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The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study

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Abstract

We examined the distinctiveness of three "positive thinking" variables (self-esteem, trait hope, and positive attributional style) in predicting future high school grades, teacher-rated adjustment, and students' reports of their affective states. Seven hundred eighty-four high school students (382 males and 394 females; 8 did not indicate their gender) completed Time 1 measures of verbal and numerical ability, positive thinking, and indices of emotional well-being (positive affect, sadness, fear, and hostility), and Time 2 measures of hope, self-esteem, and emotional well-being. Multi-level random coefficient modelling revealed that each positive thinking variable was distinctive in some contexts but not others. Hope was a predictor of positive affect and the best predictor of grades, negative attributional style was the best predictor of increases in hostility and fear, and low self-esteem was the best predictor of increases in sadness. We also found that sadness at Time 1 predicted decreases in self-esteem at Time 2. The results are discussed with reference to the importance of positive thinking for building resilience.
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1. Introduction

If youth are to be successful in an ever-increasing competitive global environment, it is essential that their academic achievements reflect their innate ability and that they have the

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psychological resources to meet life's challenges. Sadly, this is not always the case (Elias, 2006), leading to the "waste and vast erosion of human potential" (Luthar & Cicchetti, 2000, p. 857). Psychologists and others have expended much research energy on identifying the factors associated with adolescents' school performance and overall adjustment (e.g., Chamorro-Premuzic & Furnham, 2005; Smetana, Campione-Barr, & Metzger, 2006; Steinberg & Morris, 2001) and numerous individual difference factors of importance have been identified.

The present study is concerned with the impact of various forms of positive thinking and focuses on three variables, namely, hope, self-esteem, and positive attributional style. We selected these variables for two reasons. The first is their centrality to theories of well-being and effectiveness. Self-esteem and attributional style have long been examined as predictors of emotional well-being and academic performance (e.g., Baumeister, Campbell, Krueger, & Vohs, 2003; Peterson & Barrett, 1987; Peterson & Steen, 2002), and literally thousands of articles have been written on them. The measurement of hope is somewhat newer, but the construct itself has a long history in psychology and is viewed by some as a key mechanism of change in psychological interventions (e.g., Snyder, 2000a; Snyder, Rand, & Sigmon, 2002).

Second, we chose these variables because they seem to capture different aspects of thinking style. Self-esteem reflects people's evaluations of self-worth and competence (Matthews, Deary, & Whiteman, 2003), hope reflects people's evaluations of the extent they can achieve their goals (Snyder et al., 2002), and attributional style reflects people's evaluations of the causes of positive and negative events in their life (Peterson & Barrett, 1987). Hope theory emphasizes future expectancies (e.g., setting goals), whereas attributional style focuses on how the past is explained (Snyder et al., 2002).

Although we selected variables that appear to be distinctive, there is not yet any evidence that they are in fact distinctive longitudinal predictors of important outcomes such as school achievement, adjustment, and emotional well-being.

1.1. Trait hope

Trait hope involves the belief that one can produce "routes to desired goals" (Snyder, 2000b, p. 8). High hope individuals believe they can begin and maintain movement towards their goals (agency thinking) and believe they can produce plausible routes to the goals (pathways thinking). Being able to plan goals and set about to achieve them is also referred to as "mental action sequences" (Snyder et al., 2002, p. 258), which are proposed to be the major driving force that underpins an individual's positive emotions and psychological well-being, and also differentiates hope from similar constructs such as optimism, self-efficacy, and self-esteem (Snyder et al., 2002). In fact, Snyder claims that hope drives self-appraisal (Snyder et al., 1997).

Research among adolescents that assesses the longitudinal impact of hope on adjustment and school outcomes is rare (but see Valle, Huebner, & Suldo, 2006). It has been reported that hope predicts additional variance beyond other predictors of academic achievement, at least among university students. For example, Snyder and colleagues found that grades on a psychology exam predicted outcome in a subsequent psychology exam and that hope scores were able to explain additional variance in final exam scores beyond that of the first exam (Snyder et al., 1991; see also Snyder et al., 1996, study 4). Not only was hope predictive of academic outcomes, but high hope students were also

found to set higher overall academic goals and had higher expectations of success than other students (see also Curry, Snyder, Cook, Ruby, & Rehm, 1997). Likewise among children, cross-sectional studies have demonstrated that hope is significantly related to standardized school achievement tests and that it explains unique additional variance relative to other predictors such as self-esteem (Snyder et al., 1997).

