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Early Adolescent Affect Predicts Later Life Outcomes

Jessica Kansky,

University of Virginia

Joseph P. Allen, Ph.D., and

University of Virginia

Ed Diener, Ph.D.

University of Virginia

Abstract

Background—Subjective well-being as a predictor for later behavior and health has highlighted its relationship to health, work performance, and social relationships. However, the majority of such studies neglect the developmental nature of well-being in contributing to important changes across the transition to adulthood.

Methods—To examine the potential role of subjective well-being as a long-term predictor of critical life outcomes, we examined indicators of positive and negative affect at age 14 as a predictor of relationship, adjustment, self worth, and career outcomes a decade later at ages 23 to 25, controlling for family income and gender. We utilized multi-informant methods including reports from the target participant, close friends, and romantic partners in a demographically diverse community sample of 184 participants.

Results—Early adolescent positive affect predicted less relationship problems (less self-reported and partner-reported conflict, greater friendship attachment as rated by close peers), healthy adjustment to adulthood (lower levels of depression, anxiety, and loneliness). It also predicted positive work functioning (higher levels of career satisfaction and job competence) and increased self-worth. Negative affect did not significantly predict any of these important life outcomes. In addition to predicting desirable mean levels of later outcomes, early positive affect predicted beneficial changes across time in many outcomes.

Conclusions—The findings extend early research on the beneficial outcomes of subjective well-being by having an earlier assessment of well-being, including informant reports in measuring a large variety of outcome variables, and by extending the findings to a lower socioeconomic group of a diverse and younger sample. The results highlight the importance of considering positive affect as an important component of subjective well-being distinct from negative affect.

Keywords

subjective well-being; affect; transition to adulthood; adolescence

The field of subjective well-being has grown rapidly in recent years (Diener, 2013). The major emphasis has been on the causes of subjective well-being, such as income and temperament (Diener, Suh, Lucas, & Smith, 1999). There has also been a focus on the

cultural factors that affect subjective well-being (Tov & Diener, 2007; Oishi, 2002). However, more recently an important question has been how subjective well-being affects later behavior and health (Lyubomirsky, King, & Diener, 2005). Numerous studies now suggest that subjective well-being is beneficial to health and longevity (e.g., Diener & Chan, 2011; Steptoe & Wardle, 2011), as well as work performance (Judge, Thoresen, Bono, & Patton, 2001) and citizenship (Dunn, Aknin, & Norton, 2008).

One of the strongest beneficial outcomes of subjective well-being appears to be supportive social relationships (Frisch, 2005; Moore & Diener, 2015; Oishi, Diener, & Lucas, 2007). People high in life satisfaction and positive affect seem to have better social lives in that when they marry they are more likely to stay married and be happy with their marriages (Luhmann, Lucas, Eid, & Diener, 2013). They are also more likely to report having more friends, closer friends, engage in more social activities, spend time talking with others, and experience better romantic relationships (Diener & Seligman, 2002; Demir, 2008; Mehl, Vazire, Holleran, & Clark, 2010). One of the strongest findings from the National Longitudinal Study of Adolescent Health is that the experience of caring and connectedness are critical to both well-being and academic competence (Resnick et al., 1997). Much research considering the link between negative affect and social relationships has come from assessing interventions for mental illness, suggesting that interventions decrease negative affect which then lead to better social relationships (Mohr, Classen, & Barrera, 2004; Whisman, 2001). Less research has assessed whether negative affect predicts relationship distress or dysfunction directly.

The present study extends past findings in several important ways. First, subjective well-being as a predictor of later life outcomes is more commonly obtained from an adult sample, although several large-scale adolescent studies such as the National Longitudinal Study of Adolescent Health, provides relevant results regarding general well-being as mentioned above. In addition, many samples in previous studies have not been broadly representative. We seek to replicate existing findings of subjective well-being and later outcomes at an early age (14–15 years old) specifically addressing the components of positive and negative affect and with a sample that is more heterogeneous in SES, more racially/ethnically diverse, and with a wider range of educational statuses than most prior research.

By using a sample containing more SES diversity, we are able to determine whether trait levels of positive affect are always predictive of better career outcomes or whether their relation is confined to higher SES samples where positivity mixed with substantial resources is most likely to be rewarded. Diener, Nickerson, Lucas, and Sandvik (2002) found that those high in cheerfulness when they entered college later earned more money, controlling for parent income. However, this effect was strongest for those from higher income families. For those from the lowest income families, a middle-level of cheerfulness in late adolescence seems to have predicted the highest later income. A plausible conjecture is that perhaps high positive affect is most helpful for individuals who are rich in resources, and that for those in more difficult circumstances some dissatisfaction and worry, for instance, might be helpful in motivating young people to achieve more and earn higher incomes. We will address whether affect in adolescence is related to income 10 years later in a lower SES sample of participants.

