

Hope and emotional well-being: A six-year study to distinguish antecedents, correlates, and consequences

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Hope is a motivational factor that helps initiate and sustain action toward long-term goals, including flexible management of obstacles that get in the way of goal attainment. Despite an abundance of research on the benefits of hope, little attention has been given to this aspect of youth development via longitudinal studies. In this study, we collected ratings of hope and positive and negative affect from 975 adolescents over a six-year assessment period (Grades 7–12). Using cross-lagged structural equation modeling, we found that hope led to greater positive affect, with little evidence for the reverse direction. In contrast, hope and negative affective states were reciprocally related. Hope predicted future well-being particularly well in years when the young people were in transition (e.g. starting high school and transitioning to senior high school). Our data support the position that hope is a malleable attribute that fosters positive youth development.

Keywords: hope; well-being; positive emotions; negative emotions; adolescence

The adolescent years are a critical developmental period characterized by rapid biological and social changes and challenges. Contrary to prior accounts of inevitable ‘storm and stress’, teenagers exhibit substantial variability in their levels of emotional distress across time (Arnett, 1999). For this reason, it is crucial for researchers and practitioners to understand the factors that are most useful in predicting healthy psychological development (Lerner & Galambos, 1998; Steinberg & Morris, 2001; Trzesniewski et al., 2006).

Decades of research have shown that motivation-related attitudes and states are associated with physical and mental health, adjustment to stressful life events, and success in work, social relationships, sports, and other personal aspirations (Bandura, 1982; Deci & Ryan, 1985; Duckworth, Peterson, Matthews, & Kelly, 2007; Loch & Latham, 2002; Snyder, 2000).

Such studies appear to be based on the assumption that beliefs of personal efficacy, setting clear goals, developing strategies to implement goals, and believing that setbacks can and will be overcome, reflect a healthy pattern of coping with negative life events and an ability to harness the benefits of positive life events. Hope is a particularly promising individual difference factor that helps initiate and sustain action toward long-term goals, including flexible management of obstacles that might interfere with accomplishments (Snyder & Lopez, 2002; Snyder, Rand, & Sigmon, 2002). In this study, we

focused on hope and the potential contributions to the emotional well-being of adolescents.

Unlike the majority of research that has relied on cross-sectional, experimental, and brief prospective studies in adults (Cheavens, 2000; Snyder, 2000), we examined whether hope is an antecedent or consequence of emotional experiences over the six years of our study. Hope has been judged to be a psychological strength relevant to the (Snyder, 2000). Development of well-being, and developmental questions can only be addressed by assessing repeated measures of these constructs. The present study, with six assessment periods, extends several studies that have examined hope in adolescents at two time points in a single year (Ciarrochi, Heaven, & Davies, 2007; Valle, Huebner, & Suldo, 2006).

People with high levels of hope possess a capacity to implement goals for themselves (agency) and are adept at discovering how to achieve them (pathways). This second component of hope has explicit links theoretically to psychological flexibility (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Kashdan & Rottenberg, 2010). People with high levels of hope flexibly adjust implementation strategies and goal-related efforts when thwarted (Snyder, 1996, 2002). Hope can be distinguished from related variables such as optimism and positive explanatory style. Both hope and optimism are focused on the future. Optimism refers to the belief that positive events are highly likely to occur in the future

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(Scheier & Carver, 1985) and explanatory style refers to the tendency to attribute positive events to stable and internal factors (Peterson & Seligman, 1984). In contrast, hope encompasses the ability to generate *and* implement plans for the future (Bailey, Eng, Frisch, & Snyder, 2007) and is focused on what people can do to achieve their goals (Magaletta & Oliver, 1999; Snyder, 1994).

Hope and optimism have been shown to load on separate factors (Bryant & Cvengros, 2004; Magaletta & Oliver, 1999), and hope explains unique variance above and beyond optimism when predicting mental and physical health outcomes (Bailey et al., 2007; Kashdan et al., 2002; Magaletta & Oliver, 1999). Likewise, hope is broader and distinct from related variables such as global self-esteem which reflects a positive self-evaluation (Rosenberg, 1965), and self-efficacy, which reflects the belief that one can successfully complete a specific behavior (Bandura, 1982).

Hope and well-being

There are a number of reasons why hope is likely to underpin psychological well-being. First, research suggests that people with higher hope cope better with stressful life events (Chang, 1998; Ciarrochi et al., 2007; Horton & Wallander, 2001; Valle et al., 2006). Second, hope has been found to predict successful outcomes across a range of domains. For instance, hope predicts better athletic performance in college athletes beyond training and coach ratings of natural ability (Curry, Snyder, Cook, Ruby, & Rehm, 1997), greater academic success (Ciarrochi et al., 2007; Snyder et al., 1991), better understanding and use of prevention strategies when at high risk for cancer (Irving, Snyder, & Crowson, 1998), and greater engagement and gains in therapy (Snyder et al., 2000). In a study of pediatric transplant patients, higher hope was negatively related to emotional distress and in turn, greater adherence to an appropriate medication regime (Maikranz, Steele, Dreyer, Stratman, & Bovaird, 2007).

