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The Impact of Positive Traits on Teacher Performance Within A Systems Driven Charter School Management Organization

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Keywords

positive traits, teacher effectiveness, positive education, positive affect, grit, life satisfaction, charter schools, systems thinking, teacher performance, teacher performance ratings, NWEA, student achievement

Disciplines

Business Administration, Management, and Operations | Elementary and Middle and Secondary Education Administration | Psychology | Urban Education

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Management Organization

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Teacher effectiveness is the single most important in-school factor influencing the rates at which school children learn. Large variations in performance exist between teachers and this translates into missed learning opportunities for students. Whilst the impact of highly effective teachers on student learning is understood, the factors that account for the variance in teacher performance are less clear. In this study, novice teachers ($N = 313$), with six or fewer years of experience working at a tuition free public charter school, completed measures of *positive affect*, *optimistic explanatory style*, *grit* and *satisfaction with life.* At the end of the school year, teacher effectiveness was measured by student growth, principal ratings and parent satisfaction. Multiple linear regression showed that none of the traits predicted teacher performance as assessed by student growth or by parent satisfaction. *Positive affect* and *life satisfaction* were shown to positively predict principal ratings; however this finding was dismissed as likely the result of principals awarding higher scores to teachers with personality traits they found more desirable. Positive traits may not have significantly predicted teacher performance at NHA because of the charter school management organization's adherence to systems thinking with fidelity. Teachers at NHA are asked to follow best practices and compliance is considered key to success over creativity in many circumstances. Adherence to these best practices may stamp out the individual performance variation through which the effect of positive traits would be most evident.

The Impact of Positive Traits on Teacher Performance Within A Systems Driven Charter

School Management Organization

Teacher effectiveness is likely the single most important in-school factor influencing student learning (Sanders & Rivers, 1996). The variation in teacher quality that exists within American schools is profound and dramatically impacts the pace at which students learn (Hanushek, 2011). As logic suggests, students taught by highly effective teachers learn more. What is surprising is how much less students taught by ineffective teacher learn and how long the effect of inadequate instruction lasts. In one study, students taught for three years by a sequence of ineffective teachers performed 50 percentile points worse on state assessments than students of similar ability who were taught by effective teachers over the same period (Sanders & Rivers, 1996).

Econometric analysis shows that achievement gaps are rarely overcome before high school graduation. Even when ineffective teachers are in early elementary grades, their effects are profound and have a sustained negative impact on success in later life (Rivkin, Hanushek, & Kain, 2005). Hanushek (2011) has demonstrated that losses in lifetime earnings are a good way to demonstrate the sustained impact ineffective teachers have on the futures of students. For example, teachers whose performance rating is in the 69th percentile, based on student performance on state testing, increase each student's lifetime earnings by $10,600 more than a teacher in the 50th percentile. Significant economic benefits for students and the United States economy can be gained by improving the effectiveness of teachers. If all average teachers in the U.S. made a performance gain equivalent to the 19 percentile-points described in the example

above, the country's GDP is forecasted to increase by one percent resulting in an increase in economic output of $112 trillion in net present value (Hanushek, 2011).

Whilst the rewards for improved teacher performance are profound, the current state of the American education system is dire (Walsh, 2007). The National Council on Teacher Quality (NCTQ) reports only one in seven teachers meets the council's standard of effectiveness. This means that students have only a 15 percent chance of being taught by a high quality teacher each year. The effect of teacher quality is cumulative, so it is the sequence of teachers and not just a single assignment that needs to be considered (Sanders & Rivers, 1996). The odds of a student being matched to a high quality teacher for five years in a row are much less – approximately one in 17,000[1] (Walsh, 2007).

Understanding the traits that differentiate high performing teachers from ineffective ones is key to increasing the number of effective teachers in American schools and to raising the quality of education in the United States (Bill and Melinda Gates Foundation, 2010). Without precise knowledge of what makes a good teacher, school administrators are disadvantaged in their approach to teacher hiring and teacher development (Bill and Melinda Gates Foundation, 2010). Many of the characteristics traditionally valued by parents and administrators are not good criteria for selecting high quality teachers because they do not correlate with increased levels of student achievement (Rivkin et al., 2005). For example, both teacher certification and academic credentials may seem face valid, but are actually poor predictors of teacher effectiveness (Rivkin et al., 2005; Walsh & Tracy, 2004). Except for the first two years of teaching, years of experience also fails to predict teacher performance. Moreover, it can be difficult to identify top performing teachers because they are not the same individuals year after

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[1] As a point of reference, approximately 1 in 17,000 people in the United States are albinos (Allan, 2011).

year (Walsh, 2007). The correlation between a teacher's performance one year and the next can be as low as .5 (Walsh, 2007).

Methodological Challenges With Existing Research

Whilst some of the traditional measures of teacher quality do not consistently predict performance, more general characteristics, such as strong verbal and communication skills are correlated with higher student learning gains (Darling-Hammond, 2000; Wayne & Youngs, 2003). Additionally, positive psychological traits, such as *grit* and *life satisfaction*, have been shown to predict teacher performance in a sample of TeachForAmerica (TFA) corps members (Duckworth, Quinn, & Seligman, 2010). These findings suggest that personality characteristics might 1) help teachers to combat the rigors of teaching, 2) assist them in remaining unfettered by challenges, and 3) enable them to remain focused on activities that promote student achievement (Stanford, 2001; Duckworth et al., 2010).

According to Duckworth et al. (2010), prior attempts to identify personality traits correlated with teacher effectiveness have suffered from two methodological limitations. First, studies have relied on supervisors, parents and students to rate teacher performance rather than on direct measures of student learning (Flink, Boggiano, & Barrett, 1990). Ratings by observers can be unreliable because perceptions are tainted by preconceived notions of good teaching practices or by preferred characteristics that are not a true reflection of student academic gains (Clayson, 2006). Extraversion, social attractiveness, and assertiveness are characteristics that have been found to elevate observer ratings of teacher performance without being shown to impact rates of student learning (Duckworth et al., 2010). In short, performance ratings may be contaminated by the intuitions of raters as opposed to being led by criteria shown to be predictive of teacher effectiveness.

The second methodological limitation relates to the distribution of teachers across schools. Teachers are not randomly assigned to schools and instead have the opportunity to pick schools based on their preferences. The highest performing teachers disproportionately accept higher paying positions in the best performing school districts. This creates a selection bias that could artificially inflate the presence of teachers with preferred teacher personality traits at higher performing schools (Duckworth et al., 2010).

Our research avoids these methodological challenges and seeks to better understand the impact of four positive personality traits (*grit*, *life satisfaction*, *optimistic explanatory style*, and *positive affect*) on the performance of novice teachers at National Heritage Academies (NHA). NHA provides a unique setting to study the impact of positive traits on teacher performance because the school system operates more than 70 tuition free charter schools serving diverse student populations from mainly white and middle class to mostly minority and low-income (R. Smith, National Heritage Academies, personal communication, June 26, 2012). More than half of NHA schools serve minority populations with more than 75% of the students receiving free or reduced priced lunches. Thirteen of the 70 schools have been identified as struggling and in need of close attention to remedy falling or stagnant student performance.

Whilst teachers are not randomly assigned to schools, individuals interested in working at NHA apply through the central office and are matched to open positions based on their geographic preferences and the hiring needs of the school (R. Smith, National Heritage Academies, personal communication, June 26, 2012). Candidates that meet federal, state and local requirements for qualification and certification are forwarded to school principals for further interview. Recruiters select candidates by region and then seek to assign them to a school based the availability of open positions. This assignment technique is not random, but does

combat the possibility of higher quality teachers favoring jobs at the higher-performing schools(R. Smith, National Heritage Academies, personal communication, June 26, 2012).

In addition, NHA is an attractive partner for this study because it calculates teacher performance from measures of student proficiency and growth (R. Smith, National Heritage Academies, personal communication, June 26, 2012). In other words, the performance of a teacher at NHA is quantified by academic gains achieved by students in her classroom (R. Smith, National Heritage Academies, personal communication, June 26, 2012).

NHA schools provide the opportunity to assess positive personality traits across a diverse sample of schools that differ by geography, percentage of students receiving free and reduced lunch (FRL), years of operation, minority composition of the student body and percentage of students considered proficient (i.e. at grade level). It is likely that teachers working at schools with a higher percentage of students receiving FRL or at schools with a higher percentages of students below grade level will be more challenged than teachers who work at wealthier districts or schools at which a larger percentage of the students test as proficient by grade level.

Grit

Grit, defined as "perseverance and passion for long-term goals" (Duckworth et al., 2010, p. 541), has been shown to predict the achievement of challenging objectives such as the retention of cadets at West Point and the success of finalists in the National Spelling Bee (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth & Quinn, 2009). Gritty individuals perform better on long-term challenging goals because the effect of *grit* is cumulative. Gritty individuals tend to work harder and for longer than peers who are equally able, but have less *grit*. As a result, gritty individuals remain committed to goals longer and outperform equally matched contenders (Duckworth et al., 2007). Duckworth et al. (2010) demonstrated this effect in a

population of novice teachers working for TeachForAmerica (TFA). Teachers identified as one

standard deviation higher in *grit* were found to be 31% more likely to outperform less gritty

teachers (Duckworth et al., 2010).

Life Satisfaction

According to Pavot and Diener (2008), *life satisfaction* is the cognitive component of

subjective well-being (SWB) indicating an individual's contentment with her quality of life as a

whole. SWB is composed of both affective and cognitive components with *life satisfaction*

representing a cognitive component that is separate, yet correlated with the affective components

of SWB (Pavot & Diener, 2008). The correlation between *life satisfaction* and achievement has

not been adequately studied (Duckworth et al., 2010), however, there are a number of clues that

suggest that *life satisfaction* is a positive predictor of job performance.

Greguras and Diefendorff (2010) report a strong positive relationship between job

satisfaction and *life satisfaction* and infer that since job performance often drives job satisfaction

that there is likely a strong connection between job performance and *life satisfaction* as well.

Graham, Eggers and Sukhtankar (2004) found, through a longitudinal study of Russian workers,

that *life satisfaction* is predictive of economic performance. After controlling for income,

education, and other socio-demographic variables, the researchers found that happier individuals

were more likely to increase their income over time than individual less satisfied with life. The

researchers postulate that improved job performance is one of the causes for increased income

suggesting a connection between *life satisfaction* and job performance (Graham et al., 2004).

Duckworth et al. (2010) demonstrated a direct connection between *life satisfaction* and

teacher performance in a sample of novice TFA teachers. Teachers identified as one standard

deviation higher in *life satisfaction* were found to be 43% more likely to outperform their less satisfied peers (Duckworth et al., 2010).

Affect

As a secondary component of SWB, affect may also predict job performance across a diverse number of professions. Reio and Callahan (2004) surveyed recent college graduates and found a significant correlation between the emotions they reported and job performance. Specifically, the researchers posit that emotions influence an individual's curiosity, desire to learn and socialization into the workplace. In other words, the researchers propose a model of an affect-job performance relationship that is mediated by curiosity and socialization-related learning. In the study, both positive and negative emotions were predictive of job performance. For example, anger was shown to increase curiosity and learning and to positively impact the study's measure of perceived job performance (Reio & Callahan, 2004).

Lyubomirsky, King, and Diener, (2005) report a link between subjective well-being and positive outcomes across multiple dimensions of life. The researchers conducted a literature review and a cross-sectional analysis of 225 studies examining the effect of happiness on achievement. *Life satisfaction*, as a cognitive component of wellbeing, was used as a proxy for happiness, as were a variety of self-reported measures of emotional state. The analysis outlined two explanations for why happiness is a positive predictor of performance. The first explanation suggests that happy individuals more frequently experience positive emotions propelling them to actively pursue goals that they have been "socialized to believe are worthwhile" (Lyubomirsky et al., 2005, p. 822). The second explanation suggests that happy individuals have acquired "numerous adaptive characteristics" (Lyubomirsky et al., 2005, p. 825) that were collected whilst experiencing positive moods over their lifetime. In other words, happier individuals are more

likely to exhibit the thought patterns and behaviors that breed continued happiness and success (Lyubomirsky et al., 2005).

Duckworth et al. (2010) suggests that a third explanation linking happiness with performance may be particularly relevant to teachers. Increased well-being may lead to higher levels of teacher performance because children are drawn to teachers demonstrating a more positive attitude. In other words, happier teachers are likely to be more energetic and to positively impact the mood of the classroom resulting in superior performance (Duckworth et al., 2010).

