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Teacher Personality and Teacher Effectiveness in Secondary School: Personality Predicts Teacher Support and Student Self-Efficacy but not Academic Achievement

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Abstract

Students' educational outcomes are predicted by their non-cognitive characteristics, including Big Five personality domains. While theories of teaching and learning suggest that teacher non-cognitive characteristics also impact student outcomes, such characteristics are rarely studied systematically. We propose that the Big Five personality domains of teachers are associated with teacher effectiveness. Furthermore, we test two potential moderators of these relationships: (a) source of teacher personality report (student-reports may show stronger effects than teacher self-reports), and (b) frame of reference (contextualized "at school" personality items for teacher self-reports may show stronger effects than non-contextualized standard personality items). Multilevel regressions were conducted on the data collected from secondary school students (N = 2,082) and their mathematics and English teachers (N = 75). We statistically controlled for student and teacher gender, student previous academic achievement, and student personality. Teacher personality predicted the subjective measures of teacher effectiveness—the strongest predictors were conscientiousness for teacher academic support, agreeableness for teacher personal support, and neuroticism for student performance self-efficacy. Teacher personality did not predict the objective measure (student academic achievement). These effects were moderated by source of personality report but not by frame of reference. The possibility of including personality as part of the initial teacher trainee selection procedure in the future is briefly discussed.

Keywords: teacher non-cognitive characteristics; teacher personality; Big Five; teacher support; performance self-efficacy

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Educational Impact and Implications Statement

Previous research has shown that student non-cognitive characteristics, including personality, are important in student education. This study shows that teacher personality characteristics such as conscientiousness (being hard-working and detail minded), agreeableness (being sympathetic and kind), and emotional stability (having fewer negative emotions such as anxiety) are also important. Secondary school students who rated their teachers as highly conscientious felt more academically supported, secondary school students who rated their teachers as highly agreeable felt more emotionally supported, and secondary school students who rated their teachers as highly emotionally stable had higher expectations of their own academic performance. However, students' actual academic performance was not related to teacher personality. These findings suggest that teacher personality may be more important for student socio-emotional outcomes than academic outcomes.

Teacher Personality and Teacher Effectiveness in Secondary School: Personality Predicts Teacher Support and Student Self-Efficacy but not Academic Achievement

There is little dispute that teachers are impactful agents in students' educational pursuits. It is also quite clear that some teachers are more effective than others (Atteberry, Loeb, & Wyckoff, 2013), yet the source of such differences is largely unknown. For this reason, scholars of various disciplines are laboring to identify factors that characterize effective teachers. Just as individual differences in student non-cognitive characteristics are important predictors of student outcomes (Heckman & Kautz, 2012; Richardson, Abraham, & Bond,, 2012), individual differences in teacher non-cognitive characteristics may also be important predictors (Rimm-Kaufman & Hamre, 2010). The Big Five personality framework has been widely used to study the non-cognitive predictors of student outcomes. Evidence to date shows that student personality (Poropat, 2009) and, to some extent, parent personality (Nigg & Hinshaw, 1998) influence student outcomes. In this vein, the present study investigates teacher personality as a predictor of secondary school students' outcomes in mathematics and English.

Teacher Personality and Teacher Effectiveness

Models of teaching and learning recognize that teacher, student, and context variables influence student educational experiences and academic achievement (Dunkin & Biddle, 1974; Groccia, 2012). Meta-analytic evidence supports the role of teachers in these learning models, indicating that teacher characteristics are the strongest contributor to student achievement of five other environmental and personal contributors (Hattie, 2009). An important question, then, is *which teacher characteristics are associated with differences in student outcomes?*

Meta-analyses examining variety of occupational areas, including teachers, report that *personality* is associated with both job performance (Judge, Rodell, Klinger, Simon, &

Crawford, 2013) and job satisfaction (Judge, Heller, & Mount, 2002). In educational research specifically, studies have found that the characteristics of effective teachers are largely personality-based. For example, Patrick and Smart (1998) reported from their factor-analyses that the traits of effective teachers were respect for students, ability to challenge students, and having both organizational and presentation skills. Moreover, teacher personality predicts teacher self-efficacy in both pre-service and in-service teachers (Henson & Chambers, 2003; Jamil, Downer, & Pianta, 2012; Ripski, LoCasale-Crouch, & Decker, 2011). At the tertiary education level, teacher personality is associated with student evaluations of teaching (Kim & MacCann, 2016). In this vein, we propose that teacher personality is an understudied area that may account for teacher effectiveness differences among secondary school teachers.

Although many conceptualizations of personality exist, this study uses the Big Five, which is the dominant theoretical framework for personality. The Big Five emerged more than 50 years ago from factor analyses of trait adjectives (e.g., Norman, 1963; Tupes & Christal, 1992). These investigations were based on the lexical hypothesis of personality, which proposed that socially valuable and beneficial characteristics are encoded in the natural language, with the most important concepts being encoded as single words (Allport & Odbert, 1936). The Big Five proposes that five personality domains describe differences in people's behavior, thoughts, motivations, and emotions. These domains are: openness (intellect, creativity, introspection), conscientiousness (organization, efficiency, thoroughness), extraversion (energy, talkativeness, boldness), agreeableness (kindness, warmth, helpfulness), and neuroticism (anxiety, irritation, insecurity; John, Naumann, & Soto, 2008). We will examine the relationship of each of the Big Five domains to teacher effectiveness. We outline our expectations regarding which domains will relate with which aspects of teacher effectiveness in the paragraphs below, based on previous research linking personality with job performance and educational and classroom variables.

Teacher effectiveness is a multi-dimensional construct, consisting of various elements of the profession, which cannot be captured by a single criterion (e.g., student academic achievement). The paradigm shift in the nature of the teacher effectiveness construct is reflected in recent studies that aim to cover a wide outcome criterion space by using multiple measures from different sources. For example, the large-scale Measures of Effective Teaching project assessed teacher effectiveness using value-added student academic achievement, teacher class observation ratings, and student-ratings (Kane, McCaffrey, Miller, & Staiger, 2013). We assessed two of the three elements included in the project: student-ratings of teacher support and value-added student academic achievement. We additionally assessed student performance self-efficacy, which are student self-ratings of how well they will perform in the subject, given its important links to student motivation (Bandura, 1997). This study uses three different methodologies to measure the three measures of teacher effectiveness: student-ratings of the teacher (other-report), student-ratings of the self (self-report), as well as school records of academic achievement (an objective criteria). The use of multiple sources of information as well as targets (teacher and student) allows us to examine the breadth of associations that teacher personality may have with multiple measures of teacher effectiveness.

In our examinations of the association between teacher personality and teacher effectiveness, it is important to control for non-random assignment of students to teachers. The primary source of non-random assignment is streaming on the basis of academic ability (Johnston & Wildy, 2016), although other characteristics may inform this. In our study, we use previous academic achievement as a baseline for predicting future academic achievement, but also as one way to control for non-random assignment of students to teachers (as students are assigned to class streams on the basis of academic achievement). As such, previous academic achievement is a relevant control variable for all of the outcome variables in the

present study (albeit with the caveat that there may be additional factors influencing non-random assignment of students to teachers).

Teacher Support. An important measure of teacher effectiveness in secondary school is how much students believe their teacher supports them. Teacher support is the extent to which students believe that they can rely on their teachers for assistance, which is associated with academic interest and psychosocial adjustment (Hallinan, 2008; Hendrickx, Mainhard, Boor-Klip, Cillessen, & Brekelmans, 2016; Wentzel, 1998). Teacher support is further divided into two constructs: academic support (supporting students' academic endeavors); and personal support (supporting students' personhood; Johnson & Johnson, 1983). Two subscales within the Classroom Life Instrument (Johnson & Johnson, 1983) have been used to measure these two aspects of teacher support (e.g., Ghaith, 2002; Patrick, Ryan, & Kaplan, 2007) and will be considered a measure of teacher effectiveness in the present study.