In the present study we assessed 184 adolescents of which 40% of whom identified as members of a racial/ethnic minority group. The mean parent income during initial data collection in 1998 was around \$40,000 and nearly 40% of parents of these adolescents were not married. Additionally, less than half of the sample ultimately obtained an education level beyond a high school degree. This sample is thus situated to determine whether earlier findings will generalize to a more diverse sample, including substantial numbers of individuals with more restricted resources. We also study individuals throughout a major transition in life – from early adolescence at about age 14 to adulthood at about age 25. Thus, we consider whether relations hold not just across a few years within the same developmental epoch, but across critical developmental transitions as well.

Another purpose of the study is to go beyond self-reported outcome measures. The longitudinal studies evaluating subjective well-being and its components with later outcomes by and large rely exclusively upon self report data. Therefore, the possibility exists for bias to distort the relationship between well-being and later outcomes. In order to combat this potential bias, we obtain reports from close friends and romantic partners to reduce contamination by self-report positivity bias.

Finally, previous research has supported a positive link between social relationships and well-being. Most of these studies have very broadly defined social relationships and functioning. We seek to extend outcome measures related to social functioning by more narrowly defining interpersonal components. Su, Tay, and Diener (2014) developed the Comprehensive Inventory of Thriving (CIT), a measure that broadly captures a range of psychological well-being. The Relationships category of the CIT is further divided into belonging, community, loneliness, respect, support, and trust. A similar division of relationships into finer components will be a key addition in our outcomes related to subjective well-being. Specifically, we will consider whether adolescent affect predicts attachment with peers and conflict in romantic relationships, which are two specific opposing but also broad categories to capture distinct aspects of social functioning.

In addition to social relationships, we also examine whether early subjective well-being predicts healthy adjustment into adulthood. Prior research has highlighted the relationship between higher subjective well-being predicting better health and longevity, but fewer studies have addressed the psychological health subset of functioning. It has been found that the happiest people have low levels of mental illness symptoms (Diener & Seligman, 2002), but the direction of influence is uncertain. We will address whether affect predicts adjustment into adulthood focusing on internalizing behaviors (i.e., depression, anxiety, loneliness) of psychological health. Because we do not have adult measures of affect, we cannot conclude whether it is early affect or stable affect across time that contributed to adult internalizing symptoms.

While past research has found that self esteem moderates the relationship between subjective well-being and social support, coping styles, and spirituality (Smedema, Catalano, & Ebener, 2010), or is correlated with life satisfaction (Diener & Diener, 1995), few studies have assessed its relation specifically to the concept of self-worth. Emmons (1986) found that positive and negative affect related to success or failure of meeting goals, and such goal

pursuit influences self esteem. We will target the link between early affect and adult self-worth to address this conceptual gap in the literature.

Much research has assessed the link between subjective well-being and income (Diener, Sandvik, Seidlitz, & Diener, 1993; DeNeve, Diener, Tay, & Xuereb, 2013). Prior findings have also suggested there is overlap between job satisfaction and life satisfaction, but the direction of influence is debatable (Judge & Hulin, 1993; Judge & Watanabe, 1993). In addition to evaluating whether adolescent affect predicts adult earnings, we will also consider its impact on later job satisfaction and job competence to capture a broader sense of work-related functioning.

In summary, the present study fills several important lacunae in the literature. First, we seek to reduce possible measurement biases by collecting outcomes predicted by aspects of subjective well-being through the use of peer and romantic partner reports. Second, not only does this study predict outcomes nearly a decade after affect measures are collected, but it predicts across major life transitions, that from adolescence into adulthood. Third, the sample is more representative of a diverse and underrepresented population than is typical for subjective well-being predictive research. Fourth, we will assess whether positive and negative affect, distinctly, predict adult life outcomes across the domains of social relationships, adjustment, career, and self worth. In addition, we will include gender and family income as statistical controls in our analyses, given the potential for such demographical information to bias results. Thus, our study adds substantially to earlier research both in the breadth of behavioral outcomes we examine, but also in crucial methodological ways that allow stronger conclusions to be drawn.

Methods

Participant sample

The data are taken from a larger longitudinal study of adolescent development into adulthood focusing on relationships with parents, peers, and romantic partners. The project utilizes a multi-method approach (reports by self, peer, parent, and romantic partner, observed behavior, sociometric data, and physiological data) to assess adolescent development into adulthood.