Hope has also been found to be an important factor is predicting psychological adjustment (e.g., Kashdan et al., 2002; Michael & Snyder, 2005; Shorey, Snyder, Yang, & Lewin, 2003; Snyder et al., 1996; Valle et al., 2006). For instance, in their longitudinal study among high school students, Valle and colleagues (2006) found that hope at Time 1 was positively correlated with life satisfaction assessed one year later, and negatively associated with stressful life events, and internalizing/externalizing behaviors. They also found that stressful life events predicted internalizing behaviors and low life satisfaction, and this effect was strongest amongst low hope individuals. Given that high-hope individuals *believe* in their ability to succeed (Snyder et al., 1991), we hypothesized that they would also be better at actually succeeding at school.

1.2. Self-esteem

Self-esteem is regarded as an important aspect of one's social and cognitive development (Berndt, 2002; Pulkkinen, Nygren, & Kokko, 2002; Wigfield, Battle, Keller, & Eccles, 2002), with the early adolescent years being somewhat volatile and yielding substantial shifts from one year to the next (Durkin, 1995). Many studies have been conducted into the effects of self-esteem on different outcomes during the teenage years including academic performance and overall adjustment. Studies of the influence of self-esteem on academic performance have yielded conflicting results and the picture has been complicated by the fact that researchers have used either cross-sectional or longitudinal designs. Cross-sectional studies have tended to show that self-esteem is related to academic performance (e.g., Hansford & Hattie, 1982; Wylie, 1979; for a good review see also Baumeister et al., 2003). The most conclusive evidence is derived from a large meta-analysis by Hansford and Hattie (1982) in which they reviewed 128 studies. The results were unequivocal: self-esteem is positively associated with academic outcomes.

In contrast, longitudinal studies have yielded quite different conclusions. Rather than positive self-esteem leading to better grades, some studies suggest the opposite, that is, good grades lead to elevated self-esteem (e.g., Ross & Broh, 2000; Schmidt & Padilla, 2003). For example, Ross and Broh (2000) found that, once locus of control had been controlled for, self-esteem did not predict academic achievement two years later. Although Schmidt and Padilla (2003) found cross-sectional associations between grades and self-esteem, they found no longitudinal effects of self-esteem on later grades. Indeed, in a review of the longitudinal effects of self-esteem on grades, Baumeister and colleagues (2003) concluded that ''self-esteem has no impact on subsequent achievement'' (p. 13). Hair and Graziano (2003) measured several components of self-esteem only one of which (''behavioral conduct'') predicted school grades longitudinally.

There appears to be less conjecture regarding the impact of self-esteem on overall adjustment and emotional states. For instance, *low* self-esteem is significantly related to depression (e.g., Pelkonen, 2003), suicide ideation (e.g., Palmer, 2004; Wild, Flisher, & Lombard, 2004), victimization (e.g., Slee & Rigby, 1993), delinquency (e.g., Heaven, 1996, but see Jang & Thornberry, 1998), eating disorders (e.g., Gual et al., 2002), and low

happiness (Furnham & Cheng, 2000). In a cross-sectional study of over 1000 students, Aunola, Stattin, and Nurmi (2000) found that self-esteem was significantly related to low internalizing problem behaviors and significantly negatively related to parents' reports of adolescents' maladaptive achievement strategies (e.g., expectation of failure or engaging in task irrelevant behavior).

A number of longitudinal studies have been conducted into the effects of self-esteem on psychological adjustment, but these have focused primarily on depression rather than on other traits such as happiness. In a study among high school students, Heaven (1996) found that self-esteem significantly predicted self-reported delinquency two years later. In a study spanning 12 months, Robinson, Garber, and Hilsman (1995) found that self-esteem predicted depression, although not externalising behaviors (but see Heaven, 1996). Similar results with respect to depression were noted by Ralph and Mineka (1998) who also observed that individuals with low self-esteem were less well prepared to accommodate good news compared to those with higher self-esteem. As Baumeister et al. (2003) have pointed out, not only is there evidence that low self-esteem is prospectively related to emotional states, but low self-esteem also has the ability to "poison the good times" (p. 26).

1.3. Attributional style

Attributional or explanatory style refers to an individual's habitual way of explaining the causes of positive and negative events in their life (Peterson & Steen, 2002). A negative or depressive attributional style, for instance, is characterized by a tendency to attribute negative or unwelcome events as being due to a characteristic of the individual while also attributing positive events to external causes such as good fortune (Abramson, Seligman, & Teasdale, 1978). Not surprisingly, attributional style has significant implications for one's behavior. Thus, it is well established that a positive attributional style is related to elevated academic achievement and indices of positive adjustment (e.g., Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997; Peterson & Steen, 2002; Simon & Feather, 1973; Weiner, 1979). Glasgow and colleagues (1997) found that a dysfunctional attributional style was significantly negatively related to GPA at Time 1 and one year later. Similar results were obtained by Peterson and Barrett (1987).