Although it is reasonable to expect that teacher supportiveness will be impacted by teacher personality, no empirical research has targeted these relationships. Moreover, even the studies that addressed teacher supportiveness did not capture the multidimensional nature of the teacher support construct. Thus, the present study distinguishes between teacher academic support and teacher personal support, and is the first study, to our knowledge, to test whether teacher personality is associated with these important outcomes.

Specific hypotheses regarding the associations between teacher Big Five and teacher academic and personal support can be constructed from other literature. For teacher academic support, much of the literature points to conscientiousness as the key domain of interest. Highly conscientious students achieve more academically than those who are less conscientious (Poropat, 2009), indicating a central role of the conscientiousness personality domain in education settings. Furthermore, meta-analyses from organizational psychology have consistently found that conscientiousness is the strongest Big Five predictor of job

performance across all occupation groups (Barrick & Mount, 1991; Judge, Rodell, Klinger, Simon, & Crawford, 2013; Salgado, 1997). An important element of providing students academic support is to be productive and assist with students' development of concepts (Pianta & Hamre, 2009), which seem conceptually similar to qualities of efficiency and organization within Big Five's domain of conscientiousness. Given the fact that the main role of teachers is to provide students with appropriate academic tools and help, these findings suggest that teacher conscientiousness should be the personality domain most positively associated with teacher academic support in both mathematics and English subject areas.

Other Big Five domains may be involved in teacher personal support. Teaching is inherently a social practice requiring interpersonal interactions with students. Meta-analyses of job performance show that agreeableness is the best predictor of performance for jobs requiring interpersonal interaction with co-workers, clients, or customers (Mount, Barrick, & Stewart, 1998), but that extraversion also predicts performance in some job types that involve social interaction, such as managers and salespeople (Barrick & Mount, 1991). Providing students emotional support requires both the creation of a positive climate and being sensitive to students' needs (Pianta & Hamre, 2009), which seem conceptually similar to qualities of warmth and helpfulness within Big Five's domain of agreeableness. We have previously found that instructor agreeableness was the strongest Big Five predictor of student–teacher rapport among university students (Kim & MacCann, 2016). Collectively, these findings suggest that teacher agreeableness should be the personality domain most positively associated with teacher personal support, although extraversion may also play a role.

Performance Self-Efficacy. Another important measure of teacher effectiveness is student performance self-efficacy (PSE), which is students' perception of their capability to perform academically (Shell & Husman, 2001). PSE is the strongest non-cognitive predictor of students' marks (Richardson et al., 2012) and is assessed by asking the students what mark

or grade they expect to receive in their course (e.g., Shell & Husman, 2001). Previous research on self-efficacy has mostly focused on how PSE affects student academic functioning (e.g., Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) and how it can be enhanced (e.g., Schunk & Ertmer, 2000). No previous research has examined its direct association with teacher personality.

While there is currently no research linking teacher neuroticism to PSE, both theory and evidence suggest that negative emotional states of teachers affect students. Neuroticism is the Big Five factor defined by negative emotions and moodiness, such as anxiety and self-consciousness, and is considered to contain avoidance-oriented elements (Costa & McCrae, 1995). We argue that teacher neuroticism may affect students' PSE through the transmission of negative emotions via social modeling and emotion contagion, resulting in lower self-confidence among students. Teachers can affect students as teachers can be social models to students (Lumpkin, 2008). Greater levels of teacher classroom stress are known to be associated with lower self-efficacy and lower job satisfaction (Klassen & Chiu, 2010). Applied to students, when a teacher behaves anxiously and verbalizes their doubts and worries about their teaching and students' skills, students may model the teacher's low self-efficacy and nervous behaviors. Furthermore, teachers' emotional expressions may foster emotional contagions, in which students unconsciously synchronize their emotions with their teachers' (Hatfield, Cacioppo, & Rapson, 1994). Through emotional contagion processes cues associated with negative emotions arguably foster students' own emotional states leading to increased levels of anxiety and self-doubt similar to the emotions experienced by the teachers. As a result, high levels of teacher neuroticism may diminish students' PSE—an approach-oriented construct.

Academic Achievement. Student academic achievement is the most frequently assessed measure of teacher effectiveness. Currently, there is no conclusive indication of

whether teacher personality is associated with academic achievement. On the one hand, Garcia, Kupczynski, and Holland (2011) found that teacher conscientiousness predicted academic achievement. More specifically, this study examined each tenth and eleventh grade teacher's levels of the Big Five to determine mean differences in student scores on the Texas Assessment of Knowledge Skills (TAKS). Among English, social studies, science, and mathematics teachers, those with high levels of self-reported conscientiousness had students with high TAKS scores. On the other hand, Rockoff, Jacob, Kane, and Staiger (2011) found no significant relationships between teacher personality and academic achievement. Specifically, this study examined fourth to eighth grade teachers' levels of extraversion and conscientiousness separately to predict student standardized mathematics test scores but found no significant associations in either case (Rockoff et al., 2011). However, a combined "non-cognitive skills" factor, which had high positive loadings for both conscientiousness and extraversion (and in fact had its highest loading for conscientiousness), did significantly predict test scores.

Although the results from these two studies may seem contradictory, a key design difference may account for the different results. Rockoff et al. (2011) controlled for covariates associated with the outcome variable whereas Garcia et al. (2011) did not. These covariates included prior test scores (such that Rockoff et al. [2011] is considering a value-added model of teacher personality) as well as student and school demographics (e.g., ethnicity, percentage eligible for free lunch), and teaching experience. Thus, Rockoff et al. (2011) used a much more stringent test of whether teacher personality predicts student achievement. That is, while Garcia et al. (2011) found that teacher conscientiousness is associated with student academic achievement, Rockoff et al. (2011) indicate that there is only weak evidence (from the combined "non-cognitive" factor that implicates both conscientiousness and extraversion) that such a relationship indicates value added by the

teacher. To establish whether controlling for covariates is indeed the difference between the two studies' findings, like Rockoff et al. (2011), we will control for previous academic achievement in order to assess the value-added impact of teacher personality.

In both of the above studies, academic achievement was measured using standardized test scores rather than end-of-semester grades, although end of semester grades may in fact be more sensitive to the effects of teacher personality. Standardized tests consist of formal written examinations that are usually administered in large groups, with a set time limit for answering all of the questions. They assess students' broad knowledge in the subject area, which may not directly map on to the material taught recently in class. In contrast, semester report card grades are derived from a wide range of assessment tasks, which may include formal written timed exams, take-home assignments, regular homework, contributions to class discussions, talks, group projects or other assessment tasks. The content of these assessment tasks is directly linked to the material being taught in class. Thus, semester report-card grades may be more strongly affected by teacher personality, due to their stronger link with classroom activities and practices that are within the direct control of the teacher. For this reason, end-of-semester report-card grades will be used as a measure of teacher effectiveness in the present study (noting that we also control for the previous end-of-semester grade).

As one of the main goals of teachers is to facilitate student academic achievement, one may consider high grades as a key measure of their job effectiveness. As previously discussed, meta-analyses indicate that conscientiousness is the strongest Big Five predictor of job performance across multiple occupations (Barrick & Mount, 1991; Judge et al., 2013; Salgado, 1997). Based both on this result, and on the previously discussed studies linking teacher personality traits to students' scores on standardized tests, we expect teacher

conscientiousness be the strongest big five predictor of academic achievement, with a possible additional effect of extraversion.

