Basic Needs Satisfaction Survey: Validation, Physical Health and Mental Wellbeing, and

Influences from Childhood

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Acknowledgements

Abstract

Objective: Prior research proposed 5 basic needs: belonging, understanding, control, enhancing self, and trust (BUCET; Fiske, 2003). These basic needs have, individually, been associated with physical health and mental wellbeing. However, existing measures of basic needs are one-dimensional and lengthy. These studies aim to validate a new, short and comprehensive measure of basic psychosocial needs, the Basic Needs Satisfaction Survey (BNSS), and demonstrate its association with physical health and mental wellbeing. **Methods:** A study of 227 adults from the United States (40.1% male; M_{age} = 37.26 ± 13.39 years; 84.1% Euro-American Caucasian) was conducted to confirm previous EFA results for the BNSS and test both convergent and predictive validity (Study 1). In a second study, divergent validity was tested in a sample of 312 adults from the United States (47.1% male; M_{age} = 37.90 ± 12.26 years; 80.8% Euro-American Caucasian). Regression models investigated the role of the BNSS subscales as predictors of physical health and mental wellbeing. **Results:** Confirmatory factor analysis confirmed 2 reliable subscales: Life Effectance (= .91) and Life Discouragement (= .90). In 2 studies, we demonstrated construct validity and predictive ability, providing evidence that the BNSS is related to both physical health and mental wellbeing independent of socioeconomic status. **Conclusion:** Results support the validation of the BNSS. Not only will a comprehensive measure be useful for predicting health outcomes, but also there may be potential to use the BNSS and related basic needs theory to improve health behavior and promote mental wellbeing in clinical contexts.

Keywords: basic needs, health, wellbeing, depression, childhood experience

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All living organisms require sunlight, water, oxygen (or carbon dioxide), nutrients, and a

habitat with the appropriate temperature. Beyond these well-established physiological needs,

several basic psychosocial needs have also been identified as required for human survival (Fiske,

2003), relating them to physical and mental health (e.g., Hale, Hannum, & Espelage, 2005;

Boehmer, Luszczynska, & Schwarzer, 2007). Previously, basic psychosocial needs have been

measured largely individually. We developed and tested a comprehensive measure and

investigated the relation of comprehensive needs satisfaction to physical health and mental

wellbeing.

Basic Needs

Basic needs refer to a set of innate and universal needs that must be fulfilled for optimal

human functioning and development (Deci & Ryan, 1985). Maslow (1943) first introduced the

concept, proposing that humans are motivated by five basic needs: physiological, safety, love,

esteem, and self-actualization. Since Maslowøs (1943) seminal work, others have proposed their

own lists of basic needs. Deci and Ryan (1985) explained human motivation in terms of the need

for autonomy, competence, and relatedness. Diener and colleagues (1985) proposed that

subjective well-being depends on the achievement of life satisfaction. More recently, Fiske

(2003) contributed a list of five õcore social motivesö: belonging, understanding, control,

enhancing self, and trusting (BUCET list). Others suggested õpurpose,ö a focus of recent

research (Damon, 2008; Staub, 2003). The current studies integrate the findings of Deci and

Ryan, Diener, and Staub with Fiskeøs proposed BUCET list construct.

Basic Psychosocial Needs and Physical and Mental Health

Extensive previous research has revealed significant relationships among the individual BUCET variables and both physical and mental wellbeing. A brief review of some of this vast literature follows.

Belonging. Belonging refers to the basic need to form lasting supportive relationships with others (Fiske, 2003). Sense of belonging has been correlated with subjective well-being (Baumeister, 1991) and both mental and physical health problems (Moak & Agrawal, 2009), predicts perceptions of health in women and physical symptoms of health in men (Hale, Hannum, & Espelage, 2005), and improves outlook after a traumatic health-event such as being diagnosed with cancer (Boehmer, Luszczynska, & Schwarzer, 2007; Luszczynska, Mohamed & Schwarzer, 2005; Schulz & Mohamed, 2004). Social isolation is a significant risk factor for morbidity from a wide range of conditions, even after controlling for biological risk (House, Robbins, and Metner, 1982).

Understanding. Understanding refers to a sense of life coherence and purpose (Fiske, 2003) and is associated with psychological wellbeing (Zika & Chamberlain, 1992), and protection against thoughts of suicide (Heisel & Flett, 2004). Purpose buffers widely against mortality, for example, with increased lifespan even after controlling for factors of psychological wellbeing (Hill & Turiano, 2014). Among adolescents, meaning in life has been shown to protect against health risk behaviors including drug use, sedative use, unsafe sex, lack of exercise, and lack of diet control (Brassai, Piko, & Steger, 2011). In healthcare settings, those who had a coherent sense of their life were more likely to adjust better following major medical experiences such as bone marrow transplant (Johnson Vickberg et al., 2001) and cancer (Vehling et al., 2011).

Control. Control entails a relationship between behaviors and outcomes; it is the need to be able to influence the outcomes of particular events (Fiske, 2003). Both the need for autonomy (i.e. being the source of one's own behavior) and the need for competence (i.e. feeling effective in one's interactions with others) identified by self-determination theory (Deci & Ryan, 1985) fall under this category. Those with a sense of low control tend to rate themselves with lower health and show less preventative self-care, have less optimism about early treatment effectiveness, but higher illness, bed confinement and dependence on their doctor (Seeman & Seeman, 1983). Conversely, Taylor and Brown (1988) suggested that feeling in control may relate to better health, increased happiness, and longer life expectancy. In particular, Infurna & Gerstorf (2014) found that perceived control predicts functional and physiological health. Low sense of control at work and at home is related to higher risk of developing depression and anxiety (Griffin, Fuhrer, Stansfeld, & Marmot, 2002).

Enhancing self. Enhancing self refers to the need to feel good about oneself and to be motivated by the possibility to improve oneself (Fiske, 2003). Self-esteem (i.e. confidence in one's self-worth) is one aspect shown to be important for both physical and mental health, which when lacking in adolescence predicts health compromising behaviors including problem eating and suicidal ideation (McGee & Williams, 2000) as well as adult health such as poor cardiorespiratory health, high waist-to-hip ratios, and poor self-perceived health in adulthood (Trzesniewski & Caspi, 2006). However, self-enhancement encompasses more than self-esteem and includes the possibility of self-improvement. Self-efficacy refers to the belief in one's ability to improve oneself. Increased levels of self-efficacy are related to success with proactive health behaviors including smoking reduction, weight control, increase in exercise, abstinence from alcohol, and effective use of contraceptives (Strecher, DeVellis, Becker, & Rosenstock, 1986).

High levels of self-efficacy are also related to better mental health; academic self-efficacy, physical self-efficacy, and overall self-efficacy are all related to lack of depression (Ehrenberg, Cox, & Koopman, 1991).

Trust. Trust refers to a perception of benevolence in the world and requires confidence that others on whom we rely will not act in a way that will be harmful or painful to us (Fiske, 2003). High levels of interpersonal trust have been correlated with better self-rated health and longevity (Barefoot et al., 1998) whereas low levels are correlated with depression (Kim, Chung, Perry, Kawachi, & Subramanian, 2012).

Health and Socioeconomic Status

Often measured in terms of an individualøs income, education, and occupation (American Psychological Association Task Force on Socioeconomic Status, 2007), socioeconomic status (SES) is a widely accepted factor in differentiating physical health and mental wellbeing. Previous research has revealed a graded association between SES and health (most notably, the Whitehall study examining mortality in England; Marmot, Shipley, & Rose, 1984). Adults with lower SES have been shown to have higher risk for cardiovascular disease, diabetes, metabolic syndrome, arthritis, tuberculosis, gastrointestinal disease, and adverse birth outcomes (Adler & Ostrove, 1999) as well as higher rates of both major depression and general depressive symptoms (Adler et al., 1994). When considering the direction and mechanism of the graded relationship between SES and health and wellbeing, Adler et al. (1994) proposed three possible mechanisms: (a) underlying, genetic factors, (b) the influence of health on SES, and (c) the influence of SES on biological functions, which in turn impact health. The third mechanism emerged as the most probable. Recent evidence points to environmental exposures (both physical and psychosocial) that elevate stress levels, supporting the theory that SES may alter

physiological factors that contribute to overall health (Adler & Snibbe, 2003; Evans & Kim, 2010; Siegrist & Marmot, 2004). Inclusive of psychosocial environmental exposures are basic psychosocial needs. For example, environments that undermine personal control have been associated with chronic stress, which is in turn related to increased risk for the development of diseases like congenital heart disease (Siegrist & Marmot, 2004).