Optimism

Optimists tend to perform better because of their ability to maintain a subjective sense of well-being and to continue productive behaviors in the face of adversity (Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978). An individual's explanatory style, either *optimistic* or pessimistic, explains her propensity towards attributing the cause of events to temporary vs. stable explanations and specific vs. global ones (Abramson et al., 1978). Individuals with an *optimistic explanatory style* tend to believe that bad events will be short in duration and were caused by specific events that are unlikely to repeat. Individuals with a pessimistic explanatory style believe the converse and attribute bad events to global phenomenon that will impact many different situations and are likely to always be present (Abramson et al., 1978). Explanatory style is linked to performance because pessimists are more prone towards helplessness and to give up in the face of adversity, believing that their efforts will have little to no impact on ending the adverse occurrence. Optimists likely have a particular advantage over pessimists in stressful situations because the individuals with pessimistic explanatory styles may

quickly reduce effort and see themselves as powerless to impact the situation (Abramson et al.,, 1989).

Duckworth et al. (2010) demonstrated the impact of *optimism* on teacher performance in a sample of novice TFA teachers. Whilst *optimism* was a strong independent predictor, its effects were rendered insignificant when included in a model with *grit* and *life satisfaction*. The researchers hypothesize that both higher levels of *grit* and *life satisfaction* moderated the effect of *optimistic explanatory style*, however further study is needed to substantiate this (Duckworth et al., 2010).

Teacher Hiring at National Heritage Academies

National Heritage Academies is highly selective in its teacher hiring practices. In 2011, approximately 46,000 candidates applied for 750 open teacher vacancies located at schools across the United States of America (R. Smith, National Heritage Academies, personal communication, June 26, 2012). NHA uses a standardized process for pre-screening candidates that include 1) a review of qualifications and experience to ensure that the individual meets federal, state and local certification and qualification requirements and 2) a telephone interview called the Haberman Star Teacher Interview. The Star Teacher Interview was created to help schools identify high performing teachers and has been validated by the University of Milwaukee and in 13 peer reviewed articles and dissertation submissions (Blog Talk Radio, 2012). Because of the selection process used by NHA, we expect to find that NHA teachers exhibit higher levels of all four positive traits than the general population. It is also possible that teachers, as a profession, exhibit these positive traits in higher proportions than the general population.

Hypothesis

We hypothesize that the positive traits of *grit, life satisfaction, positive affect* and *optimistic explanatory style* will individually predict the performance of novice NHA teachers. We further believe that NHA teachers will exhibit these traits in higher numbers than are typically present in the general population.

Method

Participants

Participants were teachers employed by National Heritage Academies, a network of 71 charter schools operating across nine U.S. states. All NHA teachers meet the certification and subject knowledge requirements of the *No Child Left Behind Act of 2001*. Many NHA schools predominantly hire novice teachers because they are unable to afford the salaries of more experienced ones. On average, NHA teachers make 10 percent less than teachers at local traditional public school districts, which is a result of the lower funding received by charter schools in many states.

In the current study, teachers at NHA were invited to participate in an online survey aimed at learning more about the attitudes and experiences of teachers. Invitations to participate in the study were e-mailed to all NHA teachers who met both of the following criteria. First, the teacher must be listed as the *teacher of record* for a self contained classroom in grades kindergarten through fifth grade or be a mathematics or English teacher in grades sixth, seven or eight grade. Second, the teacher must also have less than six years of experience teaching. This selection criteria was used to eliminate specials teachers (Art, Music and PE) and teachers of other disciplines to which NHA's measures of student achievement cannot be attributed. In total, 1009 NHA teachers received an email invitation and approximately 34 percent chose to complete the survey.

Student achievement measures and, consequently, teacher effectiveness ratings were available for 91 percent of participating teachers, which comprised the sample (*N* = 313) used for analysis. All participants held a bachelor's degree, and 66 percent held postgraduate degrees. Approximately 36 percent of the teachers worked in schools designated by NHA as high need. A designation of high need is based on the percentage of low-income students. Schools rated as high need have 80 percent or more of the student population receiving federally subsidized free or reduced priced lunches.

Procedure

In June 2012, participating NHA teachers completed consent forms and measures of *positive* and *negative affect, life satisfaction*, *grit* and *optimistic explanatory style*. Teacher performance outcomes (*median rate of growth*, *percentage making typical growth*, *principal rating* and *parent satisfaction*), were provided by National Heritage Academies in June 2012. A number of control variables, *years employed at NHA*, *total years of teaching experience* and the *percentage of low-income students by school* (FRL) were also provided by NHA.

Measures

Grit. The Short *Grit* Scale (Duckworth & Quinn, 2009) is a brief, six-item measure of *grit*, the passionate pursuit of long-term goals. We adapted this measure to create a 12-item *grit* scale by interspersing six items assessing creativity between the items measuring *grit*. We added the six items assessing creativity and reverse scored three items on the *grit* questionnaire in order to make the assessment harder to fake. Participants rate items such as, 'Setbacks don't discourage me' on a five-point Likert-type scale, from 1 = *not at all like me* to 5 = *very much like me*. The *grit* score was determined by taking the mean of the six *grit* items after accounting for the three reverse scored questions. The observed Cronbach's Alpha for the *grit* scores was 0.73.

Life satisfaction. The Satisfaction With Life Scale (SWLS) is a five-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. The observed Cronbach's Alpha for The Satisfaction With Life Scale was 0.88.

Optimistic explanatory style. The Attributional Style Questionnaire (ASQ; Peterson et al., 1982) traditionally 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. In our questionnaire we only presented the six negative events and asked respondents to rate each cause on three dimensions (external vs. internal, unstable vs. stable, and specific vs. global) using a seven-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 the revised model proposed by Abramson, Metalsky, and Alloy (1989), we included items from the unstable vs. stable and specific vs. global dimensions but not the external vs. internal dimension. Negative event attribution scores are mean scores across the six negative events, where unstable and specific ratings are scored positively. Higher scores indicate a less optimistic attributional style (Peterson & Seligman, 1984). The observed Cronbach's Alpha for the negative attributional scores was 0.67.

Affect. *Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen 1988) is a 20-item measure comprised of two mood scales, one measuring *positive affect* and the other measuring *negative affect*. Each item is rated on a five-point Likert-type scale ranging from 1 = *very slightly or not at all* to 5 = *extremely.* Respondents are asked to indicate the extent to which they have felt the indicated feeling or emotion within the specified timeframe. Watson et al.

(1988) reported Cronbach's alpha coefficients that varied with the timeframe specified in the assessment instructions from .86 to .90 for the *Positive Affect* Scale and .84 to .87 for the *Negative Affect* Scale. The observed Cronbach's Alpha for the *Positive Affect* Scale was 0.88 and the *Negative Affect* Scale was 0.86.

   Median Rate of Growth. This measure of teacher performance was obtained from NHA personnel records. Teachers are assigned a *median rate of growth* (MROG) based on the average[2] rate of growth (ROG) of the students in their classrooms. *MROG* is not cumulative and is separately calculated each year for the period fall to spring. The ROG for each student is calculated using proficiency assessments, in both mathematics and language arts, that are administered by NHA three times per year. The *MROG* attributed to each teacher is the median ROG for her population of students. Only students who received a full year of instruction, in either language arts or mathematics, are included in a teacher's population of students. The assessment used by NHA to calculate ROG is called MAP Testing. MAP Testing was designed by the Northwest Evaluation Association (NWEA) and has been validated and nationally normalized based on a sample of over three million test events (Northwest Evaluation Association, 2012). ROG is determined for each student by comparing a student's change in test scores (fall to spring) against the average yearly change for students who started with the same test score. The average yearly change for students starting with the same test score is referred to as typical growth. A ROG greater than one represents that the pace of learning exceeds typical growth, whilst scores less than one represent a rate of learning that is slower than typical. ROG is measured in years. For example, a ROG of three represents that it would take an average student,

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[2] *Average* is used in this context to include all measures of central tendency and not just the mean.

starting at the same point, three years to make the same progress that the student made in one year.

Percentage Making Typical Growth. This measure of teacher performance was obtained from NHA personnel records. Teachers are assigned a *percentage making typical growth* (MTG) based on the rate of growth (ROG) of students in their classrooms. *MTG* is not cumulative and is separately calculated each year for the period fall to spring. The ROG for each student is calculated using proficiency assessments, in both mathematics and language arts, that are administered by NHA three times per year. The *MTG* attributed to each teacher is based on the percentage of students, in her classroom, with a ROG that is equal to or greater than the typical rate of growth. The typical rate of growth is not the same for every student. Typical growth represents the average rate of growth, from fall to spring, for students starting with the same score on the NWEA MAP Test. *MTG* is expressed as a percentage. *MTG* helps to illustrate teacher performance by demonstrating the extent to which all students are benefiting from the teacher's instruction.

Principal Rating. This measure of teacher performance was obtained from NHA personnel records. NHA administrators (principals and deans) assign ratings to each teacher based on their perception of the teacher's performance. Administrators are asked to use a detailed rubric in order to diminish inter-rater variability and to allow for comparisons to be made across schools. NHA administrators rate teachers on a five point Likert-type scale in five dimensions: 1) quality of work, 2) quantity of work, 3) sincere interest, 4) teamwork and 5) communication. Administrators also assess the promotability of each teacher and assign a rating of A, B or C. "A" means ready for promotion within the next year, "B" means the employee is performing satisfactorily in his current role and "C" signifies that the employee is not meeting

basic performance expectations in his current role. Teachers receive ratings from their administrators two times per year, once in January (*Midyear Principal Rating)* and once in May (*Year End Principal Rating).*

  Parent Satisfaction. This measure of teacher performance was obtained from National Heritage Academies. NHA surveys parents each year to determine the percentage of parents who are satisfied with the education provided to their child. Satisfaction is calculated based on the percentage of parents selecting the top score on a five-point Likert-type scale.

Results

  Summary statistics and bivariate correlations for the trait, performance, and control variables are provided in Table 1. The positive traits measured were found to be significantly intercorrelated as has been shown in other research. *Optimistic explanatory style* was positively correlated with *positive affect* ($r = .12$, $p = .04$) and *life satisfaction* ($r = .12$, $p = .05$) and negatively correlated with *negative affect* ($r = −0.14$, $p = .02$). *Grit* was similarly correlated with *positive affect* ($r = .34$, $p < .001$) and *life satisfaction* ($r = .26$, $p < .001$) and negatively correlated with *negative affect* ($r = -.25$, $p <.001$). The relationships between the other positive traits can be seen in Table 1.

  Years employed at NHA was correlated with *median rate of growth* ($r = .14$, $p = .02$), *percentage making typical growth* ($r = .16$, $p < .001$) and *parent satisfaction* ($r = .13$, $p = .05$). The *percentage of low-income students* (FRL), those students receiving federally funded free or reduced priced lunches, was negatively correlated with *median rate of growth* ($r = -.17$, $p < .001$) and *percentage making typical growth* ($r = -.14$, $p = .01$).

  The outcome measures were also intercorrelated. *Median rate of growth* was positively correlated with *percentage making typical growth* ($r = .74$, $p < .001$) and with *parent satisfaction*

($r = .36$, $p < .001$). *Principal rating* was positively correlated with *median rate of growth* ($r = .22$, $p < .001$), *parent satisfaction* ($r = .16$, $p = .02$), and *percentage making typical growth* ($r = .28$, $p < .001$).

We used multiple linear regressions to simultaneously explore the positive traits (*positive affect, life satisfaction, optimism and grit*) and the control variables (*percentage low income students, total years of teaching experience* and *years working at NHA*) as predictors of *median rate of growth* and *percentage making typical growth*. Inconsistent with our hypothesis, none of the positive traits were found to be predictive of either of these test-based outcome measures of teacher performance. Similarly, the positive traits were not predictive of *parent satisfaction*. Both *Positive affect* and *life satisfaction* were, however, found to be separately predictive of *principal rating*. A multiple regression model, including *positive affect* and all three of the control variables, was found to positively predict midyear *principal ratings* ($B = 0.18$, $p < .001$, $r^2 = .091$). A separate multiple regression model, including *life satisfaction* and the control variables, was also found to positively predict midyear *principal rating* ($B = 0.12$, $p < .001$, $r^2 = .075$). *Positive affect* and *life satisfaction* were not included in the same regression models because they are closely related measures of happiness. Summaries of the multiple regression analyses completed for *positive affect* and *life satisfaction* are available in tables 2 and 4 respectively.