Frame-of-Reference Effect

Standard personality assessments measure general personality tendencies across multiple contexts. However, personality traits may differ systematically across contexts (Mischel, 1973). One method that can mitigate these effects is to place personality assessment items within a context—for example by adding tags such as "at work" or "at school" to each item. In effect, "I talk a lot" becomes "I talk a lot at school" to evaluate loquaciousness in a school context (Schmit, Ryan, Stierwalt, & Powell, 1995). When predicting workplace performance, work-contextualized personality assessments show fewer errors of measurement (Robie, Schmit, Ryan, & Zickar, 2000) and stronger prediction of performance (Shaffer & Postlethwaite, 2012). These findings also hold for the prediction of academic achievement from student conscientiousness. Lievens, De Corte, and Schollaert (2008) assessed the levels of conscientiousness of undergraduate students for two contexts: school and workplace. Whereas workplace-specific conscientiousness was a poor predictor of academic achievement, school-specific conscientiousness was a strong predictor, indicating that a contextualized outcome is predicted best by an assessment framed within the same context.

A teacher's personality at school may be different to their personality in other contexts. However, it is their school-based personality that would influence their school behaviors. As such, an "at school" context for teacher personality may be both more relevant and more predictive of teacher effectiveness. That is, we expect that *contextualized* self-reported teacher personality will be more strongly associated with the teacher effectiveness measures than their *non-contextualized* self-reported personality. The validity of contextualized self-reports compared to non-contextualized self-reports can also be examined

with respect to their degree of correlation with other-reports of the same constructs. For example, Kurtz and Palfrey (2016) compared the correlation between home-specific versus school-specific self-reported personality with other-reports who knew the student at home (a parent) and at school (a college peer). Similarly, we can compare the correlations of student-reported teacher personality with teacher self-reports that have a school contextualization versus no contextualization. If contextualization increases the accuracy of the measure, then correlations with student-reported personality should increase when the "at school" tags are added to each item. Given the literature supporting the frame-of-reference effect, we expect that the correlation with student-reports will be greater with contextualized than non-contextualized self-reports.

Sources of Personality Report

Comparing Contextualized Self-Report with Other-Reports. Personality can be assessed in both self-report and other-report formats. Vazire's (2010) Self-Other Knowledge Asymmetry Model recognizes that the self and other have different types of information that are used to report an individual's personality. The self has access to information on private thoughts, motivations, feelings, beliefs, and behaviors across many contexts and thus the self must consider all sources of information before making a judgment on their own personality. That is, teachers must consolidate their personality in different contexts, which may be difficult to do. In contrast, other-reports on an individual are limited to information about what the other has observed within specific contexts. That is, students report their teacher's personality using the only source of information they have—their observations of the teacher's behavior at school—which in turn may produce a more consistent and reliable series of scores.

From an empirical perspective, meta-analyses indicate that other-reported personality often shows stronger prediction of job performance and academic achievement as compared

to self-reported personality (Connelly & Ones, 2010; Poropat, 2014). Furthermore, other-reports are often more reliable than self-reports in that the other-report's internal consistency indicators are often significantly greater than the self-reports' indicators (MacCann, Lipnevich, Poropat, Wiemers, & Roberts, 2015). However, previous studies' comparisons have been between other-reports and *non-contextualized* self-reports. This is problematic as it conflates the effects of source of personality report with the effect of frame of reference (as the other-reports are generally taken from a particular context such as school, work, or home). Thus, the present study examines the difference between student-reports and *contextualized* self-reports of teacher personality to assess only the effects of sources of personality report on the outcomes.

Based on these theoretical and empirical accounts, other-reports are expected to be more strongly associated with the outcomes than self-reports. That is, we expect student-reports of their teacher personality to be more strongly associated with the teacher effectiveness measures than teachers' contextualized self-reported personality.

Common Rater Effect and Multiple Rater Effect. Various explanations have been offered as to why there may be a stronger relationship between other-reports and outcomes compared to self-reports. Socially desirable responding is a common explanation given for this, whereby one enhances their reports of socially desirable qualities and hides their socially undesirable qualities (Paulhus, 2002). There are two other possible explanations for this phenomenon: the common rater effect and the multiple rater effect. That is, the relationship between a predictor and an outcome may be stronger when the same person provides information on both variables rather than when another person provides information on either of these (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is applicable to our study as students provide information on the subjective outcome measures (i.e., teacher academic and personal support, PSE), as well as on their teacher's personality. Thus, if student-reports of

teacher personality are stronger predictors of the subjective outcomes than teacher self-reports, we can examine the common rater effect by randomly allocating students' subjective outcomes within a teacher and using this to predict from other students' reports of the teacher personality. This will be referred to as the random assignment design. For example, in a class of Students A, B, and C taught by the same teacher, Student A's report of teacher personality would be correlated with Student C's rating of teacher academic support, Student B's rating of teacher personality with Student A's rating of teacher academic support, and Student C's rating of teacher personality with Student B's rating of teacher academic support. If the correlations in the random assignment design are significantly weaker than the original correlations, then the common rater effect may be an explanation for the strength of the associations between student-reports and the subjective outcomes (teacher academic and personal support, PSE).

Another possible reason that student-reporters may show stronger associations with the outcomes than teacher self-reports is the number of reporters involved in producing a mean student-report of teacher personality. When investigating student-reports of teacher personality, one can consider individual student-reports as well as multiple students' consensus of a teacher. As recognized in models such as the Social Relations Model (Malloy & Kenny, 1986), there is a distinction between target variance (i.e., teacher personality traits) and perceiver variance (i.e., students' individual perceptions of their teachers). Although students' individual perceptions may be useful, they are likely to contain biases and unique perceptions of the teacher. For student ratings of the same teacher, computing a mean across multiple students' individual perceptions can create estimates that average out idiosyncrasies from individual perceptions, which thereby increases the reliability of the estimate, and produce a more accurate reflection of the teacher's personality traits (Connelly & Ones, 2010). Thus, when investigating student-reports of teacher personality, we will investigate

both students' individual perceptions of teacher personality (individual student-reports) as well as the averaged students' perceptions (mean student-reports). To directly assess whether the number of reporters is also a factor contributing to the strength of student-reports, we will compare the correlation personality has with the outcomes (teacher academic and personal support, PSE, academic achievement) between: (a) a randomly selected single student-report for each teacher; and (b) the mean student-reports for each teacher. We will call this the single student-report design. We expect that the correlations with multiple raters will be stronger than those with a single rater, indicating the benefit of obtaining multiple raters when assessing other-reports.

The Present Study

We will examine whether the relationship between self-reported teacher personality and teacher effectiveness is moderated by the frame-of-reference effect. Specifically, we expect that adding a frame-of-reference will result in stronger associations of self-reported teacher personality with teacher effectiveness (H1a) and with the mean student-reported teacher personality (H1b).

We will also examine whether the relationship between teacher personality and teacher effectiveness is moderated by source of personality report. That is, we expect that student-reports of teacher personality will be more strongly associated with the teacher effectiveness measures than teachers' contextualized self-reported personality (H2).

Additionally, we will examine two factors that may contribute to why other-reports may be more strongly related to the outcomes than self-reports. First, we examine the common rater effect; we expect that the correlation between personality and the subjective outcomes (teacher academic and personal support, PSE) will be larger when the same students provide information on both the predictor and the outcomes compared to when different students provide predictor versus outcome ratings for each teacher (H3a). Second,

we examine the multiple rater effect; we expect that mean student-reports containing information received from multiple raters will be a stronger predictor of the outcomes (teacher academic and personal support, PSE, and academic achievement) than student-reports containing information received from a single rater (H3b).

The main hypothesis of the study is that teacher personality will be associated with teacher effectiveness in a secondary school sample (H4). More specifically, we expect teacher conscientiousness to predict teacher academic support (H4a) and teacher agreeableness to predict teacher personal support (H4b). We also propose that teacher neuroticism may negatively predict PSE (H4c) and that teacher conscientiousness may positively predict academic achievement (H4d). We test two different subject areas (mathematics and English) to test for the general effect of teacher personality and propose that these hypotheses will hold for both subject areas.