Interestingly enough, stress-resistant resources are also unevenly distributed across SES levels. For example, SES is positively related to social support, which theory suggests can buffer life stress, and consequently improve health (Uchino, 2004). SES is also positively related to self-esteem, meaningfulness, and locus of control (Lachman & Weaver, 1998; Pinquart, 2002; Twenge & Campbell, 2002). Furthermore, a longitudinal study revealed that higher SES was associated with more favorable increases in psychological resources, and that differences in health along the SES gradient over time increased only when accompanied by a decrease in psychological resources (Kiviruusu, Hurre, Haukkala, & Aro, 2013). These studies reveal an important role for psychosocial factors even within the context of the SES health gradient. Some studies even suggest that psychosocial resources could be predictors of health on their own (Matthews, Gallo, and Taylor, 2010). Therefore, we propose that a more general assessment of basic needs satisfaction could be an informative predictor of mental and physical health, above and beyond socioeconomic status.

Influence of Childhood Experience

Childhood experience is another important social determinant of health that is receiving more attention recently, as more investigators examine health across the lifespan. Over the past few decades, it has become apparent that events in early childhood have the potential to influence not only childhood health, but also health in adulthood (Shonkoff et al., 2012).

For one, a clear relationship has been established between adverse childhood experiences (ACEs) and poor physical health. Felitti et al. (1998) developed the Adverse Childhood Experiences Study (ACEs) to measure the number of types of trauma to which children are exposed and to evaluate the impact of these experiences over the course of the child's life time. A study of four birth cohorts dating back to 1900 revealed a graded relationship between ACEs scores and risk of depressed affect, lifetime suicide attempt, multiple sexual partners, sexually transmitted disease, smoking, and alcoholism (Dube, Felitti, Dong, Giles, & Anda, 2003). A longitudinal study also revealed correlations between ACEs and depressive symptoms, drug abuse, and antisocial behavior in adolescents (Schilling, Aseltine, and Gore, 2007).

More recently, Narvaez and colleagues (Narvaez, Wang & Cheng, under review) have suggested that, conversely, positive childhood experiences are associated with positive health outcomes in adulthood. Narvaez et al. (2013) identified the evolved developmental niche (EDN) as the human early nest that matches with the maturational schedule of the young child, meeting their basic needs for intensive parenting. The EDN includes breastfeeding, touch, play, responsiveness, multiple responsive caregivers, soothing perinatal experiences and social support of the mother-child dyad. With few exceptions, these childhood experiences were related to ongoing mental health (Narvaez, Wang, et al., under review).

Although the influence of childhood has been established in relation to outcomes related to basic needs satisfaction (i.e. physical and mental health), little research has been done to understand the role of childhood experience as a precursor to basic needs satisfaction in adulthood. Erikson's (1993) theory of psychosocial development suggests a likely link between basic needs and childhood experience. To progress from stage to stage in his model, each individual must overcome a psychological crisis that pits the psychological needs of the

individual against the greater needs of society and results in the development of a particular basic virtue. Many of these crises and their resulting virtues overlap with Fiske's (2003) basic needs. For example, the crisis during Erikson's first stage is between trust and mistrust. Similarly, in the second stage, the crisis is between autonomy and shame. The crisis between initiative and guilt in the third stage leads to an understanding of purpose, says Erikson, and the crisis between industry and inferiority in the fourth stage leads to competency. The fifth stage is related to understanding in that it deals with the crisis between ego identity and role confusion. The sixth stage relates to the need for belonging; the crisis between intimacy and isolation in this stage leads to the development of the virtue of love. Self-enhancement is addressed in the seventh stage with the crisis between generativity and stagnation. Finally, the eighth stage leads to the development of greater understanding and life satisfaction through the crisis between ego integrity and despair. Although Erikson's model spans the entire lifespan, based on his observations, we predict that basic needs satisfaction, along with childhood experience, will predict health (both mental and physical) in adulthood.

Current Studies

Although there are several measures that individually assess each of Fiske's (2003) BUCET list items, to our knowledge there currently are no single measures that comprehensively evaluate all five BUCET variables. The aim was to develop a measure that combines Fiske's five basic needs, and integrates the needs previously identified by Deci and Ryan (1985), Diener (1985), and Staub (2003).

In a pilot study (*N* = 239; 54.4% male; M_{age} = 32.46; 78.2% Euro-American Caucasian; normal distribution of income), we conducted an exploratory factor analysis on a pool of 24 items compiled based on the literature about each basic psychosocial need. Three items each (two positive and one negative) were included to address belonging, purpose, life satisfaction, autonomy, control, competence, self enhancement, and trust, with purpose and life satisfaction comprising the BUCET variable "understanding" and control, competence, and autonomy comprising the BUCET variable "control". Items were scored on a 5-point Likert-type scale ("strongly disagree" to "strongly agree"), with negative items reverse-scored. Individuals completed a single online session using Qualtrics, taking about five minutes. Using Principle Component Analysis SPSS19 for Windows, we extracted two factors, which we labeled Life Effectance (= .86; 8 items, e.g. "People care about me") and Life Discouragement (= .88; 7 items, e.g. "My life is meaningless")

Subsequently in two studies, we conduct a confirmatory factor analysis, as well as evaluated convergent, predictive, and divergent validity. We expected that existing measures of individual BUCET variables would correlate positively with Life Effectance and negatively with Life Discouragement and that measures evaluating thwarting or absence of individual BUCET variables would correlate positively with Life Discouragement and negatively with Life

Effectance. We also expected Life Effectance to relate to good physical health and mental wellbeing while Life Discouragement would relate to poor physical health and mental illness since previous research shows that BUCET variables are individually predictive of these outcomes. Finally, we expect that the BNSS subscales will mediate the relationship between specific childhood experiences and health in adulthood.

Study 1

The purpose of Study 1 was to further evaluate the hypothesized construct of the new Basic Needs Satisfaction Survey. A confirmatory factor analysis was conducted to verify the results of the pilot study EFA. Additionally, both the convergent and predictive validity of the survey were assessed. We measured convergent validity using a battery of measures that evaluated each separate BUCET variable. Additionally, to measure predictive validity, participants were asked to complete measures assessing physical and mental health, variables previously found to be related to each BUCET variable individually (see prior review).

Methods

Participants and General Procedure. After approval of study design and measures by the Institutional Review Board, a general population sample of 250 adults from the United States was recruited and paid through Amazon Mechanical Turk. Individuals were electronically provided with an explanation of the study, a consent form, and the study measures; administered in a single online session using Qualtrics which took on average less than 30 minutes. Participants were paid about $2.50 per hour. Twenty-three participants were excluded for spending too little time on the survey, resulting in a final sample of 227 participants (40.1% male; 18 - 74 years old; $M_{age} = 37.26$; 84.1% Euro-American Caucasian, with yearly income well distributed).

Measures. All measures were self-report. Unless otherwise specified, composite scores were created by averaging the items.

Belongingness. The Perceived Available Support subscale of the Berlin Social Support Scale (Schulz & Schwarzer, 2003) was used to evaluate belongingness with two subscales: Emotional Support (=.91; four items, e.g. õThere are some people who truly like meö) and Instrumental Support (=.91; four items, e.g. õI know some people on whom I can always relyö), using a 4-point Likert-type scale (1 = *Strongly Disagree*, 4 = *Strongly Agree*).

Understanding. We assessed understanding with measures of life satisfaction and purpose in life. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) assesses overall judgment of oneøs life (= 0.92; five items, e.g. õIn most ways my life is close to my idealö), using a 7-point Likert-type scale (1 = *Strongly Disagree*, 7 = *Strongly Agree*).The Life Engagement Test (Scheirer et al, 2006) assesses purpose in life by measuring the extent to which the individual is involved in personally meaningful activities (= 0.89; six items; e.g. õTo me the things I do are all worthwhileö), using a 5-point Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). The Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006) was also used to measure purpose in life (= 0.92; five items, e.g. õI understand my lifeøs meaningö), using a 7-point Likert-type scale (1 = *Absolutely Untrue*, 7 = *Absolutely True*).