A negative explanatory style is clearly correlated with a wide range of negative social and emotional outcomes including depression (e.g., Gladstone & Kaslow, 1995; Peterson & Seligman, 1984), loneliness and social anxiety (Crick & Ladd, 1993), low acceptance by peers (Ames, Ames, & Garrison, 1977), and peer-rejected sociometric status (Toner & Munro, 1996). For example, Toner and Munro (1996) found that young adolescents who had been rejected by their peers were more likely to attribute that rejection to stable causes thereby increasing the child's expectation of future rejection.

Longitudinal studies have supported these general findings. For example, Toner and Heaven (2005) found that a negative attributional style for peer-related events was significantly predictive of self-reported feelings of victimization, loneliness, and depression two years later. Stevens and Prinstein (2005) found that, not only was Time 1 attributional style predictive of Time 2 depression 11 months later, but that having a depressive friend explained unique additional variance. Thus, peer influences were found to exacerbate the effects of explanatory style on depression. In a study spanning five years, Nolen-Hoeksema, Girgus, and Seligman (1992) found that explanatory style was predictive of later depression, but that these effects only became more pronounced in the later stages of the study.

1.4. Aims and rationale of study

From the review above it is clear that various forms of positive thinking are related to adolescents' academic performance and overall adjustment, at least in cross-sectional studies. What is yet to be determined is whether these variables are equally effective as long-term predictors of school achievement and psychological adjustment. Do they explain unique variance in outcome measures? Thus, the aim of the present study was to explore the distinctive effects of hope, self-esteem, and positive attributional style over a one-year period, on school grades, overall adjustment, and self-reported emotional well-being. The strength of the present study is its use of both self-report, objective, and observer-reported data.

2. Method

2.1. Participants

The participants, all part of the Wollongong Youth Study, attended five high schools in one of the Catholic Diocese of New South Wales (NSW), Australia. The Diocese is centered on the city of Wollongong (population approximately 250,000), but also reaches into south-western metropolitan Sydney thereby ensuring that the socio-economic and cultural mix of the participants is diverse. In Australia 33% of all students now attend non-government (including Catholic) schools, a proportion that continues to grow (Australian Bureau of Statistics (ABS), 2004). Our sample represents a diverse range of key demographic indicators and closely resembles national distributions with respect to number of intact families (ABS, 2005) and language other than English spoken in the home (ABS, 2006).

Students were surveyed in the middle of their first year of high school and again one year later. At Time 1, more than 784 students (mean age = 12.30 yr, SD = 0.49) completed the questionnaire (382 males and 394 females; 8 did not indicate their gender). Final end-of-year grades were obtained for all of the students once they completed their second year of high school (Time 2). Data were collected from 942 participants at Time 2. This increase in sample size was due to an administrative error at Time 1 in one school where three classes of the year grade were not available for testing on that day as well as to new arrivals. Using coded questionnaires, we were able to directly match the Time 1 and 2 data of more than 600 students. Direct matches ranged from 635 (for hostility) to 657 for several school subjects.

2.2. Materials

Each student was provided with a test booklet containing a number of different measures. The following are of interest to the present report:

2.2.1. Time 1 measures
1. *Children's hope scale (Lopez, Ciarlelli, Coffman, Stone, & Wyatt, 2000; Snyder et al., 2002).* This six-item scale measures agency and pathways aspects of hope and has demonstrated reliability and concurrent validity. The agency items are: "I think I

am doing pretty well'', "I think the things I have done in the past will help me in the future'', and "I am doing just as well as other kids my age." The pathway items were, "When I have a problem, I can come up with lots of ways to solve it,'' "I can think of ways to get the things in life that are most important to me,'' "Even when others want to quit, I know that I can find ways to solve the problem''. Responses were indicated on a 6-point Likert scale ranging from "none of the time" (scored 1) to "all of the time" (6). On the present occasion Cronbach's coefficient alpha was .82.

2. *Self-esteem scale (Rosenberg, 1979)*. This well-known 10-item scale has been used in various populations and has excellent reliability and validity (Corcoran & Fischer, 1987; see also Baumeister et al., 2003). It measures global self-esteem thereby providing good indication of general rather than specific views of the self (Baumeister et al., 2003). Participants were asked to indicate their agreement with statements about the self. High scores indicate high self-esteem and on the present occasion internal consistency was .86.

3. *Children's attributional style questionnaire (CASQ; Thompson, Kaslow, Weiss, & Noel-Hoeksema, 1998)*. The CASQ is a 24-item measure designed to assess tendencies to make depressive explanations for events. Tested on a sample of children in early adolescence, the CASQ was shown to possess good criterion-related validity, satisfactory internal consistency as well as test–retest reliability. After reverse-scoring items on the negative attributional scale, they were combined with positive items to form a positive attributional scale. The alpha coefficient of this scale was .63.