Participants included 184 seventh and eighth graders (86 male and 98 female) followed over a 12-year period from approximately ages 13 to 25. Participants were interviewed at approximately age 14 (Age: $M=14.265$, $SD=0.765$), 15 (Age: $M=15.213$, $SD=0.814$) and 25 (Age: $M=25.671$, $SD=.963$) years old. The sample was diverse in terms of race, ethnicity, and socioeconomic status: 107 adolescents (58%) identified as Caucasian, 53 (29%) as African American, 15 (8%) as mixed race/ethnicity and 9 (5%) as other. Adolescents' parents reported a median family income around \$50,000. In addition, 109 (63%) of mothers reported being married, 25 (14.4%) divorced, 17 (9.8%) single, and 13.2% other (separated, widowed, or living with partner). In adulthood at age 25 (Age: $M=25.671$, $SD=.963$) years old about 50% of the participants obtained a high school diploma or less (10 (6.37%) participants had some high school education, 19 (12.1%) obtained a GED, and 48 (30.57%) received a high school diploma).

Participants were initially recruited from the 7th and 8th grades of a public middle school in the Southeastern United States with both suburban and urban populations. Students were first recruited via an initial mailing to all parents of students in the school. Those who were interested in the study (98% of parents) were contacted by telephone. Of all eligible students, 63% agreed to participate and informed assent for the adolescents along with informed consent from the parents were obtained before each interview session.

Follow-up data were obtained for 175 (95%) of the original 184 participants at ages 14, 169 (92%) at age 15, and 159 (86%) at age 25. In addition to participant-provided data, close friends provided data at follow-up for 165 participants. Finally, for participants who were in a romantic relationship lasting 3 months or longer at age 15 and 25, 70 romantic partners also provided data for participants and themselves.

Measures

Affect—The Affective Arousal Scale (AAS; Porter, 2000) was used to assess adolescent positive and negative affect at age 14. In practice, the AAS is composed of self-report items that assess feelings before and after a prompt. For the purposes of this analysis, we used the scores from 7 items pre-prompt to obtain a baseline affect score. The AAS asks, “How ___ are you right now?” with different emotions completing the sentence. Participants mark their response on a 100mm visual analog scale ranging from “Not At All” to “Very.” Negative affect is a sum score of sad, worried, angry, upset, and tense while positive affect is a sum score of happy and cheerful. Higher scores indicate more intense levels of affect. Participants completed the AAS at either wave 1 or wave 2 of data collection at age 14 (wave 1 $M=14.263$, $SD=0.765$, wave 2 $M=15.21$, $SD=0.81$). Thus, the AAS provides adolescent positive and negative affect, which serves as our predictive subjective well-being components. The internal consistency is considered good for both positive affect (Cronbach’s $\alpha = 0.73$) and negative affect (Cronbach’s $\alpha = 0.80$).

Social Relationships

Attachment: The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) was used to assess adult and adolescent perceptions of the quality of the target participant’s overall relationship with their close friend. Total attachment quality is calculated as the sum of 21 items addressing communication, trust, and alienation in relationships with high internal consistency (Cronbach’s $\alpha = 0.90$). Close friends of the participants completed the IPPA addressing the perceived attachment of the target participant at ages 14 and 25, with the first wave serving as the baseline measure for adult attachment.

Conflict: Conflict in relationships was assessed via self and romantic partner report from the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985). The NRI is a 45-item measure created to identify relationship type and quality. The conflict subscale is composed of 3 items scored on a 5-point Likert scale. Participants and their romantic partners completed the NRI about the target individual’s relationship at age 16 and age 25. The adolescent self and romantic partner conflict scores serve as the baseline measure for adult and romantic partner reported conflict. Factor analysis suggested the multi-informant

reports load on a single factor; thus self and romantic partner reports were averaged to create a total conflict measure at age 14 and age 25. Internal consistency for the aggregated conflict scale was considered good at age 14 (Cronbach's $\alpha = 0.57$) and at age 25 (Cronbach's $\alpha = 0.78$) particularly given that the scale combines reports of multiple reporters.

Adjustment

Internalizing Symptoms: Internalizing symptoms as a measure of psychological adjustment were assessed at age 14 using two measures (Child Depression Inventory; Beck Anxiety Inventory) and at age 25 using three measures (UCLA Loneliness Scale, Beck Depression Inventory; State-Trait Anxiety Inventory). The UCLA Loneliness Scale assesses loneliness using a 4-point Likert scale ranging from 0–3 and is a self-report measure of 20 items (Russell, Peplau, & Ferguson, 1978). The items consider the degree of social isolation versus immersion and quality of relationships in determining an overall loneliness total score. The total sum score is self-reported for adults (age 25) with a maximum possible score of 60 and with higher scores indicating greater loneliness.

Adults (age 25) reported the degree of their depressive symptoms using the Beck Depression Inventory (BDI). The BDI is a 21-item self-report questionnaire used to assess depression severity (Beck, Rush, Shaw, & Emery, 1979). All items (with the exception of one item with response options as 0=yes 1=no) are rated on a 4-point scale ranging from 0–3. This analysis will consider the total sum score, with higher scores indicating greater severity in depression symptoms. Adolescents (age 14) completed the Child Depression Inventory (CDI; Kovacs & Beck, 1977). The CDI is a 27-item inventory based on the BDI. The self-reported CDI sum score provides a comparable baseline for similar symptoms.