There are multiple, competing life goals aligned with the developmental milestones of adolescence. Adolescents are balancing the need for autonomy with their dependency on caregivers and teachers, the need for belonging with the challenge of navigating the social rules and hierarchy of high school, and the need for competence with the challenges of a daily regimen of academics, athletics, and novel social situations. A central tenet of hope is that this attribute, psychological strength, or motivational factor increases the likelihood of the successful pursuit of goals (Snyder, 2000, 2002). Within this context, there is evidence that the association between measures of hope and meaning in life is large in magnitude, ranging from 0.52 to 0.77 (Feldman & Snyder, 2005; Mascaro & Rosen, 2005). Furthermore, research suggests that in adolescents and adults, the positive associations between measures of happiness and purpose in

life is fully mediated by hope (Bronk, Hill, Lapsley, Talib, & Finch, 2009). In attempts to distinguish who ends up on a trajectory of positive youth development – operationalized as children with a high sense of competence, confidence, character, connections to other people, and caring – researchers found that hope scores were the best predictor, outperforming other candidates such as self-regulatory skill (Schmid et al., 2011). Additional longitudinal research revealed that baseline levels of adolescent hope were positively related to life satisfaction and negatively related to stressful life events and other indices of maladjustment one year later (Valle et al., 2006). Taken together, theory and research suggests that the goal-directed nature of hope seems particularly suited to the development and maintenance of well-being in youth.

The most widely used indicators of well-being tend to be frequent, intense levels of positive emotions and infrequent, low levels of negative emotions (Diener, Suh, Lucas, & Smith, 1999; Lyubomirsky, King, & Diener, 2005; Watson & Vaidya, 2003). This makes sense as most of human behavior is purposeful, targeting an increase in positive emotional states (e.g. be happy) and decrease in negative emotional states (e.g. avoiding anything that leads to misery or despair). Human beings, similar to other animals, strive to attain rewards and avoid pain. Positive/pleasant emotions tend to be preferred over negative/unpleasant emotions. However, the value of emotions extends beyond hedonic benefits. Emotions orient individuals to best manage the demands of an existing situation (Fredrickson & Levenson, 1998; Frijda, 1986; Tamar, 2009). When individuals believe that they are making progress in attaining their goals, whether unimpeded or impeded, this leads to positive emotions (Scheier & Carver, 1985; Snyder, 2002). Likewise, negative emotions arise from beliefs that goal-related efforts have failed or might fail (Ortony, Clore, & Collins, 1988). Feelings of guilt are a cue that an individual might have engaged in an inappropriate behavior that adversely affected their social standing and repairing the relationship should be a priority. Feelings of love signal that a relationship is worthy of investment, promoting an increase in resource allocation. Not surprisingly, existing psychological interventions designed to ameliorate problems of mental and physical health or enhance quality of life often place an emphasis on emotional well-being as an indicator of therapeutic efficacy (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hofman, Sawyer, Witt, & Oh, 2010; Suveg, Southam-Gerow, Goodman, & Kendall, 2007).

Typically, people with higher levels of hope endorse a greater frequency and intensity of positive emotions and conversely, fewer and less intense negative emotions (Snyder et al., 1996). Thus, levels of hope are tied to particular affect, such that goal setting with a sense of agency and flexibility is reinforced by positive emotional states, whereas conversely, a lack of effort and progress

toward personally meaningful goals is often the cause of reductions in emotional well-being – less positive emotions and more negative emotions (Deci & Ryan, 1985; Little, Salemla-Aro, & Phillips, 2007; McKnight & Kashdan, 2009) across the globe (Sheldon et al., 2004). Understanding whether and how hope influences the generation of particular emotional states offers insight into the development and maintenance of well-being.

An assumption of cross-sectional studies is that high hope causes well-being (Magaletta & Oliver, 1999) and fuels increased goal achievement behavior (Snyder & Feldman, 2000).

Some theorists suggest that hope precedes changes in the emotional quality of a person's life (Snyder, 2000, 2002), and other theorists argue that feeling good leads to increased goal striving and hope (Ashby, Isen, & Turken, 1999; Fredrickson, 2001). Researchers have found that inducing positive emotions leads to more effective, flexible, and creative problem-solving (Isen, Daubman, & Nowicki, 1987; Isen & Means, 1983). Flexible, creative problem-solving is related to Snyder's (2000) pathways dimension of hope or the capacity to find alternative routes to obtaining goals under challenging circumstances. Positive emotional states often inspire people to set new, meaningful goals and devote the effort to attain them and grow as a person (Garland et al., 2010; Thrash, Elliot, Maruskin, & Cassidy, 2010). Thus, there is reason to believe that hope might serve as an antecedent or consequence of emotional states.

The present study

The adolescent years are characterized by mean level changes in the major personality dimensions (Roberts & DelVecchio, 2000), as well as lower-order dimensions such as hope. To date, little longitudinal research has been conducted to assess the stability of hope and the direction of influence between hope and well-being among adolescents. In this study, we conducted an empirical test of whether and how hope is linked to emotional well-being during the adolescent phase of human development. Over the course of six years, capturing the totality of adolescence, we examined the extent that hope served as an antecedent to changes in emotional well-being, a consequence, or both (reciprocal influence model). Of additional interest was whether any emotional benefits linked to hope differed between boys and girls. In the relative absence of multi-wave longitudinal studies, gender differences in the stability and benefits of hope and affect should be considered exploratory.

Method

Participants and procedure

Participants were students at five high schools from a Catholic Diocese of New South Wales, Australia.

Catholic schools in Australia tend to be government-subsidized, charge low fees, and accept a proportion of students from other faiths. The Diocese was in a regional city with a population of approximately 250,000 that included small coastal towns, rural districts, and outer south-western suburbs of Sydney. Data were collected from participants each year for the six years of their secondary education. The total sample consisted of 975 participants (499 male, 474 female, 2 unknown). 237 participants completed all six waves, 484 completed at least five waves, 695 completed at least four waves, and 828 completed at least three waves. Mean waves completed was 4.2 (SD = 1.48). Participants completed measures at approximately the same time each year, from Grade 7 (mean Age = 12.41, SD = 0.53) to Grade 12 (mean age = 17.37, SD = 0.50).