4. *Positive and negative affect (PANAS-X; Watson & Clark, 1994)*. We assessed four affective states, namely, hostility, fear, sadness, and joviality. We refer to "joviality" as "activated positive affect", as we believe this better captures the breadth of the scale, which includes items such as, "Joyful," "delighted", "excited," "enthusiastic," and "happy". 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). The following Time 1 internal consistency coefficients were obtained on the measures: hostility = .83, fear = .87, sadness = .90, and activated positive affect = .93.

5. *Verbal and numerical ability scores*. Students completed standardized numerical and verbal assessments. These are not intelligence tests, but are classified as aptitude or ability tests, even though they assess the learning that has occurred up to the time of administration. They are therefore curriculum-based, criterion-referenced tests and are administered by the NSW Department of Education and Training. There are six numerical (numeracy, number, measurement, space, data, numeracy problem solving) and three verbal (writing achievement, reading achievement, and language achievement) subtests. Scores on the subtests were summed to provide a total verbal and total numeracy score.

2.2.2. Time 2 measures

1. *Positive and negative affect (PANAS-X; Watson & Clark, 1994)*. We used the same measure as at Time 1. The following Time 2 internal consistency coefficients were obtained on the measures: hostility = .82, fear = .85, sadness = .91, and activated positive affect = .94.

2. *Hope and self-esteem (see above)*. At Time 2, alpha coefficients were .83 (self-esteem) and .85 (hope).
3. *Teacher ratings of emotional and behavioral adjustment (Pulkkinen, Kaprio, & Rose, 1999)*. This is a 34-item multidimensional peer nomination inventory with parallel forms for teachers and parents and has been used in a major Finnish longitudinal study. It assesses three domains, namely, behavioral problems (hyperactivity-impulsivity, aggression, inattention), emotional problems (depression, social anxiety), and positive adjustment (constructiveness, compliance, social activity). The measure has demonstrated reliability and discriminative validity. Teachers were asked to indicate to what extent a description (e.g., ''teases smaller and weaker students'') is characteristic of the student. Responses were indicated on a 4-point scale from not observed in this student (0) to this characteristic fits the student very well (3). We obtained alpha coefficients of .90 (adjustment), .83 (emotional problems), and .93 (behavioral problems).
4. *Final end-of-year school grades.* Grades were obtained for all students at the end of their second year of high school. Grades were obtained for English, Math, Science, Religious Studies, Visual Art, and Design and were calculated as follows: each subject had four to five outcomes (identical outcomes applied across the schools) which were graded on a 5-point scale where 5 represented the highest achievement and 1 represented the lowest achievement. An average score for each subject was calculated for each student.

2.3. Procedure

After obtaining parental and student consent, participants were invited to participate in a survey on ''Youth issues''. Questionnaires were completed during class time in the presence of one of the authors or a school teacher. Questionnaires, which took about 50 min to complete, were completed without discussion and anonymously. Students were fully debriefed at the end of the testing session.

3. Results

3.1. Preliminary analyses

The three optimistic thinking variables were significantly correlated with large effect sizes: self-esteem and hope, $r = .44$ ($p < .001$); self-esteem and positive attributional style, $r = .36$ ($p < .001$); hope and positive attributional style, $r = .46$ ($p < .001$). Table 1 shows the correlations between the positive thinking variables and the outcome measures. Given the large number of correlations reported as well as the sample size, only correlations at $p < .01$ and .001 are indicated. What is noteworthy are the weak correlations between self-esteem and all outcome measures except with respect to self-reported affective states. In contrast, hope and positive attributional style were significantly related to almost all of the outcome measures.

3.2. Main analyses

Due to the hierarchical structure of our data, multi-level random coefficient (MLRC) modelling was used. MLwin 2.01 was the statistical software used for all analyses

Table 1
Correlations of optimistic thinking variables (Time 1) with academic performance, teacher's ratings of adjustment, and student-rated well-being (Time 2)

Time 2 outcomes	Time 1 hope	Time 1 self-esteem	Time 1 att. style
School subject			
Total grade	.27***	.10*	.24***
English	.22***	.10**	.18***
Religious studies	.25***	.08	.20***
Mathematics	.19***	.09	.13***
Science	.22***	.09	.19***
Visual art	.15***	.07	.18***
Design	.24***	.08	.25***
Teacher ratings			
Positive adjustment	.17***	.06	.18***
Behavioral problems	−.22***	−.06	−.20***
Emotional problems	−.10**	−.14***	−.09
Self-reported affective states			
Fear	−.08	−.20***	−.10**
Hostility	−.22***	−.20***	−.24***
Sadness	−.15***	−.32***	−.13**
Joy	.33***	.29***	.22**

** $p < .01$.
*** $p < .001$.

(Rashbash, Steele, Browne, & Prosser, 2004). The level 2 units were schools and the level 1 units where students within schools. In stage 1 of the analyses, we used the likelihood ratio statistic with one degree of freedom (corresponding to the added parameter, σ_{uo}^2) to compare a baseline model that assumed no random effects with a model that assumed random intercepts (i.e., that schools differed in mean level of the dependent variable). The model that best fitted the data was utilized for stage 2. If there was an unequal fit, then we used the more parsimonious model (e.g., the model that did not assume random intercepts).