Adults (age 25) completed the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) to report their general anxiety. The STAI measures both immediate and general anxiety, but we will only use the summary scale for trait anxiety. Higher scores indicate greater levels of anxiety. Adolescents (age 14) completed the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988) which is a 21-item self-report questionnaire of anxiety symptoms and summed to provide a total anxiety score. The BAI sum score provides a baseline for anxiety because the STAI was not given in the earlier wave of data collection.

Given that the UCLA Loneliness scale, BDI, and STAI measures were highly correlated and loaded on one factor, an overall measure of Adult Internalizing Symptoms was constructed by first standardizing and then taking the average of these three measures. Internal consistency for the aggregated internalizing symptoms scale at age 25 was considered quite good (Cronbach's $\alpha = 0.84$). In addition, because the CDI and BAI were highly correlated and loaded on one factor, an overall measure of Adolescent Internalizing Symptoms was constructed by first standardizing and then taking the average of these two measures to serve as baseline for internalizing symptoms. Internal consistency for the aggregated internalizing symptoms at age 14 was considered good (Cronbach's $\alpha = 0.71$).

Career

GPA: The grade point average (GPA) for adolescents collected at ages 13, 14, and 15 was averaged to compose a mean adolescent GPA score. Internal consistency for the composite GPA score is considered very good (Cronbach's $\alpha = 0.87$). Because GPA is commonly cited as a predictor of future career success, this average GPA serves as the baseline measure for job competence and career satisfaction as assessed in adulthood.

Income: Income level was obtained at all waves of data collection. We use parent income of the target individual's family of origin during the first data collection time (age 13) as the baseline income level. As mentioned, total household income serves as a covariate in all analyses. Adult (age 25) income was obtained through a self-report item in order to evaluate current income status.

Perceived Job Competence: Perceived job competence and satisfaction were assessed at age 25 using two measures: the 4-item Job Competence subscale of the Adult Self-Perception profile (Adult Harter; Harter, 1995) and a 5-item scale of career satisfaction (Greenhaus, Parasuraman, & Wormley, 1990). The target individual completed the Adult Harter measure to provide a job competence score with higher scores indicating greater job competence. Adult participants also completed a 5-item career satisfaction scale which correlated positively with having a job in general management, salary level, number of promotions received, perceptions of upward mobility, job discretion, supervisory support, perceived personal-organizational value, and job performance. Higher scores indicate greater career satisfaction. Because these two measures were highly correlated and loaded on to one factor, an overall measure of perceived job competence was constructed by first standardizing and then computing the average of these two measures. Internal consistency for the aggregated job competence at age 25 was considered good (Cronbach's $\alpha = 0.59$).

Self Worth

Self Worth: Adult (age 25) self worth was assessed using self-report of the 6-item Global Self Worth subscale of the Adult Self-Perception profile (Adult Harter; Harter, 1995). Higher scores indicate a greater sense of self worth. At age 14, adolescents completed the age-appropriate Self-Perception profile for Adolescents (Harter, 1988). The self worth subscale of the Adolescent Harter was used as the baseline measure for self worth, with higher scores indicating a greater sense of self worth.

Results

Preliminary analyses

Means, standard deviations, Cronbach's alphas, and zero-order correlations for all baseline and outcome variables examined in the study are presented in Table 1. Zero-order correlations for all outcome variables and both positive and negative affect are listed in Table 2. We found the zero-order correlation between positive and negative affect to be -0.22 ($p < 0.01$) with the following descriptive statistics for positive affect ($M=13.61$, $SD=4.23$) and negative affect ($M=1.07$, $SD=1.27$).

In addition, initial analyses examined the role of gender and family income in early adolescence on the primary measures used in the study. Because several outcome measures were related to income and gender, both factors are considered as covariates in the following analyses. Table 2 provides the significance of such regressions for all outcome measures. For the following direct predictions, we list the zero-order correlation along with the significance of the regression equation with gender and income as covariates.

We also included a set of parallel analyses with baseline levels of similar variables as a covariate in order to predict relative change in outcomes, in addition to mean levels of the outcomes, and are also presented in Table 3. For the following predictions above baseline functioning, we provide the standardized estimate for adolescent affect predicting adult outcomes along with its statistical significance.

Attrition analyses indicated that those participants who did not complete all assessments across time points (i.e., ages 14 and 25) were more likely to be male ($p < 0.01$). In addition, participants with romantic partners who did not complete all assessments had lower levels of positive affect ($p = 0.02$). Participants with close friends who didn't complete all assessments were more likely to be male ($p < 0.01$), have lower positive affect ($p = 0.04$), and lower peer-reported attachment ($p = 0.02$).