Method

Participants

E-mail invitations were sent to all independent Australian secondary schools that were available on databases listing independent schools in Australian States. Year 7 to 9 students and their mathematics and English teachers from 14 schools were surveyed; five schools participated between October-December 2014 and nine schools participated between May-July 2015. All participating schools were provided with an institutional report outlining their students' average levels of school engagement.

Students were excluded if there was no variance in their responses to the personality assessments (indicating inattentive completion; $n = 328$) or indicated that they could not speak English at all ($n = 1$). Teachers were excluded if they were not verified as teaching participating students ($n = 3$), and schools were excluded if they were a specialist school with programs different to mainstream schools ($n = 1$). After the exclusion criteria were applied,

13 schools from four states of Australia were included: ten schools were religious schools and ten schools were located in either major cities or inner regional areas. The participants were students (N = 2,082) with self-reported ages ranging from 11 to 16 years (M = 13.30, SD = 0.96; 52.45% female) as well as mathematics and English teachers (N = 75) with self-reported ages ranging from 21 to 62 years (M = 41.00, SD = 11.46; 66.67% female).

Following Australian census procedures (Australian Bureau of Statistics, 2011), students and teachers were asked to indicate their ancestry. Students reported one ancestry (44.36%), two ancestries (47.17%), three ancestries (5.96%), four ancestries (1.78%), or five ancestries (0.53%). Ancestries reported included Australian (58.89%), English (38.52%), Irish (9.37%), Scottish (11.29%), Italian (7.97%), German (5.76%), Chinese (6.39%), and Other (28.34%). Teachers reported one ancestry (61.33%), two ancestries (26.67%), three ancestries (4.00%), or four ancestries (2.67%). Ancestries reported included Australian (42.67%), English (38.67%), Irish (24.00%), Scottish (20.00%), Italian (2.67%), German (8.00%), Chinese (4.00%), and Other (14.67%). The majority of the students indicated that they spoke English well (8.50%) or very well (90.87%).

Procedure

Teacher Data Collection. School administration forwarded eligible teachers a research participation invitation email from the researchers. This email contained a web link to the study information and consent form and a 20-minute survey. Teachers participated in the online survey in their own time. They reported their demographic information, educational qualifications, years of teaching experience, non-contextualized personality (personality in general), and contextualized personality (personality at school). Their participation was compensated with a $20 gift card. All protocols were approved by the Human Research Ethics Committee at the last author's institution.

Student Data Collection. Participating students provided personal and parental consent and completed a 50-minute online survey during class time. They reported their demographic information, personality in general, mathematics teacher's personality, English teacher's personality. They also reported on the teacher effectiveness measures: their perceived level of academic and personal support from both their mathematics and their English teachers (subscales from the Classroom Life Instrument), PSE, and level of school engagement. Each school provided students' current grades in mathematics and English as well as the grades obtained in the previous semester. Student engagement was not included as one of the outcome variable as this is measured at the school level and is affected by many other subjects and extracurricular activities in the school and not only by their mathematics or English teachers.

Measures

The Big Five Inventory (BFI; John et al., 2008). The 44-item children version of the BFI measures five personality domains using easier vocabulary than the standard version: Openness (9 items, e.g., "I am someone who is inventive"), Conscientiousness (9 items, e.g., "I do things carefully and completely"), Extraversion (8 items, e.g., "I am full of energy"), Agreeableness (8 items, e.g., 'I have a forgiving nature'), and Neuroticism (8 items, e.g., "I worry a lot"). Participants indicated their level of agreement for each statement on a 5-point Likert scale, ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. A score for each domain was calculated by taking the average rating across all items associated with the relevant domain (after reverse-keying for any negatively worded items). Previous studies have shown evidence of good reliability and have demonstrated significant correlations with academic achievement (Poropat, 2009).

Students completed this inventory in three different formats: (a) self-report (which used the standard instructions), (b) observer-report on their mathematics teacher, and (c)

observer-report on their English teacher. The order of the personality questionnaires on the teachers was counter-balanced. When referring to the teacher as the target of the personality assessment, the instructions were adapted from "Describe what you are like" to "Describe what YOUR ENGLISH TEACHER/ MATHS TEACHER is like". Furthermore, the stem of each question item was adapted to refer to the teacher (e.g., "My English teacher does things carefully and completely").

The teachers completed the children version of the BFI for the sake of consistency of comparison between self-reports versus student-reports of teacher personality. Teachers completed both contextualized and non-contextualized versions of the assessment, and the order was counter-balanced. For the contextualized personality assessment, the instructions were adapted to, "Describe what you are like AT SCHOOL" and the stems of the questions were adapted to read, for example, "I do things carefully and completely at school".

Classroom Life Instrument (Johnson & Johnson, 1983). Two subscales from the modified version of the Classroom Life Measures (Johnson & Johnson, 1983) as used by Ghaith (2002) examined the student's perceptions of the levels of teacher support. The Academic Support Subscale (4 items, e.g., "My teacher cares about how much I learn") assesses student beliefs about how much their teachers care about their learning. The Personal Support Subscale (4 items, e.g., "My teacher really cares about me") assesses student beliefs about how much their teachers care about them as individuals. Students completed these measures twice, rating: (1) their mathematics teachers, and (2) their English teachers. Students indicated their level of agreement for each statement on a 5-point Likert scale, ranging from 1 *(completely false)* to 5 *(completely true)*. A score for each domain was calculated by taking the average rating across all items associated with the relevant domain. Previous studies have shown evidence of good reliability and have demonstrated significant small-moderate positive correlation with academic achievement (Ghaith, 2002) and

moderate-large positive correlations with measures of university students' levels of motivation (Jones & Skaggs, 2016).

Performance Self-Efficacy. Students reported which grades they expected to receive in their report for mathematics and English on a 4-point scale, ranging from A *(4)* to D *(1)*. Given different grading systems between schools, where some schools adopt plus and minus grades and some schools do not, this common rating measure was chosen.

Academic Achievement. Semester report card grades for mathematics and English were retrieved from school records. The grades were coded from 0 to 13 (F to A+), with higher scores indicating higher levels of achievement. Grades sent as numbers were distributed under the common secondary school grading system and coded using the above coding scheme.

Statistical Analyses

To examine hypothesis 1a (that contextualized teacher self-reports are more strongly associated with teacher effectiveness than non-contextualized teacher self-reports), level 2 correlations of contextualized versus non-contextualized teacher self-reports with all teacher effectiveness measures were compared. Steiger's *z*-test was used to calculate whether differences between the dependent correlations were significant. To examine hypothesis 1b (that contextualized self-reports are more strongly associated with other-reports than non-contextualized self-reports), level 2 correlations of contextualized versus non-contextualized teacher self-reports with mean student-reports of teacher personality were compared. Again, Steiger's *z*-test was used to calculate whether differences between the dependent correlations were significant.

To examine hypothesis 2 (that the relationships between teacher personality and teacher effectiveness are moderated by source of teacher personality report), level 2 correlations of student-reported personality and teacher self-reported contextualized

personality with all teacher effectiveness measures were compared. Again, Steiger's *z*-test was used to calculate whether differences between the dependent correlations were significant.

To examine hypothesis 3a (that the predictors are more strongly associated with the outcomes when the same rater provides information on both), a random assignment design was implemented. That is, students within a teacher were randomly assigned to provide subjective outcome information (i.e., teacher academic and personal support, and PSE) to be predicted by other students' personality reports of the same teacher. The sizes of the predictor–outcome correlations were then compared for this condition (different raters of predictor and outcome) versus the standard condition (all students rate both predictor and outcome) using Steiger's *z*-test. To examine hypothesis 3b (that the predictors are more strongly associated with the outcomes when more raters are available), a single student-report design was implemented. That is, the sizes of the predictor–outcome correlations for mean student-reported teacher personality were compared with randomly selected single students' ratings of these teachers using Steiger's *z*-test.

