



How hope measures up: Hope predicts school variables beyond growth mindset and school belonging

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Abstract

In this study, the associations among growth mindset, school belonging, and hope to several important academic variables are examined in a diverse sample of 447 high school students. In addition, the contribution made by growth mindset and school belonging to these academic variables is compared to hope's contribution. Data were collected via a school-administered survey and study analyses include a series of hierarchical regressions. This study had several notable findings. First, although growth mindset and school belonging accounted for meaningful percentages of variance in behavioral engagement, academic self-efficacy, and curiosity after controlling for demographics, both constructs did not meaningfully predict academic achievement, academic self-efficacy for self-regulation, or educational expectations. Second, hope not only accounted for the majority of variance across all academic variables compared to growth mindset and school belonging, but also explained a meaningful portion of all the academic variables (except educational expectations) beyond demographics and both variables. These results indicate that hope interventions might be a better investment than both growth mindset and school belonging interventions.

Keywords Hope · Growth mindset · School belonging · Achievement · Adolescents

Growth mindset and school belonging are two of the most popular perception-oriented constructs in American schools today. School administrators, scholars, and foundations all over the nation are spending enormous amounts of time and resources thinking of and implementing various interventions to increase the growth mindset and school belonging of students (National Science Foundation 2018a; 2018b; Sisk et al. 2018; Walton and Cohen 2011; Yeager et al. 2013). For example, a search of the PsycINFO and ERIC databases returns 416 articles for growth mindset and 405 articles for school belonging over the last 10 years. In addition, the National Science Foundation alone has expended over 50 million dollars researching how to increase growth mindset and school belonging in American students (National Science Foundation 2018a, 2018b). Finally, a listing of the most popular books read by teachers and school administrators includes books focused on increasing growth mindset and school belonging (e.g., Grantham 2017; Sztabnik 2015).

However, despite the enthusiasm for growth mindset and school belonging, several concerns have been raised recently about their importance within the school context. For example, Li and Bates (2017) attempted to replicate the original growth mindset study (i.e., Mueller and Dweck 1998) and found that a growth mindset was unrelated to both student achievement over two semesters ($\beta = -.01$, $p = .829$ and $\beta = .03$, $p = .723$) and learning across time ($\beta = 0.04$, $p = 0.228$). Similarly, a meta-analysis of 25 studies consisting of over 2000 students found that the average correlation between school belonging and academic achievement is .22, indicating <5% shared variance (Moallem 2013). Several recent studies and meta-analyses mirror the findings of these two studies (Bahník and Vranka 2017; Delgado et al. 2016; Dixon et al. 2017a; Korpershoek et al. 2019; Liu and Lu 2011; Gillen-O'Neel and Fuligni 2013; Sisk et al. 2018). Given these findings, it is possible that interventions centered on increasing a student's growth mindset or school belonging might not represent the best use of the limited resources that most schools and public institutions possess or the tremendous amount of funds being expended by funding agencies.

One perception-based construct that has shown promise in predicting performance in school is hope. Hope has been

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found to have moderate associations with a host of important school variables (Dixson et al. 2017b), including academic achievement ($r = .69$, Feldman and Kubota 2015). In addition, hope is responsive to a host of interventions (Weis and Speridakos 2011), has been found to be meaningfully changed in as little as 90 minutes (Feldman and Dreher 2011), and the effects of hope interventions have been found to last up to 18 months (Marques et al. 2011). All of these findings suggest that hope is both an attractive target to be the focus of a universal intervention and has the potential to be a better investment than growth mindset and school belonging.

In this study, I compared how growth mindset, school belonging, and hope predicted scores on six important school variables—grade point average (GPA), behavioral engagement, academic self-efficacy, academic self-efficacy for self-regulation, curiosity, and educational expectations—to better understand which of these variables would be the better investment of time and resources in schools. I begin with a discussion of hope, growth mindset, and school belonging. Then I discuss how these three constructs relate to each other and the school variables. Finally, I report on a study examining the association between the school variables and hope, growth mindset, and school belonging.

Hope

Hope has been defined as one's perceived ability to envision a better future, irrespective of one's current circumstances, mixed with the belief in one's capacity to be able to do what it takes to get there (Dixson et al. 2017a). Hope has two components: pathways and agency. Pathways is one's perceived ability to envision paths, as well as alternative paths in case of impediments, to desirable future goals. Agency is one's perceived ability, as well as one's corresponding motivation, to accomplish future goals via their envisioned paths. For example, if a college student wants to become a university professor, his perceived ability to come up with ways to become a professor (e.g., taking the GRE, going to graduate school, publishing in graduate school) would make up his pathways, whereas his perceived ability (as well as his motivation and persistence) to actually take the steps he envisioned to become a professor would make up his agency.

Hope is usually measured using the Children's Hope Scale (CHS; Snyder et al. 1997) in child and adolescent populations and the Adult Hope Scale (AHS; Snyder et al. 1991) in adult populations. Hope has been found to have meaningful associations with life satisfaction ($r = .50$, $p < .01$, Yarcheski and Mahon 2016), self-worth ($r = .54$, $p < .01$, Marques et al. 2011), resilience ($r = .48$, $p < .01$, You 2016), mental health ($r = .46$, $p < .01$, Marques et al. 2011), and depression ($r = -.47$, $p < .01$, Yarcheski and Mahon 2016).

Hope has been differentiated from similar constructs like self-efficacy and optimism both theoretically and empirically (e.g., Feldman and Kubota 2015; Snyder 2002). Hope differs from self-efficacy via its pathways construct. While self-efficacy is one's perceived ability to complete a certain task within a domain (Joo et al. 2000), hope is one's perceived ability to accomplish a future goal via the pathways that one has envisioned. If a student is a poor visionary but has a high perceived ability to accomplish a task, that student has high self-efficacy, but moderate to low hope. Hope also differs from optimism in several ways. Optimism is the general expectancy of positive future events without taking into account the person's ability, agency, or the realistic odds of an event happening (Feldman and Kubota 2015). Hope, on the other hand, is a motivational process that consists of both envisioning a goal and how to accomplish it given one's ability, agency, and perceived odds of goal achievement (Snyder 2002).

Empirically, hope has been differentiated from both constructs in several studies. For example, correlations have indicated that hope and optimism only share about 10%–25% of variance, and hope and self-efficacy share about 20%–45% variance (Dixson et al. 2016; Feldman and Kubota 2015; Rand et al. 2011). Further, an exploratory factor analysis of the items on the AHS, the Life Orientation Test (a measure of optimism, Scheier and Carver 1993), and the Self-Efficacy Scale (Sherer et al. 1982) found that the items from each scale loaded on different factors, indicating that the constructs were distinct from each other (Magaletta and Oliver 1999).

Growth Mindset

Mueller and Dweck (1998) asserted that students' beliefs about intelligence fall along a continuum. On one end of the continuum is a fixed mindset, the belief that intelligence is static and unchanging, no matter what one does. On the other is a growth mindset, the belief that intelligence is malleable and, like a muscle, can be changed with concerted effort. Dweck (2002) asserted that where students sit along this mindset continuum, which is assessed with the Theories of Intelligence Scale (TIS, Dweck 2000), has implications for their motivation and success. Her assertion is supported by a host of studies that have found that having a growth mindset is related to motivation ($r = .39$, $p < .001$, Grant and Dweck 2003), high standards ($r = .33$, $p < .0001$, Chan 2012), learning goals ($r = .34$, $p < .01$, Blackwell et al. 2007), perseverance ($r = .39$, $p < .001$, Dixson et al. 2017b), and happiness ($r = .53$, $p < .0001$, Chan 2012).

