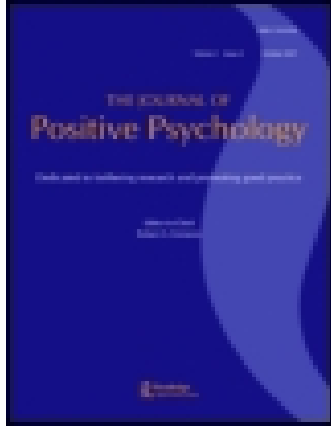


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Positive predictors of teacher effectiveness

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Some teachers are dramatically more effective than others, but traditional indicators of competence (e.g., certification) explain minimal variance in performance. The rigors of teaching suggest that positive traits that buffer against adversity might contribute to teacher effectiveness. In this prospective longitudinal study, novice teachers ($N = 390$) placed in under-resourced public schools completed measures of optimistic explanatory style, grit, and life satisfaction prior to the school year. At the conclusion of the school year, teacher effectiveness was measured in terms of the academic gains of students. All three positive traits individually predicted teacher performance. When entered simultaneously, however, only grit and life satisfaction remained significant predictors. These findings suggest that positive traits should be considered in the selection and training of teachers.

Keywords: learned helplessness; explanatory style; grit; life satisfaction; teacher performance

When I came home from school in my first year of teaching, I was so exhausted that I collapsed onto my bed... I have always said that teaching is the hardest job. I still think so. There are some who don't believe this, citing the long summer vacations and the so-called short working day. Well, I say, let them go into a classroom and see if they still sing that song (Dorothy Rich, teacher and author).

In 1966, the US Office of Education published a report by sociologist James Coleman and colleagues entitled *Equality of Educational Opportunity*. The Coleman Report, as it was called in the popular press, led many to believe that differences in family background, but not schools and teachers, determined student achievement. Recently, econometric analyses have unequivocally demonstrated that, in fact, some teachers are dramatically more effective than others and that these differences have lasting effects on student learning (Rivkin, Hanushek, & Kain, 2005; Sanders & Rivers, 1996).

But what makes a great teacher? Within the first few years of teaching, experience is predictive of student outcomes (Rice, 2003). In addition, teachers who are better able to communicate with their students are more effective; teachers' verbal skills predict student academic gains (Darling-Hammond, 2000; Wayne & Youngs, 2003). Whereas many traditional indicators of teacher quality, such as education level and certification, do not, in fact, predict student outcomes (Rivkin et al., 2005), certain aspects of

teacher education are relevant. For example, mathematics teachers who have completed mathematics-specific post-secondary coursework are more effective than peer teachers without such advanced training (Rice, 2003).

The rigors of teaching suggest that positive traits that determine commitment and resilience in the face of adversity might play an important role in determining teacher effectiveness (Stanford, 2001). About one in five teachers leaves the profession within a few years, and attrition rates are much higher in under-resourced school districts (Boser, 2000; Henke, Chen, Geis, & Knepper, 2000). Other teachers who burn out stay in teaching but reduce their effort and involvement (Cherniss, 1980). In a recent survey, 86% of new teachers asserted that, given the demands of the profession, only those with 'a true sense of calling' should pursue teaching (Public Agenda, 2000).

Prior attempts to identify personal qualities relevant to teacher effectiveness have suffered from two major methodological limitations. First, most studies have operationally defined teaching effectiveness in terms of ratings by students, observers, or supervisors, but these ratings do not always correspond with the actual academic progress of students (Flink, Boggiano, & Barrett, 1990). Rather, ratings may reflect what raters believe good teaching looks like or, even farther off mark, halo effects of unrelated positive personality attributes (Clayson & Sheffet, 2006).

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Extraverted professors receive higher ratings from their undergraduates (Murray, Rushton, & Paunonen, 1990; Rushton, Murray, & Erdle, 1987), 'social attractiveness' is associated with teacher performance ratings by trained observers (Austad, 1972), and assertive teachers receive better ratings from the National Board of Professional Teaching Standards (Emmerich, Rock, & Trapani, 2006). However, it is unclear whether these traits actually affect student learning. Indeed, it appears that performance ratings may be contaminated by perceptions of teacher personality and that the identified traits merely correspond to raters' intuitions about what effective teaching looks like.