Consistent with the second part of our hypothesis, we found that NHA teachers possess more *grit*, *life satisfaction* and *positive affect* than members of the general population of similar age. Participating teachers scored above normative young-adult sample means on *grit*, $t(597) = 11.77$, $p < 0.001$, $d = .96$, *life satisfaction*, $t(542) = 7.36$, $p < 0.001$, $d = .64$, and *positive affect*, t

(405) = 5.61, *p* < 0.001, *d* = .65. The difference was large in effect size for *grit* and medium for both *life satisfaction* and *positive affect*.

Discussion

Debacle, constant failure, trial by fire and uphill battle are all words used by authors to describe the first few years of teaching in a special edition of *Educational Leadership* dedicated to the subject of novice teachers (Scherer, 2012). What personality traits prepare novice teachers to push through such difficulties and to make positive impacts on the lives of students? In this study, we investigated four traits, *grit*, *life satisfaction*, *positive affect* and o*ptimism* in a population of teachers at National Heritage Academies (NHA). We hypothesized that each of these traits would independently predict teacher performance; with higher scoring teachers being rated higher on measures of performance.

Our results were surprising and failed to support our hypothesis. P*rincipal ratings* of teacher performance were the only outcome measure shown to be significantly impacted by positive traits. Specifically, *life satisfaction* and *positive affect* predicted the promotability ratings assigned to teachers by NHA administrators each December. Parent ratings of teacher performance (*parent satisfaction)* were not found to be impacted by any of the positive traits. Additionally, none of the positive traits studied were found to predict the test-based measures of teacher performance (*median rate of growth* and *percentage making typical growth*).

Within the field of education, there is little agreement on how best to evaluate teachers (Bill and Melinda Gates Foundation, 2012). Educators, parents and achievement tests can paint very different pictures of the effectiveness of the same teacher (Bill and Melinda Gates Foundation, 2012). For the most part, the outcome measures used to evaluate teacher performance in our study have been shown to intercorrelate. Median *rate of growth* is positively

correlated with *percentage making typical growth* ($r = .74$, $p < .001$) and with *parent satisfaction* ($r = .36$, $p < .001$). The strong positive correlation between the two test-based measures of teacher performance is to be expected because both are based on the same measure of student learning administered by the Northwest Evaluation Association (NWEA).

Whilst *median rate of* growth is correlated with *parent satisfaction,* it is interesting to note that there is no significant correlation with the other test-based measure, *percent making typical growth*. The reason for this inconsistency is not clear, but may relate to the singular focus of parents on the performance of their children, as opposed to the performance of the class at large. Parents at NHA review the growth scores for their children, including percentile rankings, and likely hold the teacher accountable for this success or failure in their satisfaction rankings. *Percentage making typical growth* is a measure of the teacher's ability to meet all of her students needs and may be more challenging for parents to initially grasp. Moreover, this rating is less relevant to the individual performance of each parent's child and therefore is likely to have a lesser impact on the parent's overall rating of teacher performance.

The ratings of teacher performance assigned by NHA principals (*principal rating*) were found to be correlated with each of the remaining outcome measures. This may suggest that NHA principals are accurately reflecting students achievement gains in their ratings, whilst also capturing factors of importance to parents. Our findings are consistent with the beliefs of many educators who value principal ratings as the only measure of teacher performance capable of capturing the diverse components that are required for success in the classroom (Darling-Hammond, 2012). Yet, these findings also support the beliefs of educators who suggest that teacher performance cannot be judged in the absence of test scores. Far from complete findings that demonstrate the full relationship between these outcome measures, the positive

intercorrelation between the *principal rating* and the other outcome measures shows a relationship that should be explored further.

　The results of our multiple regression analysis seem contradictory in the sense that the positive traits predicted *principal rating*, but none of the other measures of teacher performance. We separately analyzed multiple regression models for *positive affect* and *life satisfaction* and found that these traits account for 9.1% and 7.5% of the *principal rating* respectively. We find it difficult to imagine a bona fide justification for why these traits would increase principal ratings of teacher performance, yet have no effect on the other outcome measures. It seems possible that the *life satisfaction* and *affect* of NHA teachers may be unduly influencing principals to inflate ratings on midyear reviews. Outside of the field of education, research has demonstrated that performance appraisals are routinely confounded by the rater's interpersonal connection to the employee leading to inaccuracy and inter-rater variability (Robbins & DeNisi, 1998).

　Previous research has established that *affect*, mood and desirable personality traits unduly impact performance appraisals (Robbins & DeNisi, 1998; Ralston & Waters, 1996). Supervisors have been shown to consistently grant higher performance ratings to employees who they find more desirable (Robbins & DeNisi, 1998). This tendency for supervisors to inflate the ratings of employees exhibiting desirable traits may help explain the difference between principal determined ratings and those calculated from student test scores. There are many benefits of positivity making it reasonable to infer that principals would likely find positive teachers, those with higher scores in *positive affect* and *life satisfaction*, more desirable. Frederickson (2009) explains that positive emotions can unleash a positive spiral that is contagious and sparks a dance of elevation leading to greater interpersonal connections and even to feelings of oneness. Humans are naturally influenced by emotions to the extent that we use microscopic muscles in

our faces in order better empathize with the feelings of others (Frederickson, 2009). We are fundamentally wired to respond to positive emotion making it very likely that positive traits, such as *positive affect* and *life satisfaction*, would be more desirable to principals and lead to inflated ratings.

Positive Traits and Systems Thinking

It seems important to pause and to consider why the four positive traits measured, which have been shown to offer positive benefits in other settings, weren't shown to have a significant impact on teacher performance at NHA. We are suspicious of our findings, because peer reviewed studies, like Duckworth et al., 2010) have already demonstrated the effect of positive traits on teacher performance. Moreover, years of evidence and the field of positive psychology have well established a general correlation between positive traits and success (Frederickson, 2009). What could be different about working at NHA that might account for the failure of positive traits to predict teacher performance?

The answer may reside in the structure of NHA schools and in the organization's approach to management. NHA identifies itself as a process-driven organization that favors systems thinking (Fredrickson, 2009). Businesses employing systems thinking seek to consider the impact of decision-making on the organization as a whole and to favor choices that are good in the long run, not simply a quick fix (Sherwood, 2002). At NHA, decisions are modeled and tested and it is only practices capable of achieving replicable, repeatable and reliable results that are rolled out to the schools (A. Dershem, National Heritage Academies, personal communication, July 27 2012). NHA hiring practices are centralized and adapted to select individuals both willing and able to work in an environment in which they are consistently asked to follow defined practices. For example, teachers are hired by the school system with the

expectation that they will follow the best practices developed by the central office and give up a degree of creative freedom in order to teach in ways that have been shown, over time and in multiple settings, to consistently generate positive results for students (A. Dershem, National Heritage Academies, personal communication, July 27, 2012).

NHA's combined focus on systems thinking and best practices, leads to a culture that favors compliance over creativity. New teachers learn preferred instructional practices, curriculum, and behavior management techniques at a one-week residential orientation program. Following orientation, teachers are 1) given tools that promote compliance, such as an online grade book and a behavior management tracking system, 2) observed several times a week by school administrators and 3) coached during weekly supervision meetings (A. Dershem, National Heritage Academies, personal communication, July 27, 2012).   Novice NHA teachers report feeling well prepared to meet the needs of students in their classrooms, but often complain that they do not have enough freedom to innovate or to try new ideas (R. Smith, National Heritage Academies, personal communication, June 26, 2012). NHA reports that most teachers hired adjust to the unique culture within the first two years of employment, although a desire for more independence and instructional freedom remains a popular reason why some teachers resign and accept positions with traditional public districts (R. Smith, National Heritage Academies, personal communication, June 26, 2012).

It seems reasonable to infer that the positive traits being studied may have a lesser impact on teacher performance in an organization like NHA, than they would in an organization driven by individual creativity, problem solving and initiative. At NHA, as much as 80% of the decisions typically made by teachers are made centrally at the service center (R. Smith, National Heritage Academies, personal communication, June 26, 2012). Employees are taught to rely on

the defined processes for answers and this likely dramatically lessens the effect of positive traits

on performance. In essence, there is less for the employees to influence and fewer opportunities

for their positive or negative traits to influence the end result. This of course, is the purpose of

systems thinking and the introduction of best practices, to reduce variance and promote more

uniform quality (Sherwood, 2002). When you consider that creativity is one of the main benefits

that stem from positive traits, it is no surprise that positive traits might have a lesser impact

within an organization in which individual creativity is considered less valuable.

Employees who experience more frequent positive emotion have been found to take a

more deliberate approach to decision making, to perform better in leaderless situations, and to

find better solutions to problems (Barsade & Gibson, 2007; Staw, Sutton, & Pellod, 1994;

Wright & Staw, 1999). These are benefits that have been shown valuable in both large and small

enterprise worldwide (Wright & Staw, 1999). They are benefits that would also likely results in

improved rates of success for teacher in traditional school environments, but may not have the

same significant effect on performance in an organization favoring compliance over individual

creativity and proactivity.

Opportunities to Learn More

Our goal in this study was to investigate the effects of positive traits on teacher quality

within a traditional education setting. We wanted to survey a population of teachers who were as

similar as possible to the millions of teachers working in schools throughout the United States.

On the surface, NHA seemed an attractive choice because of its number of schools, diverse

locations, test-based measures of teacher performance and the number of teachers employed.

Yet, we overlooked the potential impact that the organization's culture of compliance might have

on our results. Many schools around the country are trying new ideas aimed at closing the

achievement gap, but few are so completely disenfranchising the teacher. For this reason, we expect that our results are unique and will have greater relevance to businesses outside of the field of education. The greatest relevance might be for companies that employ systems thinking and are highly process driven.

In the end, we did not study typical teachers working in traditional school environments. Our research demonstrates that environment, working conditions and culture, matters and that the traits significantly linked to performance will likely change in response to the dynamics of the school environment. Almost all educators in the United States face challenges, but it is hard to imagine that the same set of traits could account for teacher success in low income urban schools, as well as, middle class suburban schools or even rural schools. Moreover, it is typically the traits that differ between high and low performers that are most useful in helping leaders to hire (Smart, 2005). Further research to identify the points of differentiation between high and low performing teachers and considers school environment could dramatically aid teacher selection activities at schools nationwide.

It would be interesting to better understand the role of the *24 character strengths and virtues* (Peterson & Seligman, 2004) in shaping teacher effectiveness. Preliminary research has shown zest and humor to be associated with teacher performance, but more study is needed (Seligman, 2011). Strengths may be an important component of teacher success because in addition to garnering peak performance, the benefits to being correctly matched with your strengths are 1) increased resilience, 2) increased vitality, 3) decreased stress, 4) increased confidence and self-esteem and 5) increased happiness (Grenville-Cleave, 2012).

Finding individuals with the right combination of strengths for teaching might also combat attrition. One of the greatest challenges facing urban schools is the loss of teaching

faculty (Walsh & Tracy, 2004). As in our results, the performance of teachers has been shown to improve with time spent working at the same school (Walsh & Tracy, 2004). Novice teachers who resign are often replaced by another novice teacher and if the trend continues students remain taught by new teachers, who lack local experience, year after year. The effects of inexperience add up and this can dramatically change the quality of life for students (Walsh & Tracy, 2004).

Conclusions

Our study did not produce the results expected. In many ways, we were seeking to confirm the work of Duckworth et al. (2010) at TeachForAmerica in a more typical population of teachers working for National Heritage Academies. In the end, our results were inconsistent with our hypothesis and much of the research exploring the effects of positive traits on performance. Our unique findings could be the result of error, but may also be the results of systems thinking implemented with fidelity across the organization. We prefer the later because it seems commonsensical that systems aimed at reducing variance will naturally promote conformity and stamp out the effects of individual creativity. We recommend that this study is repeated using a sample of teachers working at traditional public schools and that a state assessment, with cohort mapping, is used as the principle outcome measure of teacher effectiveness. Further study can help better identify the traits that differentiate high performing teachers from ineffective ones and could lay the foundation for improving the teacher selection processes being used by school administrators nationwide.

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, *96*(2), 358-372. doi: 10.1037//0033-295X.96.2.358

Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, *87*(1), 49-74. doi: 10.1037/0021-843X.87.1.49

Allan, R. (2011, December). Albinism. *NYU Langone Medical Center*. Retrieved from http://www.med.nyu.edu/content?ChunkIID=22573

Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *Academy of Management Perspectives*, (February), 36-59.

