement striving had a small serial indirect effect through the two relatedness variables,  $\beta = .09$ , 95% CI [.01, .17]. Indirect effects were non-significant for personal standards  $\beta = .06$ , 95% CI [-.02, .15] and discrepancies  $\beta = -.06$ , 95% CI [-.12, .01].

### Model 6: Relatedness & Zest for Life

We found one serial indirect effect, wherein achievement striving indirectly predicted zest for life through PP relatedness and BPN relatedness, but personal standards and discrepancies did not (second set of rows in Table 5). Achievement striving had a small serial indirect effect through the two relatedness variables,  $\beta = .06$ , 95% CI [.004, .12]. Indirect effects were non-significant for personal standards  $\beta = .04$ , 95% CI [-.01, .09] and discrepancies  $\beta = -.04$ , 95% CI [-.09, .02].

### Model 7: Relatedness & Life Purpose

We found one serial indirect effect, wherein achievement striving indirectly predicted life purpose through PP Relatedness and BPN relatedness, but personal standards and dis-



Table 5 Tests of indirect and total effects for the serial mediation model with PP Relatedness, BPN Relatedness, and Well-Being.

Predictor (X)	Total effect		Mediator (M1)	Mediator (M2)	Outcome (Y)	Indirect effect	
	$\beta$	95% CI				$\beta$	95% CI
Personality			Relatedness		Well-being		
Achievement Striving	<b>.27</b>	<b>.12, .41</b>	PP Related	BPN Related	Pos. Mental Health	<b>.09</b>	<b>.01, .17</b>
APS-R Personal Standards	.16	-.01, .32	PP Related	BPN Related	Pos. Mental Health	.06	-.02, .15
APS-R Discrepancies	<b>-.30</b>	<b>-.42, -.19</b>	PP Related	BPN Related	Pos. Mental Health	-.06	-.12, .01
Achievement Striving	<b>.24</b>	<b>.10, .38</b>	PP Related	BPN Related	Zest for Life	<b>.06</b>	<b>.004, .12</b>
APS-R Personal Standards	.05	-.10, .19	PP Related	BPN Related	Zest for Life	.04	-.01, .10
APS-R Discrepancies	<b>-.41</b>	<b>-.52, -.30</b>	PP Related	BPN Related	Zest for Life	-.04	-.09, .02
Achievement Striving	<b>.21</b>	<b>.06, .36</b>	PP Related	BPN Related	Life Purpose	<b>.06</b>	<b>.003, .12</b>
APS-R Personal Standards	<b>.15</b>	<b>-.01, .32</b>	PP Related	BPN Related	Life Purpose	.04	-.01, .10
APS-R Discrepancies	<b>-.39</b>	<b>-.51, -.28</b>	PP Related	BPN Related	Life Purpose	-.04	-.09, .01
Achievement Striving	<b>.23</b>	<b>.09, .36</b>	PP Related	BPN Related	Passion	.04	-.001, .09
APS-R Personal Standards	<b>.26</b>	<b>.09, .43</b>	PP Related	BPN Related	Passion	.03	-.01, .07
APS-R Discrepancies	<b>-.19</b>	<b>-.30, -.08</b>	PP Related	BPN Related	Passion	-.04	-.08, .01

Note: Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients ( $\beta$ ). Related = relatedness; PP = Personal Projects; BPN = Basic Psychological Needs; APS-R = Almost Perfect Scale – Revised. Statistically significant coefficients bolded.

crepancies did not (third set of rows in Table 5). Achievement striving had a small serial indirect effect through the two relatedness variables,  $\beta = .06$ , 95% CI [.003, .12]. The serial indirect effect for personal standards was nonsignificant,  $\beta = .04$ , 95% CI [-.01, .10]. Similarly, discrepancies had a nonsignificant serial indirect effect,  $\beta = -.04$ , 95% CI [-.09, .01].

#### Model 8: Relatedness & Passion

None of the three serial indirect effects predicting passion through PP relatedness and BPN relatedness were statistically significant (fourth set of rows in Table 5). Indirect effects were nonsignificant for achievement,  $\beta = .04$ , 95% CI [-.001, .09], personal standards,  $\beta = .03$ , 95% CI [-.01, .07], and discrepancies,  $\beta = -.04$ , 95% CI [-.09, .01].