Second, even with sound criterion measures, there is the problem of selection bias. Typically, teachers are not randomly assigned to schools. Rather, teachers with the strongest qualifications disproportionately take better-paying jobs in higher-performing districts. For example, African American students are twice as likely to be assigned to the most ineffective teachers (Sanders & Rivers, 1996). If schools with high-achieving students choose teachers with positive traits, observed associations between student performance and these traits will be spuriously inflated.

The present research avoids these two methodological problems and examines the contributions of three positive traits (grit, life satisfaction, and optimistic explanatory style) to performance among novice teachers in the Teach For America (TFA) program. TFA is an ideal context in which to test the effects of positive traits on teaching because TFA teachers do not select the schools where they will teach; rather, after stating general preferences about geographic location, subject matter, and so on, TFA teachers are matched to school positions by administrators. While not entirely random, this process obviates the possibility that higher-quality teachers select and are selected by higher-performing districts. TFA also derives an objective measure of teacher effectiveness based on student academic gains and content mastery. A third advantage is that all TFA teachers work in under-resourced school districts where, in comparison to wealthier, higher-performing suburban districts, challenges are likely to be greater.

Grit, defined as perseverance and passion for long-term goals, has been shown to predict the accomplishment in challenging circumstances. For example, grit predicts retention of cadets at West Point and performance of finalists in the National Spelling Bee (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth & Quinn, 2009). Mediation analyses indicate that the effect of grit on outcomes is through cumulative effort: gritty individuals tend to work harder than equally able peers, and they remain committed to their chosen pursuits longer (Duckworth et al., 2007).

Life satisfaction, the cognitive component of subjective well-being, reflects contentment with one's current life situation (Pavot & Diener, 2008). Measures of dispositional positive affect predict work performance across a range of professions (Lyubomirsky, King, & Diener, 2005). Life satisfaction, which is related to and highly correlated with positive affect, has not been as extensively studied as a predictor of achievement, but at least one large, prospective longitudinal study has established its predictive validity for income (Graham, Eggers, & Sukhtankar, 2004). Lyubomirsky and colleagues (2005) offer two explanations for the causal role of well-being in determining success: 'First, because happy people experience frequent positive moods, they have a greater likelihood of working actively toward new goals while experiencing those moods. Second, happy people are in possession of past skills and resources, which they have built over time during previous pleasant moods' (p. 804). In the case of teaching, we hypothesize that a third causal pathway may also link life satisfaction to superior performance. Children may be drawn to and engaged by teachers who are higher in life satisfaction, whose energy and positive attitude can shift the set-point of mood for the entire classroom.

Finally, optimistic explanatory style might predict teacher effectiveness. Experience with aversive, uncontrollable events can lead to the expectation of helplessness (i.e., the belief that outcomes are unrelated to one's actions) (Maier & Seligman, 1976; Seligman, 1975). The most recent formulation of the learned helplessness model specifies that pessimists, who habitually attribute bad events to stable and global causes and good events to temporary and specific causes, are at greater risk for experiencing learned helplessness than those with the opposite, optimistic, explanatory style (Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978). When confronted with adversity, optimists are less likely to reduce effort, more likely to perceive contingencies between their own actions and outcomes, and more likely to maintain a subjective sense of well-being. Theoretically, therefore, the beneficial effects of optimism on performance in stressful circumstances would be expected to be mediated by higher levels of grit and life satisfaction.

The TFA program is highly selective; in 2005, approximately 2900 teachers were selected from more than 17,000 applicants (K. Gardner, Teach For America, personal communication, June 11, 2007). This competitive selection process suggests that TFA teachers might be higher than the general population in all three positive traits examined in this study. Moreover, it is possible that the profession of teaching generally tends to attract gritty, satisfied, and optimistic individuals. We therefore hypothesized that our

sample of novice teachers would demonstrate restricted range on all three positive traits, which would attenuate estimates of the predictive validity of these traits on performance. To summarize, we tested four specific hypotheses in this investigation: (1) the positive traits of grit, life satisfaction, and optimistic explanatory style independently predict performance among TFA teachers; (2) TFA teachers are higher than other young adults on all three positive traits; and (3) correcting for attenuation due to range restriction, positive traits are even stronger predictors of teacher effectiveness.