To examine hypothesis 4 (that teacher personality is associated with teacher effectiveness), multi-level regressions were conducted. Prior to running multi-level regressions, intraclass correlations were calculated for all teacher effectiveness measures to test whether the data are multi-level. Separate regressions were conducted for each teacher effectiveness measure (teacher academic support and personal support, PSE, and academic achievement). Regressions for mathematics teachers and English teachers were conducted separately (the same students had rated both their mathematics and English teachers, such results could not be combined due to dependencies among the student variables at level 1). All regressions controlled for student gender and student self-reported personality domains at level 1 (with group mean centering) and teacher gender at level 2. These control variables

were entered because they are known correlates of academic achievement (Poropat, 2009; Richardson et al., 2012; Sabbe & Aelterman, 2007). Moreover, all regressions controlled for previous academic achievement at level 1 (with group mean centering) because it is a major source of non-random assignments of students to teachers (i.e., streaming, which is based on prior academic achievement; (Johnston & Wildy, 2016). For each teacher effectiveness measure, three sets of regressions were conducted with the following predictors: (a) student-reported teacher personality, (b) contextualized self-reported teacher personality, and (c) non-contextualized self-reported teacher personality. For student-reported teacher personality regressions, individual student-reports of teacher personality were entered in level 1 with group mean centering and mean student-reports of teacher personality were entered in level 2 with grand mean centering.

Results

Reliability and Descriptive Statistics of Personality Reports

Table 1 shows the reliability and the descriptive statistics for: (a) self-reported student personality; (b) individual student-reported teacher personality for mathematics and English teachers; (c) mean student-reported teacher personality for mathematics and English teachers; and (d) self-reported teacher personality under both contextualized and non-contextualized frames of reference. Note that students also rated teachers who did not participate in this study, such that student ratings were obtained for more than the number of mathematics teachers ($N = 38$) and English teachers ($N = 38$) for whom self-reported personality data was available. Note also that one of the teachers providing a self-report taught both mathematics and English. Students reported the personality of mathematics teachers ($N = 89$) and English teachers ($N = 89$), where four of the teachers for whom student-reports were available taught both subjects. The internal consistency estimates for all personality reports were acceptable ($.69 \leq \alpha \leq .97$). The inter-rater reliabilities for individual student-reported teacher personality

were calculated using Spearman-Brown adjustments of the intraclass correlations (ICC). The inter-rater reliabilities were relatively high, ranging from .85 to .90.

INSERT TABLE 1 ABOUT HERE

Correlations of Personality with Teacher Effectiveness: Self- Versus Student-Reports and Contextualized Versus Non-Contextualized

The reliability and descriptive statistics for teacher effectiveness measures are given in Table 2. All internal consistency estimates were good ($.88 \leq \alpha \leq .90$). Correlations of teacher personality with teacher effectiveness measures are provided in Tables 2 and 3 for all three measures of teacher personality (student-reports, contextualized self-reports, and non-contextualized self-reports).

INSERT TABLE 2 ABOUT HERE

Hypothesis 1: Differences due to frame of reference. Table 3 shows the correlations of contextualized and non-contextualized self-reports of teacher personality with teacher effectiveness measures. Steiger's *z*-test for dependent correlations was used to compare whether correlations differed for contextualized versus non-contextualized reports (H1a). Contrary to our hypothesis, differences between contextualized and non-contextualized self-reports were not significant for 38 of the 40 analyses. The two exceptions were: (a) non-contextualized teacher conscientiousness was correlated more strongly with English academic support than contextualized teacher conscientiousness ($z = -2.21$, $p < .05$), and (b) non-contextualized teacher agreeableness was correlated more strongly with English PSE than contextualized teacher agreeableness ($z = -2.31$, $p < .05$). Note that these two

significant effects were opposite in direction from what was hypothesized. Of the 38 non-significant differences in correlation, 22 were in the direction of the hypothesis, 15 were in the opposite direction of the hypothesis, and there was no difference in one analysis. Overall, H1a was not supported.

INSERT TABLE 3 ABOUT HERE

We again used Steiger's *z*-test to compare whether correlations with student-reports of teacher personality differed for contextualized versus non-contextualized self-reports of teacher personality (H1b). These correlations are shown in Table 4. There were no significant differences in the strengths of the correlations for nine of the ten analyses. The exception was mathematics teachers' openness, where contextualized self-reports were more strongly related to mean student-reports than non-contextualized self-reports ($z = 2.06$, $p < .05$). Only five of the other nine non-significant analyses were in the hypothesized direction and the other four were in the opposite direction. Overall, H1b was not supported. All in all, results from the two examinations indicate little benefit of contextualizing self-reports.

INSERT TABLE 4 ABOUT HERE

Hypothesis 2: Differences due to source of teacher personality report. The correlations of teacher personality with teacher effectiveness are given in Table 2 for student-reports of teacher personality and Table 3 for self-reports of teacher personality. To test whether there are stronger effects for mean student-reports of teacher personality than contextualized teacher self-reports (H2), we again used Steiger's *z*-test to compare whether correlations with teacher effectiveness significantly differed by source. Hypotheses were

clearly supported for the effectiveness measures of academic and personal support. Compared to contextualized teacher self-reports, student-reports showed significantly stronger associations with both academic support and personal support for all five personality domains and for both mathematics and English teachers ($-3.43 \leq z \leq 6.20$, $p < .05$).

The results for PSE and academic achievement were less clear. There were differences in the results for PSE across subject areas, with H2 supported for English but not mathematics teachers. For mathematics teachers, the only significant difference in PSE was for openness, where the effect was significantly larger for contextualized self-reports ($r = -.26$) than with mean student-reports ($r = -.02$; $z = 2.35$, $p < .05$). There were no significant differences between the other four personality domains. For English teachers, all analyses supported H3 for PSE, with significantly larger correlations for student-reports for all five personality domains ($-2.87 \leq z \leq 3.64$, $p < .05$). H2 was not supported for academic achievement. There were no significant differences in the strength of correlations with academic achievement by source.

Hypothesis 3: Explanations for stronger correlations with student-reports. In support of the common rater effect (H3a), all subjective outcomes were significantly more strongly associated with teacher personality when the same students provided both sources of information than when students provided only one of these, and the effect sizes of these were very large (see Table 3; $-15.13 \leq z \leq 20.85$, $p < .05$). This finding indicates that individual student-reports are more strongly associated with the outcomes when students provide information on both the predictors and the outcomes, consistent with H3a.

In support of the multiple rater effect (H3b), mean student-reports of teacher personality showed significantly stronger associations with the outcomes in 28 of the 40 analyses examined (see Table 3; $-5.81 \leq z \leq 4.45$, $p < .05$). Six of the other 12 analyses were in the hypothesized direction and the other six were in the opposite direction, one of which

was significant (z = -2.82, p < .05). Overall, there is support for both the common rater effect and the multiple rater effect.

Multilevel Regressions Predicting Teacher Effectiveness

Intraclass correlations indicate the proportion of variance at each level in the null model for each outcome. For mathematics, the intraclass correlations were .13 for academic support, .17 for personal support, .17 for PSE, and .30 for grade. For English, the intraclass correlations were .10 for academic support, .16 for personal support, .12 for PSE, and .32 for grade. Intraclass correlations above .10 indicated that multilevel analysis was appropriate for the data (Hox, 2002).

The number of analyzable cases and clusters were reduced due to missing predictor variables for some cases. Teachers were the defined clusters and the analyses with student-reported teacher personality contained 76 clusters for mathematics and 73 for English, and the analyses with teacher self-reported personality contained 35 clusters for mathematics and 29 for English.

The standardized regression coefficients and *R*-squared values for all outcomes predicted by student-reported teacher personality are shown in Table 5. Given low and non-significant correlations and inconsistent significant regression results, regression results for self-reported teacher personality and outcomes are not included in this paper.