#### Model 9: Autonomy & Positive Mental Health

We found one serial indirect effect, wherein personal standards indirectly predicted positive mental health through PP autonomy and BPN autonomy, but achievement striving and discrepancies did not (first set of three rows in Table 6). Personal standards had a small serial indirect effect on zest for life,  $\beta = .11$ , 95% CI [.03, .18]. Indirect effects were nonsignificant for achievement striving,  $\beta = .05$ , 95% CI [-.01, .11], and discrepancies,  $\beta = -.003$ , 95% CI [-.05, .04].

#### Model 10: Autonomy & Zest for Life

We found one serial indirect effect, wherein personal standards indirectly predicted zest for life through PP autonomy and BPN autonomy, but achievement striving and discrepan-

cies did not (third set of three rows in Table 6). Personal standards had a small serial indirect effect on zest for life,  $\beta = .10$ , 95% CI [.03, .16]. Indirect effects were nonsignificant for achievement striving,  $\beta = .05$ , 95% CI [-.01, .11], and discrepancies,  $\beta = -.01$ , 95% CI [-.05, .03].

#### Model 11: Autonomy & Life Purpose

We found two serial indirect effects, wherein achievement striving and personal standards indirectly predicted life purpose through PP autonomy and BPN autonomy, but discrepancies did not (second set of three rows in Table 6). Achievement striving had a small serial indirect effect through the two autonomy variables,  $\beta = .05$ , 95% CI [.003, .10]. Personal standards also had a small serial indirect effect,  $\beta = .08$ , 95% CI [.01, .14]. However, discrepancies had a nonsignificant indirect effect through the two autonomy variables,  $\beta = -.03$ , 95% CI [-.06, .01].

#### Model 12: Autonomy & Passion

We found two serial indirect effects, wherein achievement striving and personal standards indirectly predicted passion through PP autonomy and BPN autonomy, but discrepancies did not (fourth set of three rows in Table 6). Achievement striving had a small serial indirect effect on passion through the two autonomy variables,  $\beta = .06$ , 95% CI [.01, .12]. Personal standards also had a small serial indirect effect on zest,  $\beta = .09$ , 95% CI [.02, .16]. However, discrepancies had a nonsignificant indirect on passion effect through the two autonomy variables,  $\beta = -.03$ , 95% CI [-.07, .01].

Table 6. Tests of indirect and total effects for the serial mediation model with PP Autonomy, BPN Autonomy, and Well-Being.

Predictor (X)	Total effect			Mediator (M1)	Mediator (M2)	Outcome (Y)	Indirect effect		
	$\beta$	95% CI					$\beta$	95% CI	
Personality				Autonomy		Well-being			
Achievement Striving	<b>.23</b>	<b>.10</b>	<b>.37</b>	PP Auto	BPN Auto	Pos. Mental Health	.05	-.01	.11
APS-R Personal Standards	<b>.22</b>	<b>.06</b>	<b>.37</b>	PP Auto	BPN Auto	Pos. Mental Health	<b>.11</b>	<b>.03</b>	<b>.18</b>
APS-R Discrepancies	<b>-.33</b>	<b>-.44</b>	<b>-.22</b>	PP Auto	BPN Auto	Pos. Mental Health	.00	-.05	.04
Achievement Striving	<b>.21</b>	<b>.07</b>	<b>.36</b>	PP Auto	BPN Auto	Zest for Life	.05	-.00	.11
APS-R Personal Standards	.08	-.07	.22	PP Auto	BPN Auto	Zest for Life	<b>.10</b>	<b>.03</b>	<b>.16</b>
APS-R Discrepancies	<b>-.42</b>	<b>-.53</b>	<b>-.31</b>	PP Auto	BPN Auto	Zest for Life	-.01	-.05	.03
Achievement Striving	<b>.20</b>	<b>.05</b>	<b>.35</b>	PP Auto	BPN Auto	Life Purpose	<b>.05</b>	<b>.003</b>	<b>.10</b>
APS-R Personal Standards	.16	-.01	.32	PP Auto	BPN Auto	Life Purpose	<b>.08</b>	<b>.01</b>	<b>.14</b>
APS-R Discrepancies	<b>-.43</b>	<b>-.55</b>	<b>-.32</b>	PP Auto	BPN Auto	Life Purpose	-.03	-.06	.01
Achievement Striving	<b>.22</b>	<b>.08</b>	<b>.36</b>	PP Auto	BPN Auto	Passion	<b>.06</b>	<b>.01</b>	<b>.12</b>
APS-R Personal Standards	<b>.26</b>	<b>.08</b>	<b>.43</b>	PP Auto	BPN Auto	Passion	<b>.09</b>	<b>.02</b>	<b>.16</b>
APS-R Discrepancies	<b>-.21</b>	<b>-.32</b>	<b>-.10</b>	PP Auto	BPN Auto	Passion	-.03	-.07	.01

