

Personality and Educational Outcomes

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Abstract

Among the most important outcomes for individuals and countries are those linked with education, and recent research has established that these outcomes are reliably correlated with personality measures based upon the five-factor model. Conscientiousness measures are the most strongly associated with educational outcomes at all educational levels, apparently due to conscientiousness being based upon effortful control and links with self-regulation of learning activities. Openness is next most important, resulting from associations with curiosity and motivation to learn. Correlations of academic performance with self-rated agreeableness, extraversion, and emotional stability decline at higher educational levels. Other-rated personality measures typically provide stronger, more consistent correlations with educational outcomes. Although intelligence affects some of these relationships, educational outcomes are independently linked with personality with effect sizes comparable with correlations with intelligence. Consequently, personality has a crucial role in education.

Educational outcomes are among the most important factors in advanced economies, both for individuals and nations. Better-educated populations result in greater economic growth (Hanushek and Woessmann, 2012), while an individual level, achievement on grades and grade point average (GPA) reflects not only learning achievement but also predicts later work performance (Roth et al., 1996), and occupational prestige and status (Strenze, 2007). Consequently, recent work that has established an important role for personality and related factors with respect to GPA and other educational outcomes assumes much more than academic interest.

Cognitive and Noncognitive Predictors of Educational Outcomes

Early research on predictors of educational outcomes led to the delineation of the preeminent feature of individual differences research within both psychology and education, namely intelligence. The pioneering work of Binet and Simon (1905) aimed at predicting students' potential for succeeding at school, the end-result of which were the Stanford–Binet Intelligence Scales (Wolf, 1973), while Spearman identified his *g* factor of intelligence by factor-analyzing educational performance measures (Spearman, 1927). These cognitively based individual difference factors have long been recognized as important within educational settings.

Systematic research aimed at identifying “noncognitive skills” (Heckman and Rubinstein, 2001) relevant to education has continued for at least as long as have explorations of intelligence. Yet although early research by Webb (1915) produced substantial associations between personality ratings and educational performance, most reviewers reported inconsistent results (Harris, 1940; Margrain, 1978), largely due to the lack of coherent organizing frameworks for personality measurement, effectively precluding comparison of results from different studies. In response, De Raad and Schouwenburg (1996) argued for the use of comprehensive, reliable personality factor structures for systematically reviewing this research. This recognition, together with comparable research into links

between personality and performance in other settings, especially the workplace (Barrick and Mount, 1991), provided the inspiration for recent reviews that have established consistent links between personality and educational outcomes.

The currently dominant model of personality, which has enabled recent integrative reviews, is the five-factor model (FFM). Norman (1963) is often credited with proposing the FFM, but hints of this model were provided as early as Webb (1915). The factors within the FFM are conscientiousness (organized, responsible, and self-disciplined); agreeableness (sympathetic, warm, and kind); emotional stability (relaxed and patient) but often identified by its opposite pole labeled as neuroticism (moody, irritable, and envious); extraversion (talkative and sociable); and openness (intellect and creativity, smart, innovative, and inquisitive) (Saucier and Goldberg, 1996).

Although other models of personality have been developed, and there are significant concerns about its cross-cultural validity, the FFM remains the dominant model for personality research generally, and within educational research specifically, with the overwhelming majority of studies of personality and educational outcomes using FFM-based measures (Richardson et al., 2012).

FFM and Educational Outcomes

The first systematic review of correlations with educational outcomes that was organized on the basis of the FFM was presented by Hough et al. (1990), but this has recently been followed by more rigorous and exhaustive reviews (Poropat, 2009, 2014a,b; Richardson et al., 2012). Collectively, these have demonstrated that personality has reliable and important associations with educational outcomes.

Conscientiousness

Using a precursor of factor analysis, Webb (1915) was the first researcher to identify a ‘factor’ approximating conscientiousness, by proposing the existence of a variable reflecting

'persistence of motives,' or alternatively, "*consistency of action resulting from deliberate volition, or will*" (p. 60, italics in the original): in other words, a *w* factor as a complement to Spearman's *g*, and incorporating a rating scale labeled *conscientiousness*. The FFM factor of the same name has been reported as having the strongest correlation with educational outcomes, ranging from grades (Hough et al., 1990; Poropat, 2009, 2014a,b; Richardson et al., 2012), to workplace-learning achievements (Barrick et al., 2001), and within educational settings there has been more research on conscientiousness than any other personality variable (Poropat, 2009, 2014a,b; Richardson et al., 2012).