Bill and Melinda Gates Foundation. (2010). *Empowering teachers: Readiness for reform* (Rep.). Retrieved from http://www.gatesfoundation.org/united-states/Documents/empowering-effective-teachers-readiness-for-reform.pdf

Bill and Melinda Gates Foundation. (2012, January). *Gathering feedback for teaching* (Rep.). Retrieved from http://www.metproject.org/downloads/MET_Gathering_Feedback_Research_Paper.pdf

Blog Talk Radio (Producer). (2012, April 4). *Rewiring your brain: Delia Stafford Star Teachers* [Video]. Retrieved from http://www.blogtalkradio.com/icdrrose/2012/04/04/delia-stafford--star-teachers-haberman-foundation

Clayson, D. E. (2006). Personality and the Student Evaluation of Teaching. *Journal of Marketing Education*, *28*(2), 149-160. doi: 10.1177/0273475306288402

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy

    evidence. *Education Policy Analysis Archives, 8(1).* Retrieved from

    http://epaa.asu.edu/ojs/article/view/392

Darling-Hammond, L. (2012, May). The challenges of supporting new teachers [Interview by M.

    Scherer]. *Educational Leadership*, *69*(8), 18-23.

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction With Life Scale.

    Journal of Personality Assessment, *49*(1), 71-75.

Duckworth, A. L., & Quinn, P. (2009). Development and Validation of the Short Grit Scale

    (Grit-S). *Journal of Personality Assessment*, *91*(2), 166-174. doi:

    10.1080/00223890802634290

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and

    passion for long-term goals. *Journal of Personality and Social Psychology*, *92*(6), 1087-

    1101. doi: 10.1037/0022-3514.92.6.1087

Duckworth, A., Quinn, P. D., & Seligman, M. E. (2010). Positive predictors of teacher

    effectiveness. *The Journal of Positive Psychology*, *4*(6), 540-547. doi:

    10.1080/17439760903157232

Flink, C., Boggiano, A. K., & Barrett, M. (1990). Controlling teaching strategies: Undermining

    children's self-determination and performance. *Journal of Personality and Social*

    Psychology, *59*(5), 916-924. doi: 10.1037//0022-3514.59.5.916

Fredrickson, B. (2009). *Positivity*. New York, NY: Crown.

Goodwin, B. (2012). New teachers face three common challenges. *Educational Leadership*,

    69(8), 84-85.

Graham, C., Eggers, A., & Sukhtankar, S. (2004). Does happiness pay? An exploration based on panel data from Russia. *Journal of Economic Behavior & Organization*, *55*(3), 319-342. doi: 10.1016/S0167-2681(04)00047-2

Greguras, G. J., & Diefendorff, J. M. (2010). Why does proactibe personality predict employee life satisfaction and work behaviors? A field investigation of the mediating role of the self-concordance model. *Personnel Psychology*, *63*(3), 539-560.

Grenville-Cleave, B. (2012). *Positive psychology: A practical guide*. London, UK: Icon Books.

Haidt, J. (2006). *The happiness hypothesis: Finding modern truth in ancient wisdom*. New York, NY: Basic Books.

Hanushek, E. A. (2011). Valuing teachers: How much is a good teacher worth? *Education Next*, *Summer*, 41-45.

Harwell, M., & LeBeau, B. (2010). Student Eligibility for a Free Lunch as an SES Measure in Education Research. *Educational Researcher*, *39*(2), 120-131. doi: 10.3102/0013189X10362578

Heath, D., & Heath, C. (2011, February 16). Why true grit matters in the face of adversity. *FastCompany.com*. Retrieved from http://www.fastcompany.com/magazine/153/true-grit.html

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, *131*(6), 803-855. doi: 10.1037/0033-2909.131.6.803

Moore, D. S. (1995, January). Remarks on receiving the MAA's 1994 Award for Distinguished College or University Teaching of Mathematics. *MAA Focus*, *2*, 5-8. Retrieved from http://www.stat.purdue.edu/~dsmoore/articles/Craft.pdf

Northwest Evaluation Association. (2012). Validated by Research. *Why Choose NWEA*.

   Retrieved February 20, 2012, from http://www.nwea.org/why-choose-nwea/validated-

   research

Pavot, W., & Diener, E. (2008). The Satisfaction With Life Scale and the emerging construct of

   life satisfaction. *The Journal of Positive Psychology*, *3*(2), 137-152. doi:

   10.1080/17439760701756946

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and

   classification*. Washington, DC: American Psychological Association.

Peterson, C., Semmel, A., Von Baeyer, C. L., Abramson, L. Y., Metalsky, G. I., & Seligman, M.

   E. (1982). The attributional style questionnaire. *Cognitive Therapy and Research*, *6*, 287-

   300.

Ralston, R. W., & Walters, R. O. (1996). The impact of behavioral traits on performance

   appraisal. *Public Personnel Management*, *25*(4).

Ralston, R. W., & Waters, R. O. (1996). The impact of behavioral traits on performance

   appraisal. *Public Personnel Management*, 25(4), 409-421. Retrieved from

   http://search.proquest.com/docview/619036269?accountid=14707

Reio, Jr., T. G., & Callahan, J. L. (2004). Affect, curiosity, and socialization-related learning: A

   path analysis of antecedents to job performance. *Journal of Business and Psychology*,

   19(1), 3-22. doi: 10.1023/B:JOBU.0000040269.72795.ce

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic

   achievement. *Econometrica*, *73*(2), 417-458.

Robbins, T. L., & DeNisi, A. S. (1998). Mood vs. interpersonal affect: Identifying process and rating distortions in performance appraisal. *Journal of Business and Psychology*, *12*(3), 313-325.

Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.

Scherer, M. (2012). Rewriting Survivor. *Educational Leadership*, *69*(8), 7.

Seligman, M. E. (2011, November 26). *Intro to positive psychology: Strengths*. Lecture presented at MAPP Onsite 4 in Huntsman Hall, Philadelphia.

Sherwood, D. (2002). *Seeing the forest for the trees: A manager's guide to applying systems thinking*. London, UK: Nicholas Brealey Pub.

Smart, B. D. (2005). *Topgrading: How leading companies win by hiring, coaching, and keeping the best players*. New York, NY: Portfolio.

Stanford, B. H. (2001). Reflections of resilient, persevering urban teachers. *Teacher Education Quarterly*, *28*, 75-87.

Staw, B. M., Sutton, R. I., & Pelled, L. H. (1994). Employee Positive Emotion and Favorable Outcomes at the Workplace. *Organization Science*, *5*(1), 51-71. doi: 10.1287/orsc.5.1.51

Varma, A., Pichler, S., & Srinivas, E. S. (2005). The role of interpersonal affect in performance appraisal: Evidence from two samples – the US and India. *The International Journal of Human Resource Management*, *16*(11), 2029-2044. doi: 10.1080/09585190500314904

Veltri, B. T. (2012). Teach For America: It's more about leading than teaching. *Educational Leadership*, *69*(8), 62-65.

Walsh, K. (2007). *If wishes were horses: The reality behind teacher quality findings* (Working

      Paper). Washington, DC: National Council on Teacher Quality.

Walsh, K., & Tracy, C. O. (2004). *Increasing the odds: How good policies can yield better*

      teachers (Rep.). Retrieved http://www.nctq.org/nctq/images/nctq_io.pdf

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures

      of positive and negative affect: The PANAS scales. *Journal of Personality and Social*

      Psychology, *54*(6), 1063-1070. doi: 10.1037//0022-3514.54.6.1063

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A

      Review. *Review of Educational Research*, *73*(1), 89-122.

Wright, T. A., & Staw, B. M. (1999). Further thoughts on the happy-productive worker. *Journal*

      of Organizational Behavior, *20*(1), 31-34. doi: 10.1002/(SICI)1099-

      1379(199901)20:13.0.CO;2-U

Table 1

Summary statistics and bivariate correlations

Variable	M	SD	α	n	1	2	3	4	5	6	7	8	9	10	11	12
Teacher traits																
1. Optimism	4.02	0.77	0.66	307	1.00	0.05	0.12*	-0.14*	0.12*	0.03	-0.03	0.04	-0.06	0.03	-0.01	-0.10
2. Grit	3.84	0.57	0.73	299		1.00	0.34**	-0.25**	0.26**	0.07	0.02	0.01	0.09	-0.06	0.03	-0.04
3. Positive Affect	3.54	0.83	0.88	296			1.00	-0.37**	0.23**	0.07	0.04	0.02	0.17**	-0.02	0.02	-0.09
4. Negative Affect	2.09	0.74	0.86	296				1.00	-0.15**	-0.03	0.06	0.01	-0.07	-0.11	-0.02	0.03
5. Life satisfaction	27.38	5.26	0.88	300					1.00	0.02	0.13	0.05	0.13*	-0.04	0.01	-0.10
Performance outcomes																
6. Median Rate of Growth	1.53	0.39		313						1.00	-0.01	0.74**	0.22**	-0.17**	0.14*	0.01
7. Parent Satisfaction	0.75	0.15		214							1.00	0.36**	0.16*	-0.05	0.13*	0.03
8. Percent Making Typical Growth	0.73	0.13		313									0.28**	-0.14*	0.16**	0.035
9. Principal Rating	1.81	0.56		313										0.19**	-0.18**	-0.78
Control variables																
10. Percentage low-income students	0.67	0.29		309											0.01	0.03
11. Years employed at NHA	1.91	1.06		313												0.38**
12. Total years of teaching experience																

*p<0.05; **p<0.01

Table 2

Summary of Multiple Regression Analysis for Principal Rating (N = 296)

Variable	*B*	*SE(B)*	*β*	*t*	*Sig (p)*
Positive affect	0.12	0.04	0.18	3.21	0.001
Years working at NHA	0.08	0.03	0.15	2.50	0.013
Total years teaching experience	0.001	0.02	0.004	0.06	0.954
Percentage low-income students	-0.35	0.11	-0.18	-3.19	0.002

$R^2 = .091$

Table 3

Summary of Multiple Regression Analysis for Principal Rating (N = 300)

Variable	*B*	*SE(B)*	*β*	*t*	*Sig (p)*
Life satisfaction	0.01	0.01	0.12	2.06	0.041
Years working at NHA	0.09	0.03	0.16	2.60	0.010
Total years teaching experience	0.001	0.02	0.004	0.06	0.954
Percentage low-income students	-0.35	0.11	-0.18	-3.24	0.001

$R^2 = .075$

Appendix A: IRB Submission

Running Head: IRB SUBMISSION FOR NHA TEACHER STUDY

IRB Submission for National Heritage Academies Teacher Study

Adam Maurer

University of Pennsylvania

Advisor: Angela Duckworth (Principal Investigator)

Brief description of the protocol

Our aim is to determine whether positive personality characteristics are associated with superior performance as a teacher. National Heritage Academies (NHA) operates public charter schools, in nine states, serving more than 45,000 students. The study involves collecting self-report survey data from up to 600 teachers. We'll use this data to predict teacher performance ratings from NHA records.

Study Instruments

I. SELF-REPORT MEASURES

Participants will complete a subset of the following questionnaires not to exceed 2 hours of completion time.

1. **Attributional Style Questionnaire**

   This questionnaire asks the participant to imagine hypothetical situations (e.g., A friend is very angry with you) and then to imagine and write down one main cause. The participant is then asked to classify each cause on dimensions of internal-external, global-local, and stable-unstable.

   Dykema, K., Bergbower, K., Doctora, J. D., & Peterson, C. (1996). An Attributional Style Questionnaire for general use. *Journal of Psychoeducational Assessment*, 14, 100-108.

2. **Approaches to Happiness**

This questionnaire contains three six-item subscales which measure the degree to which the participant endorses pleasure, engagement or meaning as an approach to happiness.

Peterson, C., Park, N., & Seligman, M. E. (2005). Orientations to happiness and life satisfaction: The full life versus the empty life. *Journal of Happiness Studies*, 6, 25-41.

3. **Life Satisfaction**

The Satisfaction With Life Scale (SWLS) is a 5-item questionnaire designed to measure global cognitive judgments of one's life.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

4. **Positive and Negative Affect**

The Positive Affect Negative Affect Schedule (PANAS) is a psychometric scale developed to measure the largely independent constructs of positive and negative affect both as states and traits.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. doi: 10.1037//0022-3514.54.6.1063

5. **Short Grit Scale**

The Short Grit Scale includes eight items that measure sustained interest and effort toward challenging goals. Either the original version using a standard 5-point Likert-type scale or a parallel version using forced-choice responses will be used.