School Belonging

School belonging is one's feelings of community in or sense of personal relatedness to one's school (Sánchez et al. 2005).

Ye and Wallace (2013) argued that school belonging consists of three factors: identification with and participation in school, perception of fitting in among peers, and generalized connection to teachers. Thus, school belonging can include students' sense of membership to their school, the number of friends they have in school, how close they feel to their teachers and other adults in school, and their participation in school activities (e.g., sports teams, clubs, leadership; Cohen and Garcia 2008; Gibson et al. 2004; Sánchez et al. 2005).

In research, school belonging is usually measured using one of several scales (e.g., Psychological Sense of School Membership Scale; Goodenow 1993). School belonging's importance within the school context has been documented via meaningful associations with expectations for success ($r = .36, p < .01$, Sánchez et al. 2005), academic effort ($r = .35, p < .01$, Sánchez et al. 2005), academic achievement ($r = .33, p < .001$, Goodenow 1993), and school attendance ($r = .29, p < .05$, Sánchez et al. 2005).

Associations among Hope, Growth Mindset, and School Belonging

To date, there has been very little scholarship comparing how hope, growth mindset, and school belonging relate to one another. At the time of this writing, only three studies could be found that examined the relationship between hope and school belonging. Dixson (2017) conducted a study examining how hope relates to several school variables in a sample of 297 adolescents. They found that hope ($r = .40, p < .0002$) and both of its subscales ($r = .34$, agency; $r = .38$ pathways, $p < .0002$) meaningfully predicted school belonging. Similar findings were reported by Van Ryzin (2011) and Van Ryzin et al. (2009). Van Ryzin (2011) found that hope was meaningfully related to students' feelings of support from both teachers ($r = .30, p < .001$) and classmates ($r = .33, p < .001$) in a sample of 423 high school students, and Van Ryzin et al. (2009) reported that hope was significantly related to students' feelings of support from teachers ($r = .27, p < .001$) and students' feelings of support from classmates ($r = .36, p < .001$) in a sample of 283 high school students.

Three studies were also found that shed light on the relationship between hope and growth mindset, but the findings were mixed. In her dissertation study, Riegel (2012) examined the relationship of several positive constructs to leadership in a sample of 95 elementary school principals. She found that hope was unrelated to both a growth ($r = -.08, p > .05$) and fixed mindset ($r = -.05, p > .05$), but was meaningfully related to resilience ($r = .53, p < .01$), optimism ($r = .36, p < .01$), and leadership ($r = .38, p < .01$). Conversely, Lee et al. (2016) found that agency ($r = .19, p < .01$) and pathways ($r = .36, p < .01$) were significantly related to growth mindset scores in their sample of 290 mothers during their examination of

whether parental stress is related to children's well-being. Lastly, in another study, Lee (2016) found that hope was meaningfully related to growth mindset ($r = .31, p < .01$) and wellbeing scores ($r = .38, p < .01$) in a similar sample.

Finally, although there are several conceptual pieces outlining how growth mindset is related to school belonging (e.g., Dweck 2008), few empirical studies have been conducted examining this association. Burnette et al. (2017) examined the association between growth mindset and school belonging in a sample of 222 adolescent girls. They assessed the efficacy of a mindset intervention on several academic variables and reported that pre, post, and follow-up growth mindset scores were unrelated to pre ($r = -.04, p > .05$), post ($r = .04, p > .05$), and follow-up ($r = .02, p > .05$) school belonging scores. This study's findings are similar to results reported by Dixson et al. (2017a), who examined the association between growth mindset and belonging to one's ethnic group. In a sample of 105 high achieving African American students, Dixson, Roberson et al. reported that growth mindset scores were unrelated to students' feelings of belonging to their own ethnic group ($r = .13, p > .05$). Given the limited scholarship and mixed findings, it is not possible to draw definitive conclusions about how hope, growth mindset, and school belonging relate to one another.

The Current Study

Hope, growth mindset, and school belonging have all been shown to be associated with academic achievement. However, there are several other school-related variables that predict academic success, and how hope, growth mindset, and school belonging are associated with these variables will have implications for their contributions to academic success more broadly. The school variables included in this study are GPA, behavioral engagement (i.e., students' behavioral and emotional investment in their academic activities; Skinner et al. 2008), academic self-efficacy (i.e., students' perceived ability to do well across a range of academic subjects), academic self-efficacy for self-regulation (i.e., students' perceived ability to regulate themselves and employ effective strategies in order to achieve academically; Zimmerman et al. 1992), curiosity (i.e., student willingness to seek out and embrace the novel or unknown), and educational expectations (i.e., student beliefs about how much education they can obtain).

These specific variables were chosen for three primary reasons. First, several studies indicate that these variables have a meaningful relationship (i.e., at least a medium effect size) with academic achievement (Kashdan and Yuen 2007; Pintrich and de Groot 1990; von Stumm and Chamorro-Premuzic 2011; Zhan 2014; Zimmerman et al. 1992). Second, several other studies suggest that these variables are meaningfully related to school success more broadly via

predicting (i.e., $r_s > .30$) several non-GPA indicators of academic success (e.g., academic motivation, cognitive engagement in school, school attendance; Dixson et al. 2016; Dogan 2015; Kashdan et al. 2004; Sánchez et al. 2005; Schoon and Ng-Knight 2017; Van Ryzin 2011; Walker et al. 2006). Finally, as stated previously, there are few studies linking many of these school variables to hope, growth mindset, and school belonging (Burnette et al. 2017; Dixson et al. 2016; Dixson et al. 2017b; Goodenow and Grady 1993; Kern et al. 2015; Uwah et al. 2008).

The current study is an examination of the contributions of hope, growth mindset, and school belonging in predicting GPA, behavioral engagement, academic self-efficacy, academic self-efficacy for self-regulation, curiosity, and educational expectations. This study is warranted given the time and resources devoted to interventions based on growth mindset and school belonging (e.g., Paunesku et al. 2015; Walton and Cohen 2011; Yeager et al. 2013) and is guided by the following research questions: (a) how much variance of the school variables is accounted for by growth mindset and school belonging?, (b) how does the school variable variance explained by growth mindset and school belonging compare to the variance explained by hope?, and (c) how much variance of the school variables is explained by hope after controlling for growth mindset and school belonging?

Consistent with previous research (e.g., Blackwell et al. 2007; Burnette et al. 2017; Dixson and Stevens 2018; Goodenow and Grady 1993; Mueller and Dweck 1998), growth mindset and school belonging were hypothesized to be positively related to the school variables and to explain a significant percentage of their variance. In addition, and consistent with previous research that indicates that hope has a stronger association with school variables than growth mindset and school belonging (e.g., Burnette et al. 2017; Dixson et al. 2017a; Goodenow and Grady 1993; Korpershoek et al. 2019; Moallem 2013; Sisk et al. 2018), it was hypothesized that hope would account for a meaningful percentage of the school variables' variance relative to and beyond growth mindset and school belonging (i.e., $\geq 9\%$; Cohen 1988).