Method

Participants

Participants were teachers for TFA, a non-profit organization that recruits recent college graduates to teach for 2 consecutive years in under-resourced public schools nationwide. Most TFA teachers are graduates of highly selective undergraduate institutions, and many have no education background prior to joining the program. In the current study, TFA placed participants in more than 300 different under-resourced urban or rural schools in more than 20 different regions across the United States. TFA used criteria for placing teachers including the teacher's preference for geographic region and grade level. Because teachers do not choose schools directly, teacher quality and school quality were not confounded.

Invitations to participate in the study were e-mailed to a random sample of 62% of TFA teachers (800 first-year and 1500 second-year teachers). About 27% of invited teachers chose to participate, of whom 2% dropped out of TFA before the end of the school year. Achievement measures and, consequently, teacher effectiveness rankings were available for students of 63% of participating teachers, which comprised the sample ($N=390$) used for analysis. Seventy-nine percent of this final sample was female; the mean age was 24 years ($SD=2$). All participants held a bachelor's degree, and 14% held a postgraduate degree as well. Sixty-six percent of participants had completed a year of service and were preparing for their second year of teaching, and the remainder were preparing for their first year. Half of participants were assigned to teach in elementary schools, 38% taught in secondary schools, and 12% taught in special education programs.

Procedure

In August 2005, participating TFA teachers completed consent forms and measures of life satisfaction, grit, and explanatory style. Teacher effectiveness rankings, demographic information, and school assignments

(elementary, secondary, or special education) were provided by TFA in August 2006.

Measures

Grit. The Short Grit Scale (Duckworth & Quinn, 2009) is a brief, 8-item measure of grit, the passionate pursuit of long-term goals. Participants rate items such as 'Setbacks don't discourage me' on a 5-point Likert-type scale, from 1 = *not at all like me* to 5 = *very much like me*. We scored grit as the mean of all eight items.

Life satisfaction. The Satisfaction With Life Scale (SWLS) is a 5-item survey that measures global life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). Participants rate items like 'In most ways my life is close to my ideal' on a 7-point Likert-type scale, from 1 = *strongly disagree* to 7 = *strongly agree*. Life satisfaction is scored as the sum of the five SWLS items.

Optimistic explanatory style. The Attributional Style Questionnaire (ASQ; Peterson et al., 1982) presents respondents with six positive and six negative events and asks them to provide 'the one major cause' of each event if this event were to happen to them. The respondent next rates each cause on three dimensions (external vs. internal, unstable vs. stable, and specific vs. global) using a 7-point Likert-type scale. For example, responses on the specific vs. global items are rated from 1 = *influences just this particular situation* to 7 = *influences all situations in my life*. In accordance with Abramson et al.'s (1989) revised model, we included items from the unstable vs. stable and specific vs. global dimensions but not the external vs. internal dimension. Positive event attribution scores are mean scores across the six positive events, where stable and global ratings are scored positively. Negative event attribution scores are mean scores across the six negative events, where unstable and specific ratings are scored positively. A composite optimistic attribution score (CPCN) is calculated as the difference between positive and negative attribution scores, with higher composite scores indicating a more optimistic attributional style. We used CPCN scores in this study because relative to negative or positive attribution scores, these are more consistently predictive of depressive deficits and other outcomes (Peterson & Seligman, 1984). The observed coefficient alpha for positive and negative attribution scores were 0.75 and 0.76, respectively.

Teacher performance. Rankings of teacher effectiveness were obtained from TFA records. For research purposes, TFA administrators assigned a ranking to each teacher based on the academic gains of their students over the course of the 2005–2006 academic year. Using a detailed rubric to make unbiased comparisons across teachers, TFA administrators

estimated grade-level gains (e.g., a two-grade change would be indicated if average students' reading ability improved from a fifth- to a seventh-grade level), average student mastery of educational content goals (e.g., students mastered 80% of material covered), or both. Data available for effectiveness rankings varied with grade level, subject, state, and school; for 37% of teachers in the original sample, insufficient data were available to estimate student gains and therefore no rating was given. Because teacher performance was an ordinal variable, we used ordinal logistic regression models to estimate the effects of positive traits on teacher performance. We standardized all continuous predictor variables prior to analyses to aid interpretation of odds ratios (ORs).