The occupations of the fathers of our participants at Time 1 resembled national distributions (Australian Bureau of Statistics, ABS, 2004): Professionals comprised 20.4% of the sample (whereas nationally the figure was 16.5%); associated professionals, 15.1% (12.7%); intermediate production and transport, 11.2% (13.4%); tradespersons, 34.3% (21%); managers, 4.8% (9.7%); laborers, 3.3% (10.8%); advanced clerical, 1.2% (0.9%); intermediate clerical, 5.5% (8.8%); and elementary clerical, 4.3% (6.1%).

We obtained university ethics clearance for each year of the study as well as clearance from the Diocesan Schools Authority, parents, and schools. Students were invited to participate in a study on 'Youth Issues' and both students and parents provided consent prior to completing the questionnaire each year. At all times, administration of the questionnaires took place during regular classes under the supervision of either a teacher or a member of the research team. Students completed the questionnaires without any discussion. At the conclusion of each testing session, students were thanked for their participation and debriefed.

Measures

Children's hope scale (Snyder et al., 2002)

This scale comprises six items that participants responded to on a Likert scale with endpoints that ranged from 1 (*none of the time*) to 6 (*all of the time*). The scale items assess the agency aspects of hope (e.g. 'I think I am doing pretty well') as well as pathways hope (e.g. 'I can think of ways to get the things in life that are most important to me'). This measure has demonstrated validity (Snyder, 2000; Snyder et al., 1997) and is known to be correlated to measures of adolescent adjustment (Valle et al., 2006). Hope has been shown to be distinguishable from other related constructs, such as optimism, hopelessness, self-esteem, and emotional

awareness (Bryant & Cvengros, 2004; Heaven, Ciarrochi, & Hurrell, 2010; Magaletta & Oliver, 1999; Snyder et al., 1997). It has shown criterion related validity, linking to positive parenting style (Heaven & Ciarrochi, 2008) school grades (Ciarrochi et al., 2007), standardized test performance (Snyder et al., 1997), and positive psychological outcomes (Kashdan et al., 2002). On the present occasion, alpha coefficients from Grade 7 to 12 were 0.82, 0.85, 0.86, 0.90, 0.88, and 0.89, respectively.

Positive and negative affect schedule – expanded form (PANAS-X; Watson & Clark, 1994)

The PANAS-X was used to assess a number of affective states, namely, fear (6 items), sadness (5 items), hostility (6 items), and joviality (8 items). Students were asked to describe their feelings and emotions over the past month. Evidence shows strong convergence between trait and state indices of affect when using the PANAS-X (Watson & Clark, 1994). Alpha coefficients ranged from 0.82 (hostility; Grade 8) to 0.95 (joviality; Grades 10, 11, and 12). These instruments have been well validated and are the most widely employed measures of subjective well-being (Linley, Matlby, Wood, Osborne, & Hurling, 2009).

The hope and PANAS scales were treated as latent variables in SEM, in order to explicitly represent measurement error in the models (Weston & Gore, 2006). Due to the large number of parameters to be estimated, we used a parceling procedure in accordance with Little, Cunningham, and Shahar (2002). For models where items measure a single construct, parcels can be created through random assignment of items to individual parcels (Coffman & MacCallum, 2005). Numerous authors have noted the advantages of using item parcels since they are more normally distributed, reliable, less influenced by unique characteristics of individual items and require the estimation of fewer parameters (Bagozzi & Heatherton, 1994; Coffman & MacCallum, 2005; Kishton & Widaman, 1994; West, Finch, & Curran, 1995). The latent hope and positive affect factors were specified as a one-factor model, based on three item parcels, each consisting of randomly selected items from each questionnaire. The smaller negative affect scales were also specified as one-factor models with each parcel consisting of two items.

Results

Preliminary results

Missing value analyses revealed only two significant differences between those who completed all waves and those who did not. Completers had slightly higher hope

in Grades 8 and 9 ($M_8 = 4.57$, $SD = 0.94$; $M_9 = 4.43$; $SD = 0.94$) than non-completers ($M_8 = 4.39$, $SD = 0.96$; $M_9 = 4.26$; $SD = 1.00$), $p < 0.05$, Cohen's $d < 0.20$. Completers and non-completers were similar on measures of positive and negative affect, with no significant differences and Cohen's d not larger than 0.12. Thus, while some selectivity effects were observed for hope, the effects were typically small. Nevertheless, in all analyses, we dealt with missing data using full-information maximum likelihood estimation (FIML). Traditional approaches to missing data (e.g. listwise or pairwise deletion) can lead to considerable bias in parameter estimates. In contrast, FIML provides a superior approach to dealing with missing data which uses all the available information for parameter estimation (Enders & Bandalos, 2001).

We found no associations between any of our variables and mothers and fathers employment status, all $ps > 0.05$. We next examined bivariate correlations between hope, negative affect, and positive affect across the school years. Correlations between positive and negative affect were moderate in magnitude with larger effect sizes when both variables were measured in the same year (r varied between $-.44$ in Grade 12 and -0.25 in Grade 8). Correlations were lower across years (cross-grade r varied between -0.08 [Grade 7 and 11] and -0.29 [Grade 10 and 11]). Bivariate correlations are presented in Table 1 and indicated strong relationships between the variables of interest over time.

Table 1. Intercorrelations for hope, joviality, and negative affective states across six high school years.