In order to best address any potential biases due to missing data within waves or attrition in longitudinal analyses, Full Information Maximum Likelihood (FIML) methods were utilized with analyses including all variables that were linked to future missing data (i.e., where data were not missing completely at random). These procedures have been found to provide the least biased estimates when all available data are used for longitudinal analyses (Arbuckle, 1996). Thus, all analyses reflect the entire sample or subsample available; specifically, this means the full sample of 184 adolescents was used for any self report measures, 70 adolescents were included for romantic partner-reported measures, and 165 adolescents were included for close friend-reported measures. Using the full sample provides both the best possible estimates of variances and covariances in measures of interest and least chance for biases due to missing data.

Primary analyses

Predictions of social relationships

Direct prediction: Zero-order correlational analyses, as presented in Table 2, indicated several significant relationships between adolescent positive affect and various interpersonal functioning measures in adulthood. Specifically, positive affect at age 14 was associated with adult (age 25) self and romantic partner reported conflict ($r = -0.25$, $p < 0.01$). The correlation between positive affect and adult attachment in relationships based on friend report was marginally significant ($r = 0.17$, $p = 0.05$). Simple correlational analyses did not indicate any significant relationships between adolescent negative affect and relationships functioning in adulthood in terms of conflict ($r = 0.13$, $p = 0.06$) and attachment ($r = -0.03$, $p = 0.56$).

Predictions above baseline functioning: We next examined whether predictions would remain after controlling for baseline levels of parallel measures of social functioning in adolescence. These analyses reveal whether scores of affect at age 14 predict relative changes in the outcome variables over time. As presented in Table 3, positive affect in adolescence predicted relative decreases in age 25 romantic conflict ($\beta = -0.26, p < 0.01$) after controlling for age 14 conflict as reported by the teen and his or her romantic partner. Positive affect in adolescence marginally predicted total attachment in adulthood as reported by a close friend ($\beta = 0.18, p = 0.05$) after controlling for age 14 close peer-reported attachment of the target participant. Negative affect in adolescence did not predict relative changes in conflict or attachment at age 25 after controlling for baseline measures of social functioning in adolescence. Thus, positive, but not negative, affect in adolescence at age 14 predicted certain social outcomes in adulthood, and predicted desirable relative change over time in these social outcomes.

Predictions of Adjustment

Direct prediction: Positive affect at age 14 was correlated with adult (age 25) self-reports of internalizing symptoms, a composite of depression, anxiety and loneliness ($r = -0.30, p < 0.01$). Simple correlational analyses did not indicate a significant correlation between adolescent negative affect and adult internalizing symptoms ($r = 0.11, p = 0.22$).

Predictions above baseline functioning: We next examined whether predictions would remain after accounting for baseline levels of mental health functioning in adolescence. Positive affect in adolescence predicted relative decreases in the composite internalizing symptoms score ($\beta = -0.27, p < 0.01$) in adulthood at age 25 after controlling for internalizing symptoms at age 14. Negative affect in adolescence did not predict relative changes in self-reported internalizing symptoms after controlling for adolescent depression at age 14. Again, positive affect not only predicted later mean levels of desirable mental health outcomes, but desirable relative changes over time in several of these outcomes as well.

Predictions of Career

Direct prediction: Positive affect at age 14 was correlated with adult (age 25) self-reported career competence and satisfaction ($r = 0.30, p < 0.01$). No significant correlations were found between adolescent negative affect and work-related adult outcomes. In addition, there were no significant correlations between adult income and positive affect ($r = -0.12, p = 0.17$) or negative affect ($r = -0.02, p = 0.84$).

Predictions above baseline functioning: We next examined whether predictions would remain after accounting for baseline levels of grade point average (GPA) in early adolescence (averaging across ages 13, 14, and 15), which is hypothesized to strongly correlate with academic and work achievement. GPA was used in lieu of an exact work-related baseline variable because work-specific measures could not be collected until adulthood. Positive affect in adolescence, after accounting for GPA, continued to predict relative increases in job competence and satisfaction ($\beta = 0.30, p = 0.01$). Adolescent negative affect did not predict relative changes in adult career-related outcomes including

when controlling for GPA in adolescence. Thus, even controlling for achievement behavior in adolescence, positive affect predicted certain later achievement behaviors.

Predictions of Self Worth

Direct prediction: Zero-order correlational analyses indicated a significant relation between adolescent positive affect and adult self-reported self worth ($r = 0.31, p < 0.01$). No significant correlation was found between adolescent negative affect and adult self worth.

Predictions above baseline functioning: We next examined whether predictions would remain after accounting for baseline levels of self worth in adolescence. Positive affect in adolescence at age 14 predicted relative increases in adult self worth as reported by self ($\beta = 0.24, p < 0.01$) even after controlling for self worth in adolescence based on self report. Adolescent negative affect did not predict relative changes in adult self worth when controlling for baseline level of global self worth.