Duckworth, A.L., & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment,* 91, 166-174.

6. **PERMA-P Scale**

The PERMA-P scale measures well-being across the five dimensions of PERMA proposed by Seligman (2011). The scale includes 15 items, three questions for each of the five PERMA constructs.

University of Pennslyvania IRB Protocol #813733

II. BASELINE COVARIATES FROM NHA RECORDS

Demographics and information from applicant records (e.g., GPA) will be obtained from National Heritage Academies.

III. OUTCOME MEASURES

1. **Attrition**

Voluntary or involuntary termination of employment including date of departure will be obtained from personnel records supplied by National Heritage Academies.

2. **NWEA performance rating**

    A performance rating calculated by National Heritage Academies will be obtained from

    personnel records. This performance rating is based on how much academic progress

    students made fall to spring. Specifically, NHA administers Northwest Evaluation

    Association (NWEA) MAP Testing three times per year as a validated and nationally

    normalized assessment of student achievement.

    Northwest Evaluation Association. (2012). Validated by Research. Why Choose NWEA.

    Retrieved February 20, 2012, from http://www.nwea.org/why-choose-nwea/validated-

    research

3. **Manager assessed promotability**

    Teachers at NHA are rated as A, B or C by their manager to signify overall

    performance/contribution and then designated as 0, 1 or 2 to indicate potential

    promotability. Employees rated as A are assessed to be consistently exceeding

    expectations, B are meeting expectations and C are below expectations. Employees are

    given a 0 if they are not considered promotable, 1 if they are considered promotable one

    level and 2 if they are considered promotable two or more levels. For example, an

    employee rated A2 is exceeding expectations and is expected to be promoted two or more

    levels. Each of the 9 permutations of letter and number combinations will be coded

    working alphabetically and sequentially (A0 = 1, A1 = 2, A2 = 3, B0 =4 C1 = 8, C2 = 9).

4. Employee Satisfaction/Engagement

National Heritage Academies uses a proprietary tool purchased from Aon Consulting to measure employee satisfaction and engagement. Corporations use the tool worldwide to both benchmark employee engagement against competing organizations and to measure changes in engagement over time. NHA employees complete an Aon survey in March each year.

Engagement 2.0: Focus on the right people. Build the excitement. Preserve the Passion. (n.d.). *Thought Leadership/Engagement 2.0*. Retrieved March 12, 2012, from http://www.aon.com/attachments/thought-leadership/engagement_2.0.pdf

Group Modifications

Not applicable

Method for Assigning Subjects to Groups

This is not an experimental study and therefore does not require assignment to groups. Teachers presently employed by NHA will be invited to participate in the study.

Administration of Surveys and/or Process

Teachers at National Heritage Academies (NHA) will be asked to complete a single questionnaire that combines the six surveys referenced in the Study Instruments. We expect that most teachers will complete the surveys within 45-55 minutes. All NHA teachers, with four or fewer years of teaching experience, will be invited to complete the surveys by a member of the

NHA leadership team. Participation is voluntary. Teachers who choose to participate will be

entered into a drawing to win an iPad.

Surveys will be administered online using the Qualtrics online platform. Each teacher

will receive an invitation to participate by email. The email (see attachements) will include a

link to a website containing the consent documentation as well as directions for completing the

survey. All self-reported and outcome data will be de-identified when received by the research

team. None of the information collected from teachers should be considered sensitive or

confidential insofar as items concern everyday behaviors and attitudes.

Data Management

Once downloaded from Qualtrics, data will be stored on secure, password-protected

servers at the University of Pennsylvania Positive Psychology Center. No manual entry of data

will be necessary because data collection will be conducted via the Internet and because outcome

data will be provided by National Heritage Academies in electronic format.

Periodically, during the data collection phase of the study, Tansley Taylor, NHA's main

project contact, will be sent a list of the names of NHA employees who completed the survey

during the preceding seven days. This will enable Taylor to send out reminder emails to those

who have yet to complete the survey.

Once the required number of responses are collected, the survey website will be closed

and a unique identification (ID) number created for each study participant. An excel document

containing the name of each participant and their assigned unique ID number will be sent to the

NHA Measurement Research and Accountability Team (MRA). The MRA team will use this

document as a key and return a file reporting the outcome variables requested (principal

promotability rating, employee engagement/satisfaction, NWEA performance rating and attrition) by unique ID only.

Similarly, the survey results will be de-identified by our team, using the same key. This will allow the survey results, as well as the data provided by NHA, to be matched and combined into a single de-identified file. NHA will not be provided with the survey results and the key will be stored separate from the de-identified data on the Positive Psychology Center server. Kate Von Culin, of the Psychology Center, will create the key, ensure it is stored separately and securely and be responsible for matching the data to create a single de-identified file to be used for analysis by the project's investigators.

Because Adam Maurer is an employee of NHA and a member of the research team, special precautions will be put in place to ensure confidentiality is maintained. It is important to note that Maurer does not routinely have access to confidential personnel records of employees at NHA. However, to ensure that there is no opportunity for matching of names with the survey data, Maurer will not create the key or be involved in the creation of the de-identified file. Maurer is not a member of the MRA team nor is the team in his direct line of oversight. A single employee will be appointed by the Director of MRA to handle the key and to create the de-identified file. Maurer will not be told the name of the individual creating the file and MRA team members will be informed not to discuss this project with Maurer directly. Similarly, the de-identified file will be created at the Positive Psychology Center by Von Culin and Maurer will not have access to the key or the study results by name.

De-identified data may be stored on the personal computer of Adam Maurer for the purposes of completing statistical analysis or preparing study findings. Upon completion of the

study, all files will be saved on the server in the Positive Psychology Center and permanently

deleted from Maurer's computer.

Overall objectives

In the proposed study, we set out to examine whether there are characteristics not

typically collected by school districts, during the hiring process, that can predict substantial

variance in teacher retention and effectiveness. The proposed study will investigate whether 1)

teacher performance (principal ratings of teacher performance, suitability for promotion and

student achievement on NWEA MAP tests) and 2) employee status (continued employment and

employee satisfaction) can be predicted in novice teachers by a) overall subjective well-being

and its components of life satisfaction, positive affect, and lack of negative affect and b)

character strengths such as perseverance, optimism and grit. Our study will attempt to establish

the predictive value of each of the positive psychological traits collected statistically and then

postdict teacher performance and employment status in an effort to test the accuracy of our

findings.

Background

In recent years, a significant body of research has demonstrated that teacher effectiveness

is the single most important in-school influence on student learning (Johnson, Berg, &

Donaldson, 2005; Sanders & Rivers, 1996). Theoretically, assigning students in low-income

communities to highly effective teachers five years in a row would eliminate the achievement

gap separating these youth from their counterparts in high-income communities (Walsh, 2007).

Ensuring that all children have access to high quality instruction can prove challenging because

there is considerable variability in teacher effectiveness (Johnson et al., 2005; Sanders & Rivers, 1996). Policy makers have found it challenging to define metrics that reliably measure teacher effectiveness and identify the characteristics that account for variation in teacher performance.

Teacher Effectiveness and retention collectively determine teacher impact

Arguably, the most critical measure of teacher effectiveness is the impact teachers have on student achievement. A fundamental challenge, however, in determining teacher effectiveness is how to separate the impact of instruction from other influences (e.g., student socioeconomic status) on student learning. Recently developed longitudinal data systems, which can track individual students over time, have led to the rapid expansion of value-added assessment and other forms of student growth modeling, which attempt to control for potentially confounding factors by looking at student progress over time. Notwithstanding methodological and practical challenges (Baker et al., 2010; Kupermintz, 2003; Rothstein, 2010), value-added measures of teacher effectiveness are becoming increasingly commonplace (U.S. Department of Education, 2009). The Northwest Evaluation Association has developed a commercially available measure of student progress over time, MAPP Test, which as of 2003 had been administered to more than 3 million students and used to assess both student and teacher performance across 1200 schools in the United States (Northwest Evaluation Association, 2012).

Unfortunately, nearly half of teachers leave the profession within the first five years of service (Ingersoll & Smith, 2003). Furthermore, attrition rates are typically one-third higher in urban areas than in suburban ones (Ingersoll & Smith, 2003), creating a revolving door of inexperienced teachers in the nations neediest schools. High rates of turnover have significant costs for districts, as principals typically replace those leaving the classroom with less

experienced novice teachers (Johnson et al., 2005), who are, on average, less effective than their more experienced colleagues (Rockoff, 2004). Further, constant changes in staff composition disrupt the organizational culture of a school, which can impede the development of a coherent educational strategy (Neild, Useem, Travers, & Lesnick, 2003). Finally, high turnover rates force districts to incur otherwise unnecessary recruitment, selection, and professional development costs; the annual nationwide cost of public school teacher turnover is estimated at over $7 billion (NCTAF, 2007). This is not to say that retaining all teachers is in itself the optimal outcome. Indeed, some level of turnover may be desirable, in so far as new teachers bring energy and fresh ideas and less effective teachers should be encouraged to leave the classroom.

Still, an obvious strategy for improving student learning outcomes in general and the progress of low-income students in particular is to identify at the time of hire individuals who will both remain committed to the profession of teaching and, in addition, prove effective in raising student achievement.

Prior research on predictors of teacher effectiveness and retention

Evidence associating teacher characteristics observable at the time of hire and their performance in the classroom has been mixed (Greenwald, Hedges, & Laine, 1996; Hanushek, 1997; Palardy & Rumberger, 2008). For instance, whereas some scholars have contended that teacher certification strongly predicts student achievement (Darling-Hammond, 2000), others have questioned the validity of this evidence (Ballou & Podgursky, 2000). In their systematic review, Wayne and Youngs (2003) concluded that the impact of certification and degrees on student achievement is inconclusive at best, with the exception of advanced degrees in mathematics predicting gains in student achievement in math (Goldhaber & Brewer, 1997;

Goldhaber & Brewer, 2000). Overall, there appears to be a growing consensus that certification has a negligible impact on student learning (Kane et al., 2006; Rivkin et al., 2005). Likewise, some studies have found that teachers with higher standardized test scores (e.g., ACT scores) are slightly more likely to produce greater student learning gains (Clotfelter, Ladd, & Vigdor, 2007; Ferguson & Ladd, 1996). Other research has suggested that teachers with higher measured ability are more likely to transfer to higher performing schools or leave the classroom entirely (Guarino, Santibañez, Daley, & Brewer, 2004; Lankford et al., 2002). In sum, evidence for the importance of prior academic success to teacher performance is equivocal (Rockoff et al., 2008).

What else might forecast the eventual commitment and performance of a potential teaching hire? One logical possibility is that the personality of the teacher is a significant variable in the classroom. Indeed some would argue it is the most significant variable (Getzels & Jackson, 1963, p. 506). Reviewing the extant literature on personality and teacher effectiveness, Getzels and Jackson (1963) concluded that notwithstanding prodigious research effort, very little is known for certain about the nature and measurement of teacher personality, or about the relation between teacher personality and teaching effectiveness (p. 574). In addition to the difficulties inherent in measuring teacher effectiveness (particularly, we should note, in the days before value-added approaches), Getzels and Jackson (1963) identified challenges associated with both defining and measuring personality traits with precision.

Unfortunately, minimal progress has been made in the half-century since Getzels and Jacksons review. Several studies have suggested that teachers perceived self-efficacy can contribute to student learning (Armor et al., 1976; Rumberger & Palardy, 2005; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998) and decisions about whether to remain in the classroom (Johnson & Birkeland, 2003). However, only limited attention seems to have been paid to

traditional measures of personality in the extant literature. Many districts now ask prospective

teachers to complete commercially available self-report questionnaires, such as the Haberman

Star Teacher Evaluation PreScreener and the Gallup TeacherInsight Assessment, to measure

traits, beliefs and values that are believed to be predictive of future classroom success.

Unfortunately, convincing evidence for the predictive validity of these and similar instruments is

lacking (Rockoff et al., 2008).