In stage 2 we compared the best model from stage 1 to a model that assumed random slopes for each predictor. The new model required the estimate of two extra parameters and two degrees of freedom, namely, the variance of the slope residuals and their covariance with the intercept residuals. The final model was one that thus included any random intercept or slope effects that significantly improved models of fit to the data. Gender was dummy coded (0 = male; 1 = female).

3.2.1. Grades analyses

We assessed the impact of our positive thinking variables on total grades. Assuming a random intercept model was a significant improvement over the no random effects model, $\chi^2(1) = 127.06$, $p < .01$. There were no significant random slope effects, $ps > .05$. Table 2 shows that hope was the only variable to significantly predict grades after controlling for gender, verbal, and numerical ability. Little difference was noted when assessing the impact of positive thinking variables on individual subjects. Across every subject, hope was related to higher grades, even after controlling for ability. The only other "positive thinking" effect involved the subject Design and attributional style, with more positive attributional style predicting better grades in that subject ($\beta = .083$, SE $\beta = .038$,

Table 2
Multi-level random coefficient analyses involving past academic ability and positive thinking style (year 7) predicting grade point average in year 8

Time 1 predictors	β	SE β	T
Sex	.473	.049	9.65[***]
Verbal ability	.300	.037	8.11[***]
Numerical ability	.383	.036	10.64[***]
Hope	.100	.028	3.57[***]
Attribution style	.032	.026	1.23
Self-esteem	.029	.026	1.12

Note. The random intercept model was a significant improvement over the no random effects model and was the model used in this analysis.
[***] $p < .001$.

$t = 2.2$, $p < .05$). There were no significant effects involving self-esteem. The gender effects indicated that girls tended to get better grades than boys in all subjects, except Science.

3.2.2. Emotional well-being

We next evaluated whether, on average, participants who scored high on the various indices of positive thinking would show greater increases in emotional well-being (EW) compared to those who scored low on the positive thinking variables with the same baseline EW. Compared to the baseline model, the random effects and random slopes model did not improve the fit of the model, ps $> .05$, suggesting that mean levels of well-being did not vary significantly across schools, and mean effects of the positive thinking variables did not vary across schools.

Table 3 presents these results. The pattern of effects suggests that no individual positive thinking variable had an influence on all aspects of well-being. Hope significantly predicted changes in activated positive affect, self-esteem significantly predicted changes in activated positive affect and sadness, and positive attributional style significantly predicted changes in hostility and fear. All effects where in the expected direction, with higher scores on the positive thinking scales indicative of improvements in well-being (compared to baseline well-being). Concerning gender effects, girls expressed higher levels of fear and sadness.

3.2.3. Teacher rated behavior

We examined whether positive thinking predicted future teacher ratings of behavior, when controlling for past verbal and numerical ability. The random intercept models provided better fit than the baseline models involving emotional problems and behavioral problems, $\chi^2(1) > 10$, $\underline{p} > .05$, suggesting that teacher ratings on these variables differed across schools. There were no significant effects involving the random slopes models, suggesting that any observed positive thinking effects tended to generalize across schools.

Table 4 presents the results. Low self-esteem predicted future teacher rated emotional problems, and low hope predicted higher rates of behavioral problems. There were no positive thinking effects for teacher ratings of positive adjustment. The gender effects indicate that teachers thought girls were more likely to have emotional problems, whereas boys were more likely to have behavioral problems and poor adjustment. Finally, verbal ability consistently predicted the positivity of teacher ratings.

Table 3
Multi-level random coefficient analyses involving past emotional well-being and optimistic thinking style (year 7) predicting emotional well-being in year 8

Variables	β	SE β	T
Predicting fear			
Baseline fear	.247	.041	6.02***
Sex	.339	.079	4.29***
Hope	.031	.048	0.65
Self-esteem	−.089	.047	−1.89
Attributional style	−.087	.045	−1.93*
Predicting hostility			
Baseline hostility	.203	.044	4.61***
Sex	.016	.080	0.20
Hope	−.074	.049	−1.51
Self-esteem	−.068	.047	1.45
Attributional style	−.120	.046	−2.61**
Predicting sadness			
Baseline sadness	.305	.045	6.78***
Sex	.375	.075	5.00***
Hope	−.038	.045	−0.84
Self-esteem	−.133	.047	−2.83**
Attributional style	−.027	.043	−0.63
Predicting activated positive affect			
Baseline activated positive affect	.287	.044	6.52***
Sex	.142	.075	1.89
Hope	.153	.047	3.26**
Self-esteem	.124	.045	2.76**
Attributional style	.018	.043	0.42

Note. Assuming random intercept or random slopes did not significantly improved the fit of the model.
  * $p < .05$.
 ** $p < .01$.
*** $p < .001$.