Method

Participants and Procedure

The sample consisted of 447 (53.3% male) adolescents aged 12–19 ($M_{\text{age}} = 15.8$, $SD = 1.28$) attending an urban high school in a Midwestern state. Students' ethnic backgrounds were self-reported as 55.8% European American, 25.3% African American, 5.7% Hispanic American, 3% Asian American, and 10.2% Multi-Ethnic/Other. The socioeconomic status of the sample was self-reported (via a single item that

asked students "How would you describe your family's socioeconomic status?") as 1.6% poor, 8.4% working class, 15.5% lower middle class, 54.2% middle class, 16.2% upper middle class, 2.1% lower upper class, and 2.1% wealthy.

Data were collected via a school-administered survey that assessed student perceptions about school climate. Students completed the survey in a single online session during an administration period. All scales on the survey were presented in a randomized order for each student. Teachers were available throughout the administration in case students had questions. Students generally spent about 30 min completing the survey. Missing data were imputed using the expectation maximization algorithm (15 iterations, data were found to be missing completely at random [Little's MCAR test: Chi-Square = 1824.82, $DF = 1737$, $p = .070$]); 1.8% to 11.2% of the data were imputed per item in this study.

The current study was approved by a university Institutional Review Board (IRB). In accordance with district policy and the university IRB, consent for participation in the current study was obtained passively. Two weeks before the survey was administered, all students were sent home with a passive consent form outlining study risks, procedures, possible benefits, and contact information for a study representative. If a parent wanted to opt their child out of the current study, they were to sign and return the passive consent form (indicating that they did not want their child to participate in the study). If they consented to their child participating in the study, no action was required. On the day the survey was administered, all students who did not return the passive consent form were given the option to participate in the study (i.e., assent to participate). Those who chose not to participate were allowed to read while those who agreed to participate were told that they could skip any questions as well as opt out of the study at any time without negative consequences. Only nine parents returned the passive consent form (< 2% of the school population), and after absences and assent were taken into account, 92.6% of the school's student body participated in the current study.

Measures

Hope

Hope was measured using the CHS (Snyder et al. 1997), a 6-item scale that measures a student's perceived ability to accomplish goals via envisioned paths. Three items on the CHS measured agency (e.g., "I am doing just as well as other kids my age") and three items measured pathways (e.g., "When I have a problem, I can come up with lots of ways to solve it"). Response options were on a 6-point Likert scale (1 = *None of the time*, 6 = *All of the time*). Higher scores were indicative of higher agency and pathways. Scores on the CHS have been found to be reliable in similar samples with alpha estimates

ranging from .70 to .85 for pathways, agency, and hope (Dixson 2017). In the current sample, alpha estimates were .76 for agency, .81 for pathways, and .88 for hope. A 2-factor exploratory factor analysis (EFA; principal axis extraction) indicated that CHS scores were structurally valid with communalities ranging from .416 to .649 and factor loadings ranging from .645 to .805.

School Belonging

School belonging was measured via three items that measured the extent that students felt a part of their school community. The three items were: “I feel welcome at [Blinded] High School;” “I like [Blinded] High School;” and “I fit in at [Blinded] High School.” Response options were on a 6-point Likert scale (1 = *Strongly disagree*, 6 = *Strongly agree*). Higher scores were indicative of higher school belonging. In this sample, school belonging scale (SBS) scores had an alpha estimate of .85. SBS scores were also concluded to be structurally valid, with a 1-factor EFA yielding a communality range of .576 to .815 and a factor loading range of .759 to .903.

Growth Mindset

Growth mindset was measured using the growth mindset subscale (Growth Mindset) of the TIS scale (Dweck 2000). This 4-item scale measured student beliefs about the malleability of their intelligence (e.g., “You can always substantially change how intelligent you are”). Response options were on a 6-point Likert scale (1 = *Strongly disagree*, 6 = *Strongly agree*). Higher scores were indicative of a higher degree of endorsement that intelligence is malleable. Previous research has found Growth Mindset scores to be reliable with alpha estimates ranging from .76 to .85 (Chan 2012; Dixson et al. 2017b). In the current sample, Growth Mindset scores were found to be reliable ($\alpha = .88$) and structurally valid (a 1-factor EFA yielded a communality range of .589 to .719 and a factor loadings range of .767 to .848).

Grade Point Average

Grade point average (GPA) was self-reported on a 4-point scale via asking students “What is your current GPA?” Several studies have found self-reported GPA to be reliable in adolescent populations. For instance, Kuncel et al. (2005) found in a meta-analysis consisting of over 40,000 students that the average correlation between self-reported GPA and actual GPA reported by schools is .84, with the range of correlations being .82 to .90 for high school and college student populations.

Behavioral Engagement

Behavioral engagement was measured using the Behavioral Engagement subscale of the Engagement vs. Disaffection scale (Skinner et al. 2008). This 5-item subscale measured students’ willingness to initiate, focus, and persist in educational or learning activities (e.g., “When I’m in class, I participate in class discussions”). Response options were on a 7-point Likert scale (1 = *Not true at all*, 7 = *Very true*). Higher scores were indicative of higher behavioral engagement in school. Behavioral Engagement scores have been found to be reliable in previous research, with alpha estimates ranging from .71 to .72 (Skinner et al. 2008). In the current sample, Behavioral Engagement scores were found to be both reliable ($\alpha = .86$) and structurally valid (a 1-factor EFA yielded a communality range of .240 to .756 and factor loadings that ranged from .489 to .869).

Academic Self-Efficacy

Academic self-efficacy and academic self-efficacy for self-regulation were measured using subscales of the Children’s Multidimensional Self-Efficacy Scale (Bandura 1990; Zimmerman et al. 1992). The 11-item academic self-efficacy for self-regulation subscale (ASESR) measured one’s perceived ability to engage in success-oriented academic behaviors and strategies (e.g., “How well can you take good notes during class instruction?”), and the 9-item academic self-efficacy subscale (ASE) measured students’ perceived ability to learn and do well within academic subjects (e.g., “How well can you learn algebra”). Response options for both subscales were on a 6-point Likert scale (1 = *Not at all*, 6 = *Extremely well*). Higher scores were indicative of higher self-efficacy beliefs.

Both subscales have been found to be reliable in previous research with alpha estimates for ASE scale scores ranging from .70 to .90 and from .82 to .87 for ASESR scale scores (Dixson et al. 2016; Joo et al. 2000; Zimmerman et al. 1992). In the current sample, both ASE and ASESR scale scores were found to be reliable with alpha estimates of .86 and .92, respectively. In addition, exploratory factor analyses indicated that both ASE and ASESR scale scores were structurally valid with acceptable communality estimates (range of .261 to .586 for ASE and .227 to .661 for ASESR) and factor loadings (range of .511 to .765 for ASE and .476 to .813 for ASESR).

Curiosity

Curiosity was measured using the second edition of the Curiosity and Exploration Inventory (CEI-II; Kashdan et al. 2009). This 10-item scale measured students’ willingness to seek out and embrace new experiences, uncertainty, and new knowledge. The scale consisted of two subscales, stretching

and embracing. Five items measured stretching, one's willingness to seek out new knowledge and experiences (e.g., "I actively seek as much information as I can in new situations"), and five items measured embracing, one's openness and willingness to engage with uncertainty (e.g., "I am the type of person who really enjoys the uncertainty of everyday life"). Response options were on a 5-point Likert scale (1 = *Very slightly or not at all*, 5 = *Extremely*). Scores were added together to create a curiosity score. Higher scores were indicative of higher trait curiosity. CEI-II scores have been found to be reliable in similar samples with alpha estimates ranging from .83 to .86 (Kashdan et al. 2009). In the current sample, CEI-II scores were found to be both reliable ($\alpha = .90$) and structurally valid (a 1-factor EFA yielded a communality range of .346 to .669 and factor loading range of .589 to .818).