Some research has examined the effect of teacher personality traits on classroom

management styles (Martin, Yin, & Baldwin, 1998) and classroom environment (Fisher & Kent,

1997), but not on student learning. To our knowledge, the one exception is Rockoff et al. (2008);

in this study, the authors administered the Haberman Star Teacher Evaluation PreScreener, a

standard Big Five personality self-report questionnaire, and self-efficacy questionnaires, to new

math teachers during the school year and associated these measures with a variety of teacher and

student outcomes. Results revealed that none of the Big Five personality traits (i.e.,

conscientiousness, agreeableness, emotional stability, openness to experience, and extraversion)

or the Haberman Star Teacher Evaluation PreScreener, were associated with teacher

effectiveness measured by students' academic gains on a standardized math test. Collectively,

however, the full set of non-cognitive measures had a modest and statistically significant

relationship with student outcomes (Rockoff et al., 2008).

Grit as a predictor of teacher effectiveness and retention

Which aspects of personality might enhance teaching effectiveness and retention?

Teaching is by all accounts an extraordinarily demanding profession. In a national survey, 86%

of new teachers claimed that given the challenges inherent in their work, only those with a true

sense of calling should pursue teaching as a profession. Teachers in this same study identified

enthusiasm, effort, and energy as among the most critical qualities for success in the classroom

(Farkas, Johnson, & Foleno, 2000). Indeed, despite its many rewards, the unrelenting challenges

and uncertainties of teaching can be demoralizing. Thompson (1991), in a letter to a fellow

young teacher, observed that the most disheartening and discouraging aspect of teaching is the

fact that results are intangible and unobservable (p. 104). Learning their trade largely by trial and

error, new teachers often take part in sink or swim induction processes that can lead to feelings

of isolation and ineffectiveness. Initial socialization into the profession is marked by a certain

abruptness with which full responsibility is assumed, as the beginning teacher is expected to

perform the same tasks as experienced veterans, and oftentimes, receives an even more

challenging teaching load (Lortie, 1975, p. 59). In low-income districts, novice teachers

sometimes leave the classroom mid-year because they feel overwhelmed with the sense of

responsibility and challenge (Johnson & Birkeland, 2003).

It seems logical, therefore, that because teaching is extremely challenging work, grit,

defined as perseverance and passion for long-term goals, can have an important impact on

teacher effectiveness. One prior study has shown that grit, measured with a self-report

questionnaire, predicts teaching performance indexed as the academic gains of teachers students

(Duckworth, Quinn, & Seligman, 2009). Self-reported grit has also been shown to predict

accomplishments in a variety of other challenging domains, including retention at West Point

Military Academy and performance in the National Spelling Bee (Duckworth et al., 2007;

Duckworth & Quinn, 2009). Mediation analyses confirm that the effect of grit on outcomes is

through cumulative effort: gritty individuals tend to work harder than their peers, and they

remain committed to chosen pursuits over a sustained period of time (Duckworth et al., 2007).

Not only do grittier individuals show up, but they also work diligently on specific practice activities to improve performance (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011). Following this logic, we would expect that gritty teachers would remain committed to their students and more likely to sustain efforts toward improving their instructional practice.

Design

Teachers who are presently working for National Heritage Academies (NHA) will be invited to participate in the study. Our collaborators at NHA will email teachers a description of the study that includes a link to the survey website (see attachements). The first page of the survey website will include the consent form, information about informed consent, and directions for completing the survey. The website will be hosted on Qualtrics.com.

Both the email and the survey website will clearly inform prospective participants that participation in the study is voluntary and that the decision to participate or not to participate will have no impact on their employment with National Heritage Academies. If NHA employees decide to proceed to complete the survey this will be considered acceptance of informed consent. They will also be informed that their implied consent will permit NHA to send our research team performance and attrition data (See attached Implied Consent Form).

Data gathered on the website will include full name for the purpose of matching to NHA outcome data. Participants will be asked to complete the following measures, which in total we estimate taking 45-55 minutes. All measures have been validated for use with adult populations, and none ask for sensitive information.

- Short Grit Scale
- Satisfaction With Life Scale

- PANAS

- PERMA-P

- Attributional Style Questionnaire

Outcome data will be collected from NHAs records. Data will be stored on secure, password protected servers at the University of Pennsylvania Positive Psychology Center. No manual entry of data will be necessary because data collection will be conducted via the Internet and because outcome data will be provided by NHA in electronic format.

Study duration

       Our goal is to begin the proposed study in May 2012. Teachers wishing to participate will be asked to complete the surveys online within three weeks. A series of reminder emails will be sent to participants, one email per week. Completion of the survey questions will be at most two hours and for most participants closer to 30 minutes.

       It is expected that NHA will provide outcome data within one week of receiving the names of individuals electing to participate in the study. Analysis of the data provided will likely take until late June 2012. The next 6 weeks will be used to write up findings to meet the capstone project deadline at the beginning of August 2012.

       Additional performance and employee status data will be provided by NHA in August 2011 and again in August 2012. This information will be sent to the principal investigator in a de-identified format, using the original key. No further information will be collected from survey participants.

Target population

The subjects in this study will be teachers currently employed by National Heritage Academies who have been teaching for four or fewer years. We will receive their de-identified data only. NHA will only provide data that has no reference to name, employee ID number, or any other unique identifying information.

Subjects at Penn: 600

Subjects at Sites Other than Penn: 0

Vulnerable Populations

None of the above populations are included in the research study

Subject recruitment

National Heritage Academies will request the participation of its teachers with an introductory email sent by the school systems' Vice President of Student Services. This email from NHA will inform teachers that their participation is completely voluntary and that they can elect to complete the questionnaires by clicking the link enclosed. Reminder emails will be sent weekly to those individuals who have yet to complete the survey. A copy of the invitation email, to be sent by National Heritage Academies, is attached to this application.

Subject compensation

Will subjects be financially compensated for their participation? Yes

Study participants, who fully complete all survey questions, will have the opportunity to enter their name into a drawing for an iPad (valued at $499). The name of the winner will be given to NHA for distribution of the prize.

Procedures

1. Upon approval, all teachers who are presently working for National Heritage Academies (NHA) and have four or fewer years of teaching experience will be invited to participate in the study. Our collaborators at NHA will email all teachers fitting these two conditions a description of the study that includes a link to the survey website.

2. The first page of the survey website will include the consent form, information about informed consent and directions for completing the survey. The website will be hosted on a password-protected server, with SSL encryption and be supported by experienced Internet programmers. Both the email and the survey website will clearly inform prospective participants that participation in the study is voluntary and that the decision to participate or not to participate will have no impact on their employment with National Heritage Academies. If NHA employees decide to proceed to complete the survey this will be considered acceptance of informed consent. They will also be informed that their implied consent will permit NHA to send our research team performance and attrition data (See attached Implied Consent Form).

3. Data gathered on the website will include full name, preferred email address, gender, ethnicity and birth date. In addition, participants will be asked to complete the following measures, which in total we estimate taking 45-55 minutes. All measures have been validated for use with adult populations, and none ask for sensitive information.

4. Survey responses will be collected from NHA employees for 3 weeks. Each Friday, during this three week period, a list of employees who completed the survey during the past 7 days will be sent to NHA. A one week cushion will be added to the 3 week data collection period to accommodate teachers who are slow to submit responses (i.e. total of four weeks for data collection).

5. NHA will send out a reminder email each week to individuals who have not completed the survey.

6. Once the desired number of responses has been obtained, the survey will be closed. We believe that only 84 responses are required to establish statistical significance, however,

we are hopeful, based on response rates from previous surveys at NHA, that between 350 and 400 complete surveys will be submitted.

7. The names of all individuals who have completed the survey will be sent to the NHA Measurement Research and Accountability (MRA) team, along with a unique ID number assigned to each individual. This will serve as the key.

8. NHA will provide outcome data from its records by unique ID number only. Data provided to us will be stored on secure, password-protected servers at the University of Pennsylvania Positive Psychology Center.

9. No manual entry of data will be necessary because data collection will be conducted via the Internet and because outcome data will be provided by NHA in electronic format.

10. The outcome data provided by NHA will be matched, by unique ID, with the survey results collected.

11. Statistical analysis will be performed using SPSS to determine if any of the positive psychological traits assessed by the survey are correlated with the outcome variables provided by NHA.

12. Study investigators will attempt to postdict employee performance and employee status based on the statistical findings.

Analysis Plan

Prior work by the Duckworth Lab suggests a relationship between predictor and outcomes variables of moderate effect size ($r = .3$). Thus, to achieve statistical power of 80% at a two-tailed alpha level of .05, we will require 84 of the possible 400 subjects to participate. All

estimates of required sample size are included in Cohen's 1988 edition of Statistical Power

Analysis for the Behavioral Sciences.

We will quantify the relationship between predictors and teacher performance using

Pearson correlation, partial correlation, and multiple regression techniques. We will quantify the

relationship between predictors and attrition using binomial regression techniques. Calculations

will be performed using SPSS. In sum, the analyses used for this data will be standard,

parametric models in which potential confounds are introduced as covariates to clarify

relationships between personality traits and outcomes.

<u>Subject Confidentiality</u>

Sensitive data in this study includes unique identifying information (full name and

birthdate) and outcome data (teacher performance ratings and employee status). Confidentiality

will be maintained by keeping data on a password-protected server at the University of

Pennsylvania Positive Psychology Center. In addition, we will assign confidential ID numbers to

participants once all self-report questionnaire data have been gathered. We will create a key

linking ID numbers to participant names for National Heritage Academies, and then send this

key to a designate in NHA's Measurement Research and Accountability (MRA) team. A member

of the MRA team will send us back performance and employment status data by ID number

rather than by name. Our database will keep ID number and full name in separate files, and data

files used for statistical analysis will not include names. Questionnaire data will not be shared

with our collaborators at National Heritage Academies. Rather, we will provide National

Heritage Academies with a summary of results. Since NHA will not have access to the survey

results, it is not possible for any of this data to be recorded in the participant's personnel records.

Because one of the study researchers, Adam Maurer, is employed by National Heritage Academies additional precautions will be taken to preserve confidentiality. Maurer's access to electronic human resource files will be discontinued throughout the duration of the study. This is an extra precaution because Maurer does not presently have access to any data sources related to the project. All student performance, teacher performance and teacher attrition data is held by National Heritage Academies in secure databases that can only be directly accessed by the NHA Measurement Research and Accountability team. None of Maurer's direct or indirect reports work within the MRA team.

Data Disclosure

N/A

Consent Process

Overview

Participants will be provided with consent documentation on the survey website. The text of the consent document is attached. Informed consent is considered obtained once the study participant elects to enter their name and email address on the site and commences the first survey questionnaire.

Potential Study Risks

Because of the nature of the questionnaires used in this study, anticipated risks are minimal. Whilst there is a small possibility that NHA could gain access to the survey results,

care is being taken to ensure that this will not happen. Moreover, the information collected is not valuable to NHA without extensive analysis. None of the questionnaires ask employee to make direct judgments about their place of work in ways that could elicit retaliation.

Potential Study Benefits

There are no direct benefits to subjects as a result of their participation in the study. Study findings, if significantly predictive of teacher performance or turnover, could prove valuable to National Heritage Academies in their selection of teachers for their schools. Additionally, schools outside of NHA may see value in using the findings to shape the way they recruit teachers or may even seek to repeat the study within their own organizations in order to better ascertain internal validity.

Risk / Benefit Assessment

Both the risks and the direct benefits of participation in this study are minimal. Thus, we believe the risk to benefit ratio is modest but acceptable.

Appendix A

From: Todd McKee <tmckee@nhamail.com>
Date: March 13, 2012 2:58:13 PM PDT
To: INSERT NAME
Subject: An important Study

Dear <insert teacher first name>,

      NHA is partnering with the University of Pennsylvania to learn more about the attitudes and experiences of teachers. You have the opportunity to help with this important research and by doing so to be entered into a drawing to win an iPad (the new one).

      You are 1 of 400 teachers selected to participate in the study. Below is a link to an online questionnaire. To get started, all you will need to do is click the link from your home or NHA computer. You will be taken to a website that is hosted by the research team at the University of Pennsylvania.

<INSERTLINK>.COM

      You will be able to complete this questionnaire in approximately 25 minutes of uninterrupted time. It is important that you follow the directions carefully and pick the answers most relevant to you in a work setting. You should know that the information collected is only for the purposes of this study. None of the information collected will be passed on to your supervisor or used by NHA to make decisions related to your employment.

      I would appreciate your help and ask that you complete the survey by no later than 5PM on Friday, <insert date>. Thank you in advance for your participation. The success of this project relies on the university receiving as many responses as possible by the 5PM deadline on Friday. If you have any questions regarding the content of the survey, please email the researchers directly at <insert email>.