INSERT TABLE 5 ABOUT HERE

Teacher support. Student-level variables predicted 39% and 38% of the level 1 variances and teacher-level variables predicted 90% and 79% of the level 2 variances of mathematics and English academic support, respectively (see Table 5). At level 1, individual student-reports of teacher conscientiousness were the strongest predictor of academic support

(β = .35 and .29, respectively) and agreeableness was the strongest predictor of personal support (β = .43 and .35, respectively), in line with H4a and H4b. At level 2, mean student-reports of teacher conscientiousness was the strongest predictor of academic support (β = .74 and .67, respectively) and agreeableness was the strongest predictor of personal support (β = .84 and .68, respectively), again in line with H4a and H4b.

PSE. Student-level variables predicted 30% and 22% of the level 1 variances and teacher-level variables predicted 21% and 37% of the level 2 variances of mathematics and English PSE, respectively (see Table 5). The predictors of PSE were not consistent across mathematics and English at level 1. For mathematics at level 1, individual student-reports of teacher neuroticism were the strongest teacher personality predictor of PSE (β = -.09), in line with H1. For English at level 1, individual student-reports of teacher openness was the strongest predictor of PSE (β = .35), not in line with H4c. For mathematics at level 2, individual student-reports of teacher neuroticism was the strongest predictor of PSE (β = -.61), in line with H1c. For English at level 2, mean student-reports of teacher conscientiousness was the strongest predictor of PSE (β = .54), although neuroticism was also a strong predictor (β =-.51). Overall, there seems to be a role of neuroticism in predicting PSE, in line with H4c.

Academic achievement. Student-level variables predicted 44% and 41% of the level 1 variances and teacher-level variables predicted 9% and 13% of the level 2 variances of mathematics and English academic achievement, respectively (see Table 5). For mathematics at level 1, individual student-reports of teacher extraversion were the strongest teacher personality predictor of academic achievement (β = .06), not in line with H4d. For English at level 1, none of the individual student-reports of teacher personality significantly predicted academic achievement. At level 2, none of the mean student-reports of teacher personality predicted academic achievement for both mathematics and English, not in line with H4d.

In summary, teacher personality predicted the subjective measures of teacher effectiveness (teacher academic support, teacher personal support, and PSE) for both mathematics and English, but did not predict the objective measure of teacher effectiveness (academic achievement) in either subject areas. These results provide partial support for H4.

Discussion

The present study investigated the effect of teacher personality on three aspects of teacher effectiveness: (a) teacher support (academic and personal), (b) PSE, and (c) academic achievement. We compared the effects of two frames of reference (contextualized and non-contextualized) in teacher self-reports, as well as the effects of two sources of teacher personality report (student-reports and teacher self-reports) in their associations with the subjective and objective measures of teacher effectiveness.

Frame of reference did not moderate the effects of teacher personality on measures of effectiveness—contextualized and non-contextualized teacher self-reports showed similar degrees of association with the teacher effectiveness measures (H1a) and with the student-reports of teacher personality (H1b), which were contrary to our hypotheses. Source of personality report *did* moderate the relationships between teacher personality and effectiveness, with other-reports showing stronger effects than self-reports (H2). The larger effect size for other-reports was clearly underpinned by the common rater effect (H3a) and the multiple rater effect (H3b). Teacher personality was associated with teacher effectiveness but this was not consistent across all measures of effectiveness. Specifically, teacher personality domains indeed predicted teacher academic support (H4a), teacher personal support (H4b), and PSE (H4c). Contrary to our hypothesis, teacher personality did not predict academic achievement in either mathematics or English (H4d).

Frame-of-Reference Effect

In contrast to our expectations, contextualized personality did not emerge as a stronger predictor of teacher effectiveness than non-contextualized personality. Such a result is not in line with previous findings that contextualization increased the validity of personality reports (e.g., Lievens et al., 2008; Shaffer & Postlethwaite, 2012). In addition, other-reported personality was no more strongly related to contextualized than non-contextualized personality. However, this is consistent with a recent study, which investigated whether school contextualized personality would correlate more highly with a school other-report of personality (college peer) than home other-report of personality (parent) and vice-versa (Kurtz & Palfrey, 2016). Consistent with our findings, they also did not find evidence that contextualization improves the correlations with other-reports. Rather, they found that parents and peers were consistently better reporters regardless of the context. Hence, it may be the case that other-reports provide more useful information whether self-reports are contextualized or not.

Students as an Appropriate Source of Teacher Personality Report

Previous meta-analytic comparisons of self-reports and other-reports have found superior predictions of other-reports in a variety of outcomes such as job performance and academic achievement (Connelly & Ones, 2010; Poropat, 2014). We built on these studies by considering contextualized self-reports when comparing with other-reports. In line with these meta-analytic findings, student-reports explained more variance and were more strongly related to the teacher effectiveness measures, but for teacher academic support and teacher personal support only. The strength of other-reports were explained by both the common rater effect (Podsakoff et al., 2003) and multiple rater effect (Connelly & Ones, 2010). Overall, our finding provides partial evidence supporting the appropriateness (and potential utility) of secondary school students' reports of teacher personality. The very large effect size of the

common rater effect suggests that individual perceptions of teacher personality that relate to individual perceptions of support are important, rather than the aggregate (and potentially more accurate) estimates of teacher personality.

Teacher Personality Predicts Teacher Support and Student Self-Efficacy

Three teacher Big Five personality domains seem to be particularly important to how much students feel supported and how they perceive their own academic capability. These domains are conscientiousness, agreeableness, and neuroticism.

Teacher conscientiousness was most important for teacher academic support, and teacher agreeableness was most important for teacher personal support. These findings are consistent with meta-analyses reporting that conscientiousness is predictive of job performance averaged across many occupations (Barrick & Mount, 1991; Judge et al., 2013; Salgado, 1997), and agreeableness is predictive of job performance requiring interpersonal connections (Mount et al., 1998). An implication of these findings is that including only a broad aggregated measure of teachers' job performance (or effectiveness) may mask the real effects of different personality domains on specific aspects of job performance. That is, not only are qualities such as organization and achievement-striving important for teachers in supporting their students, but so are qualities such as kindness and warmth.

Teacher neuroticism was negatively associated with PSE. The mechanism by which teacher neuroticism translates to lower student self-efficacy may be through students modeling the teachers' self-doubt, anxiety, or negative behaviors (Lumpkin, 2008). The finding is also consistent with Emotional Contagion theory (Hatfield, Cacioppo, & Rapson, 1994), which suggests that individuals can spread both positive and negative emotions to their social network; the central role that a teacher has in class may increase their influence as the agent of such emotional contagion.

Previous studies suggest that the association of teacher personality with academic achievement may not hold when key covariates (such as prior academic achievement) are included (Garcia et al., 2011; Rockoff et al., 2011). Our results support this interpretation. Specifically, teacher personality was correlated with academic achievement, consistent with Garcia et al.'s (2011) findings. However, teacher personality did not predict academic achievement when covariates were controlled for in the regressions, consistent with Rockoff et al.'s (2011) findings. The lack of predictive association between teacher personality and academic achievement evident in a tertiary setting (Kim & MacCann, 2016) was also evident in a secondary setting. Overall, these results indicate teachers' limited role in engendering actual short-term changes in achievement when other factors are controlled for, and that academic achievement may be too distal to be predicted by teacher personality.

Perhaps the relationship of teacher personality with teacher support and PSE suggests that teachers play an influential role in students' socio-emotional development. That is, teacher personality appears more important for student emotion-related outcomes than for academic outcomes. We argue that this is a non-trivial effect with important implications for student well-being and educational policy. Increasing attention is placed on schools as providers of social and emotional learning (SEL). For example, SEL outcomes are explicitly included in Australia's national curriculum, and SEL programs and approaches are widely implemented in American and British school systems. Given our findings that teacher personality is associated with students' feelings of academic and personal support and academic confidence, it seems likely that teacher personality would impact SEL outcomes, and may constitute an important moderator of the effectiveness of SEL programs. Such influences may also have long-term effects on academic achievement given the positive association between SEL and academic achievement (Zins, Weissberg, Wang, & Walberg, 2004).