Educational Expectations

Educational expectations were measured via a single item that asked students, "How much schooling do you expect to have by the time you are 30 years old," with the following Likert scale options: 1 (*High school diploma or equivalent*), 2 (*Some college [no degree]*), 3 (*Associate's degree*), 4 (*Bachelor's degree*), 5 (*Master's degree*), and 6 (*Doctoral or professional degree [PhD, JD, DDS]*). This item has been used effectively in previous research to measure educational expectations (e.g., Dixson et al. 2017a).

Results

Descriptive Statistics

The means, standard deviations, and intercorrelations for study variables are presented in Table 1. A series of t-tests and one-way ANOVAs were conducted to assess for differences among study variables across gender and race respectively. The few differences that were found were in keeping with the existent literature (most p 's > .05). European Americans reported higher school belonging than African Americans ($d = .34$, $p = .009$), and females reported higher GPAs ($d = .20$, $p = .042$), educational expectations ($d = .36$, $p < .001$), behavioral engagement ($d = .29$, $p = .002$), and academic self-efficacy for self-regulation ($d = .34$, $p < .001$) than males, all with modest effect sizes. As can be seen in Table 1, most study variables were, as expected, meaningfully related to each other with most correlations having a medium to large effect size. These relationships are in keeping with the existing literature (e.g., Dixson et al. 2017b; Kashdan et al. 2009; Strayhorn 2012; Zimmerman et al. 1992).

Main Analyses

A series of hierarchical regressions were used to answer the research questions. Age, gender, and socioeconomic status were included in Block 1 of all regressions in order to control for these known possible confounding factors (e.g., Dixson 2017; Sirin 2005). Hierarchical regressions were employed because of their ability to (a) control for the included demographics (i.e., age, gender, and socioeconomic status), (b) to assess how much variance school belonging and growth mindset account for across the included school variables, and (c) to examine how much variance hope explained of the included school variables compared to and beyond growth mindset and school belonging. School belonging and growth mindset were included in Block 2 in order to assess whether they accounted for a meaningful percentage of the included school variables beyond demographics. Pathways and agency were included in Block 3 in order to not only examine how they related to the included school variables in comparison to school belonging and growth mindset, but also to conduct the more stringent test of seeing whether they accounted for a meaningful percentage of the school variables' variance beyond school belonging and growth mindset.

Growth Mindset, School Belonging, and Important School Variables

Results of all study regressions are presented in Table 2. As can be seen, after controlling for the variance explained by the demographics, growth mindset and school belonging scores only explained a meaningful percentage of variance (i.e., $\geq 9\%$; Cohen 1988) in behavioral engagement, academic self-efficacy, and curiosity, all with a medium effect size. Both growth mindset and school belonging scores were statistically significant contributors ($ps < .01$ to include a Bonferroni correction) for behavioral engagement and academic self-efficacy, while only growth mindset scores were statistically significant for curiosity. Additionally, despite not arising to at least a medium effect size, both growth mindset and school belonging scores were statistically significant contributors to GPA and academic self-efficacy for self-regulation. Neither growth mindset nor school belonging scores were significantly related to educational expectations.

Hope, Growth Mindset, School Belonging, and Important School Variables

Results of hierarchical regressions with growth mindset and school belonging scores entered in Block 2 (after controlling for age, gender, and socioeconomic status in Block 1) and pathways and agency scores entered in Block 3 are presented in Fig. 1 and Table 2. As can be seen, for both GPA and educational expectations, agency was the only significant

Table 1 Descriptive statistics for hope, school belonging, growth mindset, and school variables

	1	2	3	4	5	6	7	8	9	10	<i>M</i>	<i>SD</i>
1. Agency	–										3.87	1.09
2. Pathways	.77*	–									3.93	1.11
3. School Belonging	.28*	.25*	–								3.96	1.26
4. Growth Mindset	.39*	.42*	.12	–							4.25	1.01
5. GPA	.38*	.28*	.16*	.17*	–						2.88	0.75
6. Behavioral Eng.	.46*	.42*	.28*	.22*	.40*	–					4.83	1.20
7. Academic SE	.45*	.40*	.25*	.31*	.35*	.44*	–				4.32	0.78
8. Academic SE for SR	.44*	.43*	.22*	.19*	.33*	.60*	.59*	–			3.69	1.00
9. Curiosity	.39*	.47*	.15	.30*	.09	.32*	.33*	.31*	–		3.23	0.84
10. Educational Exp.	.28*	.20*	.02	.13	.40*	.35*	.34*	.31*	.15	–	4.15	1.32

Behavioral Eng. = Behavioral Engagement; Academic SE = Academic Self-Efficacy; Academic SE for SR = Academic Self-Efficacy for Self-Regulation; Educational Exp. = Educational Expectations

* $p < .0011$

predictor after Block 3 was entered and the hope subscale scores accounted for an additional 9.2% and 5.7%, respectively—a medium and small effect size. For behavioral engagement, school belonging, agency, and pathways were significant predictors, with the hope subscale scores accounting for an additional 14.8% beyond growth mindset and school belonging, a medium effect size. For academic self-efficacy, the significant predictors were school belonging and agency, with hope subscale scores accounting for an additional 11.5% beyond growth mindset and school belonging, a medium effect size.

For academic self-efficacy for self-regulation, only pathways and agency were significant predictors after Block 3 was entered, with the hope subscale scores accounting for an additional 15.9% beyond Block 2—a medium effect size. For curiosity, growth mindset and pathways were the only significant predictors after Block 3 was entered, with hope subscale scores accounting for an additional 12.1% of curiosity's variance beyond growth mindset and school belonging, also a medium effect size. Finally, for all six variables, the combined semi-partial correlation (sr^2) of pathways and agency were greater than the combined sr^2 of growth mindset and pathways, indicating that the subscales of hope explained more variance of the six school variables than growth mindset and school belonging.

Discussion

The focus of this study was to examine the contributions of hope, growth mindset, and school belonging to several important variables in the school environment to better understand

whether hope is a better predictor of the school variables and thus might be a better target for academic interventions. This study had three primary goals: (a) to examine how growth mindset and school belonging scores related to several influential school variables (i.e., GPA, behavioral engagement, academic self-efficacy, academic self-efficacy for self-regulation, curiosity, and educational expectations), (b) to compare the relative contributions that hope, growth mindset, and school belonging have to the several influential school variables, and (c) to assess whether hope accounted for a meaningful percentage of variance in the influential school variables beyond the contributions of growth mindset and school belonging. This study had several notable findings.

First, consistent with previous research (e.g., Burnette et al. 2017; Dixson and Stevens 2018; Goodenow and Grady 1993; Mueller and Dweck 1998; Blackwell et al. 2007), growth mindset and school belonging accounted for a meaningful portion (i.e., < 9%; Cohen 1988) of behavioral engagement, academic self-efficacy, and curiosity as hypothesized. This finding was expected given the several previous studies that have found that growth mindset and school belonging are positively related to various aspects of school success (e.g., Mueller and Dweck 1998; Blackwell et al. 2007; Walton and Cohen 2011). Findings like the current one likely provide insight into why these constructs are held in such high regard. The ability to predict behavioral engagement, academic confidence, and curiosity is highly valued within the school context and would be held in high regard by most.