Results

Consistent with the premise that the first years of public school teaching in relatively poor communities can be demanding, second-year teachers were less satisfied with their lives than were first-year teachers, $t(388)=3.72$, $p < 0.001$, $d=0.40$. Teachers assigned to elementary school ($B=1.62$, $OR=5.07$, $p < 0.001$) and special education ($B=1.24$, $OR=3.45$, $p < 0.001$) positions had a greater impact on their students than did secondary school teachers. Additionally, second-year teachers were more likely to outperform first-year teachers ($B=0.73$, $OR=2.07$, $p < 0.001$), and women were more likely to outperform men ($B=0.63$, $OR=1.88$, $p=0.004$). We therefore controlled for gender, experience, and teacher assignment in all subsequent analyses.

Consistent with our first hypothesis, all three positive traits predicted teacher performance. As summarized in Table 2, teachers one standard deviation higher in grit were 31% more likely to outperform their less gritty peers ($B=0.27$, $OR=1.31$, $p=0.002$). Teachers who were one standard deviation higher in life satisfaction were 43% more likely to outperform their peers, $B=0.36$, $OR=1.43$, $p < 0.001$. Finally, teachers one standard deviation higher in optimistic explanatory style were 20% more likely to outperform their peers, $B=0.19$, $OR=1.20$, $p=0.04$. The effect sizes of these relationships were all small (Rosenthal, 1996).

As shown in Table 1, all three positive traits were significantly intercorrelated, $r_s=0.17$ to 0.32 , $p_s < 0.05$. To assess the unique effects of each trait on performance, we fit a simultaneous ordinal logistic regression model. As expected, the effects of optimism on performance were reduced to insignificance once grit and life satisfaction were accounted for. As summarized in Model 4 of Table 2, grit ($B=0.21$, $OR=1.23$, $p=0.03$) and life satisfaction ($B=0.31$, $OR=1.36$, $p < 0.001$) remained significant predictors

of performance, whereas explanatory style ($B=0.06$, $OR=1.06$, $p=0.52$) did not.

Teach for America (TFA) teachers were especially gritty, satisfied, and optimistic compared to age-matched comparisons. Participating teachers scored above normative young-adult sample means on grit, $t(688)=13.03$, $p < 0.001$, $d=0.99$, life satisfaction, $t(632)=7.53$, $p < 0.001$, $d=0.60$, and optimistic explanatory style, $t(488)=2.55$, $p=0.01$, $d=0.28$. These differences were large, medium, and small in effect size, respectively. See Table 3 for comparison sample descriptive statistics.

Because TFA teachers were above average in the positive traits, a ceiling effect and the resulting restriction on range may have downwardly biased our estimates of the effects of grit, life satisfaction, and optimistic explanatory style on teacher performance. To obtain more accurate estimates of the effects of positive traits on teacher performance, we corrected odds ratios for attenuation due to range restriction (Hunter & Schmidt, 1990). As shown in Table 4, correction for range restriction most dramatically increased the predictive validity of life satisfaction. Nevertheless, corrected effects for all three positive traits remained small in size.

Interpreting the direction of causality for the observed effects was difficult for the subset of teachers who completed questionnaires prior to their *second* year of teaching. Specifically, we wanted to rule out the possibility that responses to explanatory style, life satisfaction, and grit items were the consequence rather than the cause of teacher effectiveness. We therefore repeated all our analyses, omitting the teaching experience variable, for the subset of teachers ($n=132$) who completed questionnaires prior to their *first* year of teaching. Due to the 66% reduction in sample size, not all predictors reached significance, but importantly, coefficients were nearly identical to those in the original model.

Discussion

In a longitudinal, prospective study of novice teachers in the Teach For America (TFA) program, grit, life satisfaction, and optimistic explanatory style separately predicted performance as measured by the academic gains of students. In a simultaneous model, however, only grit and life satisfaction predicted teacher performance. Although the observed effects were small in size, as a point of comparison, they were comparable in magnitude to the effects of comprehensive school reform interventions (Borman, Hewes, Overman, & Brown, 2003). TFA teachers were a standard deviation higher in grit than a normative comparison sample of young adults, more than half of a standard higher in life satisfaction, and a third of

Table 1. Summary statistics and intercorrelations among positive traits.