	Hope7	Hope8	Hope9	Hope10	Hope11	Hope12
Fear7	-0.21**	-0.16**	-0.15**	-0.19**	-0.09	-0.19**
Fear8	-0.08*	-0.12**	-0.18**	-0.19**	-0.13**	-0.18**
Fear9	-0.07	-0.06	-0.16**	-0.23**	-0.19**	-0.19**
Fear10	-0.12**	-0.09*	-0.16**	-0.25**	-0.24**	-0.19**
Fear11	-0.11*	-0.15**	-0.21**	-0.29**	-0.37**	-0.25**
Fear12	-0.05	-0.03	-0.14**	-0.20**	-0.14**	-0.31**
Hos7	-0.35**	-0.28**	-0.21**	-0.22**	-0.12*	-0.20**
Hos8	-0.22**	-0.22**	-0.21**	-0.21**	-0.18**	-0.19**
Hos9	-0.17**	-0.18**	-0.23**	-0.21**	-0.17**	-0.24**
Hos10	-0.12**	-0.04	-0.15**	-0.21**	-0.18**	-0.22**
Hos11	-0.14**	-0.16**	-0.26**	-0.30**	-0.33**	-0.33**
Hos12	-0.18**	-0.16**	-0.25**	-0.23**	-0.14**	-0.36**
Sad7	-0.27**	-0.21**	-0.18**	-0.25**	-0.14**	-0.23**
Sad8	-0.15**	-0.29**	-0.28**	-0.33**	-0.25**	-0.27**
Sad9	-0.15**	-0.19**	-0.33**	-0.39**	-0.31**	-0.30**
Sad10	-0.17**	-0.13**	-0.26**	-0.40**	-0.28**	-0.24**
Sad11	-0.17**	-0.17**	-0.26**	-0.35**	-0.42**	-0.30**
Sad12	-0.15**	-0.14**	-0.25**	-0.26**	-0.24**	-0.40**
Jov7	0.40**	0.25**	0.25**	0.25**	0.27**	0.26**
Jov8	0.33**	0.50**	0.34**	0.32**	0.32**	0.25**
Jov9	0.27**	0.34**	0.50**	0.41**	0.35**	0.32**
Jov10	0.23**	0.26**	0.35**	0.48**	0.37**	0.26**
Jov11	0.19**	0.19**	0.32**	0.39**	0.49**	0.27**
Jov12	0.24**	0.24**	0.35**	0.30**	0.34**	0.51**

Note: * $p < .05$; ** $p < .01$.

Structural equation modeling strategy

We utilized Mplus 6.1 and structural equation modeling to represent the relationships between hope and affective states across the six years of the study. We utilized maximum likelihood parameter estimates with standard errors and a chi-square test statistic that are robust to non-normality.

The data for the current study had a nested data structure in which students were nested within schools. If this complex data structure is not accounted for, standard errors, chi-square, and log-likelihood values may be biased (Hox, 2010). Therefore, we utilized the TYPE = COMPLEX option in Mplus, which adjusts standard errors for the effects of clustered data and hence provides appropriate statistical significance tests.

Models were considered to fit the data well if a) the solution was well-defined, b) parameter estimates were consistent with the theory proposed, and c) the fit indices were acceptable, giving emphasis to fit indices which are appropriate for larger sample sizes (Marsh, Balla, & McDonald, 1988; McDonald & Marsh, 1990). Specifically, we provide two additional fit indices in addition to chi-square, considering its sensitivity to sample size (all chi-squares for the models were, as expected, significant). The comparative fit index (CFI) ≥ 0.97 and root mean square error of approximation (RMSEA) < 0.05 were considered to provide evidence of model fit in accordance with commonly accepted criteria.

Testing measurement invariance across time and gender

Before testing the relationship between hope and affect, we first considered whether the instruments operated in a similar manner across time and gender. This is important as differences in the way gender respond to a questionnaire or, indeed, differences in the way individuals respond over the course of high school represents a potentially concerning confound for this research (Parker, Dowson, & McInerney, 2007). For this reason, we employed multi-group (across gender) and longitudinal invariance testing. Invariance testing consists of first fitting a baseline model (M1) which holds only the model structure the same across groups and across time (i.e. configural invariance). Should this model provide an acceptable fit to the data, it is used as a baseline from which increasingly restrictive nested models are then compared. Multiple models are used as different invariance assumptions underlying various analyses. The present study is particularly focused on the covariance-based models (e.g. the cross-lagged models) that assume weak factorial invariance (M2; i.e. configural and indicator factor loadings are held to have the same weight for the same indicators across each year in the study). In addition, the comparison of latent means across time and gender assumes strong factorial invariance (M3: i.e. configural and factorial variance, and intercepts for matching items are held invariant across the different years).

Evidence of invariance comes from comparing a well-fitting baseline model to alternate nested models.

Table 2. Gender and longitudinal measurement invariance statistics.

	χ^2	df	$\Delta\chi^2$	CFI	RMSEA
Hope					
Model 1: Configural	173.77	156	–	0.997	0.016
Model 2: Weak invariance	212.988	183	39.2	0.995	0.019
Model 3: Strong invariance	251.965	193	78.20**	0.991	0.026
Sadness					
Model 1: Configural	199.780	156	–	0.991	0.025
Model 2: Weak invariance	236.119	183	36.34	0.990	0.026
Model 3: Strong invariance	273.277	193	73.50*	0.984	0.031
Joviality					
Model 1: Configural	201.837	156	–	0.994	0.026
Model 2: Weak invariance	227.742	183	36.34	0.994	0.023
Model 3: Strong invariance	252.117	193	50.28**	0.992	0.026
Hostility					
Model 1: Configural	202.039	156	–	0.988	0.026
Model 2: Weak invariance	225.299	183	23.26	0.989	0.023
Model 3: Strong invariance	278.037	193	76.00**	0.978	0.032
Fear					
Model 1: Configural	243.502	156	–	0.989	0.036
Model 2: Weak invariance	310.037	183	66.54**	0.985	0.040
Model 3: Strong invariance	320.191	193	76.70**	0.985	0.039

Notes: Best model highlighted in gray. The configural model estimates measurement structure freely across time and gender; the weak invariance model constraints factor loadings to be equivalent across time and gender; the strong invariance model constrains loadings and intercepts to be equivalent across time and gender.