Limitations and Future Research

The present study examined the concurrent relationship between teacher personality and teacher effectiveness. Some researchers have claimed that teacher effects carry over time (Chetty, Friedman, & Rockoff, 2011; Sanders & Horn, 1998). Examinations of the possible additive or multiplicative effects of teacher personality over time may prove to be a fruitful avenue to determine the nature and the temporal durability of its effects.

The participants in the present study were from independent schools, who are likely to be of higher socioeconomic status (SES) than the general population. The distribution of Australian schools across sectors in 2015 were 71% government, 18% Catholic, and 11% independent schools (Australian Bureau of Statistics, 2016). The majority of full-time students studying in Australian non-government schools in 2015 were in New South Wales (31%), Victoria (26%), in Queensland (20%), and in Western Australia (11%). Our participants came from these four states and further research may investigate the extent to which these findings may be moderated by SES and cultural factors. For example, students from low SES backgrounds or from culturally and linguistically diverse (CALD) groups may derive greater benefit from a conscientious teacher who puts extra effort in (whereas students from majority privileged backgrounds have existing support structures that could make up for the effects of less effortful teaching).

Some schools may have assigned students to teachers based on pre-existing information about the student educational outcomes (Kalogrides, Loeb, & Beteille, 2012). Streaming typically occurs using previous academic performance (Johnston & Wildy, 2016), which we statistically controlled for, and hence would not have affected the interpretation of the current results. It is possible, however, that students may have been grouped by students' prior perceptions of teacher support and self-efficacy, which were not measured. Hence,

caution must be taken when interpreting the empirical association we found between teacher personality and student educational outcomes, such that it may not be causal.

Teachers received the survey web link through their work email. In effect, even when teachers were responding to the non-contextualized personality assessment, they may have been implicitly applying an "at school" frame of reference. Furthermore, sending the survey web link to their work email may have potentially created the impression that these assessments could be shared or be made available to their school, even though the participation information statement assured otherwise. Such beliefs may have manipulated the context of the personality assessments to be perceived as a high stakes one and thus making it more likely to engage in socially desirable responding. To avoid unintended frame of reference applications and high-stakes context creation, future studies may consider distributing the survey material through a less work-affiliated channel. Furthermore, other measurement techniques less vulnerable to the effects of presentation bias may be considered, such as forced-choice assessments (Brown & Maydeu-Olivares, 2013) and situational judgment tests (Lievens, Peeters, & Schollaert, 2008).

We were limited to a smaller sample size of teacher self-reported personality compared to student-reports of teacher personality. Thus, future studies should aim to obtain larger sample sizes of both sources of report so to attain similar statistical power in the analyses.

Practical Implications

Given the extensive use of personality assessments in organizational psychology to aid personnel selection, it may be appropriate to start a discussion on the usefulness of personality assessments in education to aid applicant selection. Researchers have previously suggested using personality as a selection procedure for entering teacher preparation (Thornton, Peltier, & Hill, 2005) and for entering teaching practice (Kennedy, 2012). Teacher

trainee selection procedures used in a variety of countries are not based on strong theory-based or evidence-based models. As such, our findings provide preliminary empirical support for a potential role of Big Five assessments, particularly conscientiousness and agreeableness, for academic systems that especially emphasize building student–teacher relationships and student self-efficacy. Nevertheless, high-stakes use of personality assessments for teacher selection clearly requires substantial further evidence, both in terms of incorporating teacher personality into existing theoretical models and in terms of developing its assessment methodology. Furthermore, the assessment of teacher trainee candidate personality should initially be tested in small scales with tests of longitudinal predictive validity before large-scale systematic approaches are seriously considered.

A future research direction could be to examine the mechanisms that underpin the relationships between teacher personality traits and teacher effectiveness. For example, interviews or observational analysis could identify the behaviors that conscientious teachers employ to garner greater student perceptions of academic support. If such processes can be identified, then these behaviors can be taught as explicit classroom strategies in teacher training.

Conclusions

Teacher personality seems to be a promising path to identify factors important for vital aspects of teacher effectiveness. Students' perceptions of teacher conscientiousness, agreeableness, and neuroticism may be particularly useful in future considerations due to their association with a sense of being supported by their teachers, as well as their own performance self-efficacy. The support that students receive in school and their self-efficacy may be founding stones on which they build their approach to education, academic goals, and even identity. Teacher personality is associated with these key variables, and may thus be a key driver of student social and emotional outcomes.

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Table 1

Reliability and Descriptive Statistics for Self-Reported Student Personality (N = 2,082), Individual Student-Reported Teacher Personality (N = 2,082), Mean Student-Reported Teacher Personality (N = 89), and Self-Reported Teacher Personality (N = 38)

	Student-Reported Personality																	Self-Reported Teacher Personality											
	Student			Individual Math Teacher				Individual English Teacher				Mean Math Teacher			Mean English Teacher			Contextualized						Non-Contextualized					
																		Math Teacher			English Teacher			Math Teacher			English Teacher		
Domain	α	*M*	*SD*	α	*M*	*SD*	*ICC*	α	*M*	*SD*	*ICC*	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*
O	.77	3.83	0.61	.82	3.50	0.65	.87	.82	3.82	0.64	.87	.90	3.52	0.36	.93	3.81	0.36	.84	3.66	0.66	.69	3.98	0.48	.87	3.65	0.71	.80	3.93	0.58
C	.84	3.55	0.73	.88	4.16	0.73	.86	.88	4.07	0.75	.85	.93	4.13	0.41	.94	4.08	0.40	.79	4.11	0.65	.83	4.30	0.56	.83	4.04	0.66	.82	3.96	0.66
E	.79	3.65	0.71	.78	3.84	0.70	.88	.75	3.97	0.64	.85	.86	3.85	0.40	.84	3.96	0.35	.77	3.65	0.62	.85	3.82	0.65	.83	3.39	0.73	.81	3.63	0.70
A	.82	3.90	0.66	.90	4.01	0.84	.89	.89	3.99	0.84	.90	.94	3.95	0.49	.97	3.94	0.54	.74	4.15	0.55	.73	4.22	0.47	.79	4.14	0.54	.78	4.07	0.55
N	.82	2.61	0.81	.83	2.06	0.75	.85	.84	2.14	0.78	.89	.87	2.12	0.40	.93	2.16	0.45	.86	2.31	0.79	.85	2.45	0.76	.87	2.60	0.88	.86	2.82	0.79

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.
ICC = A measure of inter-rater reliability using Spearman-Brown adjustments of the intraclass correlation.