Employees who complete the entire survey will be automatically entered into a drawing to win a third generation iPad (the brand new one).

Sincerely,

Todd McKee
Vice President of Student Services

CONSENT FORM

University of Pennsylvania Study

Principal Investigator: Angela L. Duckworth
Email: duckworth@psych.upenn.edu

Your participation in this research study is voluntary. By completing the information on the following web page, you are agreeing to take part in this research study. If you do not desire to participate, simply close this browser window and accept our appreciation for your time.

If you would like more information on any aspect of the study, please email your question to the principal investigator at the address referenced above.

This survey is being coordinated with the support of members of the National Heritage Academies Measurement Research and Accountability (MRA) and Talent Acquisition teams. Adam Maurer is a member of the research team as well as the Director of Talent Acquisition for National Heritage Academies.

What is the purpose of the study?
The purpose of the study is to create an opportunity for reflection and to learn more about the attitudes and experiences of teachers.

What will you be asked to do?
Participating in this study entails answering a series of questions about your attitudes and experiences.

What will happen to the information you provide?
Once enough surveys have been completed, the research team will begin to analyze the information you provided in conjunction with responses from other teachers at your school, within your region and across the United States. We will confidentially match your survey information with performance and attrition information that is held by your employer.

What happens if you do not choose to join the research study?
Your participation is voluntary, and there is no penalty if you choose not to join the research study. Whilst you have been invited to participate in this survey by National Heritage Academies (NHA), your manager will have no direct knowledge about your decision to participate or not to participate. Whatever your decision, it will have no bearing on your employment with NHA whatsoever.

How will confidentiality be maintained and your privacy be protected?
The research team will make every effort to keep all the information you tell us during the study strictly confidential, as required by law. The Institutional Review Board (IRB) at the University of Pennsylvania is responsible for protecting the rights and welfare of research volunteers like

you. The IRB has access to study information. All the documents will be destroyed when the study is over. We have assigned you a confidential ID number, and any information you provide will be stored using that ID number. Separately, we maintain a key linking ID to name, and this key is stored in a separate file on a password-protected server at the University of Pennsylvania. All data collected in the study will be kept strictly confidential and separate from official NHA records. Only selected individuals in the NHA MRA and Talent Acquisition teams will be able to link your responses with your name or key identifiers like the grade you teach or the school at which you are located.

<u>Whom do you contact if you have questions about your rights and welfare?</u>
If you have questions about your rights and welfare as a volunteer in the research study please contact the Office of Regulatory Affairs at the University of Pennsylvania at 215-898-2614 and/or the PI named on the first page of this document.

<u>Compensation</u>
If you complete the survey in its entirety then you will be entered to win a brand new iPad. The iPad will be awarded to one participant by National Heritage Academies in early May.

By completing the following web pages, you are agreeing to take part in the research study. Thank you very much for your participation.

Appendix C

References

Armor, D. J., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., ... Zellman, G. (1976). *Analysis of the School Preferred Reading Program in selected Los Angeles minority schools*. Sant Monica, CA: Rand Corporation.

Baker, E. L., Barton, P. E., Darling-Hammond, L., Haertel, E., Ladd, H. F., Linn, R. L., & Shepard, L. A. (2010). *Problems with the Use of Student Test Scores to Evaluate Teachers*, (Briefing Paper #278), Washington, DC: Economic Policy Institute.

Ballou, D., & Podgursky, M. (2000). Reforming teacher preparation and licensing: Continuing the debate. *Teachers College Record 102(1)*, 5-27.

Berg, S. M., Berg, J. H., & Donaldson, M. L. (2005). *Who stays in teaching and why: A review of the literature on teaching retention*. Cambridge, MA: The Project on the Next Generation of Teachers, Harvard Graduate School of Education.

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). *Teacher credentials and student achievement in high school: A cross-subject analysis with student fixed effects* (CALDER Working Paper No. 11). Washington, DC: National Center for Analysis of Longitudinal Data in Education Research.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives, 8(1)*. Retrieved from http://epaa.asu.edu/ojs/article/view/392

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, *49*(1), 71-75.

Duckworth, A., Kirby, T., Tsukayama, E., Berstein, H., & Ericsson, K. (2011). Deliberate

practice spells success: Why grittier competitors triumph at the National Speilling Bee.

Social Psychological and Personality Science, *2*(2), 174-181.

Duckworth, A. L., & Quinn, P. (2009). Development and Validation of the Short Grit Scale

(Grit-S). *Journal of Personality Assessment*, *91*(2), 166-174. doi:

10.1080/00223890802634290

Duckworth, A. L., & Quinn, P. (2009). Development and Validation of the Short Grit Scale

(Grit-S). *Journal of Personality Assessment*, *91*, 166-174.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and

passion for long-term goals. *Journal of Personality and Social Psychology, 92(6)*, 1087-

1101.

Duckworth, A. L., Quinn, P. D., & Seligman, M. P. (2009). Positive predictors of teacher

effectiveness. *Journal of Positive Psychology*, *19*, 540-547.

Dilemma, K., Bergbower, K., Doctora, J. D., & Peterson, C. (n.d.). An attributional questionnaire

for general use. *Journal of Psychoeducational Assessment*, *14*, 100-108.

Engagement 2.0: Focus on the right people. Build the excitement. Preserve the Passion. (n.d.).

Thought Leadership/Engagement 2.0. Retrieved March 12, 2012, from

http://www.aon.com/attachments/thought-leadership/engagement_2.0.pdf

Farkas, S., Johnson, J., & Foleno, T. (2000). *A sense of calling: Who teaches and why*. New

York, NY: Public Agenda Foundation.

Ferguson, R. F., & Ladd, H. F. (1996). Additional evidence on how and why money matters: A

production function analysis of Alabama schools. In H. F. Ladd (Ed.), *Holding schools*

accountable: Performance-based reform in education (pp. 265-298). Washington, DC: The Bookings Institution.

Getzels, J. W., & Jackson, P. W. (1963). The teacher's personality and characteristics. In N. L. Gate (Ed.), *Handbook of research on teaching* (pp. 506-582). Chicago, IL: Rand McNally.

Goldhaber, D., & Brewer, C. (1997). Why don't schools and teachers seem to matter? Assessing the impact of unobservables on educational productivity. *Journal of Human Resources*, *32*(3), 505-523.

Goldhaber, D. D., & Brewer, D. J. (2000). Does Teacher Certification Matter? High School Teacher Certification Status and Student Achievement. *Educational Evaluation and Policy Analysis*, *22*(2), 129-145.

Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). The Effect of School Resources on Student Achievement. *Review of Educational Research*, *66*(3), 361-396.

Guarino, C. M., Santibanez, L., Daley, G., & Brewer, D. (2004). *A review of the research literature on teacher recruitment and retention* ((TR-164-EDU)). Santa Monica, CA: Rand Corporation.

Hanushek, E. A. (1997). Assessing the Effects of School Resources on Student Performance: An Update. *Educational Evaluation and Policy Analysis*, *19*(2), 141-164.

Ingersoll, R., & Smith, T. (2003). The wrong solution to the teacher shortage. *Educational Leadership*, *60*(8), 30-33.

Johnson, S. M., & Birkeland, S. E. (2003). Pursuing a "sense of success": New teachers explain their career decisions. *American Educational Research Journal*, *40*(3), 581-617.

Johnson, S. M., Berg, J. H., & Donaldson, M. L. (2005). *Who stays in teaching and why: A review of the literature on teaching retention*. Cambridge, MA: The Project on the Next Generation of Teachers, Harvard Graduate School of Education.

Kane, T. J., Rockoff, J. E., & Staiger, D. (2006). *What does certification tell us about teacher effectiveness? Evidence from New York City* (Working Paper 11844). Cambridge, MA: National Bureau of Economic Research.

Kupermintz, H. (2003). Teacher Effects and Teacher Effectiveness: A Validity Investigation of the Tennessee Value Added Assessment System. *Educational Evaluation and Policy Analysis*, *25*(3), 287-298.

Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher Sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis*, *24*, 37-62.

Lortie, D. C. (1975). *Schoolteacher*. Chicago, IL: University of Chicago Press.

Martin, N. K., Yin, Z., & Baldwin, B. (1998). Construct validation of the attitudes & beliefs on classroom control inventory. *Journal of Classroom Interaction*, *33*(2), 6-15.

National Commission on Teaching and America's Future. (2007). *Policy brief: The high cost of teacher turnover*. Washington, DC: Author.

Neild, R. C., Useem, E., Travers, E. F., & Lesnick, J. (2003). *Once & for all: Placing a highly qualified teacher in every Philadelphia classroom*. Philadelphia, PA: Research for Action.

Northwest Evaluation Association. (2012). Validated by Research. *Why Choose NWEA*. Retrieved February 20, 2012, from http://www.nwea.org/why-choose-nwea/validated-research

Palardy, G. J., & Rumberger, R. W. (2008). Teacher Effectiveness in First Grade: The
Importance of Background Qualifications, Attitudes, and Instructional Practices for
Student Learning. *Educational Evaluation and Policy Analysis*, *30*(2), 111-140.

Pervin, L. A., & John, O. P. (1999). *Handbook of personality: Theory and research* (2nd ed.,
102-138). New York, NY: Guilford Press.

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and
classification*. Washington, DC: American Psychological Association.

Peterson, C., Park, N., & Seligman, M. P. (2005). Orientations to happiness and life satisfaction:
The full life versus the empty life. *Journal of Happiness Studies*, *6*(1), 25-41. doi:
10.1007/s10902-004-1278-z

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic
achievement. *Econometrica*, *73*(2), 417-458.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from
panel data. *American Economic Review*, *94*(2), 247-252.

Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2008). *Can You Recognize an
Effective Teacher When You Recruit One?* (Working Paper 14485.), retrieved from
national bureau of economic research website: http://www.nber.org/papers/w14485.

Rothstein, J. (2010). Teacher Quality in Educational Production: Tracking, Decay, and Student
Achievement. *Quarterly Journal of Economics*, *125*(1), 175-214.

Rumberger, R. W., & Palardy, G. J. (2005). Does Segregation Still Matter? The impact of
student composition on academic achievement in high school. *Teachers College Record*,
107(9), 1999-2045.

Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.

Thompson, A. S. (1991). On teaching: A letter to Luke. In P. R. Kane (Ed.), *The first year of teaching: Real world stories from America's teachers* (pp. 103-107). New York, NY: Walker and Company.

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, *68*, 202-248.

U.S. Department of Education. (2009, November). *Race to the Top Program Executive Summary*. Retrieved from http://www.ed.gov/programs/racetothetop/executive-summary.pdf

Walsh, K. (2007). *If wishes were horses: The reality behind teacher quality findings* (Working Paper). Washington, DC: National Council on Teacher Quality.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. doi: 10.1037//0022-3514.54.6.1063

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A Review. *Review of Educational Research*, *73*(1), 89-122.

Appendix B: IRB Approval Letter

University of Pennsylvania
Office of Regulatory Affairs
3624 Market St., Suite 301 S
Philadelphia, PA 19104-6006
Ph: 215-573-2540/ Fax: 215-573-9438

INSTITUTIONAL REVIEW BOARD

(Federalwide Assurance # 00004028)
24-May-2012
Angela L Duckworth

duckwort@sas.upenn.edu
amaurer@sas.upenn.edu

PRINCIPAL INVESTIGATOR : Angela L Duckworth

TITLE : National Heritage Academies Teacher Study
SPONSORING AGENCY : NO SPONSOR NUMBER
PROTOCOL # : 815577
REVIEW BOARD : IRB #8

Dear Dr. Angela Duckworth:

The above referenced protocol and was reviewed and approved by the Executive Chair (or her authorized designee) using the expedited procedure set forth in 45 CFR 46.110, category 7, on 23-May-2012. This study will be due for continuing review on or before 22-May-2013.

Approval by the IRB does not necessarily constitute authorization to initiate the conduct of a human subject research study. Principal investigators are responsible for assuring final approval from other applicable school, department, center or institute review committee(s) or boards has been obtained. This includes, but is not limited to, the University of Pennsylvania Cancer Center Clinical Trials Scientific Review and Monitoring Committee (CTSRMC), Clinical and Translational Research Center (CTRC) review committee, CAMRIS committee, Institutional Bio-safety Committee (IBC), Environmental Health and Radiation Safety Committee (EHRS), and Standing Conflict of Interest (COI) Committee. Principal investigators are also responsible for assuring final approval has been obtained from the FDA as applicable, and a valid contract has been signed between the sponsor and the Trustees of the University of Pennsylvania. If any of these committees require changes to the IRB-approved protocol and informed consent/assent document(s), the changes must be submitted to and approved by the IRB prior to beginning the research study.