Post-hoc analyses

We also considered whether positive affect was still predictive for any of our outcome measures after controlling for negative affect, income, gender, and baseline. We found that positive affect remained significant in predicting relative increases in self worth ($\beta = 0.24, p < 0.01$) and job satisfaction and competence ($\beta = 0.30, p < 0.01$) at age 25 after controlling for negative affect and baseline equivalents at age 14 along with income and gender. Positive affect continued to predict relative decreases in internalizing symptoms ($\beta = -0.27, p < 0.01$) and conflict ($\beta = -0.24, p < 0.01$) at age 25 after controlling for negative affect, income, gender, and baseline equivalents at age 14. However, positive affect did not continue to predict relative increases in attachment at age 25 ($\beta = 0.17, p = 0.06$) after accounting for baseline income, gender, negative affect, and adolescent attachment at age 14. Taken together, this suggests that negative and positive affect have a more complicated relationship in predicting relative changes in attachment.

Discussion

Adolescent positive affect appears to be associated with many important life outcomes in adulthood, even after accounting for baseline levels of the outcome measures. Using a longitudinal framework with an early subjective well-being measure and predicting outcomes throughout adolescence and into adulthood suggests teen affect may play a critical role in development. Overall, positive affect was more strongly predictive of life outcomes than was negative affect. Our results replicate and extend several previous findings by examining predictions from positive affect from adolescence to adulthood and by examining such predictions in a more heterogeneous sample than has typically been considered (lower SES, racially/ethnically diverse, with a broader range of educational and parental statuses).

Adolescents who reported higher positive affect were more likely to have less conflict in relationships based on reports by both participants and their romantic partners in adulthood. Close friends were also more likely to report that those adolescents with higher positive affect have healthy attachment with friends in adulthood. Both of these interpersonal

outcomes remained significant even after accounting for baseline relationship functioning in adolescence. Therefore, positive affect seems to predict the development of better intimate relationships and friendships, even after accounting for baseline relationship quality in adolescence. These findings indicate that positive affect not only predicts desirable behaviors, but also predicts positive relative changes in them over time.

Why might positive affect potentially lead to better social relationships? Functional accounts of emotions suggest that affect guides behavior in general, and social behavior in particular, by serving informative, evocative, and incentive functions (Keltner & Haidt, 2001; Keltner & Kring, 1998). Furthermore, psychological disorders result when the social function of emotions becomes impaired in some way, and the disorders tend to further disrupt relationships. Positive emotions inform the person that the activity is going well and therefore is worth repeating, and the pleasant feelings associated with the positive emotions serve to reinforce the behavior causing them so that it is more likely in the future. In terms of the evocative function, positive emotions can foster such activities as play, which people may share with others and thereby build bonds with them. Another prominent theoretical explanation of the connection between positive feelings and strong social bonds is the broaden-and-build theory of Fredrickson (1998, 2001; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Fredrickson maintains that the primary reason we experience positive emotions is to broaden and build our resources for the future, and one type of important resource is social support. Thus, positive emotions allow us to build close attachment with others that can help them cope with future challenges.

Interestingly, our results suggest that positive affect predicts the *development* of attachment with friends and conflict in romantic partnerships. Perhaps adolescents with higher positive affect learn to develop close relationships with peers over time. Negative affect was not correlated with or predictive of conflict and attachment in adulthood. This suggests that, although poor early relationship functioning is predictive of poor adulthood social functioning, negative affect does not predict additional relative deficits over time. Nonetheless, it appears that even after accounting for romantic experiences that emerge during adolescence and the possible long lasting impacts of romantic relationships into adulthood, *positive* affect is predicting the likelihood of adults to have fewer conflict-ridden romantic relationships.

As mentioned previously, much research relating affect and mental illness has focused on interventions to reduce negative affect that is often comorbid with disorders. Little research has addressed the relationship between positive affect and healthy adjustment and mental functioning. Our results suggest that it may be worth enlarging the existing framework. Results indicated that adolescent positive affect potentially buffered against the development of common mental distress through relative decreases in mental illness, while negative affect was not significantly predictive of any later mental health outcomes. Specifically, those adolescents with higher positive affect appear to be less likely to *develop* internalizing problems such as depression, anxiety, or loneliness in adulthood, even when controlling for baseline levels of such distress. It appears that positive affect seems at least partially influential in aiding healthy adjustment into adulthood, while negative affect may not be as

critical. If replicated, these findings may have rather dramatic implications for mental health and interventions.