Table 2

Reliability and Descriptive Statistics of Teacher Effectiveness Measures and their Correlations with Self-Reported Student Personality, Individual Student-Reported Teacher Personality, and Mean Student-Reported Teacher Personality

Outcome	*n*	α	*M*	*SD*	Self-Reported Student Personality					Individual Student-Reported Teacher Personality					Mean Student-Reported Teacher Personality									
					O	C	E	A	N	O	C	E	A	N	*n*	O		C		E		A		N	
Math																								
AS	2008	.88	4.27	0.81	.15**	.21**	.11**	.22**	-.12**	.53**	.65**	.48**	.63**	-.52**	88	.66**	(.77**)	.68**	(.89**)	.59**	(.66**)	.69**	(.82**)	-.57**	(-.74**)
PS	2008	.90	3.70	1.00	.14**	.24**	.08**	.20**	-.11**	.58**	.54**	.48**	.66**	-.51**	88	.79**	(.69**)	.62**	(.65**)	.55**	(.68**)	.81**	(.83**)	-.60**	(-.61**)
PSE	1914	-	3.07	0.87	.11**	.28**	.08**	.11**	-.16**	.14**	.18**	.19**	.19**	-.22**	70	-.02	(.21)	.12	(.28)	.21	(.23)	.06	(.24)	-.21	(-.39**)
Grade	1987	-	8.03	3.47	.05*	.17**	.03	.05*	-.06*	.08**	.12**	.16**	.13**	-.15**	89	.08	(.09)	-.06	(.10)	.19	(.21)	.09	(.19)	.00	(-.19)
English																								
AS	2008	.90	4.36	0.77	.23**	.21**	.11**	.22**	-.09**	.54**	.60**	.46**	.58**	-.46**	89	.67**	(.75**)	.71**	(.78**)	.53**	(.55**)	.64**	(.80**)	-.55**	(-.68**)
PS	2008	.90	3.85	0.97	.22**	.22**	.12**	.18**	-.11**	.56**	.51**	.47**	.62**	-.49**	89	.80**	(.79**)	.73**	(.72**)	.63**	(.46**)	.82**	(.81**)	-.70**	(-.68**)
PSE	1914	-	3.13	0.76	.25**	.24**	.12**	.15**	-.04	.24**	.22**	.21**	.23**	-.23**	71	.45**	(.61**)	.43**	(.52**)	.38**	(.58**)	.38**	(.59**)	-.41**	(-.50**)
Grade	1984	-	8.42	2.98	.17**	.18**	.06**	.12**	.03	.16**	.10**	.21**	.13**	-.15**	89	.20	(.33*)	.03	(.10)	.23*	(.50**)	.06	(.32)	-.12	(-.20)

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.
AS = Teacher Academic Support, PS = Teacher Personal Support, PSE = Performance Self-Efficacy.
Numbers in parentheses under Mean Student-Reported Teacher are correlations with the randomly selected single students' ratings of the 89 teachers who provided contextualized personality reports.
* $p < .05$. ** $p < .01$.

Table 3

Teacher Effectiveness Measures and their Correlations with Self-Reported Teacher Personality, and Student-Reported Teacher Personality under Random Assignment Design and Single Student-Report Design

	Self-Reported Teacher Personality											Student-Reported Teacher Personality										
	Contextualized						Non-Contextualized					Random Assignment Design[a]						Single Student-Report Design[b]					
Outcome	*n*	O	C	E	A	N	O	C	E	A	N	*n*	O	C	E	A	N	*n*	O	C	E	A	N
Math																							
AS	38	.04	-.04	.26	.20	-.18	-.09	-.15	.20	.09	-.01	2008	.12**	.14**	.12**	.16**	-.12**	38	.54**	.64**	.56**	.60**	-.49**
PS	38	.31	.18	.32*	.33*	-.20	.22	.16	.19	.29	.03	2008	.16**	.14**	.15**	.19**	-.13**	38	.54**	.46**	.47**	.56**	-.44**
PSE	37	-.26	.06	.02	.19	-.13	-.29	.02	-.01	.00	-.18	1914	.03	.05*	.04	.02	-.07**	37	-.14	.09	.00	-.09	-.07
Grade	38	.05	.17	.05	.23	-.09	.04	.14	-.03	.16	-.13	n/a	n/a	n/a	n/a	n/a	n/a	38	-.02	.15	.03	.06	-.13
English																							
AS	38	.30	.01	.20	.20	-.34*	.30	.28	.18	.26	-.41*	2008	.15**	.14**	.10**	.15**	-.13**	38	.37*	.24	.33*	.32	-.16
PS	38	.25	-.05	.12	.24	-.20	.19	.18	.09	.31	-.28	2008	.21**	.17**	.12**	.21**	-.17**	38	.65**	.24	.39*	.48**	-.22
PSE	37	.26	-.07	.15	-.15	-.02	.21	.08	.03	.18	-.15	1914	.13**	.14**	.09**	.11**	-.12**	37	.20	.04	.29	.15	-.23
Grade	38	.08	-.16	.21	-.08	.05	.20	.01	.12	.08	.10	n/a	n/a	n/a	n/a	n/a	n/a	38	.07	-.06	.26	.12	-.13

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.
AS = Teacher Academic Support, PS = Teacher Personal Support, PSE = Performance Self-Efficacy.
[a] In the random assignment design, outcome data for each teacher was randomly assigned amongst the students within a teacher (i.e., personality and outcome data did not come from the same students).
[b] In the single student-report design, a single student was randomly selected for each teacher, and their ratings of the teacher personality were used (i.e., student-reports of teacher personality were obtained from a single rater, so as to be comparable to teacher self-reports in terms of the number of raters).
* $p < .05$. ** $p < .01$.

Table 4

Comparisons of Contextualized and Non-Contextualized Self-Reports with Mean Student-Reports (N = 38)

	Mean Student-Reports vs. Contextualized Teacher Self-Reports		Mean Student-Reports vs. Non-Contextualized Teacher Self-Reports	
	Math Teacher	English Teacher	Math Teacher	English Teacher
Domain	*r*	*r*	*r*	*r*
O	.29	.42*	.12	.51**
C	-.01	.11	-.08	.34*
E	.53*	.41*	.50**	.38*
A	.30	.10	.26	.32*
N	.18	.41*	.17	.37*

Note. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.
* $p < .05$, * $p < .01$.

Table 5

Multilevel Multiple Regression Analyses Predicting Teacher Effectiveness Measures from the Covariates, Self-Reported Student Personality, Individual Student-Reported Teacher Personality, and Mean Student-Reported Teacher Personality in Standardized Regression Coefficients with R-Squares at Each Level

Predictor	Math Teacher				English Teacher			
	AS	PS	PSE	Grade	AS	PS	PSE	Grade
	n = 1218		n = 1164	n = 1238	n = 1220		n = 1166	n = 1242
Level 1								
Student Gender	.01	-.04	-.09*	.03	.06*	-.01	.10**	.24**
Student PSG	.02	.03	.42**	.62**	.04	.03	.30**	.50**
Student O	.04	.03	-.01	-.05*	.03	.07*	.12**	.05
Student C	.05*	.13**	.21**	.10**	-.04	.00	.17**	.13**
Student E	.06*	.01	.00	-.01	-.02	.04	.04	.00
Student A	-.02	-.02	-.05	-.06*	.00	-.04	-.09**	-.03
Student N	.06*	.07**	-.06*	-.02	-.06*	-.02	-.02	.00
Teacher O	.11**	.16**	.06	-.04	.20**	.20**	.08*	.03
Teacher C	.35**	.06	-.06	.01	.29**	.07	.01	-.06
Teacher E	.04	.04	.01	.06**	.05	.06	-.04	.02
Teacher A	.26**	.43**	.04	.02	.26**	.35**	.04	.07
Teacher N	.07	.05	-.09*	-.05	.12**	-.01	-.03	.03
R^2	.39**	.37**	.30**	.44**	.38**	.38**	.22**	.41**
Level 2								
Teacher Gender	-.03	.06	.17	.12	-.13	-.05	.06	-.16
Averaged Teacher O	.08	.24	-.28	-.06	.12	.27	-.42	-.08
Averaged Teacher C	.74**	.16	-.06	-.26	.67**	.11	.54*	.00
Averaged Teacher E	.27*	.12	.16	.20	.18	.02	.52**	.29
Averaged Teacher A	.28	.56**	-.10	.28	-.03	.68**	-.43	-.45
Averaged Teacher N	.30**	.07	-.61*	.00	-.06	.09	-.51*	-.46
R^2	.90**	.84**	.21*	.09	.79**	.88**	.37**	.13

Note. PSG = Past Subject Grade, O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.
AS = Teacher Academic Support, PS = Teacher Personal Support, PSE = Performance Self-Efficacy.
* $p < .05$, ** $p < .01$.