Control. Measures of control assessed autonomy, competence, and control in life. Autonomy was measured using the Autonomy subscale of the Sociotropy Autonomy Scale (Bieling, Beck, & Brown, 2000). The scale specifically assesses Independent Goal Attainment (=.85; eight items, e.g. õIf a goal is important to me I will pursue it even if it may make other people uncomfortableö), using a 5-point Likert-type scale (1 = *Strongly Disagree,* 5 = *Strongly Agree*). Competence was measured using the Competence subscale from the International

Personality Item Pool (IPIP; Goldberg, 2006); =.90; 10 items, e.g. õI come up with good solutionsö), using a 5-point Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). Control was measured using two subscales from the Spheres of Control Scale (Paulhus & Van Selst, 1990): Personal Control (=.82; 10 items, e.g. õI can usually achieve what I want if I work hard for itö) and Interpersonal Control (=.86; 10 items, e.g. õI have no trouble making and keeping friendsö); using a 7-point Likert-type scale (1 = *Disagree*, 7 = *Agree*).

Enhancing self. The Core Actualization factor of the Brief Index of Self-Actualization was used to measure self-enhancement (Sumerlin & Brundrick, 1996; =0.85; 10 items, e.g. õI am still learningö), scored using a 5-point Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*).

Trust. Trust was measured using the IPIP Trust scale (IPIP; Goldberg, 2006; =.93; 10 items, e.g. õI trust othersö), scored using a 5-point Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*).

Health measures. We assessed health with measures of both physical health and mental wellbeing.

Positive physical health. Positive physical health was measured using seven basic health items: three items regarding health in the last month (e.g. õIn the past month I have felt physically unwellö) scored using a 5-point Likert-type scale (1 = *Almost Never*, 5 = *Almost Always*), one item rating their current health on a 5-point Likert-type scale (1 = *Bad*, 5 = *Excellent*), one item reporting health history on a 7-point Likert-type scale (1 = *I have more than one major disease for which I take medication*, 7 = *It has always been excellent*), and one item each comparing current health status to previous health status and to the health status to those of others their age, both on a 3-point Likert-type scale (1 = *Worse*, 3 = *Better*). Since these seven

items were on different scales, each item was standardized, and a mean score was computed

using z scores to form a õgood physical healthö score (= .80).

Negative physical health. Five items assessed negative impacts of health; one item each

regarding the frequency of clinic visits, hospitalizations, prescription drug usage, and over the

counter medication usage, and one item reporting perception of health status preventing

participation in desired activity. Since these five items were on different scales, each item was

standardized, and a mean score was computed using z scores to form a õpoor physical healthö

score (= 0.59).

Mental health. We measured symptoms of depression and anxiety with the Inventory

of Depression and Anxiety Symptoms (IDAS; Watson et al., 2008). Participants rated how often

they experienced a variety of feelings, sensations, or problems (e.g. õI felt depressedö) in the past

two weeks, using a 5-point Likert-type scale (1 = *Not at all*, 5 = *Extremely*). The inventory

contains 12 subscales: General Depression (= 0.92; with suicidality not assessed and removed

from sum), Anxiety (=.89), Dysphoria (= .92), Ill Temperament (=.87), Lassitude (= .85),

Insomnia (= .86), Appetite Loss (=.88), Appetite Gain (=.76), Panic (= .89), Traumatic

Intrusions (= .88), and Wellbeing (= .90). The Suicidality subscale was excluded due to IRB

restrictions.

Results and Discussion

Unless otherwise noted, all analyses were conducted using SPSS 19 for Windows.

Confirmatory factor analysis. A confirmatory factor analysis was conducted in R, using

the lavaan package, in order to validate the two factors extracted in the pilot study. Several fit

indices suggested that the two factor model was a good fit (*CFI* = 0.95, *RMSEA* = 0.07, *SRMR* =

0.05). Chi-squared was significant ($p < 0.01$), but given the other fit indices and the fact that chi-

squared falsely punishes large sample sizes (i.e. $N > 100$), the model was still ruled a good fit. Cronbachøs alpha evaluated internal consistency of the items in each subscale (Life Effectance: = 0.87; Life Discouragement: = 0.88) (See Appendix for final scale and scoring).

Convergent validity. To measure convergent validity, Pearson correlations among the BNSS subscales and existing measures of individual BUCET variables were examined. Table 1 summarizes the means, standard deviations, ranges, and correlations among the BNSS subscales and these measures. Correlations were in expected directions for each subscale, positive for Life Effectance and negative for Life Discouragement, providing evidence of convergent validity.

Predictive validity. To assess predictive validity, based on previous findings, Pearson correlations between BNSS subscales and physical and mental health were examined. See Table 2. Life Effectance was correlated positively with good physical health and mental wellbeing and negatively with poor physical health and symptoms of mental illness. Conversely, Life Discouragement was correlated positively with poor physical health and mental illness and negatively with good physical health and mental wellbeing. Life Discouragement was most strongly correlated with depression, and Life Effectance was most strongly correlated with wellbeing. These correlations support previous findings that satisfaction of each BUCET variable is, individually, related to physical health and mental wellbeing (See prior review). Furthermore, they suggest that comprehensive need satisfaction could be used as a predictor of health and wellbeing outcomes.

Study 2

The purpose of Study 2 was multifold. First, we aimed to establish divergent validity to demonstrate that the BNSS measures a distinct construct. Second, we aimed to further investigate the role of basic needs satisfaction as a predictor of physical health and mental

wellbeing beyond demographics (i.e. income, social status, and age) using hierarchical linear regression. Finally, we aimed to explore the role of basic needs satisfaction as a potential mediator in the relationship between childhood experiences and health and wellbeing in adulthood.

Methods

Participants and general procedure. Following the same approval and design procedures in study 1, we recruited a general population sample of 350 adults from the United States through Amazon Mechanical Turk. Participants were paid about $3.00 per hour and took about 40 minutes on average. Excluded were 37 participants who failed to complete the task in its entirety and a single univariate outlier, resulting in a final sample of 312 participants (47.1% male; ages 18 -70 years; M_{age} = 37.90; 80.8% Euro-American Caucasian; with a distributed range of income).

Measures. All measures were self-report. Unless otherwise specified, composite scores were created by averaging the items.

Basic Needs Satisfaction Survey. We used the measure confirmed in study 1.

Divergent measures. These measures were selected based on the prediction that they would measure something distinct from basic psychosocial needs.

Basic economic needs. One item assessed basic economic needs, asking participants to rate their financial situation in terms of their ability to meet basic needs (i.e. õPlease select which statement most accurately describes your financial situation), using a 5-point Likert-type scale (1 = *We often lack enough money for basic needs*, 5 = *We have far enough money both for basic needs and for our desires*).

Social desirability. To evaluate social desirability, the shortened Marlowe-Crowne Social Desirability Scale (Crowne & Marlow, 1964; = .75; eight items, e.g. õAre you quick to admit making a mistake?ö), using a 3-point Likert-type scale (1 = *No*, 2 = *Don't know*, 3 = *Yes*).

Personality. The HEXACO-60 (Ashton & Lee, 2009) measures five major dimensions of personality: Honesty/Humility (= .81 ; 10 items, e.g. õI would never accept a bribe, even if it were very largeö), Emotionality (= .78; 10 items, e.g. õI sometimes canøt help worrying about little thingsö), Extraversion (= .90; 10 items, e.g. õI prefer jobs that involve active social interaction to those that involve working aloneö), Agreeableness (versus Anger) (= .81; 10 items, e.g. õI rarely hold a grudge, even against people who have badly wronged me), Conscientiousness (= .77; 10 items, e.g. õI plan ahead and organize things, to avoid scrambling at the last minuteö), and Openness to Experience (= .79 ; 10 items, e.g. õIøm interested in learning about the history and politics of other countriesö), using a 5-point Likert-type scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). Each subscale contained four, five, or six negative items that were reverse-scored.