If this protocol involves cancer research with human subjects, biospecimens, or data, you may not begin the research until you have obtained approval or proof of exemption from the Cancer Center's Clinical Trials Review and Monitoring Committee.

The IRB reviewed and approved a waiver of written documentation of consent as per HHS 45 CFR 46.117(c)(2) or FDA 21 CFR 56.109(c)(1): That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context {e.g. Telephone survey}.

The following documents were included in this review:

-HS ERA Initial Application submission, confirmation code: jbdaedd, submitted 5.22.12
-IRB Response Document, dated 4.12.12
-Signed CISC Management Plan, dated 5.4.12
-NHA Teacher Study Procedure, uploaded 5.20.12
-Revised Teacher Recruitment email script, uploaded 5.1.12
-CITI Human Research Completion Report for Adam Maurer, passed on 4.30.12
-NHA IRB Letter, dated 10.25.10
-PERMA-P Brief Further Development, dated 2.24.12
-Teacher Questionnaire, uploaded 5.1.12

When enrolling subjects at a site covered by the University of Pennsylvania's IRB, a copy of the IRB approved informed consent form with the IRB approved from/to stamp must be used unless a waiver of written documentation of consent has been granted.

If you have any questions about the information in this letter, please contact the IRB administrative staff. Contact information is available at our website: http://www.upenn.edu/regulatoryaffairs.

Thank you for your cooperation.

Sincerely,

Digitally signed by Kyle Stephens
DN: cn=Kyle Stephens,
o=University of Pennsylvania,
ou=IRB, email=kstep@upenn.edu,
Reason: I attest to the accuracy and integrity of this document
Date: 2012.05.25 09:11:44 -04'00'

Kyle Stephens
IRB Administrator

Appendix C: Transcript of Survey

University of Pennsylvania Study
Principal Investigator: Angela L. Duckworth
Email: duckworth@psych.upenn.edu

Your participation in this research study is voluntary. By completing the information on the following web page, you are agreeing to take part in this research study. If you do not desire to participate, simply close this browser window and accept our appreciation for your time. To ensure you receive no further correspondence about the study, please click here.   If you would like more information on any aspect of the study, please email your question to the principal investigator at the address referenced above.

Adam Maurer is a member of the research team and also serves as a full time employee at National Heritage Academies. He is the Director of Talent Acquisition for National Heritage Academies.

What is the purpose of the study? The purpose of the study is to create an opportunity for reflection and to learn more about the attitudes and experiences of teachers.

What will you be asked to do? Participating in this study entails answering a series of questions about your attitudes and experiences.

What will happen to the information you provide? Once enough surveys have been completed, the research team will begin to analyze the information you provided in conjunction with responses from other teachers at your school, within your region and across the United States. We will confidentially match your survey information with performance and attrition information that is held by your employer.

 What happens if you do not choose to join the research study? Your participation is voluntary, and there is no penalty if you choose not to join the research study. Whilst you have been invited to participate in this survey by National Heritage Academies (NHA), your manager will have no direct knowledge about your decision to participate or not to participate. Whatever your decision, it will have no bearing on your employment with NHA whatsoever.

How will confidentiality be maintained and your privacy be protected? The research team will make every effort to keep all the information you tell us during the study strictly confidential, as required by law. The Institutional Review Board (IRB) at the University of Pennsylvania is responsible for protecting the rights and welfare of research volunteers like you. The IRB has access to study information. All the documents will be destroyed when the study is over. We have assigned you a confidential ID number, and any information you provide will be stored using that ID number. Separately, we maintain a key linking ID to name, and this key is stored in a separate file on a password-protected server at the University of Pennsylvania.

All data collected in the study will be kept strictly confidential and separate from official NHA records. Only selected individuals in the NHA MRA and Talent Acquisition teams will be able to

link your responses with your name or key identifiers like the grade you teach or the school at which you are located.   If you consent to participate in the study, NHA will send the research team information about your years of teaching experience, years working at NHA and overall performance. Data about your performance will include the results of MAP assessments taken by the students in your classroom, as well as your manager's assessment of your work. All information will be provided to the research team using the confidential ID assigned to you in order to protect your confidentiality.

Whom do you contact if you have questions about your rights and welfare? If you have questions about your rights and welfare as a volunteer in the research study please contact the Office of Regulatory Affairs at the University of Pennsylvania at 215-898-2614 and/or the PI named on the first page of this document.

Compensation If you complete the survey in its entirety then you will be entered to win a brand new iPad. The iPad will be awarded to one participant by National Heritage Academies in early June 2012.   By completing the following web pages, you are agreeing to take part in the research study.

Thank you very much for your participation.
      First Name (1)
      Last Name (2)
      Email Address (3)Q2

Q3 Below are five statements with which you may agree or disagree. Using the scale below, indicate your agreement with each item. Please be open and honest in your responding.

Q4 In most ways my life is close to my ideal
○ Strongly Disagree (1)
○ Disagree (2)
○ Slightly Disagree (3)
○ Neither Agree Nor Disagree (4)
○ Slightly Agree (5)
○ Agree (6)
○ Strongly Agree (7)

Q5 The conditions of my life are excellent.
○ Strongly Disagree (1)
○ Disagree (2)
○ Slightly Disagree (3)
○ Neither Agree Nor Disagree (4)
○ Slightly Agree (5)
○ Agree (6)
○ Strongly Agree (7)

Q6 I am satisfied with my life.
○ Strongly Disagree (1)
○ Disagree (2)
○ Slightly Disagree (3)
○ Neither Agree Nor Disagree (4)
○ Slightly Agree (5)
○ Agree (6)
○ Strongly Agree (7)

Q7 So far I have gotten the important things I want in life.
○ Strongly Disagree (1)
○ Disagree (2)
○ Slightly Disagree (3)
○ Neither Agree Nor Disagree (4)
○ Slightly Agree (5)
○ Agree (6)
○ Strongly Agree (7)

Q8 If I could live my life over, I would change almost nothing.
- ○ Strongly Disagree (1)
- ○ Disagree (2)
- ○ Slightly Disagree (3)
- ○ Neither Agree Nor Disagree (4)
- ○ Slightly Agree (5)
- ○ Agree (6)
- ○ Strongly Agree (7)

Q9 Successful teachers can have very different work styles. Please respond to the following 12 items. Be honest - there are no right or wrong answers!

Q10 I am curious about many different things.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q11 Setbacks don't discourage me.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q12 I have few artistic interests.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q13 I have been obsessed with a certain idea for a short time but later lost interest.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q14 I am diligent. People say I am an extremely hard worker.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q15 I am ingenious. I like to think deeply about ideas.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q16 I often set a goal but later choose to pursue a different one.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q17 I have difficulty maintaining my focus on projects that take more than a few months to complete.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q18 I am creative. I enjoy inventing things and have an active imagination.
- ○ Not like me at all (1)
- ○ Not much like me (2)
- ○ Somewhat like me (3)
- ○ Most like me (4)
- ○ Very much like me (5)

Q19 I finish whatever I begin.
○ Not like me at all (1)
○ Not much like me (2)
○ Somewhat like me (3)
○ Most like me (4)
○ Very much like me (5)

Q20 I am original. I very often come up with new ideas.
○ Not like me at all (1)
○ Not much like me (2)
○ Somewhat like me (3)
○ Most like me (4)
○ Very much like me (5)

Q21 I value beauty, whether in music, literature, art or nature.
○ Not like me at all (1)
○ Not much like me (2)
○ Somewhat like me (3)
○ Most like me (4)
○ Very much like me (5)

Q22 For this part of the survey, you will be presented with a series of hypothetical situations, please read each situation and vividly imagine it happening to you.   For each situation (6 Total) 1. Decide what you believe to be the one major cause of the situation and write it in the blank provided. 2. Use the radio buttons to answer the three questions listed under each situation.

Q23   SITUATION #1   YOU HAVE BEEN LOOKING FOR A JOB UNSUCCESSFULLY FOR SOME TIME.   Write down one major cause:

Q24 Is the cause of your unsuccessful job search due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	○	○	○	○	○	○	○

Q25 In the future, when looking for a job, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	○	○	○	○	○	○	○

Q26 Is the cause something that just influences looking for a job, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	○	○	○	○	○	○	○

Q27   Situation #2   A FRIEND COMES TO YOU WITH A PROBLEM AND YOU DON'T TRY TO HELP HIM/HER.   Write down one major cause:

Q28 Is the cause of your not helping your friend due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	○	○	○	○	○	○	○

Q29 In the future, when a friend comes to you with a problem, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	○	○	○	○	○	○	○

Q30 Is the cause something that just affects what happens when a friend comes to you with a problem, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	○	○	○	○	○	○	○

Q31   Situation #3   YOU GIVE AN IMPORTANT TALK IN FRONT OF A GROUP AND THE AUDIENCE REACTS NEGATIVELY.   Write down one major cause:

Q32 Is the cause of the audience's negative reaction due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	○	○	○	○	○	○	○

Q33 In the future, when you give talks, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	○	○	○	○	○	○	○

Q34 Is the cause something that just influences giving talks, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	○	○	○	○	○	○	○

Q35   Situation #4   YOU MEET A FRIEND WHO ACTS HOSTILELY TOWARDS YOU.
Write down one major cause:

Q36 Is the cause of your friend acting hostile due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	❍	❍	❍	❍	❍	❍	❍

Q37 In the future, when interacting with friends, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	❍	❍	❍	❍	❍	❍	❍

Q38 Is the cause something that just influences interacting with friends, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	❍	❍	❍	❍	❍	❍	❍

Q39   Situation #5   YOU CAN'T GET ALL THE WORK DONE THAT OTHERS EXPECT OF YOU.   Write down one major cause:

Q40 Is the cause of your not getting the work done due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	❍	❍	❍	❍	❍	❍	❍

Q41 In the future, when doing work that others expect, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	❍	❍	❍	❍	❍	❍	❍

Q42 Is the cause something that just effects doing work that others expect of you, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	❍	❍	❍	❍	❍	❍	❍

Q43   Situation #6   YOU GO OUT ON A DATE AND IT GOES BADLY.   Write down one major cause:

Q44 Is the cause of the date going badly due to something about you or something about other people or circumstances?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Totally due to other people or circumstances:Totally due to me (1)	○	○	○	○	○	○	○

Q45 In the future when you are dating, will this cause again be present?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Will never again be present:Will always be present (1)	○	○	○	○	○	○	○

Q46 Is the cause something that just influences dating, or does it also influence other areas of your life?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Influences just this particular situation:Influences all situations in my life (1)	○	○	○	○	○	○	○

Q47   This scale consists of a number of words that describe different feelings and emotions. Read each word and then select the choice that indicates to what extent you feel this way right now, that is, at the present moment or indicate the extent you have felt this way over the past week.

	Very Slightly or Not at All (1)	A Little (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
Interested (1)	○	○	○	○	○
A Little Distressed (2)	○	○	○	○	○
Excited (3)	○	○	○	○	○
Upset (4)	○	○	○	○	○
Strong (5)	○	○	○	○	○
Guilty (6)	○	○	○	○	○
Scared (7)	○	○	○	○	○
Hostile (8)	○	○	○	○	○
Enthusiastic (9)	○	○	○	○	○
Proud (10)	○	○	○	○	○
Irritable (11)	○	○	○	○	○
Alert (12)	○	○	○	○	○
Ashamed (13)	○	○	○	○	○
Inspired (14)	○	○	○	○	○
Nervous (15)	○	○	○	○	○
Determined (16)	○	○	○	○	○
Attentive (17)	○	○	○	○	○
Jittery (18)	○	○	○	○	○
Active (19)	○	○	○	○	○
Afraid (20)	○	○	○	○	○

Q48 Thank you for taking the time to complete this survey. The answers you provided are important to our research.

Q49 Would you like to be entered into the drawing to win an iPad?   If you answer YES then you will be taken to a separate page where you can enter your name and contact information. An answer of NO will end the survey.
○ Yes (1)
○ No (2)

If No Is Selected, Then Skip To End of Survey

Q50 Please enter the information requested.
First Name (1)
Last Name (2)
School Name (3)
Phone Number (For Summer) (4)
Email Address (For Summer) (5)