One reason that growth mindset and school belonging may meaningfully contribute to behavioral engagement, academic self-efficacy, and curiosity is through getting students to embrace their academic identity (i.e., increasing the importance

Table 2 Hierarchical regressions of hope, growth mindset, and school belonging predicting important school variables

Variable	B	β	sr ²	Adjusted R ²	ΔR ²
Grade Point Average					
Block 1				.033	
Age	-.048	-.081			
Gender	.165	.109			
Socioeconomic Status	.107	.145*			
Block 2				.086	.053
School Belonging	.106	.175**	.030		
Growth Mindset	.108	.145*	.021		
Block 3				.178	.092
School Belonging	.054	.088	.007		
Growth Mindset	.025	.033	.001		
Agency	.262	.377**	.057		
Pathways	-.030	-.044	.001		
Behavioral Engagement					
Block 1				.017	
Age	.015	.016			
Gender	.340	.144*			
Socioeconomic Status	.083	.073			
Block 2				.124	.107
School Belonging	.261	.276**	.074		
Growth Mindset	.183	.158**	.024		
Block 3				.272	.148
School Belonging	.153	.162**	.024		
Growth Mindset	-.015	-.013	.000		
Agency	.330	.305**	.037		
Pathways	.178	.169*	.011		
Academic Self-Efficacy					
Block 1				.002	
Age	-.011	-.019			
Gender	.036	.024			
Socioeconomic Status	-.064	-.087			
Block 2				.137	.135
School Belonging	.142	.234**	.053		
Growth Mindset	.197	.264**	.068		
Block 3				.252	.115
School Belonging	.080	.132*	.125		
Growth Mindset	.085	.114	.103		
Agency	.201	.288**	.183		
Pathways	.088	.130	.082		
Academic Self-Efficacy for Self-Regulation					
Block 1				.028	
Age	.021	.027			
Gender	.333	.167**			
Socioeconomic Status	-.063	-.066			
Block 2				.099	.071
School Belonging	.172	.216**	.045		
Growth Mindset	.144	.147*	.021		
Block 3				.258	.159

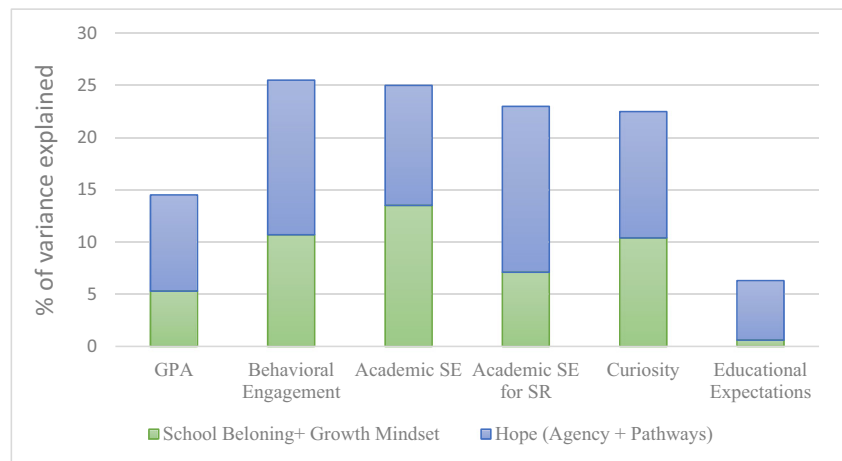
Table 2 (continued)

Variable	B	β	sr ²	Adjusted R ²	ΔR ²
School Belonging	.080	.100	.009		
Growth Mindset	-.035	-.035	.001		
Agency	.218	.238**	.023		
Pathways	.230	.257**	.026		
Curiosity					
Block 1				-.002	
Age	-.002	-.004			
Gender	-.060	-.036			
Socioeconomic Status	.047	.058			
Block 2				.102	.104
School Belonging	.068	.102	.010		
Growth Mindset	.246	.300**	.088		
Block 3				.223	.121
School Belonging	.006	.009	.000		
Growth Mindset	.114	.139*	.016		
Agency	.056	.074	.002		
Pathways	.260	.347**	.047		
Educational Expectations					
Block 1				.047	
Age	-.022	-.021			
Gender	.482	.183**			
Socioeconomic Status	.200	.157**			
Block 2				.053	.006
School Belonging	.031	.030	.001		
Growth Mindset	.125	.096	.009		
Block 3				.110	.057
School Belonging	-.043	-.041	.001		
Growth Mindset	.004	.003	.000		
Agency	.350	.288**	.033		
Pathways	-.018	-.015	.000		

*p < .01, **p < .001

of the academic domain within their conception of themselves). Students who feel that their effort will dictate their academic success or feel that they belong in school may place more value on performing academically, possibly resulting in more behavioral engagement, higher academic confidence, and the increased tendency to embrace curiosity at school. Support for this can be found in two different studies. Good et al. (2007) explored how having a growth mindset influenced women’s math identity and desire to pursue a math education in a large sample of undergraduate women. They found that even when negative stereotypes were pervasive within their classroom environment, those students who possessed a growth mindset were still confident that they belonged in the math class, intended to enroll in additional math classes in the future, and continued to earn high math grades (Dweck 2008; Good et al. 2007). Similarly, Uwah et al. (2008) examined how school belonging was related to

Fig. 1 % of variance explained by hope subscales beyond school belonging and growth mindset



academic self-concept and educational expectations in a sample of male adolescents. They reported that within their sample, school belonging meaningfully predicted academic self-concept ($r = .29, p > .05$), and academic self-concept meaningfully predicted both feelings of encouragement to participate in school ($r = .42, p < .01$) and educational expectations ($r = .39, p < .05$).

Second, contrary to what was hypothesized as well as previous research (e.g., Blackwell et al. 2007; Burnette et al. 2017; Goodenow and Grady 1993), growth mindset and school belonging did not explain a meaningful percentage of GPA, academic self-efficacy for self-regulation, or educational expectations. Although this finding is consistent with the recent studies that have cast doubt on the efficacy of growth mindset and school belonging within the school context (e.g., Dixson et al. 2017a; Korpershoek et al. 2019; Li and Bates 2017; Moallem 2013; Sisk et al. 2018), this finding is surprising given the high regard these variables are held by teachers, administrators, scholars, and even politicians (e.g., Blackwell et al. 2007; Grantham 2017; Walton and Cohen 2011). Moreover, it is even more surprising given the amount of monetary and school resources that are expended on increasing these psychosocial factors nationwide (National Science Foundation 2018a, 2018b). For instance, a White Paper centered on scaling up growth mindset interventions has been written to the White House, and the Centers for Disease Control and Prevention has put out a report focused on increasing school belonging (Centers for Disease Control and Prevention 2009; Yeager et al. 2013).

One possible reason for this finding is that scholars and practitioners may have moved too quickly in creating and implementing interventions based on these constructs without first thoroughly and rigorously assessing these constructs and how they are measured in multiple samples and across studies as is considered best practice (Furr 2017). Support for this assertion can be found by the multitude of studies that examined growth mindset and school belonging interventions as opposed to just gaining a better understanding of the

constructs in general and how they relate to other factors within the school environment (e.g., see Sisk et al. 2018 for review). Thus, moving forward it might be beneficial for scholars to conduct more foundational research on both school belonging and growth mindset in order to figure out under what circumstances and for whom it is best to target these constructs so that interventions are optimally effective and efficient to make better use of the monetary and school resources expended on these constructs. This recommendation is supported by Sisk et al. 2018, who found in a pair of meta-analyses (total $n > 400,000$ students) that despite growth mindset being weakly related to academic achievement overall (average $r = .10$) and growth mindset interventions not being beneficial for school samples as a whole, growth mindset interventions were found to be beneficial for high-risk and low socioeconomic students.