Physical and Mental Health measures. We used the same basic physical health questions from study 1 (= .82 and = .68 for good and poor health, respectively). Because of their strong correlations in study 1, we used the same Wellbeing subscale (= .95) and revised version of the General Depression subscale (i.e. without suicidality items; = .83) of the Inventory of Depression and Anxiety Symptoms; IDAS; Watson et al., 2008)

Socioeconomic status. Socioeconomic status was measured in terms of income and social status (i.e. education and occupation). A single item asked participants to choose the range of incomes that best matches their annual household income on 6-point Likert-type scale (1 = *less than $15,000*, 6 = *over $100,000*). Social status (i.e. educational attainment and occupational

prestige; not social class) was assessed using The Barratt Simplified Measure of Social Status (Barratt, 2006)**.** Participants are asked to answer two questions about themselves, their parents, and their spouse (if married) regarding education and occupation. An overall social status score was computed using a weighting of education to occupation of 3:5.

Childhood experience measures. To measure childhood experience, we included measures of adverse childhood experiences, attachment style, and early developmental environment.

Adverse childhood experiences. Negative childhood experiences were measured using the short form of the Adverse Childhood Experiences scale (ACES; Dube, Felitti, Dong, Chapman et al., 2003). This scale measures 10 different types of childhood trauma, five personal (i.e. physical abuse, verbal abuse, sexual abuse, physical neglect, and emotional neglect) and five related to other family members (i.e. alcoholic parent, mother victim of domestic violence, family member in jail, family member diagnosed with mental illness, and disappearance of parent) using one item for each trauma (= .79) (*yes* or *no*) prior to their 18th birthday. One point is added for each trauma experienced, such that the ACE score ranges from 0 (no experience with childhood trauma) to 10 (experience with all of the traumas).

Secure Attachment. We assessed attachment style using the Close Relationships Questionnaire (Bartholomew and Horrowitz, 1991). This instrument contains four paragraph-long descriptions of each of the attachment styles (i.e. secure, insecure avoidant, insecure ambivalent, and disorganized). Participants are asked, first, to select the description that best describes them, and then, with four additional items, to rate the extent to which each description corresponds to their general relationship style. The rating was on a 7-point Likert-type scale

(1=*Not at all like me*, 7=*Very much like me*). Secure attachment was measured using the single-item rating provided for the secure prototype.

Embeddedness. Two questions from The Evolved Developmental Niche History measure (EDNH; Narvaez et al., 2013), a self-report measure of adult recollections of childhood experiences consistent with the evolved developmental niche, were used to assess social embeddedness (doing things together as a family outside the home and inside the home, respectively) and their mean was taken to form an overall õsocial embeddednessö score (= .64), using a 5-point Likert-type scale (1=*less than yearly*, 5=*every day*).

Play. Three questions from EDNH ask about play: in adult-organized activities, free play outside, and free play inside, and their mean was taken to form an overall õplayö score (= .71), using a 5-point Likert-type scale (1=*never*, 5=*very often*).

Responsivity. Three additional questions from EDNH address perceptions of parental responsiveness (happy, supportive, needs met) and their mean was taken to form an overall õparental responsivenessö score (= .93), using a 5-point Likert-type scale (1=*very little, or not at all*, 5=*very much*).

Positive Touch. A single item from EDNH assessed positive touch (hugs and kisses), using a 5-point Likert-type scale (1=*never*, 5=*very often*).

Corporal Punishment. Another single item from EDNH assessed corporal punishment (negative touch), using a 5-point Likert-type scale (1=*never*, 5=*very often*)..

Emotional Punishment. An individual item from EDNH character asked about emotional punishment (e.g. being demeaned, screamed at, or humiliated in public), using a 5-point Likert-type scale (1=*never*, 5=*very often*).

Positive Climate. To measure social support, we included four items from EDNH about home climate in terms of common positive feelings experienced, one each for joy, expansiveness, self-assurance, and serenity. The mean of these four items was used to form a positive climate variable (= .87), using a 6-point Likert-type scale (1=*don't recall*, 6=*always or almost always*).

Negative Climate. To measure lack of social support, we included six items from EDNH about home climate in terms of common negative feelings experienced, one each for grief, humiliation, guilt, fear, anger, and numbness. The mean of these six items was used to form a negative climate variable (= .91), using a 6-point Likert-type scale (1=*don't recall*, 6=*always or almost always*).

Results and Discussion

Unless otherwise noted, all analyses were conducted using SPSS 19 for Windows.

Divergent validity. To measure divergent validity, Pearson correlations among the BNSS subscales and scales expected to measure constructs distinct from basic needs satisfaction were examined. Table 3 summarizes the means, standard deviations, ranges, and correlations among the BNSS subscales, basic economic needs, social desirability, and personality. Although the BNSS subscales were significantly related to each of these constructs, they were only weakly correlated (i.e. $r < 0.4$) with most. The exceptions were extraversion, agreeableness and conscientiousness which were moderately correlated (i.e. $0.4 < r < 0.7$) with at least one of the BNSS subscales. It is not a surprise that the constructs chosen to demonstrate divergent validity were still significantly related to basic needs satisfaction given that basic psychosocial needs are a fundamental and universal set of needs that are expected to be related to a wide variety of outcomes. In particular, it makes sense that the BNSS subscales would be more highly correlated

with extraversion, agreeableness, and conscientiousness because when you feel good, you are more likely to engage with others, which these three dimensions of personality measure (Aghababaei & Arji, 2014). These results, therefore, still provide some evidence of divergent validity.

Basic needs and physical and mental health in adulthood. To measure the relationship among basic needs and physical and mental health in adulthood, Pearson correlations among the BNSS subscales and good physical health, mental wellbeing, poor physical health, and depression were examined. The positive relationship between basic needs satisfaction and physical and mental health from Study 1 was supported; the adulthood physical health and mental wellbeing measures were significantly correlated with the BNSS subscales, in the expected directions (Table 4).

To clarify these findings, a series of regressions were conducted to investigate whether Life Effectance and Life Discouragement predict physical health and mental wellbeing in adulthood above and beyond demographics. Typically, potential confounding variables would be included in the first model and variables of actual interest would be added in later models, but in this case the models were constructed with the BNSS subscales in the first and second models, and the potential confounding variables were added later to allow for a better comparison of the variance accounted for by the BNSS subscales. Hierarchical regression analyses were separately conducted for poor physical health, good physical health, depression, and wellbeing. In the first model, Life Effectance was the only predictor. In the second model, Life Discouragement was added to the set of predictors. To understand the role of potential confounding variables, in the third and fourth models, demographic variables (i.e. age, income, and social status) and social desirability were added, respectively.

Table 5 summarizes the regression indices for the four hierarchical models conducted. Life Effectance significantly predicted each of the health and wellbeing outcomes in the first model, but when Life Discouragement was considered in the second model, Life Effectance only remained significantly related to wellbeing. Life Discouragement was a significant predictor of all four health outcomes and remained significant even after considering demographic variables and social desirability. Age is a significant predictor for physical health (poor and good), but not mental health, reflecting the fact that as people age, their physical health tends to deteriorate. Social desirability accounted for variance in both positive outcomes (good physical health and wellbeing), but not the negative outcomes, suggesting that when people feel good (i.e. high Life Effectance), they may have a rosier outlook on their own behavior (Pollyanna effect; Boucher & Osgood, 1969). Alternatively, it might be more socially desirable to report that one's physical and mental health is good. Interestingly enough, social status was not a significant predictor of any of the health outcomes studied, and income was only important for good physical health, suggesting that perhaps basic needs satisfaction may be a better predictor of both physical health and mental wellbeing than socioeconomics, despite the copious literature discussing the socioeconomic gradient in health (e.g. Adler & Ostrove, 1999; Adler et al., 1994). Furthermore, these findings support the recent literature suggesting that psychosocial resources may be important predictors of health independent of SES-related stress (Matthews, Gallo, and Taylor, 2010).

Childhood experience, basic needs satisfaction, and health and wellbeing in adulthood. To measure the relationship among basic needs and childhood experiences, Pearson correlations among the BNSS subscales, ACEs, and selected EDN measures were examined (Table 4). All of the childhood variables except corporal punishment were significantly

correlated with the BNSS subscales. Negative childhood experiences (i.e. ACEs, emotional punishment, and negative climate) were correlated positively with Life Discouragement and negatively with Life Effectance while positive childhood experiences (i.e. secure attachment, social embededess, play, responsiveness, positive touch, and positive climate) were correlated positively with Life Effectance and negatively with Life Discouragement.