Note: Confidence intervals (CI) were derived using a Monte Carlo method with 5,000 resamples using standardized coefficients ( $\beta$ ). Auto = autonomy; PP = Personal Projects; BPN = Basic Psychological Needs; APS-R = Almost Perfect Scale – Revised. Statistically significant coefficients bolded.

## DISCUSSION

The purpose of this study was to identify the relationships between personality factors (achievement striving, personal standards, and discrepancies), positive psychological functioning (BPN satisfaction, passion, zest for life, life purpose, positive mental health), and personally valued activities (personal projects). Researchers have previously called for high personal standards to be conceptualized as a healthy dimension of conscientiousness (as achievement striving is) rather than as an adaptive dimension of perfectionism (Flett & Hewitt, 2006). For this conceptualization to hold, any positive relationship between personal standards and well-being should be attributed to the conceptual overlap of personal standards and achievement striving. Thus, to disentangle the conceptual overlap between all three constructs, our models simultaneously incorporated discrepancies and achievement striving. Discrepancies were negatively related to well-being while controlling for personal standards and achievement striving, thus supporting H1. Similarly, high personal standards is still positively predictive of well-being after controlling for achievement striving and discrepancies, thus supporting H2. Finally, competence serially mediated the relationship between both APS-R perfectionism variables and well-being, thus supporting H3. In the sections that follow, we discuss the nuances across all 12 serial mediation models.

### Competence and well-being

Perfectionistic discrepancies was indirectly related to lower well-being, while both personal standards and achievement striving were indirectly related to higher well-being. These

relationships held regardless of the type of well-being (i.e., passion, zest for life, life purpose, positive mental health), potentially because competence has been identified as the strongest BPN predictor for individual well-being (Patrick et al., 2007). That is, competence may be so strongly linked to well-being that the relationship is captured across dimensions or types of well-being. Those with high personal standards are characterized by holding high expectations for performance, striving for excellence, and expecting the best out of oneself (Slaney et al., 2001). Thus, those who strive for achievement are characterized by holding high expectations for their performance as well as others', concerned with turning plans into actions, and demanding high quality (Costa et al., 1991). Notably, having high personal standards is specific to the individual's own expectations and performance, while being high in trait achievement striving includes attitudes and perceptions beyond the self. In the present study, competence was the mechanism linking ambitious personality traits and well-being, particularly personal standards. As competence is an individual sense of capability, it may be more suitable to an individual-level motivation (i.e., meeting personal standards) rather than a motivation for everyone (i.e., self and others striving for achievement) when predicting well-being.

Those with high personal standards likely pursue personal projects related to personal strivings that elicit feelings of efficacy and achievement which in turn lead to well-being (Little et al., 1992), such as personal projects that are manageable and not overly stressful (Little, 1989). As the need for competence is particularly significant for achievement-oriented individuals, satisfaction of that need will provide a boost in well-being following the achievement of strivings, whether that is positive mental health, feeling purposeful and engaged in life, or increased passion. Participants with

the highest sense of competence in their personal projects tended to be concerned with their education (finishing their degree and getting good grades). Similarly, those who reported frequently feeling competent (i.e., satisfied the BPN for competence) tended to report personal projects related to intensive study, admission to competitive graduate programs, and getting “perfect” grades. The sample may be biased toward those who have an achievement-oriented disposition and whose well-being would benefit from feeling competent and capable. Feeling competent entails feeling capable in endeavors (Hadden & Smith, 2019), such as carrying out personal projects (Little, 1989). Holding confidence in one’s capability to complete a project may facilitate feelings of having something important to contribute to society and feeling confident to express your ideas and opinions, two experiences reflected in well-being (Keyes, 2005).