The relationship between early subjective well-being components and later adult career-related outcomes provided conflicting results with existing literature. Neither positive nor negative affect in adolescence was significantly related to or predictive of income levels ten years later. Diener et al. (2002) found that college freshman who reported higher cheerfulness earned higher incomes 19 years later. However, these effects were strongest for students from affluent families and weak for those from poorer families. The authors suggested that perhaps those students with a more disadvantaged background could benefit from a more moderate amount of cheerfulness in order to be motivated to change their circumstances by earning higher incomes. Based on this logic, it appears that while we failed to replicate the link between positive affect predicting higher incomes, it could be due to our more representative SES sample. Few people in our sample were from affluent families and thus positive affect might not be strongly tied to future earnings. Nonetheless, adolescents with greater positive affect were more likely to feel competent and satisfied with their career ten years later, even when controlling for baseline academic performance. It is interesting to note that negative affect was not correlated with or predictive of any career-related outcomes.

Previous literature left a gap in directly assessing the relationship between subjective well-being components and self worth. Our results suggest that there is a significant correlation between early positive affect and adult self worth. Even after accounting for baseline levels of perceived self worth, this relationship remained significant. Thus, positive affect not only predicted self-esteem but seemed to help *build it over time*. Again, negative affect was not correlated with or predictive of adult self worth.

Taken together, results suggest that adolescent positive affect may have a strong correlational and predictive relationship with many important life outcomes, while negative affect is less strongly associated with parallel outcomes. This suggests that it may be worthwhile to shift our attention towards the merit of positive affect rather than focusing solely on the negative, as prior research has tended to do.

Our results add to the growing body of literature assessing how subjective well-being components are related to beneficial life outcomes. Our study is distinct in that we used a multi-informant approach, collecting information from peers and romantic partners beyond only self-report data. In addition, our sample is unique in that we assessed subjective well-being components at an early age (14 years) and evaluate their interaction with development across the critical transition into adulthood. Our sample is heterogeneous in terms of race/ethnicity, education level, income, and marital status especially compared to the relatively high SES samples of previous similar studies.

Not only do our results indicate that early affect may be predictive of positive life outcomes a decade later, but many of these predictions remained significant when controlling for baseline versions of the outcome measures. Therefore, we are not only proposing that early affect is associated with certain levels of later life outcomes, but rather that positive affect

specifically may be predicting desirable relative changes in critical social, adjustment, self worth, and career outcomes over time, consistent with Fredrickson's broaden-and-build model (1998, 2001).

While the results are promising in filling in several gaps in the subjective well-being literature, there are several limitations. First, our full sample size is 184 participants, with smaller samples of other informants (i.e, peers and romantic partners). Due to a relatively moderate sample size, we have relatively lower power, which may contribute to difficulty for detecting independent effects of positive and negative affect. In addition, given the correlational nature of the study, unmeasured variables could potentially account for both predictor and outcome variables. For example, perhaps those with stable home environments, safer neighborhoods, or academically superior schools might be more likely to have higher positive affect, lower negative affect, concurrent beneficial functioning, and increased beneficial later outcomes. However, there are several considerations that give some weight to our causal interpretation. We did control gender as well as income, which intuitively is one of the more likely confounding variables. In addition, in experiments in which mood is manipulated, social relationships, work achievement and productivity, and citizenship have each benefitted by induced positive moods (Barsade, 2006; Boehm & Lyubomirsky, 2008; Lyubomirsky, King, & Diener, 2005; Staw & Barsade, 1993; Tenney, Poole, & Diener, 2015). Similarly, in laboratory studies in which positive moods are induced, people tend to become more sociable and cooperative (e.g., Moore & Diener, 2015). Another relevant finding is that when people are treated for depression and their positive moods rise, their social relationships also improve (e.g., Mohr, Classen, & Barrera, 2004; Whisman, 2001). These studies suggest that early positive affect is not merely a result of some unmeasured third variable, but that it is plausibly influential in the later outcomes.

Although our results combined with the experimental findings make plausible the influence of early levels of affect on life outcomes, several additional types of studies will help to identify the influence with more certainty. First, we can assess in future longitudinal studies potential third variables and determine the degree to which they account for the relation between affect and behavioral outcomes. Second, large-scale interventions can be conducted in which people's long-term levels of positive affect are raised, and changes in the behavioral outcomes observed.

Finally, we should measure both affect and outcome at each point in time in longitudinal studies in order to determine whether they change together. It is important to note across all of our findings, the possibility exists that it is concurrent levels of positive and negative affect that are associated with the critical outcomes in adulthood that we have assessed. We acknowledge that it is possible that the dispositional level of affect is accounting for the positive life outcomes that are related to our measure of adolescent positive affect. Without controlling for the concurrent level of affect in adulthood, it may be that the stability of affect overtime is the driving force behind our findings. However, much previous research has indicated that affect remains relatively stable overtime, especially once reaching early adulthood. For example, Watson & Walker (1996) found that positive and negative affect had a significant moderate level of stability from approximately age 18 to 24. Overall, personality does change overtime, but common patterns emerge such that overall people

increase in emotional stability and social dominance in young adulthood and increase on openness and social vitality in adolescence (Roberts, Walton, & Viechtbauer, 2006; Robert & Mroczek, 2008). Because people generally change in the same direction, it is likely that we would still find an association between adult affect and our measures of social relationships, work, adjustment, and self worth.