We also examined Pearson correlations among childhood variables and adulthood health variables (Table 4). All of the childhood experiences were significantly correlated with measures of health in adulthood. Positive childhood experiences were correlated positively with good physical health and wellbeing and negatively with poor physical health and depression while negative childhood experiences were correlated positively with poor physical health and depression and negatively with good physical health and wellbeing. Interestingly enough, corporal punishment was only significantly correlated with measures of physical health and emotional punishment was significantly correlated only with measures of mental health and poor physical health.

Basic needs mediation. Based on Pearson correlations (Table 4) and regression analyses (Table 5), we tested several mediation models that demonstrate the mediating role of Life Discouragement and Life Effectance in the relationship between childhood experience and adult health and wellbeing. Direct and indirect effects were computed for 10,000 bootstrapped samples, and the 95% confidence intervals were computed by determining the total effect for the lower and upper 5%. Controls for each model were selected based on regression analyses (Table 5); those control variables that were found to be a significant predictor of a given physical health or mental wellbeing outcome were included as controls for mediation models containing that same outcome.

The relationship between ACEs and negative adult physical health was partially mediated by Life Discouragement. As Figure 1 illustrates, both the total direct and total indirect effects were significant (direct effect: $b = 2.4$, $p < 0.01$; indirect effect: $b = 0.25$, $p < .01$, 95% bias corrected bootstrap CI: [2.29, 3.04]; $R^2 = 0.48$) (Figure 1). This model adjusts for age. The relationship between ACEs and depression was also partially mediated by Life Discouragement. As Figure 2 illustrates, both the total direct and total indirect effects are significant (direct effect: $b = 0.42$, $p < 0.01$; indirect effect: $b = 0.29$, $p < .01$, 95% bias corrected bootstrap CI: [0.50, 0.94]; $R^2 = 0.39$) (Figure 2).

The relationship between negative home climate in childhood and adult depression was partially mediated by Life Discouragement. As Figure 3 illustrates, both the total direct and total indirect effects were significant (direct effect: $b = 0.11$, $p < 0.01$; indirect effect: $b = 0.11$, $p < .01$, 95% bias corrected bootstrap CI: [0.17, 0.27]; $R^2 = 0.39$) (Figure 3). Additionally, the relationship between positive home climate in childhood and positive adult physical health was completely mediated by Life Discouragement. As Figure 4 illustrates, the total indirect was significant, but the total direct effect was not (direct effect: $b = -0.06$, $p > 0.05$; indirect effect: $b = 0.09$, $p < .01$, 95% bias corrected bootstrap CI: [0.08, 0.22]; $R^2 = 0.24$) (Figure 4). This model adjusts for age, income, and social desirability.

The relationship between a responsive childhood and adult mental wellbeing was partially mediated by both Life Effectance and Life Discouragement. As Figure 5 illustrates, both the total the total indirect and total direct effects were significant (direct effect: $b = 0.81$, $p < 0.05$; indirect effect: $b = 0.20$, $p < .01$, 95% bias corrected bootstrap CI: [0.20, 0.37]; $R^2 = 0.44$) (Figure 5). This model adjusts for social desirability.

General Discussion

The purpose of the current studies was to validate a short, comprehensive measure of basic psychosocial needs satisfaction that captures the five basic needs identified by Fiske (2003). Additionally, the current studies were designed to investigate the role of basic needs satisfaction as a predictor of both physical health and mental wellbeing. In two studies, we confirmed the reliability and validity of the Basic Needs Satisfaction Survey (BNSS) with its two subscales performing in opposite manner. Life Discouragement predicted both physical and mental health; it was positively associated with poor physical health and depression and negatively with good physical health and wellbeing, suggesting that lack of basic psychosocial needs, or basic needs thwarting, predicts negative health outcomes. However for wellbeing both variables were predictive, suggesting that lack of discouragement is not enough for flourishing, a sense of effectance is also required. These findings support the World Health Organization's (1948) definition of health as õa state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.ö We speculate that one might be resilient when discouragement is low, but flourishing may require a sense of effectance (Vansteenkiste & Ryan, 2013). Furthermore, the BNSS predicted health outcomes independent of socioeconomic status, a variable that has been clearly associated with both physical and mental health in the past (Adler & Ostrove, 1999; Adler et al., 1994), supporting previous suggestions that psychosocial resources could be predictors of health on their own (Matthews, Gallo, and Taylor, 2010).

Given the role of the BNSS as a significant predictor of health, there may be potential to use the BNSS and related basic needs theory to improve health behavior and promote mental wellbeing in clinical contexts. Many studies have already demonstrated the utility of self-determination theory (Deci & Ryan, 1985) in the clinic (Markland, Ryan, Tobin, & Rollnick,

2005; Ng et al., 2012; Sheldon, Williams, & Joiner, 2008). For example, enhanced autonomous motivation and perceived competence has been shown to promote glycemic control (Williams, McGregor, Zeldman, Freedman, & Deci, 2004), decrease plaque and gingivitis (Halvari & Halvari, 2006), and increase smoking cessation (Williams et al., 2006). Empirical studies on the role of self-determination theory in the context of mental health treatments are sparse, but Sheldon, Williams, and Joiner suggest ways in which the theory could be used to effectively treat substance abuse problems, as well as anxiety, eating, mood, and personality disorders. Because the BNSS adds the need to understand, enhance self, and trust, to the three basic needs addressed by Deci and Ryanøs (1985) self-determination theory (i.e. relatedness, autonomy, and competence), it has potential to be even more effective than motivational techniques based on their model.

Our study also provides evidence of how childhood experience may influence health and wellbeing in adulthood. Our mediation models suggest that those who are exposed to negative home climates and adverse childhood experiences may be more likely to experience poor physical health and depression in adulthood because they have high Life Discouragement, and that those who are exposed to positive home climates in childhood may be more likely to experience good physical health in adulthood because they have low Life Discouragement. Additionally, those who had a responsive childhood may be more likely to experience mental wellbeing in adulthood because they not only have low Life Discouragement but also have high Life Effectance.

These results provide evidence in support of the American Academy of Pediatricsø(2012) recommendations for the integration of patient- and family-centered care in hospitals, clinics, and other healthcare systems. Patient- and family-centered care, which is grounded in

collaboration between healthcare providers, patients, and their families, has emerged in pediatrics as physicians and other healthcare providers become increasingly aware of the importance of meeting the psychosocial and developmental needs of patients as well as the role that families play in promoting the health and wellbeing of their children. Previous studies have shown associations between high-quality, patient- and family-centered care and pediatric patient outcomes (American Academy of Pediatrics, 2012). Our results further suggest that this type of care could potentially have health benefits that extend into adulthood.

Limitations and Future Directions.

There are several limitations to this paper. First, all samples were cross-sectional, convenience samples and so we cannot determine causation. A longitudinal study is needed to determine the direction of the effect. Also, because the data collected is self-reported, it is impossible to know for sure that the respondents were accurate and honest with their answers. Additionally, we realize that it is possible that better physical health or mental wellbeing is associated with an optimistic view of life.

Conclusion

The BNSS fills a gap in basic needs studies by providing a short 15-item comprehensive measure that evaluates all five basic psychosocial needs outlined in Fiske¢s (2003) BUCET list. A comprehensive measure may be a useful tool for predicting not only physical and mental health, but also other important life outcomes such as moral capacities. The BNSS has the potential to be applied in a wide array of psychological contexts in the future since basic needs are integral to human behavior and development.

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Appendix: Basic Needs Satisfaction Survey

Please indicate the extent to which you agree or disagree with each of the following statements:

1	2	3	4	5
Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree

Life Engagement (n=8)

1. People care about me. (Belonging)
2. I fit into at least in one social group. (Belonging)
3. I feel like I have influence on those who are important in my life. (Control)
4. Other people value my skills. (Control: competence)
5. I feel like I have talents to share with others. (Control: competence)
6. In key areas in my life I can make choices that matter. (Control: autonomy)
7. When I need to, I have the ability to make choices. (Control: autonomy)
8. When necessary, I can find support from others that I need. (Trust)

Life Discouragement (n=7)

9. My life is meaningless. (-Understanding: purpose)
10. I am unhappy with my life. (-Understanding: life satisfaction)
11. There is nothing I can do to change my life. (-Control)
12. In key areas in my life, I feel incapable. (-Control: competence)
13. I feel boxed in with no freedom. (-Control: autonomy)
14. I feel beaten down. (-Enhancing Self)
15. The world is a mean place so I have to be careful. (-Trust)

Scoring: The score of each subscale is found by summing all of the subscale's items (i.e. 1-8 for Effectance and 9-15 for Discouragement).