### Relatedness and well-being

Exploratory indirect effects for relatedness produced much less consistent results, with 3 of 12 indirect effects emerging as statistically significant (all achievement striving). Achievement striving was indirectly related to higher well-being through relatedness, for each type of well-being but passion. Interestingly, previous research has identified relatedness as the only BPN able to distinguish between adaptive and maladaptive forms of passion (Chamorro et al., 2020) yet it was the only BPN not related to passion in this study. Feeling supported by others in personal projects may include emotional (encouragement, approval), financial (money, material possessions) or practical (active assistance) support (Little, 1983). Relatedness has been identified as the strongest BPN predictor for relationship well-being (Patrick et al., 2007), which may help explain the relationship to positive mental health which contains social well-being (Keyes, 2005). Otherwise, each of the remaining three types of well-being are individual-focused, including perception of life’s possibilities (zest for life), engagement in activities that are personally valued (life purpose), and interest in a general theme or skill (passion). Nonetheless, there was not broad support for relatedness as a mediator of the relationship between personality and well-being in these data.

### Autonomy and well-being

Indirect effects for autonomy also tended to be smaller than effects found for competence, with only 6 of 12 serial indirect effects emerging as statistically significant (4 for personal standards, 2 for achievement striving). Having high personal standards and feeling autonomous was a significant pathway to well-being, regardless of the dimension of well-being (i.e., positive mental health, passion, zest for life, life purpose). Achievement striving indirectly led to well-being through feeling autonomous when the type of well-being was life purpose or passion. However, only personal standards indirectly predicted positive mental health. Overall, support for autonomy as a mediator was mixed.

Autonomy is concerned with people’s volition and will-*ingness* (Vansteenkiste et al., 2020); when the need for autonomy is satisfied, one may feel free, self-directed, and in-

tegrated (Deci & Ryan, 2000). As personal projects are action-oriented (i.e., intentional; Little & Coulombe, 2015) and lead to experiences of intrinsic motivation (i.e., authentic and generated from the self; Deci & Ryan, 2000), they may be a natural avenue to exercise autonomy. That is, personal projects are characterized by what people choose to do with their lives, which requires some degree of autonomy. Passionate pursuit of personal projects has been linked to well-being, and particularly, the experience of positive emotions (Vallerand et al., 2003). According to Vallerand’s (2015) dualistic model of passion, well-being benefits most from activities that are autonomously internalized into one’s identity (harmonious passion) rather than originated from external pressure to pursue the activity. That is, passionately pursuing projects leads to higher well-being when the activity is autonomously valued (harmonious passion). Those with particularly high standards who strive for achievement likely prefer to work toward their goals independently, rather than collaboratively. By avoiding overly collaborative work requiring trusting others with performance outcomes, achievers may feel particularly autonomous and in control of their performance. On the other hand, constantly assuming full responsibility for all aspects of one’s performance at the workplace or school could place one at risk for burn-out.

### Limitations and future directions

A primary limitation to this study was limited opportunity to recruit representative participants from the general population. Due to the pandemic restrictions, sampling methods for the general population were limited to posters and online advertisements to avoid social contact. To obtain the target sample size, we also recruited participants from the university participant pool, which is relatively homogenous in terms of gender and ethnic background. Essentially, our sample is predominated by White women, which limits the generalizability of the results. However, past research on women students in the same university participant pool has failed to show a gender moderation with perfectionism (Cowie et al., 2018).

A second limitation is concerned with measurement of personal projects and perfectionism. The original Personal Project Analysis is based on ten personal projects per participant. To reduce participant burden, we asked for three personal projects which may require participants to choose only essential, key projects, which tends to fall in major life domains such as education, work, and family. By reducing the number of personal projects, each participant was restricted in the comprehensiveness of the information they could provide about their day-to-day lives. By using the APS-R (Rice & Ashby, 2007) as our measure of perfectionism, we acknowledged the adaptive vs. maladaptive theoretical debate in the literature but did not complement the measurement of perfectionism with another multi-dimensional measure that would allow us to consider the target or source of expectations (Frost et al., 1990; Hewitt & Flett, 1996).