Variable	<i>M</i>	<i>SD</i>	α	Possible range	Observed range	2	3
1. Grit	3.89	0.63	0.77	1–5	1.88–5.00	0.17*	0.32*
2. Life satisfaction	27.10	4.91	0.77	5–35	8–35		0.21*
3. Optimistic explanatory style	2.39	2.04	0.74	–12–12	–4.33–9.83		–

* $p < 0.001$.

Table 2. Summary of simultaneous ordinal logistic regression models predicting teaching effectiveness.

Variable	Model 1	Model 2	Model 3	Model 4
Female gender	1.69*	1.77**	1.86**	1.76*
Experience	2.19***	2.57***	2.20***	2.51***
Elementary	4.73***	5.04***	4.74***	4.81***
Special education	3.29***	3.16***	3.42***	3.03***
Grit	1.31**			1.23*
Life satisfaction		1.43***		1.37***
Optimistic explanatory style			1.20*	1.06
Nagelkerke R^2	0.23***	0.24***	0.22***	0.25***

Note: Values are odds ratios.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3. Comparison sample descriptive statistics.

Measure	Source	Sample	<i>N</i>	<i>M</i>	<i>SD</i>
Grit	Duckworth & Quinn, 2009	Young adults (age 25–34)	300	3.21	0.73
Life satisfaction	Pavot & Diener, 1993	US college students	244	23.70	6.40
Optimistic explanatory style	Isaacowitz, 2005	Young adults (age 18–25)	100	1.81	2.13

Table 4. Corrections for attenuation due to range restriction.

Effect	Grit	Life satisfaction	Optimistic explanatory style
Separate models			
Uncorrected	1.31	1.43	1.20
Corrected	1.36	1.58	1.21
Simultaneous model			
Uncorrected	1.23	1.37	1.06
Corrected	1.27	1.50	1.07

Note: Values are odds ratios in logistic regression models predicting teaching effectiveness.

a standard deviation higher in optimism. The predictive effects of these traits were all magnified when correcting for restriction on range but remained small in size.

Our finding that experienced teachers were less satisfied with life corroborates vivid anecdotal evidence that despite the many rewards of teaching, concomitant challenges and setbacks can be demoralizing (Kane, Rockoff, & Staiger, 2006). Frequently, the contingencies between a teacher's actions and student

outcomes are neither obvious nor immediate. In a letter to a fellow young teacher, Thompson (1991) observed that 'the most disheartening and discouraging' aspect of teaching is 'the fact that results are so intangible and unobservable. A carpenter at the end of the day can actually see what he has built, a doctor can observe a patient responding to treatment, but a teacher oftentimes has to go along for months with relatively few noticeable results...' (p. 104). We suspect that in under-resourced school districts, the link between effort and results is further obscured by the multiplicity of factors outside a teacher's control that impede learning.

Our results suggest that both grit and life satisfaction may be proximal contributors to teacher effectiveness. Why grit should benefit performance is perhaps more obvious. In prior studies, grittier individuals worked harder and longer in very challenging settings than did their less gritty peers; sustained effort despite adversity could theoretically have both a direct impact on performance and, through the accumulation of skill over time, an indirect benefit (Duckworth et al., 2007; Duckworth & Quinn, 2009). Given that the current sample included novice teachers only, the effect of grit on performance was likely due to

effort expended during the school year rather than prior development of teaching skill.

What about teachers who are more satisfied with their lives? Of the positive traits included in this investigation, life satisfaction was the best predictor of performance, particularly when corrections for attenuation due to range restriction were applied. Teachers higher in life satisfaction may be more adept at engaging their pupils, and their zest and enthusiasm may spread to their students. Again, the words of a first-year teacher: 'These young children needed help with reading and mathematics, but they also needed much more in their lives. They needed imagination and self-confidence. So we sang, happily and frequently. We recited, clapped, danced, and wiggled. We explored sounds and ideas. We discussed issues and concerns. We drew pictures and made up songs and stories, injecting into the grimness of many of their lives small pockets of joy. I could feel the love growing between us' (Charles, 1991). Moreover, given the observed decline in life satisfaction over the first year of teaching, teachers who begin with a higher 'reserve' of life satisfaction may be better off if a threshold level of this dimension of well-being is necessary to teacher effectiveness.