Conscientiousness has been shown to have reliable correlations with academic performance at primary, secondary, and tertiary levels of education (Poropat, 2009), and this pattern has been observed across cultures (Kaufman et al., 2008; Poropat, 2009). Typically, research on personality uses self-rated measures, yet correlations of academic performance with conscientiousness increase substantially when someone other than the student rates their personality. Notably, observed correlations (i.e., uncorrected for measurement artifacts) of academic performance with other-rated conscientiousness exceed comparable correlations with intelligence at secondary and tertiary levels of education (Poropat, 2014a,b).

At the behavioral level, conscientiousness is associated with compliance with social norms, setting and pursuing goals, and operating in a purposeful manner (Roberts et al., 2009). Goal-setting reliably predicts school achievement, as do a range of other conscientiousness-related behaviors and activities, including self-monitoring and self-management, planfully and persistently following a course of action regardless of distractions, and noticing and correcting errors (Hattie, 2009). So, in many ways the actions of the conscientious student mirror those that educators should encourage in their students in order to achieve better learning outcomes.

At a deeper level, conscientiousness has been closely associated with *effortful control*, a component of individual temperament (Rothbart, 2007). Effortful control has been posited to encompass elements such as the ability to control attention and inhibit inappropriate responses, and consequently to self-regulate and persist with activities. The capacities associated with effortful control are apparently based upon executive attention activities within the brain (Posner and Rothbart, 2009), which have been explicitly linked with conscientiousness (Rothbart, 2007). These abilities play an important role in the relationship between conscientiousness and educational outcomes (Bidjerano and Dai, 2007; Eilam et al., 2009; Richardson et al., 2012). For example, more conscientious students are more likely to stay enrolled (Komaraju and Karau, 2005; Sitzmann, 2012), and are better at managing and allocating their time to enable them to study more (MacCann et al., 2012a; Poropat, 2011b; Poropat and Jones, 2009). But more conscientious students also study more effectively (Bidjerano and Dai, 2007), adapting their activities to specific learning requirements (Swanberg and Martinsen, 2010), resulting in better outcomes (Zhang et al., 2011).

Conscientiousness is also linked with intrinsic motivation to learn (Clark and Schroth, 2010), both initially and subsequent to formal educational activities, when more conscientious students are more likely to focus on activities that will

assist them in applying their learning beyond educational settings (Yamkovenko and Holton, 2010). At the same time, conscientiousness is valuable in assisting students to control negative responses to learning, with more conscientious students being more able to manage stress and to refocus from stressors to their learning-based tasks (Saklofske et al., 2012). This is aided by the use of problem-focused coping (MacCann et al., 2012b), including shifting focus from performance goals to learning goals, which in turn reduces levels of stress and tension for students who are more conscientious (Cianci et al., 2010) resulting in these students feeling better within themselves (MacCann et al., 2012b). Thus, conscientiousness aids learning in many ways, which helps to explain why it is the FFM dimension that has the strongest associations with education outcomes.

Agreeableness

Agreeableness is associated with the ability of students to develop and maintain positive relationships with others, which seems to account for links between agreeableness and learning (Saklofske et al., 2012), because the adaptability associated with agreeableness makes it easier for students to make extra efforts outside of formal teaching, including making greater efforts with homework (Lubbers et al., 2010). Yet more agreeable students also appear to be generally better at time management and independent effort regulation, potentially contributing to later academic performance (Bidjerano and Dai, 2007). More agreeable students have a greater ability to internalize the interests of others, enabling them to more readily recognize and behaviorally comply with extrinsic demands even when they conflict with personal interests (Clark and Schroth, 2010). These factors assist students to learn more effectively in groups, which is important given that group learning is often more effective than individual learning (Michael, 2006).