3.2.4. Distinctiveness of the hope scale

The hope scale is newer and less established than self-esteem and attributional style and some of its content appears to overlap with self-esteem (e.g., "I am doing pretty well" and "I am doing just as well as other kids). Therefore, we conducted additional analyses to investigate the discriminant validity of the hope scale.

We first conducted factor analysis of all the items on the three positive thinking scales. We utilized principle axis factoring and oblimin rotation. To determine the number of factors, we used a combination of eigenvalues greater than 1 rule, scree plot, and interpretability. We identified three interpretable factors, which could be labelled as self-esteem, attributional style, and hope. We focus on the hope loadings, because they are of greatest relevance here (see Table 5). The hope items share some overlap with the self-esteem and attributional style factors, but loaded most highly and consistently on the hope factor.

Confirmatory factor analysis was also used to evaluate whether hope and self-esteem where distinguishable. We compared a number of models and the best fitting model involved assuming self-esteem, hope, and attributional style were distinct factors ($\chi^2 = 2432.97$, $\chi^2/df = 2.9$, NFI = .63, RMSEA = .045) . This model provided a better fit than one that assumed that hope and self-esteem were the same factor ($\chi^2 = 2828.5$,

Table 4
Multi-level random coefficient analyses involving past academic ability and optimistic thinking style (year 7) predicting teacher ratings of year 8 behavior (emotional problems, behavioral problems, and positive adjustment)

Predictors	β	SE β	T
Predicting emot. prob.[a]			
Sex	.197	.083	2.37[**]
Verbal ability	−.132	.063	−2.1[*]
Numerical ability	−.082	.06	−1.37
Self-esteem	−.112	.045	−2.49[*]
Hope	−.027	.047	−0.57
Attributional style	−.012	.044	−0.27
Predicting behav. prob.[a]			
Sex	−.417	.081	−5.15[***]
Verbal ability	−.138	.062	−2.23[*]
Numerical ability	−.087	.059	−1.47
Self-esteem	−.006	.044	−0.14
Hope	−.11	.046	−2.39[**]
Attributional style	−.042	.043	−0.98
Predicting positive adjust.			
Sex	.409	.079	−5.18[**]
Verbal ability	.161	.061	2.64[**]
Numerical ability	.155	.057	2.72[**]
Self-esteem	.026	.043	0.6
Hope	.048	.045	1.07
Attributional style	.066	.042	1.57

[a] The random intercept model was a significant improvement over the no random effects model and was the model used in these analyses. Assuming random slopes for each predictor did not significantly improve the fit of the model.
[*] $p < .05$.
[**] $p < .01$.
[***] $p < .001$.

Table 5
Factor loadings (pattern matrix) involving items from the hope scale

Item	Self-esteem factor	Attrib. style factor	Hope factor
Agency subscale			
I think I am doing pretty well	.23	.25	.54
I am doing just as well as other kids my age	.18	.24	.54
I think the things I have done in the past will help me in the future	−.02	.16	.66
Pathways subscale			
I can think of many ways to get the things in life that are important to me	.15	.18	.41
When I have a problem, I can come up with lots of ways to solve it	.09	.20	.55
Even when others want to quit, I know that I can find ways to solve the problem	.06	.20	.60

$\chi^2/\mathrm{df} = 3.45$, NFI $= .57$, RMSEA $= .051$), and one that assumed the three agency items from the hope scale where part of the self-esteem factor rather than the hope factor ($\chi^2 = 2686$, $\chi^2/\mathrm{df} = 3.3$, NFI $= .59$, RMSEA $= .049$), $\chi^2_{\mathrm{diff}} > 100$, $p < .001$.

Table 6
Multi-level random coefficient analyses involving past academic ability, optimistic thinking style (year 7), and emotional well-being predicting self-esteem and hope in year 8

Time 1 predictors	β	SE β	T
Predicting self-esteem			
Baseline self-esteem	.463	.043	10.77***
Attributional style	.052	.039	1.33
Trait hope	.077	.042	1.83
Verbal ability	.105	.054	1.94
Numeric ability	−.081	.052	−1.56
Fear	.029	.041	0.72
Hostility	.046	.044	1.05
Sadness	−.144	.047	−3.06**
Activated positive affect	.036	.039	0.92
Sex	−.281	.073	−3.85***
Predicting trait hope			
Baseline hope	.491	.043	11.42***
Attributional style	.015	.040	0.38
Self-esteem	.049	.044	1.11
Verbal ability	.038	.055	0.69
Numeric ability	.092	.053	1.74
Fear	−.003	.042	−0.07
Hostility	−.107	.045	−2.38
Sadness	.024	.049	0.49
Activated positive affect	.037	.040	0.93
Sex	−.038	.075	−0.51

Note. Assuming random intercept or random slopes did not significantly improved the fit of the model.
** $p < .01$.
*** $p < .001$.