Whereas optimistic explanatory style predicted teacher performance in an independent model, the inclusion of life satisfaction and grit in the model rendered it an insignificant predictor. One interpretation of this finding is that optimism is a relatively weaker determinant of teacher success. We favor an intriguing alternative explanation which is predicted by learned helplessness theory. Specifically, grit and life satisfaction may have mediated the effects of optimism on performance. Unfortunately, optimistic explanatory style, grit, and life satisfaction were measured simultaneously in the current investigation, and we were unable to determine the temporal precedence of optimistic explanatory style to grit and life satisfaction (Cole & Maxwell, 2003). In future research, we intend to test directly whether optimistic explanatory style disposes teachers to higher levels of grit and life satisfaction, which in turn improve teaching performance.

Several limitations circumscribed the external validity of our conclusions. First, the current findings might not generalize to veteran teachers. The literature on expertise suggests that once the challenges encountered in the first years of teaching are mastered, they are supplanted by qualitatively different ones (Bloom, 1985; Ericsson, 2002). Second, TFA teachers are not typical new teachers. Typically graduates of elite colleges and universities with no prior teaching experience, TFA teachers are often hired through state-approved alternative certification programs. Finally, voluntary participation in this study was slightly biased toward more effective TFA teachers,

$t(2249) = 3.62, p < 0.001, d = 0.20$. However, this effect was small in magnitude, and we do not see any theoretical reason why the observed relations would differ for lower-performing TFA teachers.

Beyond threats to external validity, our conclusions were limited by the variables included in the current research. Although we measured teacher effectiveness in the currency that we believe matters most (student learning) we did not include measures of other worthwhile educational outcomes, such as student engagement. The literature on life satisfaction, grit, and optimistic explanatory style provided a strong theoretical basis for their hypothesized roles in effective teaching, but our research did not include other positive traits that may influence performance.

We see reason to explore four additional traits in future research on teacher effectiveness. Evidence that student learning is linked to teachers' willingness to vary strategies and adapt their instructional approach brings to mind creativity as a potential contributor to teacher performance (Darling-Hammond, 2000). Additionally, undergraduates often rate outgoing or socially capable teachers highly, which suggests extraversion as another candidate trait (Murray et al., 1990; Rushton, Murray, & Erdle, 1987). Given the relative predictive strength of life satisfaction in the present research, it would be interesting to explore the contributions of affective well-being, which predicts performance across a wide range of professionals, as well (Lyubomirsky et al., 2005). Indeed, because positive emotions expand individuals' cognitive and behavioral repertoires (Fredrickson, 2001), dispositional positive affect may be a common underlying contributor to effective teaching, life satisfaction, creativity, and extraversion. Finally, future studies should explore the role of hope, defined as the perceived capacity to generate pathways to goals and motivation to reach those goals (Snyder et al., 1991). Hope is predictive of life satisfaction (Bailey, Eng, Frisch, & Snyder, 2007), and to the extent that this relation is causal, hope may be an important precursor to effective teaching. Future efforts should extend this research in terms of the traits included and the relations among those traits.

Despite its limitations, the current study makes an important contribution toward understanding the positive traits that distinguish effective teachers. We see two implications of our conclusions. First, when recruiting and selecting teachers, schools should consider that positive traits such as grit, life satisfaction, and optimism may be as important, if not more so, than traditional indicators of performance (e.g., certification). Our study suggests that to some degree, sorting on personal qualities already exists; TFA teachers are a standard deviation higher in grit than other young adults. However, more deliberate

emphasis on life satisfaction and optimism may also be in order.

Second, our findings suggest a place for positive interventions in the professional development of current teachers. The relative stability of individual differences such as grit, life satisfaction, and optimistic explanatory style may belie their susceptibility to intervention. Simple exercise designed to boost subjective well-being have at least short-term effect (Seligman, Steen, Park, & Peterson, 2005). Compelling evidence that optimistic explanatory style can be taught comes from the Penn Resiliency Program, a group intervention for late elementary and middle school students (Gillham et al., 2007; Reivich, Gillham, Chaplin, & Seligman, 2005), which has been successfully adapted for young adults (Seligman, Schulman, DeRubeis, & Hollon, 1999). Less is known about increasing grit, but mean level increases in grit across the lifespan suggest that it may be improved by intervention (Duckworth et al., 2007; Duckworth & Quinn, 2009). Given the crucial role played by teachers in the lives and learning of children, the possibility of improving their capabilities seems worth testing.

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