Finally, our cross-sectional serial mediation model is not without limits. Cross-sectional mediation uses only one measurement occasion, and therefore it is assumed that the

cause and effect occur within the time of data collection and cannot demonstrate temporal precedence (Cain et al., 2018). Given that it is well-known that covariation does not necessarily imply causation, any causal inferences made from these models are weak. Therefore, further study of the role of personal projects in satisfying basic psychological needs to improve well-being would be well situated for a longitudinal design to assess effects on well-being over time, such as random intercept cross-lagged panel effects between need satisfaction at both levels and well-being.

## Conclusion

Striving for achievement and having high personal standards led to increased well-being and discrepancies led to decreased well-being when the BPN of competence was satisfied (in general and specific to personal projects). In fact, all three personality variables led to higher well-being through competence regardless of the type of well-being outcome. In contrast, results were mixed when considering relatedness or autonomy as mediators of the relationship between personality variables and well-being. Nonetheless, both relatedness and autonomy were correlated with well-being in the expected directions. Overall, these findings provide some counter-evidence to the contention that personal standards perfectionism (as measured by the APS-R) is exclusively maladaptive, and provides evidence that high personal standards is not simply synonymous with achievement striving.

## Notes

<sup>1</sup> The Order subscales on the APS-R (Rice & Ashby, 2007) measure preference for order and organization. Order was not included in the study analysis because it is not used to classify perfectionists, as it is not considered a core dimension of perfectionism. We used the subscales Personal Standards and Discrepancies only.

<sup>2</sup> Other existing multidimensional models of perfectionism do not consider adaptiveness in the conceptualization. For example, Hewitt & Flett (1991) conceptualize perfectionism based on the source and target of expectations, including self-oriented, other-oriented, and socially prescribed perfectionism. Frost et al. (1990) describes the dimensions of perfectionism in terms of experiences characteristic of perfectionism, including concern over making mistakes, high personal standards, the perception of high parental expectations, the perception of high parental criticism, the doubting of the quality of one's actions, and a preference for order and organization. These models remain valuable but are not under study in the present paper.

<sup>3</sup> For readers who prefer more conventional power analyses over precision analyses, a sensitivity power analysis in G\*Power software shows that  $N = 327$  can detect an effect size of  $r = .197$  or smaller, assuming alpha of .05 and 95% power.

<sup>4</sup> The three needs were identified as being strongly correlated with each other in prior research ( $r = 0.64$  for autonomy/competence,  $r = 0.62$  for autonomy/relatedness, and  $r = 0.57$  for relatedness/competence; Hadden & Smith, 2019); thus, including them together in a single multiple mediator model might result in multicollinearity.

<sup>5</sup> The reader is reminded that our primary hypotheses are on competence (4 models) and that autonomy and relatedness are explored as supplementary analyses (8 models).

<sup>6</sup> The reader is reminded that the total effect equals the direct effect (i.e., paths  $c'$ ,  $cc'$  and  $ccc'$  in Figure 1) plus the total serial indirect effect (see formulas in Figure 1). Thus, the total serial indirect effect is the amount that the total effect shrinks after controlling for both mediators.

<sup>7</sup> As shown in the bivariate correlation matrix in Figure 2, sample (0 = community, 1 = student) is positively albeit weakly correlated with achievement striving, *personal* standards, and perfectionistic discrepancies, indicating that these personality traits are generally higher in the student sample

than the community sample. Sample was controlled for in all subsequent data analysis.

<sup>8</sup> The IPIP items can be found at: <https://ipip.ori.org/newNEOKey.htm#Achievement-Striving>.

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This study was approved by Dalhousie University's Social Sciences and Humanities Research Board (approval number 2020-5376). Participants gave informed consent to participate.

Data and code: <https://osf.io/f4stj/>

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Taylor G. Hill and Sean P. Mackinnon. The first draft of the manuscript was written by Taylor G. Hill and Emma C. Coughlan. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. We would like to thank Sean Alexander for his research assistance in reviewing R code for accuracy.

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