We also used confirmatory factor analysis to examine whether the agency items and the pathway items were better represented by a single "hope" factor, or by two factors, agency and pathways. The two factor model ($\chi^2 = 103.85$, $\chi^2/df = 12.98$, NFI = .93, RMSEA = .11) provided a better fit than the one-factor model ($\chi^2 = 123.7$, $\chi^2/df = 13.74$, NFI = .92, RMSEA = .12), $\chi^2_{diff} = 19.89$, $p < .001$.

Finally, given the statistical distinction between agency and pathways, we explored the extent that these two hope subscales where responsible for the significant effects involving hope and grades, activated positive affect, and teacher rated behavioral problems. The multi-level analysis previously described was repeated, except that either the pathways variable or agency variable was substituted for the hope variable. Self-esteem and attributional style acted as covariates. The agency subscale was a reliable predictor of grades ($\beta = .11$, SE = .031, $t = 3.54$, $p < .001$), behavioral problems ($\beta = −.16$, SE = .047, $t = 3.40$, $p < .001$), and activated positive affect ($\beta = .178$, SE = .047, $t = 3.79$, $p < .001$). In contrast, the pathways variable tended to be a less reliable predictor of grades ($\beta = .035$, SE = .029, $t = 1.21$, $\underline{p} > .05$), behavioral problems ($\beta = −.06$, SE = .043, $t = 1.39$, $p > .05$), and activated positive affect ($\beta = .087$, SE = .043, $t = 2.0$, $p < .05$).

3.2.5. Self-esteem and hope as outcomes

Hope and self-esteem were measured at both time points. This allowed us to examine these two variables as outcome variables, not just as initial predictors. The same MLRCM

procedures were used as above, except now the Time 1 variables (sex, verbal and numerical ability, emotional states, positive thinking variables) were used to predict either hope or self-esteem. Because we controlled for Time 1 measures of the outcome measure, we were able to examine change in personality. That is, we evaluated whether, on average, participants who scored high on a particular variable would show greater increases in self-esteem or hope compared to those who scored low on the particular variable with the same baseline hope or self-esteem. In light of the exploratory nature of these analyses, we set alpha to a conservative .01 level.

Assuming random intercepts or slopes did not improve the fit of the model, all $ps > .05$. Table 6 presents the results of these analyse. As expected, the baseline measures of self-esteem and hope were highly significant predictors of Time 2 self-esteem and hope, respectively. Higher sadness at Time 1 and being female, predicted decreases in self-esteem at Time 2. There were no other significant effects.

4. Discussion

The main aim of this longitudinal study was to determine the capacity of three positive thinking variables to predict distinctive variance in academic achievement, psychological adjustment, and self-rated well-being. We selected hope, self-esteem, and positive attributional style because they are generally regarded as key protective factors in adolescent psychological development (Peterson & Steen, 2002; Snyder et al., 2002). An important feature of this study is its longitudinal design and its use of self-reported, observer-reported, and objective data.

The results demonstrate that, once extraneous variables were controlled, hope had a more reliable effect on total school grades as well as individual subjects (English, Religious Studies, Math, Science, and Design) than positive attributional style and self-esteem. In contrast, the positive variables differed in their ability to predict affective states: self-esteem predicted decreases in sadness and increases in activated positive affect, hope predicted increases in activated positive affect, and positive attributional style was predictive of decreases in fear and hostility.

The positive variables also differed in their ability to predict teacher ratings of behaviors. Whereas positive attributional style did not predict teacher ratings, self-esteem was predictive of higher ratings of emotional problems, while hope predicted lower ratings of behavioral problems. It is important to note that we did not have pretest measures for the teacher ratings analyses. Consequently, we cannot tell whether the Time 1 variables are predicting changes in these outcome measures.

In summary, we started out by asking which of the positive thinking variables were distinctive predictors of future behavior and emotional well-being. We found that the answer to this question depends on the outcome variable. There was a context in which each of the positive thinking variables was distinctive and useful. Trait hope was the best predictor of grades, attributional style was the best predictor of decreases in hostility, and self-esteem was the only distinctive predictor of increases in sadness.

Hope was the only variable to have predictive utility across all of our outcome domains. As Snyder and his colleagues have suggested (e.g., Snyder, 2000a; Snyder et al., 1991, 1996), hope is important for goal-directed behavior such as school grades and is also a significant predictor of specific behaviors such as inattention, aggressiveness, and hyperactivity (as observed by teachers). Thus, hope is especially important for predicting

success at worldly activities such as good school grades and acceptable behavior as judged by others.