* $p < .05$; ** $p < .01$.

Invariance sensitivity to sample size of the chi-square that underlies the widespread use of fit indices (e.g. RMSEA, CFI, and Tucker Lewis index (TLI)) does not merely relate to model fit but additionally log-likelihood ratio tests that are often used to conduct such model comparisons. Therefore, in this study, we use the criteria by Cheung and Rensvold (2002) who suggest invariance between nested models if $\Delta CFI \leq 0.01$ (we utilize the same criteria for the TLI) and the criteria described by Chen (2007) who suggest invariance between nested models if $\Delta RMSEA \leq 0.015$.

As can be seen in Table 2, the configural invariance model (M1) was supported in all analyses. Assuming weak (M2) or strong (M3) factorial invariance did not result in a change in CFI and RMSEA for the longitudinal analyses beyond the criteria used in this research (though the assumption of strong invariance would be rejected if the χ^2 -difference test was used). The latent means and standard errors from these analyses are presented in Figure 1. Girls experienced more sadness and fear than boys, but not more hostility. Girls also experienced higher joviality than boys. Finally, girls started out higher in hope than boys, then dropped well-below boys in Grade 10, and bounced back somewhat in Grades 11 and 12.

Cross-lag models

We next sought to evaluate the likely causal ordering of hope and affect. We were particularly interested in the extent that hope acted as an antecedent to the development of affect. We tested a series of increasingly restrictive structural models in order to identify the most parsimonious model concerning these longitudinal relationships. Given the strong invariance model did show a significant decrease in chi-square (though not in CFI and RMSEA), we report the results for the weak invariance models below, and the strong invariance models in the supplementary materials. Assuming strong or weak invariance had no significant effects on the autocorrelations and cross-lags.

Model 1 allowed the cross-lag and autoregression estimates to vary across year, and estimated autoregression effects across all lags. Model 2 was the same as Model 1 except that autoregression paths were constrained to single year spans (e.g. from Time 1 to Time 2 but not Time 1 to Time 3). Finally, Model 3 constrained all autoregression and cross-lag effects from Model 2 to be consistent across time. This model was thus a test of whether the relationship between hope and affect had consistent developmental effects across high school. To compare these models, as with gender and longitudinal invariance above, we used the criteria described above.

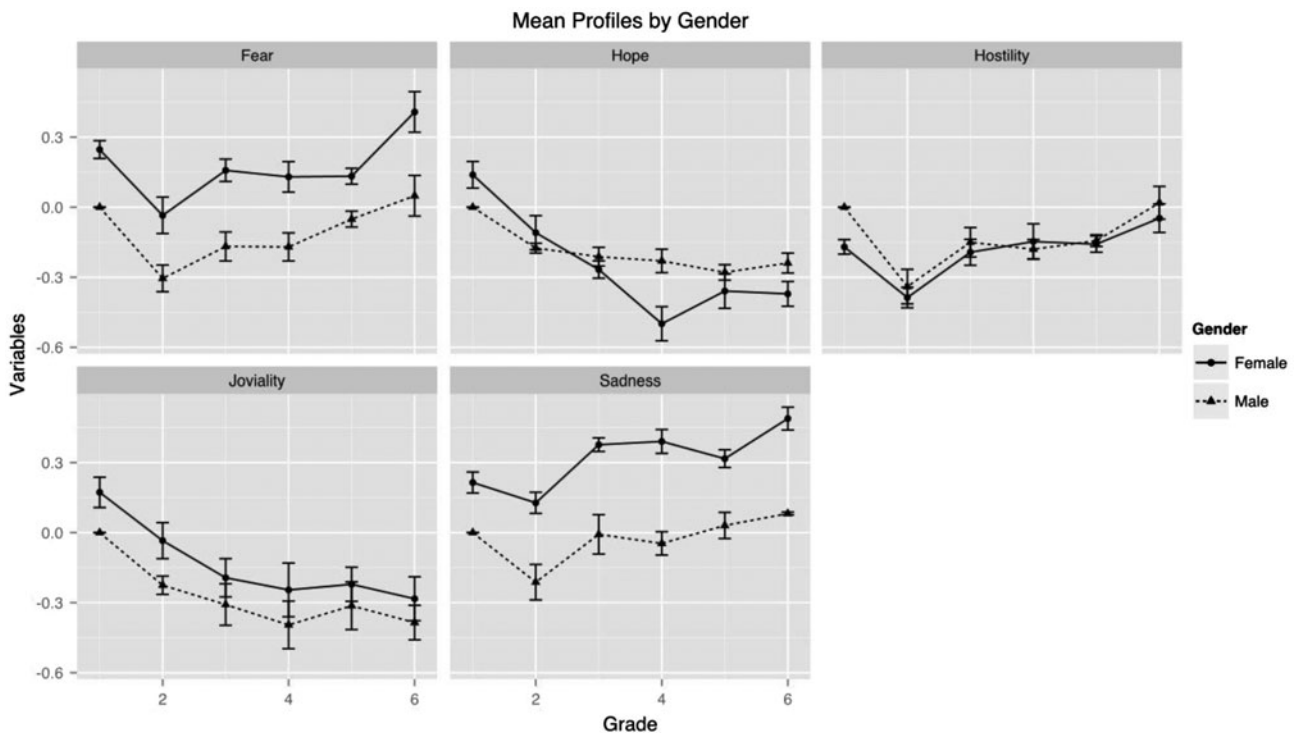


Figure 1. Male (solid line) and female (dotted line) levels of hope, and positive and negative affective state across six years of high school.