A possible reason that growth mindset and school belonging meaningfully predicted behavioral engagement, academic self-efficacy, and curiosity but not GPA, academic self-efficacy for self-regulation, and educational expectations might be that the latter involves more long term thinking and planning. The belief that effort matters for academic success or the feeling that one is a member of their school community might get a student to raise her hand in class or feel more curious, but it might not be enough to get a student to form a plan for studying for tests or aspiring to complete more education. This assertion would be consistent with previous research (e.g., Dixson et al. 2017b; Good et al. 2007; Singh et al. 2010). Nonetheless, these findings indicate that school belonging and growth mindset may not be as well understood as previously thought (e.g., Dweck 2008; Strayhorn 2012).

Third, for all six influential school variables, the hope subscales explained the majority of the variance accounted for by hope, growth mindset, and school belonging altogether. Moreover, the hope subscales explained a meaningful percentage of GPA, behavioral engagement, academic self-efficacy, academic self-efficacy for self-regulation, and curiosity beyond growth mindset and school belonging. In addition,

despite not accounting for a meaningful portion of educational expectation's variance beyond growth mindset and school belonging, the hope subscales did explain nine and a half times the amount of variance in educational expectations that growth mindset and school belonging together accounted for.

Although these findings are consistent with previous research, which found that the relationships reported between hope and several school variables are higher than the relationships reported between both growth mindset and school belonging to several school variables (e.g., Dixson et al. 2017a; Dixson et al. 2017b; Roeser et al. 1996), it is still very surprising given the countless number of interventions that have been developed for both growth mindset and school belonging and the amount of resources that have been expended on increasing growth mindset and school belonging in students (e.g., Cohen and Garcia 2008; Good et al. 2007; National Science Foundation 2018a; 2018b; Sisk et al. 2018; Slaten et al. 2016; Walton and Cohen 2011). Further, this finding mixed with research indicating that hope interventions are quick (e.g., Feldman and Dreher 2011), effective (e.g., Weis and Speridakos 2011), and cheap to implement (e.g., Marques et al. 2011), suggest that hope interventions might be a better investment than growth mindset and school belonging interventions. Schools are notoriously underfunded and commonly lack the resources to implement research-based interventions that focus on psychosocial factors. Thus, schools might want to consider targeting the hope of students to get the best return on the time, energy, and resources expended on implementing a psychosocial school intervention. However, before school administrators start implementing hope interventions in lieu of growth mindset and school belonging interventions, more research should be conducted on all three of these constructs to ensure that other studies replicate the current research and to better understand the effectiveness of interventions that target all three constructs.

Finally, it is important to highlight the dynamic between hope and the included school outcomes. For some outcomes, both pathways and agency were significant predictors, while for many others, only one of the two significantly predicted the outcome variable. The latter point not only highlights the synergy of the two subscales of hope, but also indicates a possible reason for why hope was found to be a better predictor of the included school variables than both growth mindset and school belonging. Both growth mindset and school belonging can be described as influential, but narrow, beliefs about a single aspect of one's life. Growth mindset consists of the belief that intelligence is malleable and school belonging is the belief, and corresponding feelings, that one is a member of a particular school community. Hope on the other hand, is more than just a single belief, it is two broad beliefs about one's ability to look towards and accomplish future goals, encompassing the many factors that it takes to obtain valued future goals (e.g., motivation, overcoming setbacks,

initiative; Snyder 2002). In addition, these beliefs are constantly informed by all goal pursuits, both big (e.g., become the next president of the United States) and small (e.g., go to sleep by a certain time), that one has undertaken throughout life (Snyder 2002). Thus, it makes sense that hope, the construct that consists of two broader beliefs that are informed by previous experiences that cut across all aspects of one's life, is a better predictor of school outcomes than both growth mindset and school belonging, which are two constructs that consist of rather narrow beliefs centered around only one aspect of one's life.

Conclusions and Limitations

There are two major conclusions of this study. First, growth mindset and school belonging may not be as well understood as previously thought. This study found that these variables were important for some school variables and unrelated to others. This is a finding that was not fully predicted by previous research (especially the finding of growth mindset and school belonging explaining a meaningful portion of academic self-efficacy, but not academic self-efficacy for self-regulation). Further research on these variables should be conducted in order to better understand how these variables relate to the school context so that this study's findings can be better understood and future interventions can be better informed. Second, this study indicates that hope may be a better target of psychosocial interventions in schools than both growth mindset and school belonging. More research in the future should examine hope in the school context. Both to replicate this study's findings and to expand current research on hope in the schools to better inform hope interventions.

Finally, like all research, this study had several limitations. First, this study was cross-sectional, precluding casual inferences from being drawn on the basis of this study alone. Future research should focus on conducting psychological experiments that provide additional insight into the causal mechanisms surrounding how hope, growth mindset, and school belonging relate to influential school variables and achievement. Second, educational expectations were measured by a single item in this study. Despite multi-item scales being considered best practice for both validity and reliability (Furr 2017), the single item's meaningful correlations with GPA, behavioral engagement, and academic self-efficacy indicate some internal validity. Finally, achievement was self-reported in this study. Although it would have been best practice to obtain student achievement from school records, several studies indicate that self-reported GPA is reliable in adolescent populations (see Kuncel et al. 2005 for meta-analysis). These limitations notwithstanding, this study indicates that hope is an influential variable within the school context and that students could benefit from researchers, school

administrators, and educators having an increased focus on leveraging hope in schools.

Compliance with Ethical Standards

Conflict of Interest The author of this manuscript asserts that: (a) there is no conflict of interest to disclose involving the current study, (b) the current research was reviewed by the Institutional Review Board at one of the author's institutions and was found to be in compliance with the institution's ethical standards, and (c) informed consent was obtained from every study participant.