Factor analysis suggested that hope was distinguishable from self-esteem and attributional style, and MLRC modelling suggested that hope predicted variance over and above these two variables, and over and above prior achievement and emotional well-being. Post-hoc analyses where used to explore whether the two components of hope, agency and pathways, were equally predictive of outcomes. We found that the agency subscale was a more reliable predictor than the pathway subscale, and indeed predicted as well as the entire hope scale. This finding suggests that the "active ingredients" of the hope construct may be less broad than originally conceptualized. Our results are consistent with a recent longitudinal study which found that agency, and not pathways, predicted decreases in depression and anxiety (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007).

Additional research is needed to examine the extent that trait hope overlaps with theoretically relevant measures. It is possible that other positive thinking variables not measured in the present study overlap with hope. It is also possible that trait hope relates to measures of self-concordant or authentic goal striving (Sheldon & Houser-Marko, 2001; Sheldon & Elliot, 1998). The agency items of the hope scale reflects people's perception that they are "doing" well and the items predict actual goal achievement (getting good grades). Sheldon and Houser-Marko (2001) have shown that people with higher goal achievement tend to also have more self-concordant goals. Future research should examine the extent that hope and self-concordance overlap, and the possibility that these variables interact to predict future goal striving success. For example, having self-concordant goals may be most beneficial when people believe they can actually achieve those goals, or have a high sense of agency.

Concerning self-esteem, our results accord with other studies which have demonstrated that self-esteem is a poor predictor of school grades and certain behaviors such as problem behaviors. In a recent thorough review of the self-esteem literature, Baumeister et al. (2003) concluded that the importance of self-esteem for some behavioral and emotional outcomes has been overstated. With respect to academic grades, we concur with their conclusion that self-esteem does not predict academic grades and that the links with some problem behaviors (as rated by teachers) are extremely weak. Our finding that self-esteem predicts later affective states is also in accord with their conclusions.

Finally, in addition to looking at self-esteem and trait hope as predictors, we were able to examine them as outcomes. The main finding of interest was that sadness at Time 1 predicted decreases in self-esteem at Time 2. Low self-esteem also predicted increases in sadness. Thus, there appears to be a reciprocal relationship between these two variables, a kind of "downward spiral." In contrast, changes in trait hope were not predicted by past ability, well-being, or thinking style.

It is interesting to speculate on why some aspects of positive thinking predict some outcomes and not others. People with negative attributional style think they are responsible for the occurrence of negative events, and this thinking style was the only one to predict hostility. Anger and hostility often occur as the result of the appraisal that some agent has done something unpraiseworthy and undesirable (Ortony, Clore, & Collins, 1988). Perhaps people with negative attributional style experience self-directed hostility because they appraise their own actions to be both unpraiseworthy and undesirable. Future research should evaluate this interesting possibility.

Trait hope seemed to be particularly important in predicting activated positive affect. People high in trait-hope appear to be better at achieving their goals. For example, they achieved better grades in our study. Research suggests that successful goal attainment may be a critical cause of positive affect (Csikszentmihaly, 1999; Sheldon & Houser-Marko, 2001). Future research should examine the extent that goal attainment mediates the relationship between trait hope and activated positive affect.

4.1. Building resilience in teenagers

The results of our study suggest that interventions designed to improve academic achievement and behavioral adjustment should vary in their targeting of positive thinking variables. Whereas hope should be the focus of improving grades and lessening behavioral problems, self-esteem should be the focus of interventions designed to promote activated positive affect and decreased sadness. Positive attributional style should target fear and hostility. In general, we agree with Baumeister et al. (2003) that it is better if high self-esteem is contingent on positive behavior, rather than simply "given" to them, regardless of how they behave. Future research is needed to evaluate the impact of interventions that seek to increase the impact of our positive thinking variables.

We obtained only a one-year "snapshot" of the influence of these positive thinking variables on affect, behavior, and school performance. Over time, these effects may be cumulative and compounded. For instance, hope has important implications for school achievement in that low-hope students perform worse than is expected based on their verbal and numerical ability scores. Low hope decreases such a student's chances of making the cut-off for a gifted class, of graduating from school with good grades, and of making it into a chosen university course. Thus, persistent low hope over a number of years is likely to have consequences beyond the time frame of this study.

4.2. Concluding comments

One strength of this study is our multi-method approach. Because we used self-reports, observer reports, and objective outcome measures, many of the observed effects are unlikely to be inflated by common method variance (Lindell & Whitney, 2001). Some of our main outcome measures focus on observable behavior (teacher ratings and school grades) and are not reliant on the accuracy (or inaccuracy) of student self-judgements.

These data suggest that positive traits like hope, self-esteem, and positive attributional style play out in quite different ways in the lives of teenagers. Although they can be regarded as protective factors, their effects on achievement and psychological well-being are clearly quite different and their capacities to build resilience in young people are also distinctive.

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