Note: Male time 1 was fixed to 0 in order to allow the model to be identified.

Table 3 shows that Model 3 in which cross-lags and autoregression coefficients were constrained to be equal across all time lags (e.g. the relationships between Time 1 and 2 are constrained to be equal to those from Time 2 to 3) was within our criteria for invariance (i.e. there was little change in CFI and RMSEA fit from Model 1). This suggests that there was some consistency in the effects of hope and affect over time. However, there was significant drop in chi-square, which suggests that our assumption of temporal invariance may not be entirely accurate. To err on the conservative side, we report both the detailed results from Model 1 (Table 4) and the averaged results from Model 3 (Figure 2).

As illustrated in Table 4, hope was a significant predictor of the development of joviality in three of the five

cross-lags, with the other cross-lags being positive and in the expected direction. In contrast, only two of the joviality to affect cross-lags were significant, with one in the expected direction and one in the unexpected direction. Thus, we had reliable evidence for the hope-as-antecedent hypothesis, but not for the hope-as-consequence model. In contrast to joviality, the cross-lags involving hope and the negative affective states were not as reliably significant, and when they were significant, tended to support the reciprocal influence model, with negative affect predicting decreases in hope, and hope predicting decreases in negative affect.

The constrained results of Model 4 are presented in Figure 2 and indicate that hope had a significant effect on change in positive affect over the course of high

Table 3. Assessment of the consistency of cross-lag effects across time.

	χ^2	df	$\Delta\chi^2$	CFI	RMSEA
Hope and sadness					
Model 1: Multiple time span, autoregressive model	809.102	484	–	0.976	0.026
Model 2: Single time span autoregressive model	948.756	504	139.65**	0.968	0.030
Model 3: Time span invariant model	983.213	520	174.11**	0.966	0.030
Hope and joviality					
Model 1:	893.745	484	–	0.974	0.029
Model 2:	1036.863	504	143.11**	0.967	0.033
Model 3:	1076.814	520	189.07**	0.965	0.033
Hope and hostility					
Model 1:	658.059	484	–	0.985	0.019
Model 2:	786.381	504	128.32**	0.975	0.024
Model 3:	816.968	520	158.901**	0.974	0.024
Hope and fear					
Model 1:	660.939	484	–	0.989	0.019
Model 2:	807.107	504	146.17**	0.981	0.025
Model 3:	848.758	520	187.82**	0.979	0.025

Note: Best model highlighted in gray. Model 1: Cross-lags and autoregression paths allowed to differ at each time point, and autoregression effects estimated at all time lags. Model 2: Identical to Model 1 except that autoregression effects estimated at lags of one year. Model 3: Identical to model 1 except that cross-lags and auto-correlations assumed to be equal across all time points.

** $p < .01$.

Table 4. Standardized coefficients (standard errors) at one year lag for Model 1.

	Joviality	Sadness	Hostility	Fear
G 7→G 8				
Hope→Affect	0.43 (0.061)***	–0.10 (0.045)*	–.020 (0.045)***	–0.06(0.029)*
Affect→Hope	0.00 (0.034)	–0.08 (0.034)*	–0.07 (0.055)	–0.04 (0.031)
G 8→G 9				
Hope→Affect	0.22 (0.085)*	–0.08 (0.022)**	–0.05 (0.054)	–0.022 (0.036)
Affect→Hope	0.023(0.042)	–0.14 (0.031)***	–0.09 (0.066)	–0.11 (0.039)**
G 9→G 10				
Hope→Affect	0.09 (0.061)	–0.05 (0.028)	–0.01 (0.073)	–0.09 (0.063)
Affect→Hope	0.13 (0.018)***	–0.26 (0.03)***	–0.07 (0.06)	–0.16 (0.041)***
G 10→G 11				
Hope→Affect	0.17 (0.024)***	–0.12 (0.051)*	–0.21 (0.053)***	–0.17 (0.094)*
Affect→Hope	0.03 (0.024)	–0.06 (0.045)	–0.04 (0.048)	–0.10 (0.021)***
G 11→G 12				
Hope→Affect	0.09 (0.064)	0.01 (0.049)	0.05 (0.084)	0.04(0.061)
Affect→Hope	–0.07 (0.025)**	–0.007(0.062)	–0.09 (0.048)*	–0.03 (0.044)

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Model 1, single time span, multiple span autocorrelation.

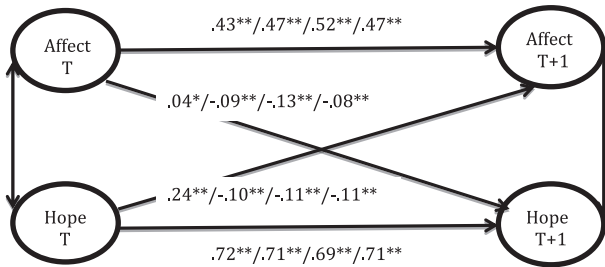


Figure 2. Average autocorrelation and cross-lagged effects for hope and affective state (Time T) predicting across a year (Time $T + 1$) for six waves of data (Model 3).