References

- Bahník, Š., & Vranka, M. A. (2017). Growth mindset is not associated with scholastic aptitude in a large sample of university applicants. *Personality and Individual Differences, 117*, 139–143. <https://doi.org/10.1016/j.paid.2017.05.046>.
- Bandura, A. (1990). *Multidimensional scales of perceived self-efficacy*. Stanford: Stanford University.
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*, 246–263. <https://doi.org/10.1111/j.1467-8624.2007.00995.x>.
- Burnette, J. L., Russell, M. V., Hoyt, C. L., Orvidas, K., & Widman, L. (2017). An online growth mindset intervention in a sample of rural adolescent girls. *British Journal of Educational Psychology, 88*, 428–445. <https://doi.org/10.1111/bjep.12192>.
- Centers for Disease Control and Prevention. (2009). *School connectedness: Strategies for increasing protective factors among youth*. Atlanta: U.S. Department of Health and Human Services.
- Chan, D. W. (2012). Life satisfaction, happiness, and the growth mindset of healthy and unhealthy perfectionists among Hong Kong Chinese gifted students. *Roeper Review, 34*, 224–233. <https://doi.org/10.1080/02783193.2012.715333>.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Routledge Academic.
- Cohen, G. L., & Garcia, J. (2008). Identity, belonging, and achievement: A model, interventions, implications. *Current Directions in Psychological Science, 17*, 365–369. <https://doi.org/10.1111/j.1467-8721.2008.00607.x>.
- Delgado, M. Y., Ettekal, A. V., Simpkins, S. D., & Schaefer, D. R. (2016). How do my friends matter? Examining Latino adolescents' friendships, school belonging, and academic achievement. *Journal of Youth and Adolescence, 45*, 1110–1125. <https://doi.org/10.1007/s10964-015-0341-x>.
- Dixson, D. D. (2017). Hope across achievement: Examining psychometric properties of the Children's Hope scale across the range of achievement. *SAGE Open, 7*, 2158244017717304. <https://doi.org/10.1177/2158244017717304>.
- Dixson, D. D., Roberson, C. B., & Worrell, F. C. (2017a). Psychosocial keys to African American achievement? Examining the relationship between achievement and psychosocial variables in high achieving African Americans. *Journal of Advanced Academics, 28*, 120–140. <https://doi.org/10.1177/1932202X17701734>.
- Dixson, D. D., Worrell, F. C., & Mello, Z. (2017b). Profiles of hope: How clusters of hope relate to school variables. *Learning and Individual Differences, 59*, 55–64. <https://doi.org/10.1016/j.lindif.2017.08.011>.
- Dixson, D. D., & Stevens, D. (2018). A potential avenue for academic success: Hope predicts an achievement-oriented psychosocial profile in African American adolescents. *Journal of Black Psychology, 44*(6), 532–561. <https://doi.org/10.1177/0095798418805644>.
- Dixson, D. D., Worrell, F. C., Olszewski-Kubilius, P., & Subotnik, R. F. (2016). Beyond perceived ability: The contribution of psychosocial factors to academic performance. *Annals of the New York Academy of Sciences, 1377*, 67–77. <https://doi.org/10.1111/nyas.13210>.
- Dogan, U. (2015). Student engagement, academic self-efficacy, and academic motivation as predictors of academic performance. *The Anthropologist, 20*, 553–561. <https://doi.org/10.1080/09720073.2015.11891759>.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Taylor & Francis.
- Dweck, C. S. (2002). Messages that motivate: How praise molds students' beliefs, motivation, and performance (in surprising ways). In *Improving academic achievement: Impact of psychological factors on education* (pp. 37–60). San Diego: Academic Press.
- Dweck, C. S. (2008). *Mindsets and math/science achievement*. New York: Carnegie Corporation of New York.
- Feldman, D. B., & Dreher, D. E. (2011). Can hope be changed in 90 minutes? Testing the efficacy of a single-session goal-pursuit intervention for college students. *Journal of Happiness Studies, 13*, 745–759. <https://doi.org/10.1007/s10902-011-9292-4>.
- Feldman, D. B., & Kubota, M. (2015). Hope, self-efficacy, optimism, and academic achievement: Distinguishing constructs and levels of specificity in predicting college grade-point average. *Learning and Individual Differences, 37*, 210–216. <https://doi.org/10.1016/j.lindif.2014.11.022>.
- Furr, R. M. (2017). *Psychometrics: An introduction*. Los Angeles: SAGE Publications, Inc..
- Gibson, M., Bejinez, L., Hidalgo, N., & Rolón, C. (2004). Belonging and school participation: Lessons from a migrant student club. In M. Gibson, P. Gandara, & J. Koyama (Eds.), *School connections: U.S. Mexican youth, peers, and school achievement*. New York: Teachers College press.
- Gillen-O'Neel, C., & Fuligni, A. (2013). A longitudinal study of school belonging and academic motivation across high school. *Child Development, 84*, 678–692. <https://doi.org/10.1111/j.1467-8624.2012.01862.x>.
- Good, C., Rattan, A., & Dweck, C. S. (2007). Theories of intelligence influence females' sense of belonging, intent to continue, and achievement in math. Unpublished manuscript, Department of Psychology, Columbia University, New York, NY.
- Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools, 30*, 79–90. [https://doi.org/10.1002/1520-6807\(199301\)30:1<79::AID-PITS2310300113>3.0.CO;2-X](https://doi.org/10.1002/1520-6807(199301)30:1<79::AID-PITS2310300113>3.0.CO;2-X).
- Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *The Journal of Experimental Education, 62*, 60–71. <https://doi.org/10.1080/00220973.1993.9943831>.
- Grantham, N. (2017). *The top 50 best books for teachers – Professional development*. Retrieved from <https://www.fractuslearning.com/2015/04/01/best-books-for-teachers-pd/>. Accessed 14 May 2020.
- Grant, H., & Dweck, C. S. (2003). Clarifying achievement goals and their impact. *Journal of Personality and Social Psychology, 85*, 541–553. <https://doi.org/10.1037/0022-3514.85.3.541>.
- Joo, Y. J., Bong, M., & Choi, H. J. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and internet self-efficacy in web-based instruction. *Educational Technology Research and Development, 48*, 5–17. <https://doi.org/10.1007/BF02313398>.
- Kashdan, T. B., Gallagher, M. W., Silvia, P. J., Winterstein, B. P., Breen, W. E., Terhar, D., & Steger, M. F. (2009). The curiosity and exploration inventory-II: Development, factor structure, and