Table 1

Pearson Correlations, Means, Standard Deviations, and Ranges for BNSS Subscales and Existing Measures of BUCET variables

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Life Effectance	--												
2. Life Discouragement	-.68**	--											
3. Emotional Support	.73**	-.64**	--										
4. Instrumental Support	.73**	-.62**	.91**	--									
5. Life Engagement	.65**	-.75**	.58**	.58**	--								
6. Presence of Life Meaning	.55**	-.63**	.53**	.53**	.73**	--							
7. Satisfaction with Life	.54**	-.69**	.55**	.54**	.61**	.60**	--						
8. Independent Goal Attainment	.42**	-.29**	.27**	.24**	.40**	.28**	.19**	--					
9. Competence	.58**	-.69**	.49**	.45**	.71**	.59**	.58**	.49**	--				
10. Personal Control	.61**	-.67**	.51**	.51**	.69**	.53**	.56**	.47**	.76**	--			
11. Interpersonal Control	.61**	-.66**	.59**	.55**	.59**	.59**	.56**	.38**	.66**	.67**	--		
12. Self-Actualization	.72**	-.74**	.64**	.63**	.76**	.67**	.64**	.49**	.76**	.77**	.65**	--	
13. Trust	.46**	-.46**	.43**	.44*	.34**	.35**	.38**	.13	.34**	.32**	.51**	.43**	--
Mean	3.94	2.34	3.09	3.13	3.79	4.77	4.41	3.92	3.69	4.98	4.63	3.82	3.42
SD	0.60	0.85	0.73	0.75	0.85	1.47	1.65	0.57	0.76	0.96	1.06	0.68	0.80
Range	1.75 to 5	1 to 4.57	1 to 4	1 to 4	1 to 5	1 to 7	1 to 7	1.88 to 5	1.1 to 5	2.4 to 7	1.3 to 7	1.1 to 5	1 to 5

Note. N= 227. *p< 0.05, **p<0.01.

Table 2

Pearson Correlations, Means, Standard Deviations, and Ranges for BNSS Subscales and Measures of Physical Health and Mental Wellbeing

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Life Effectance	--														
2. Life Discouragement	-.68**	--													
3. Good Phys. Health	.24**	-.36**	--												
4. Poor Phys. Health	-.17**	.20**	-.66**	--											
5. Depression	-.51**	.71**	-.51**	.35**	--										
6. Anxiety	-.40**	.53**	-.34**	.23**	.78**	--									
7. Dysphoria	-.49**	.70**	-.45**	.30**	.96**	.81**	--								
8. Ill Temperament	-.39**	.46**	-.27**	.23**	.66**	.58**	.68**	--							
9. Lassitude	-.33**	.52**	-.45**	.35**	.81**	.67**	.75**	.56**	--						
10. Insomnia	-.22**	.38**	-.34**	.27**	.71**	.55**	.61**	.49**	.60**	--					
11. Appetite Loss	-.29**	.33**	-.15**	.16**	.54**	.38**	.48**	.44**	.37**	.50**	--				
12. Appetite Gain	-.22**	.29**	-.18**	.13**	.42**	.46**	.47**	.35**	.48**	.30**	.03**	--			
13. Panic	-.39**	.46**	-.32**	.26**	.74**	.72**	.75**	.67**	.62**	.62**	.55**	.41**	--		
14. Traumatic Intrusions	-.38**	.52**	-.35**	.28**	.78**	.67**	.78**	.61**	.63**	.57**	.53**	.30**	.69**	--	
15. Wellbeing	.61**	-.70**	.39**	-.16**	-.56**	-.32**	-.48**	-.22**	-.38**	-.27**	-.08**	-.15**	-.23**	-.30**	--
Mean	3.94	2.34	0	0	2.01	1.76	1.82	1.54	1.98	1.96	1.55	1.91	1.43	1.67	2.92
Standard Deviation	0.60	0.85	0.75	0.61	0.72	0.91	0.81	0.71	0.84	0.83	0.78	0.90	0.61	0.87	0.92
Range	1.75 to 5	1 to 4.57	-1.93 to 1.46	-0.74 to 1.98	1 to 4.28	1 to 5	1 to 4.7	1 to 4.8	1 to 4.5	1 to 4.33	1 to 5	1 to 5	1 to 4	1 to 5	1 to 5

Note. N=227. *p< 0.05, **p<0.01. . Good and Poor Phys. Health were calculated by standardizing seven and five items, respectively.

Table 3

Pearson Correlations, Means, Standard Deviations, and Ranges for BNSS Subscales and Divergent Measures

Construct	1	2	3	4	5	6	7	8	9	10
1. Life Effectance	--									
2. Life Discouragement	-.71**	--								
3. Economic Basic Needs	.24**	-.35**	--							
4. Social Desirability	.18**	-.29**	.07	--						
5. Honesty and Humility	.15*	-.36**	.11	.41**	--					
6. Emotionality	-.13	.21**	-.14*	-.07	.00	--				
7. Extraversion	.67**	-.67**	.20**	.22**	.11	-.30**	--			
8. Agreeableness	.33**	-.39**	.12	.51**	.52**	-.09	.37**	--		
9. Conscientiousness	.38**	-.40**	.11	.24**	.41**	-.05	.25**	.28**	--	
10. Openness to Experience	.24**	-.07	-.11	.01	-.01	.00	.17*	.16*	.27**	--
Mean	3.94	2.29	3.16	2.16	3.39	3.10	3.17	3.30	3.73	3.64
SD	0.61	0.83	0.92	0.57	0.71	0.66	0.80	0.65	0.57	0.65
Range	1.13 to 5	1 to 5	1 to 5	1 to 3	1.2 to 5	1 to 5	1 to 5	1.4 to 5	1.5 to 5	1.2 to 5

Note. N=312. *p< 0.05, **p<0.01.

Table 4 *Pearson Correlations, Means, Standard Deviations, and Ranges for BNSS Subscales, Childhood Experiences, and Health/Wellbeing Outcomes*

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Life Effectance	--															
2. Life Discouragement	-.74**	--														
Childhood Experiences																
3. ACEs	-.19**	.23**	--													
4. Secure Attachment	.48**	-.48**	-.22**	--												
5. Social Embededness	.18**	-.25**	-.40**	.22**	--											
6. Play	.29**	-.26**	-.33**	.23**	.40**	--										
7. Responsiveness	.37**	-.36**	-.71**	.38**	.43**	.52**	--									
8. Positive Touch	.35**	-.27**	-.38**	.37**	.30**	.46**	.63**	--								
9. Corporal Punishment	-.06	.11	.44**	-.16**	-.23	-.17	-.40**	-.20**	--							
10. Emotional Punishment	-.19**	.28**	.66**	-.18**	-.38**	-.34**	-.63**	-.35**	.52**	--						
11. Positive Climate	.42**	-.38**	-.50**	.35**	.41**	.55**	.74**	.55**	-.24**	-.50**	--					
12. Negative Climate	-.30**	.40**	.65**	-.28**	-.33**	-.30**	-.65**	-.34**	.38**	.62**	-.50**	--				
Health/Wellbeing Variables																
13. Good Physical Health	.33**	-.44**	-.29**	.32**	.17**	.22**	.31**	-.17**	-.13*	-.25	.25**	-.38**	--			
14. Poor Physical Health	-.19*	.29**	.29**	-.22**	-.15**	-.16**	-.23**	-.05	.15**	.15**	-.14*	.26**	-.64**	--		
15. Depression	-.41**	.60**	.31**	-.35**	-.31**	-.17**	-.28**	-.14*	.07	.25**	-.27**	-.40**	-.53**	.43**	--	
16. Well-Being	.60**	-.67**	-.18**	.48**	.21**	.27**	.34**	.29**	-.06	-.18**	.44**	-.29**	-.44**	-.24**	-.41**	--
Mean	3.94	2.29	0.18	4.23	3.84	3.51	3.64	3.43	2.46	2.34	4.07	2.81	0.00	0.00	2.08	2.86
Standard Deviation	0.61	0.83	0.22	2.16	0.80	0.83	1.14	1.13	1.11	1.25	1.04	0.92	0.76	066	0.51	0.98
Range	1.13 to 5	1 to 5	0 to 1	1 to 7	1 to 5	1 to 5	1 to 5	1 to 5	1 to 5	1 to 5	1 to 6	1 to 6	-2.12 to 1.35	-0.72 to 2.26	1.39 to 3.78	1 to 5

Note. N=312. *p< 0.05, **p<0.01. Good and Poor Physical Health were calculated by standardizing seven and five items, respectively.