Nonetheless, in future waves of data collection with our sample, we may administer an affect measure in order to address this potential confound of affect stability. Ideally, we would compare both concurrent and predictive relationships between affect and our critical outcomes with the new affect data. While there is general stability or patterns of change in personality across development, it would be very important to parse these effects apart.

Future research may seek to identify possible moderating effects that circumscribe or amplify the relationship between adolescent affect and later life outcomes. For example, might positive affect benefit later income more in the context of a benign rather than impoverished childhood? Might positive affect be more helpful to individuals who are conscientious? Understanding moderators will help us to understand *why* positive affect is potentially beneficial across the transition from adolescence to adulthood. Two related additional lines of research may address whether the balance between positive and negative affect or the change in affect may also be associated with adult life outcomes. Although we have considered positive and negative affect as distinct predictors, perhaps viewing the relationship between the two may provide additional insight into the predictive power of adolescent affect on adult life outcomes. Alternatively, perhaps emotional reactivity, measured by change in positive or negative affect in response to a conflict or reward, can account for the change in various life outcomes during the transition to adulthood. An important additional issue for future research is the examination of the effects of specific positive emotions on behavior. Although it seems self-evident that specific positive emotions such as gratitude might help us get along with others and receive more support from them (Emmons & McCullough, 2004; McCullough, Emmons, & Tsang, 2002), it is not quite as obvious that all positive emotions, for example enjoyment or pride, would do so. Thus, a key question in this area is to uncover which positive emotions are most predictive of future stronger relationships and which are not. Thus, there are a number of important research questions remaining about when and why positive emotions might improve social relationships. Our results provide an exciting area to which we can further evaluate the relationship between early subjective well-being components and beneficial life outcomes in adulthood.

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Table 1

Descriptive statistics and correlations between all baseline and outcome measures

	Mean	SD	Cronbach's alphas	2	3	4	5	6	7	8	9	10
Age 13												
1. Attachment	98.62	15.05	.90	-.05	-.01	.05	.10	.08	-.24*	-.14	.25***	.26***
2. Conflict	5.63	2.16	.57	-	.23*	-.29**	-.25*	-.13	.36**	.01	-.04	-.08
3. Internalizing Symptoms	.00	.88	.71		-	-.10	-.42***	.01	.18	.24***	-.14	-.18*
4. GPA	2.80	.85	.87			-	.03	.11	-.34**	.06	.04	.02
5. Self Worth	13.18	2.68	.83				-	.05	-.22*	-.28**	.22*	.34***
Age 25												
6. Attachment	109.00	12.21	.92					-	-.10	-.21*	-.01	.04
7. Conflict	7.05	2.24	.78						-	.25*	-.24*	-.23*
8. Internalizing Symptoms	.00	.86	.84							-	-.58***	-.71***
9. Job Competence	.00	.85	.59								-	.72***
10. Self Worth	19.77	3.70	.89									-

Table 2

Correlations of Affect and Later Outcomes

Variable	Zero-order correlation	Significance when controlled for T1 income and gender
<i>Positive Affect</i>		
Attachment	0.17	0.05
Conflict	-0.25	<0.01
Internalizing Symptoms	-0.30	<0.01
Job Competence	0.30	<0.01
Self Worth	0.31	<0.01
<i>Negative Affect</i>		
Attachment	-0.03	0.56
Conflict	0.13	0.06
Internalizing Symptoms	0.11	0.22
Job Competence	-0.08	0.34
Self Worth	-0.11	0.20

Table 3

Standardized estimates for all covariates in regression models

Variable	Gender	Income	Baseline Equivalent	Affect
Positive Affect				
Attachment	0.21	-0.01	-0.03	0.18 *
Conflict	-0.01	-0.27 **	0.31 **	-0.26 **
Internalizing Symptoms	0.08	-0.01	0.14	-0.27 ***
Job Competence	0.03	0.01	0.05	0.30 ***
Self Worth	-0.01	0.06	0.27 ***	0.24 **
Negative Affect				
Attachment	0.22	0.01	-0.04	-0.06
Conflict	-0.04	-0.28 **	0.31 **	0.15
Internalizing Symptoms	0.06	-0.01	0.23 *	0.01
Job Competence	0.04	0.02	0.01	-0.08
Self Worth	-0.01	0.06	0.35 ***	-0.01

*
p-value < .05,**
<.01,***
<.001