- psychometrics. *Journal of Research in Personality*, 43, 987–998. <https://doi.org/10.1016/j.jrp.2009.04.011>.
- Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment*, 82, 291–305. https://doi.org/10.1207/s15327752jpa8203_05.
- Kashdan, T. B., & Yuen, M. (2007). Whether highly curious students thrive academically depends on perceptions about the school learning environment: A study of Hong Kong adolescents. *Motivation and Emotion*, 31, 260–270. <https://doi.org/10.1007/s11031-007-9074-9>.
- Kern, M. L., Waters, L. E., Adler, A., & White, M. A. (2015). A multi-dimensional approach to measuring well-being in students: Application of the PERMA framework. *The Journal of Positive Psychology*, 10, 262–271. <https://doi.org/10.1080/17439760.2014.936962>.
- Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., & de Boer, H. (2019). The relationships between school belonging and students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: A meta-analytic review. *Research Papers in Education*. Advance online publication., 1–40. <https://doi.org/10.1080/02671522.2019.1615116>.
- Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research*, 75, 63–82. <https://doi.org/10.3102/00346543075001063>.
- Lee, C. (2016). The roles of hope and growth mind-set in the relationship between mothers' parenting stress and children's well-being. *Indian Journal of Science and Technology*, 9. <https://doi.org/10.17485/ijst/2015/v8i1/108371>.
- Lee, C. S., Park, S. U., & Hwang, Y. K. (2016). The structural relationship between mother's parenting stress and child's well-being: The mediating effects of mother's growth mindset and hope. *Indian Journal of Science and Technology*, 9. <https://doi.org/10.17485/ijst/2016/v9i36/102702>.
- Li, Y., & Bates, T. C. (2017). *Does mindset affect children's ability, school achievement, or response to challenge? Three failures to replicate*. Retrieved from <https://osf.io/preprints/socarxiv/tsdwy>
- Liu, Y., & Lu, Z. (2011). Trajectories of Chinese students' sense of school belonging and academic achievement over the high school transition period. *Learning and Individual Differences*, 21, 187–190. <https://doi.org/10.1016/j.lindif.2010.12.007>.
- Magaletta, P. R., & Oliver, J. M. (1999). The hope construct, will, and ways: Their relations with self-efficacy, optimism, and general well-being. *Journal of Clinical Psychology*, 55, 539–551. [https://doi.org/10.1002/\(SICI\)1097-4679](https://doi.org/10.1002/(SICI)1097-4679).
- Marques, S., Lopez, S., & Pais-Ribeiro, J. (2011). "Building hope for the future": A program to foster strengths in middle-school students. *Journal of Happiness Studies*, 12, 139–152. <https://doi.org/10.1007/s10902-009-9180-3>.
- Moallem, I. (2013). *A meta-analysis of school belonging and academic success and persistence*. Chicago: Loyola University.
- Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, 75, 33–52. <https://doi.org/10.1037/0022-3514.75.1.33>.
- National Science Foundation. (2018a). *Award search*. Retrieved from <https://www.nsf.gov/awardsearch/simpleSearchResult?queryText=school+belonging>. Accessed 14 May 2020.
- National Science Foundation. (2018b). *Award search*. Retrieved from <https://www.nsf.gov/awardsearch/simpleSearchResult?queryText=growth+mindset>. Accessed 14 May 2020.
- Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science*, 26, 784–793. <https://doi.org/10.1177/0956797615571017>.
- Pintrich, P. R., & de Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33–40. <https://doi.org/10.1037/0022-0663.82.1.33>.
- Rand, K. L., Martin, A. D., & Shea, A. M. (2011). Hope, but not optimism, predicts academic performance of law students beyond previous academic achievement. *Journal of Research in Personality*, 45, 683–686. <https://doi.org/10.1016/j.jrp.2011.08.004>.
- Riegel, L. A. (2012). *Efficacy and academic emphasis: A leadership factor in elementary school principals, and its relationship to hope, resilience, optimism, and view of intelligence* (doctoral dissertation). Available from ProQuest dissertations and theses database. (UMI no. 3520779).
- Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408–422. <https://doi.org/10.1037/0022-0663.88.3.408>.
- Sánchez, B., Colón, Y., & Esparza, P. (2005). The role of sense of school belonging and gender in the academic adjustment of Latino adolescents. *Journal of Youth and Adolescence*, 34, 619–628. <https://doi.org/10.1007/s10964-005-8950-4>.
- Scheier, M. F., & Carver, C. S. (1993). On the power of positive thinking: The benefits of being optimistic. *Current Directions in Psychological Science*, 2, 26–30.
- Schoon, I., & Ng-Knight, T. (2017). Co-development of educational expectations and effort: Their antecedents and role as predictors of academic success. *Research in Human Development*, 14, 161–176. <https://doi.org/10.1080/15427609.2017.1305808>.
- Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, 51, 663–671. <https://doi.org/10.2466/pr0.1982.51.2.663>.
- Singh, K., Chang, M., & Dika, S. (2010). Ethnicity, self-concept, and school belonging: Effects on school engagement. *Educational Research for Policy and Practice*, 9, 159–175. <https://doi.org/10.1007/s10671-010-9087-0>.
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75, 417–453. <https://doi.org/10.3102/00346543075003417>.
- Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta-analyses. *Psychological Science*, 29, 549–571. <https://doi.org/10.1177/0956797617739704>.
- Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology*, 100, 765–781. <https://doi.org/10.1037/a0012840>.
- Slaten, C. D., Ferguson, J. K., Allen, K. A., Brodrick, D. V., & Waters, L. (2016). School belonging: A review of the history, current trends, and future directions. *The Educational and Developmental Psychologist*, 33, 1–15. <https://doi.org/10.1017/edp.2016.6>.
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13, 249–275. https://doi.org/10.1207/S15327965PLI1304_01
- Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60, 570–585. <https://doi.org/10.1037/0022-3514.60.4.570>.
- Snyder, C. R., Hoza, B., Pelham, W. E., Rapoff, M., Ware, L., Danovsky, M., Highberger, L., Ribinstein, H., & Stahl, K. J. (1997). The development and validation of the Children's Hope scale. *Journal of Pediatric Psychology*, 22, 399–421. <https://doi.org/10.1093/jpepsy/22.3.399>.

- Strayhorn, T. L. (2012). *College students' sense of belonging: A key to educational success for all students*. New York: Routledge.
- Sztabnik, B. (2015). *The top 15 book recommendations for teachers*. Retrieved from <http://talkswithteachers.com/top-15-book-recommendations-for-teachers/>. Accessed 14 May 2020.
- Uwah, C. J., McMahon, H. G., & Furlow, C. F. (2008). School belonging, educational aspirations, and academic self-efficacy among African American male high school students: Implications for school counselors. *Professional School Counseling, 11*, 296–305.
- Van Ryzin, M. J. (2011). Protective factors at school: Reciprocal effects among adolescents' perceptions of the school environment, engagement in learning, and hope. *Journal of Youth and Adolescence, 12*, 1568–1580. <https://doi.org/10.1007/s10964-011-9637-7>.
- Van Ryzin, M. J., Gravely, A. A., & Roseth, C. J. (2009). Autonomy, belongingness, and engagement in school as contributors to adolescent psychological well-being. *Journal of Youth and Adolescence, 38*, 1–12. <https://doi.org/10.1007/s10964-007-9257-4>.
- von Stumm, H., & Chamorro-Premuzic. (2011). The hungry mind: Intellectual curiosity is the third pillar of academic performance. *Perspectives on Psychological Science, 6*, 574–588. <https://doi.org/10.1177/1745691611421204>.
- Walker, C. O., Greene, B. A., & Mansell, R. A. (2006). Identification with academics, intrinsic/extrinsic motivation, and self-efficacy as predictors of cognitive engagement. *Learning and Individual Differences, 16*, 1–12. <https://doi.org/10.1016/j.lindif.2005.06.004>.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*, 1447–1451. <https://doi.org/10.1126/science.1198364>.
- Weis, R., & Speridakos, E. C. (2011). A meta-analysis of hope enhancement strategies in clinical and community settings. *Psychology of Well-Being: Theory, Research and Practice, 1*, 5. <https://doi.org/10.1186/2211-1522-1-5>.
- Yarcheski, A., & Mahon, N. E. (2016). Meta-analyses of predictors of hope in adolescents. *Western Journal of Nursing Research, 38*, 345–368. <https://doi.org/10.1177/0193945914559545>.
- Ye, F., & Wallace, T. L. (2013). Psychological sense of school membership scale. *Journal of Psychoeducational Assessment, 32*, 202–215. <https://doi.org/10.1177/0734282913504816>
- Yeager, D. S., Paunesku, D., Walton, G. M., & Dweck, C. S. (2013). *How can we instill productive mindsets at scale? A review of the evidence and an initial R&D agenda*. A White Paper prepared for the White House meeting on “Excellence in Education: The Importance of Academic Mindsets.” Retrieved from <https://labs.la.utexas.edu/adrg/files/2013/12/Yeager-et-al-RD-agenda-6-10-131.pdf>. Accessed 14 May 2020.
- You, J. W. (2016). The relationship among college students' psychological capital, learning empowerment, and engagement. *Learning and Individual Differences, 49*, 17–24. <https://doi.org/10.1016/j.lindif.2016.05.001>.
- Zhan, Y. (2014). Educational expectations, school experiences, and academic achievements: A longitudinal examination. *An International Journal, 12*, 43–65.
- Zimmerman, B., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal, 29*, 663–676. <https://doi.org/10.3102/00028312029003663>.

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