Table 5

Regression Analyses Predicting Physical Health and Mental Wellbeing from Basic Needs

Model	Poor Physical Health			R^2	Good Physical Health			R^2
	b	SE			b	SE		
Model 1				.03				.07
Effectance	-.21**	.06	-.19		.25**	.05	.27	
Model 2				.08				.11
Effectance	.06	.09	.05		-.01	.09	-.01	
Discouragement	.26	.06	.33		-.26**	.07	-.34	
Model 3				.09				.15
Effectance	.07	.09	.07		-.05	.09	-.05	
Discouragement	.26**	.06	.32		-.28**	.07	-.37	
Age	.01**	< .01	.14		-.01**	< .01	-.16	
Income	-.04	.03	-.08		.08**	.03	.16	
Social Status	< .01	< .01	-.01		< .01	< .01	-.55	
Model 4				.10				.16
Effectance	.07	.09	.07		-.02	.09	-.03	
Discouragement	.27**	.07	.34		-.25**	.07	-.32	
Age	.01*	< .01	.13		-.01**	< .01	-.17	
Income	-.03	.03	-.07		.09**	.03	.16	
Social Status	< .01	< .01	< .01		< .01	< .01	-.02	
Social Desirability	.08	.07	.07		.16*	.07	.12	

Model	Depression			R^2	Wellbeing			R^2
	b	SE			b	SE		
Model 1				.17				.36
Effectance	-.34**	.04	-.41		.98**	.07	.60	
Model 2				.36				.48
Effectance	.06	.06	.07		.38**	.10	.23	
Discouragement	.40**	.04	.65		-.60**	.07	-.50	
Model 3				.36				.47
Effectance	.06	.06	.07		.38**	.10	.23	
Discouragement	.38**	.04	.63		-.60**	.07	-.51	
Age	< .01	< .01	-.07		< .01	< .01	< .01	
Income	-.02	.02	-.05		< .01	.03	-.01	
Social Status	< .01	< .01	< .01		< .01	< .01	-.03	
Model 4				.36				.48
Effectance	.05	.06	.06		.38**	.10	.24	
Discouragement	.37**	.04	.62		-.57**	.07	-.48	
Age	< .01	< .01	-.07		< .01	< .01	< .01	
Income	-.02	.02	-.06		< .01	.03	< .01	
Social Status	< .01	< .01	< .01		< .01	< .01	-.03	
Social Desirability	-.05	.04	-.06		.20**	.07	.11	

N=312. *p< 0.05, **p<0.01. R^2 is adjusted. Good and Poor Physical Health were calculated by standardizing seven and five items, respectively.
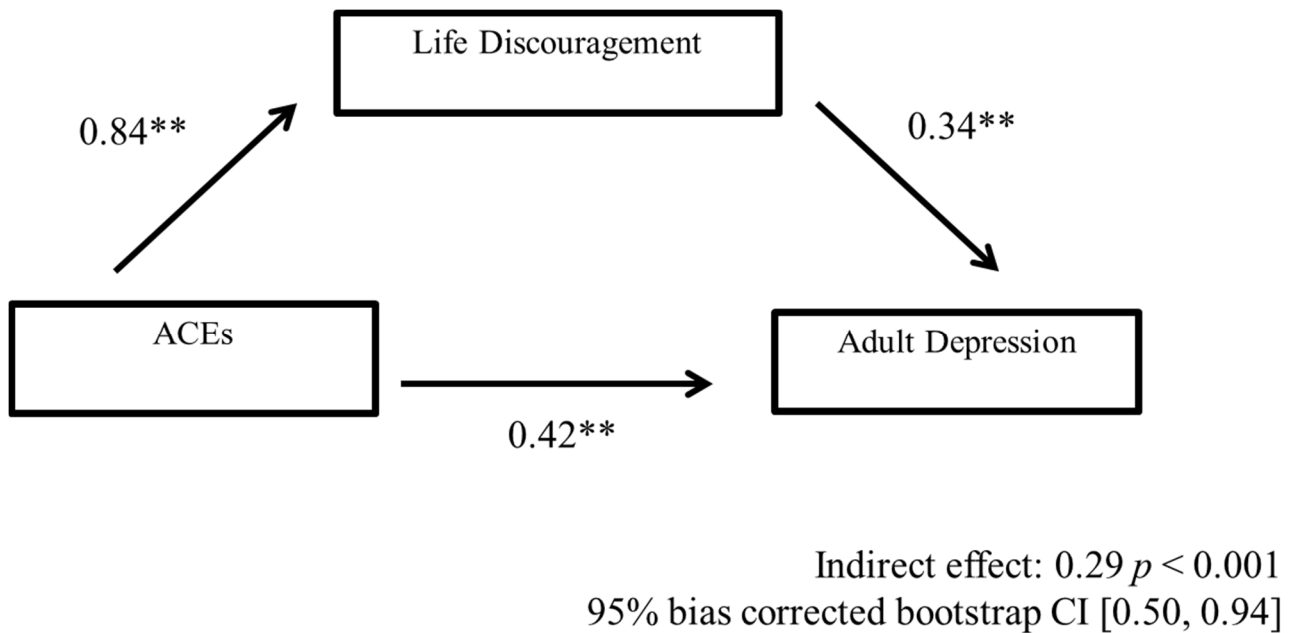
Figure 1.

Model of the relationship between adverse childhood experiences and negative adult physical health, as mediated by Life Discouragement.

Indirect effect: 0.25 p = .003

95% bias corrected bootstrap CI [2.29, 3.04]
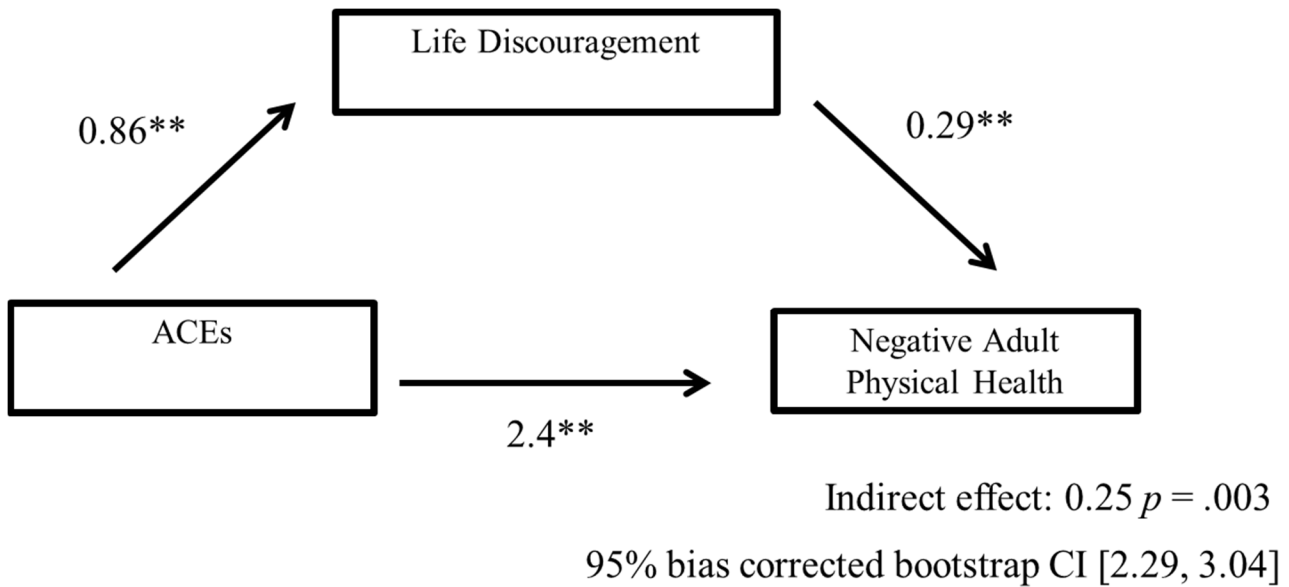
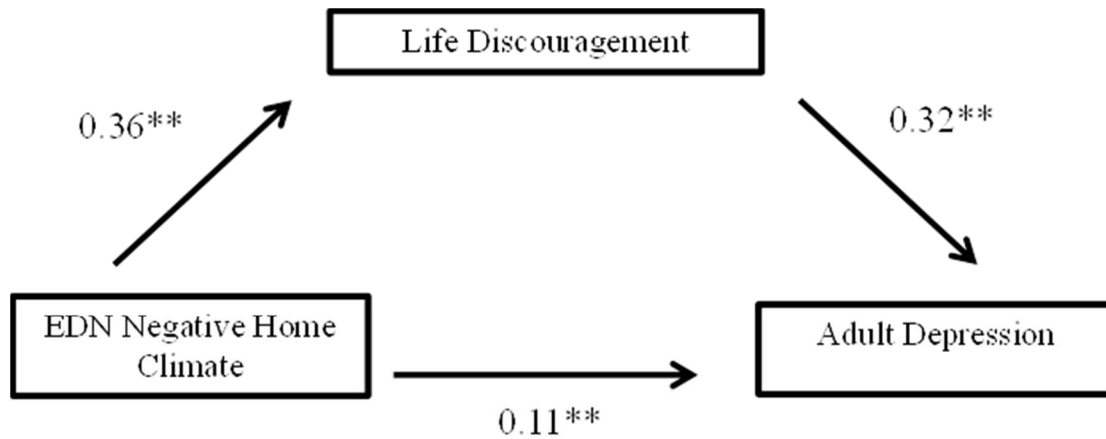*Note.* R^2 = 0.48. * = $p < .05$,** = p < .01. Model controlled for age.