Note: * $p < 0.01$; ** $p < 0.001$; effects are reported in the order of joviality/fear/sadness/hostility.

school ($\beta = 0.23$, $p < 0.001$), whereas positive affect only had a weak effect on hope ($\beta = 0.047$, $p < 0.01$). Using the delta method, these parameters were significantly different ($\beta_{\text{diff}} = 0.185$, $p < 0.001$). In contrast, the negative states had consistent, reciprocal influences, with no significant difference in the cross-lags. Hope predicted lower sadness ($\beta = -0.12$), fear ($\beta = -0.10$), and hostility ($\beta = -0.10$), $ps < 0.001$, and sadness, fear, and hostility predicted lower hope, $\beta = -0.11$, $\beta = -0.09$, $\beta = -0.08$, respectively, $ps < 0.001$.

Finally, we conducted multigroup analyses to examine the extent that the effects described above were consistent across gender (gender invariance). Past research suggests that males and females may decline more rapidly in hope that males from Grade 7 to 10 (Heaven & Ciarrochi, 2008). We compared a model where the effects of gender were allowed to vary to a model where gender effects were fixed to be the same. Significant drop in log-likelihood would indicate that gender was not invariant. While in previous analyses, we used changes in fit indices rather than fit statistics as measures of invariance, in these analyses, we use chi-square differences test given the small degrees of freedom difference between these models. Invariance was supported for sadness, joviality, and hostility, $p > 0.1$. However, there was a significant effect for fear ($\Delta\chi^2(4) = 14.8$, $p < 0.01$). We then used the delta method to determine which parameters were different across gender. Interestingly, the gender effects were not in the cross-lags but in the stability of fear. On average, fear was less stable in boys ($\beta = 0.36$ $p < 0.001$) than in girls ($\beta = 0.49$, $p < 0.001$).

Discussion

We tested how a brief and reliable measure of hope – reflecting goal-directed behavior, self-efficacy, perseverance, and flexibility in response to impediments (Snyder, 2000) – was related to measures of positive and negative affect over the six years that characterize adolescence. Adding to the findings of previous research that has been

mostly cross-sectional or limited to adult samples, we found clear support for hope being an antecedent to positive affect, rather than a mere consequence or concomitant. Hope predicted changes in positive affect, whereas there was only a weak, and significantly smaller, effect of positive affect predicting hope. In contrast, we found evidence that hope and the negative affective states were reciprocally related: hope predicted decreasing negative affect (antecedent effect), negative affect predicted decreasing hope (consequence effect), and there was no significant difference between the size of the antecedent and consequence effects.

We also found some evidence that hope may be particularly important at transition points. Specifically, hope most reliably predicted all forms of well-being at two transition points. Grade 7 and 10. Grade 7 is when the young Australians begin high school. Grade 10 is when they transition into the last two critical years of high school (similar to senior high school in the United States). At the end of these two years, students take a series of standardized exams which are the major determinant of whether they will get into university. Transition points in education are generally externally mandated and are associated with a conglomeration of developmental tasks that require channeling of engagement efforts (Dietrich, Parker, & Salmela-Aro, 2012; Masten & Curtis, 2000; Savickas, 2011). Adaptive transitions are associated with well-being (Roisman, Masten, Coatsworth, & Tellegen, 2004; Schulenberg, Bryant, & O'Malley, 2004; Zarrett & Eccels, 2006).

Given hope is associated with developing and successfully pursuing goals, it is likely that hope preceding the transition is associated with more adequate engagement and as a result higher well-being, explaining the particularly strong link between these constructs observed here. Indeed, Litalien, Lüdtkke, Parker, and Trautwein (2013) showed that goal motivation was a positive predictor of well-being for the transition from school to university consistent with the current research. Future research is needed to replicate this finding and to examine the possibility that hope is of particular importance during transitional periods.

Our longitudinal data support claims that positive emotional states and well-being are a consequence of goal-directed thought and flexible, determined goal pursuit. As Snyder (2000) theorized, there is good evidence that hopeful thoughts drive positive feelings and that there is very little evidence of the reverse. Hopeful thoughts help build positive emotions, which have been shown to be building blocks leading to other dimensions of well-being. Both theoretical and empirical work indicate that positive emotions foster positive evaluations of the self and other people (Vaughn & Fredrickson, 2006), social activity and the development of healthy relationships (Algoe, Haidt, & Gable, 2008; Keltner &

Bonanno, 1997), flexible thinking and problem-solving (Estrada, Isen, & Young, 1994, 1997; Isen et al., 1987), resilience to stressful life events (Ong, Bereman, Bisconit, & Wallace, 2006; Zautra, Johnson, & Davis, 2005), the ability to extract rewards from positive life events (Catalino & Fredrickson, 2011), greater mindfulness and purpose in life (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; King, Hicks, Krull, & Del Gaiso, 2006), and physical health ranging from stronger immunological functioning to greater life longevity (Lyubomirsky, King, & Diener, 2005; Pressman & Cohen, 2005). The broad benefits of positive emotions imply the need for further inquiry into any disposition that increases the propensity to experience positive emotions – in this case, hope.

There was a general drop in well-being and hope across the high school years, a result that is generally consistent with past research (Larson, Moneta, Richards, & Wilson, 2002). This result may be explainable in terms of the new and sometimes stressful challenges that occur as young people progress (Larson et al., 2002; Smetana, Campione-Barr, & Metzger, 2006; Steinberg & Morris, 2001). Based on past research, we would expect mean levels of well-being to improve once the young people leave high school, and for variability in emotional experience to decrease (Larson et al., 2002; Williams, Ciarrochi, & Heaven, 2014).

Our results converge with dominant theories and research on the relative independence of positive and negative affect (Watson & Clark, 1994), as we found that hope has a more robust impact on positive compared with negative affect. This might be because people with high hope might show a higher sensitivity to the rewards of goal effort and progress; people with high hope may also create and pursue increasingly challenging life goals that inevitably induce negative emotions such as anxiety and frustration. In this context, negative emotions might be unpleasant but simultaneously necessary and desirable. Pursuing goals that are aligned with one's deepest interests and values can be anxiety provoking because of their meaningfulness and desirability (Hayes, Strosahl, & Wilson, 2011). When asked, most people would choose a life imbued with meaningful life pursuits, even if distress arises, rather than an easy, simple life (King & Napa, 1998; Scollon & King, 2004). In the absence of contextually sensitive measures, negative affect might be less useful as an outcome variable compared with positive affect in evaluating well-being (See Emmons [1986]; Little et al. [2007] for strategies to measure affect in the context of goal pursuit). Future research should examine the possibility that high hope is associated with the pursuit of more emotionally challenging goals.

Hope can influence one's emotions – indeed, emotions are a consequence of goal-directed behaviors and thoughts (Snyder, 2000). Scheier and Carver (1985) and Snyder (2002) suggested that, when individuals perceive

that they are making progress in attaining a goal, or have overcome impediments in achieving goals, this leads to a positive emotional state. Our data converge with these claims as it appears to be the case that higher levels of hope are predictive of positive dispositions or mindsets. The current research extends prior work by the attention to a critical phase of human development when people's personalities are highly sensitive to biological and environmental stimuli and thus malleable. If we are to understand personality development, the six years of adolescence might be the ideal time frame to explore stability, change, and associated benefits and costs. To our knowledge, this is the first study to examine hope over the entire stage of adolescence.

Gender differences

We found substantial stability in hope, but also substantial change. Compared to boys, girls started out with higher levels of hope, and then experienced a precipitous reduction in hope by Grade 10. Girls appeared to rebound with an increase in hope from Grade 10 to the end of high school. We also found mean differences in affective states, with girls experiencing higher fear and sadness across the years, but also slightly higher joviality. These findings are consistent with previous findings that suggest females experience emotions more intensely than males (Fujita, Diener, & Sandvik, 1991). Finally, we found that fear was less stable in boys than in girls, suggesting that boys' level of fear may be more driven by environmental demands.

Hope and negative affect

Compared to the prediction of positive affect, hope was not as strong a predictor of the development of sadness, fear, and hostility. We can only speculate about this pattern, but we would suggest that more hopeful people engage in more goal striving. Such striving increases the opportunities to contact reinforcers, but also may increase contact with adversity, such as those associated with failure (sadness) and future risks (fear). For example, striving to get the best possible grades may lead to anxiety about getting poor results. There are risks to goal striving. Even with these risks, however, hope did predict somewhat less negative affect.

Implications and future directions

Prior theorists have argued that regardless of therapy type, all therapies seek to increase hope (Grencavage & Norcross, 1990; Snyder, Michael, & Cheavens, 1999; Stotland, 1969; Waddington, 2002). It is 'the' common factor. It is also assumed to be the common antecedent, or mediator, of positive changes in mental health. In order to assess this hypothesis, one needs a reliable

measure of hope, a measure that has certain properties. It should be brief to be useful in practice. It should not be redundant with mental health and affective measures. And, in keeping with the notion of hope as a mediator, this process should be shown to be an antecedent to the development of well-being. The measure of hope used in the present study satisfies all these criteria. It is brief (six items), reliable, and predicts future positive affect when controlling for baseline levels of positive affect (and so is not redundant with it).

Future research should evaluate the hope mediational hypotheses. A past meta-analysis suggests that hope enhancement interventions may be of most benefit among community samples and may have their largest effects on positive states such as life satisfaction, while having little effect on psychological distress (Weis & Speridakos, 2011). There are a wide variety of types of hope intervention, varying from ones that use positive music, guided imagery, narratives, and/or memory recall (Weis & Speridakos, 2011). Future research is needed to identify the hope enhancement strategies that are best at increasing hope and positive outcomes in specific populations.

Despite three decades of research on hope as defined by Rick Snyder, little work has addressed the question of how hope operates during the developmental transition of adolescence. Our results suggest that hope is a useful personality dimension in understanding the development of well-being. However, we need to acknowledge some limitations. Our results focus on a general population of high school students and may not generalize to clinical populations. We utilized parcels which has the benefit of reducing the number of parameters that need to be estimated and tends to make the indicators more normally distributed, but parceling can also hide sources of model misspecification (Marsh, Lüdtke, Nagengast, & Morin, 2013). Future research with larger samples should replicate the findings using individual items rather than parcels. In addition, the present study does not assess features of the context that might support hope or buffer negative affect in the presence of low hope (e.g. adolescents' relationships with their parents, peers, teachers, etc.). Moreover, it is possible that hope is linked indirectly to positive affect by successful goal attainment or through the engagement of in positive behaviors/avoiding negative behaviors, such as selecting supportive peers and avoiding drug use. Future research is needed to tease apart the relations between hope and positive and negative affect by assessing features of the context as well as individual behaviors across the adolescent period. Answers to questions on the etiology of hope, and the various strategies that lead to high, sustainable levels of hope and well-being will offer guidance on how to improve existing efficacious interventions for positive youth development.

Supplementary data

Supplementary data for this article can be accessed here: <http://dx.doi.org/10.1080/17439760.2015.1015154>.

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