Figure 2.

Model of the relationship between adverse childhood experiences and depression, as mediated by Life Discouragement.

Indirect effect: 0.29 p < 0.001

95% bias corrected bootstrap CI [0.50, 0.94]

Note. R^2 = 0.39. * = $p < .05$,** = $p < .01$.

Figure 3.

Model of the relationship between negative home climate in childhood and adult depression, as mediated by Life Discouragement.
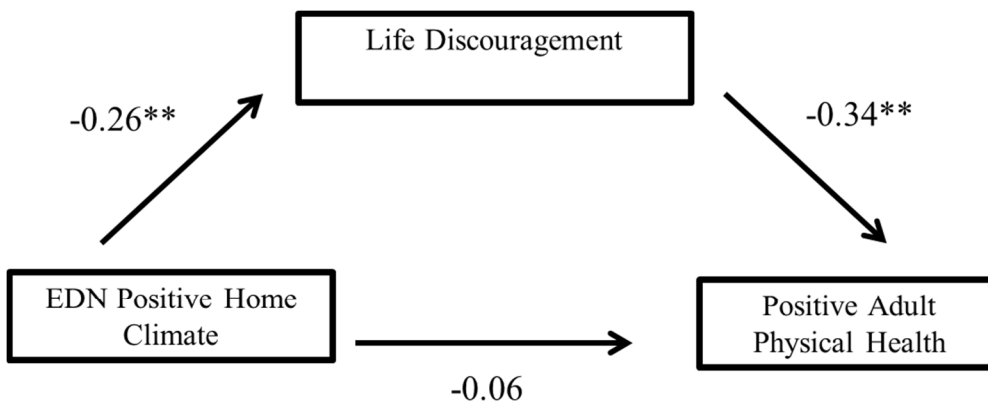

Indirect effect: $0.11 \ p < 0.001$
95% bias corrected bootstrap CI $[0.17, 0.27]$

Note. $R^2 = 0.39$. $* = p<.05, ** = p<.01$.

Figure 4.

Model of the relationship between positive home climate in childhood and good adult physical health, as mediated by Life Discouragement.
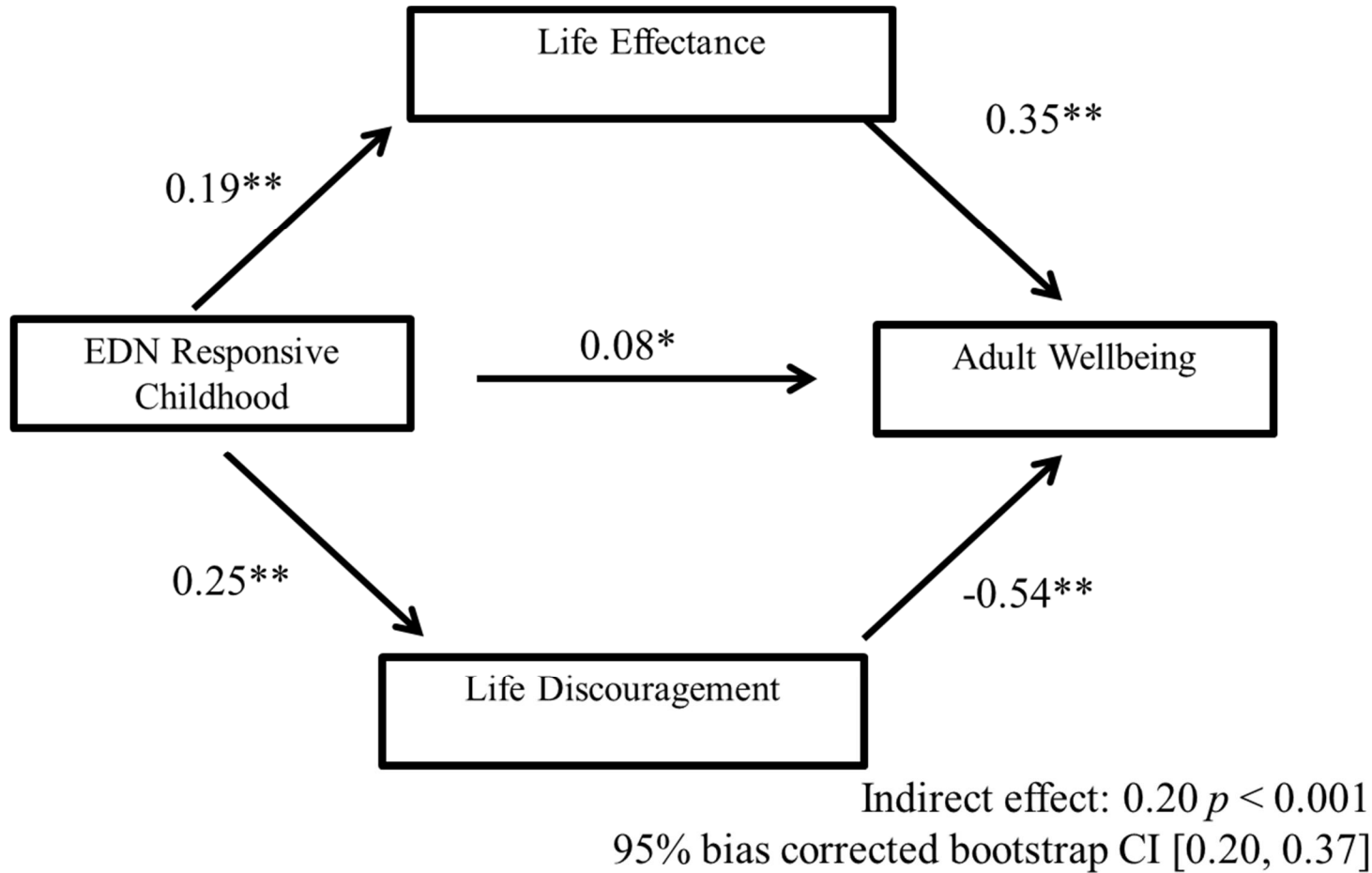

Indirect effect: $0.09 \ p < .001$
95% bias corrected bootstrap CI $[0.08, 0.22]$

Note. $R^2 = 0.24$. $* = p<.05, ** = p<.01$. Model controlled for age, income, and social desirability.

Figure 5.

Model of the relationship between a responsive childhood and adult mental wellbeing as mediated by Life Discouragement and Life Effectance.

Indirect effect: 0.20 $p < 0.001$
95% bias corrected bootstrap CI [0.20, 0.37]

Note. $R^2 = 0.44$. * = $p<.05$,** = $p<.01$. Model controlled for social desirability.