Consistent with these associations, agreeableness has reliable correlations with academic performance in primary education, although there is reason to think that this may be partly due to methodological issues associated with self-ratings among younger children (Poropat, 2014a). When agreeableness is rated by someone other than the student, reliable but modest correlations are found (Poropat, 2014a,b), suggesting that agreeableness has persistent but limited impact on educational outcomes.

Emotional Stability

Emotional stability is often referred to by the label for its opposite pole, namely *neuroticism*, a close correlate of the component of temperament called negative affectivity (De Pauw, 2012; Rothbart, 2007). Negative affectivity interferes with learning by prompting task interruption and goal-blocking in response to distress (Rothbart, 2007). More emotionally stable people have weaker reactions to negative stimuli and hence are less readily discouraged, less distractible, and more confident in their own abilities (Ormel et al., 2013). Consistent with this, more emotionally stable students are less anxious and pay less attention to errors, which facilitates learning from errors (Zhao, 2011). This appears to be partly due to the ability of emotionally stable students to switch

focus away anxiety-prompting information, thereby reducing the degree to which they are distracted by ruminative thoughts that actively interfere with learning (Kircanski et al., 2008). Likewise, students who are higher on emotional stability are more able to stay focused on learning activities such as homework, and have better academic outcomes as a consequence (Lubbers et al., 2010).

The consequences of emotional stability extend to motivation and involvement in learning and education. Emotional stability is negatively correlated with discouragement, withdrawing from studies, or general avoidance motivations in education (Komarraju and Karau, 2005; Payne et al., 2007). Unlike agreeableness, emotional stability is negatively correlated with attention to extrinsic demands, such as those imposed by educators (Clark and Schroth, 2010; Komarraju et al., 2009), and is negatively correlated with motivation to learn (Zhao, 2011), possibly due to links with fear of failure. So, the association between emotional stability and academic motivation is complicated.

The association between self-rated emotional stability and academic performance in primary schooling is practically as well as statistically significant, but becomes virtually nonexistent in higher levels of education (Poropat, 2009). However, when other-ratings are used, there is no corresponding decline in this association (Poropat, 2014a,b), suggesting that what changes is the extent to which self-raters accurately report their level of emotional stability, possibly because low levels of emotional stability are socially undesirable.

Extraversion

Extraversion has long been recognized as a major component of individual differences in interpersonal behavior (Wiggins, 1991), and has been linked with aspects of temperament such as surgency and sociability (Mervielde and Asendorpf, 2000), as well as reduced behavioral inhibition and positive affectivity (McCrae and Costa, 1989). Poropat (2009) reported an association between extraversion and academic performance at primary education, but this association disappeared in secondary and tertiary education. Unlike emotional stability, use of self- or other-raters does not affect this pattern. Consequently, the differences in correlations between extraversion and academic performance do not appear to be due to changes in validity of self-ratings.

Poropat (2009) suggested that interaction levels may increase the level of attention that teachers give to extraverted students in primary education, making it easier to identify behavioral examples that warrant better grades. Consistent with this, teachers in primary schools tend to rate shyer, less-extraverted children as lower in intelligence and academic ability (Coplan et al., 2011). It appears that changes in educational assessment methods and reduced levels of interaction with students in secondary and tertiary education explain the reduced correlations with extraversion (Poropat, 2009).

Nonetheless, the impulsivity associated with extraversion can assist educational processes, with students who impulsively provide answers to questions showing greater learning (Tymms and Merrell, 2011), apparently because the simple act of providing an answer increases comprehension (Graesser, 2009). Similarly, extraversion is linked with novelty-seeking (Bernard,

2010), resulting in greater levels of experience and subsequent ability (Dragoni et al., 2011), especially in situations where learners are able to explore their learning environment independently (Orvis et al., 2011). So it appears that extraversion may be useful for learning, but the results are unlikely to affect grades.

Openness

There are strong theoretical arguments for expecting openness to be linked with education (De Raad and Schouwenburg, 1996), and openness has the strongest association with academic performance of any FFM factor apart from conscientiousness (Poropat, 2009), especially when rated by someone other than the student (Poropat, 2014a,b). Much of the reason for the link between openness and educational outcomes appears to be due to motivational effects, with students high on openness having greater curiosity, more interest in developing their ability, enjoying thinking, and generally wanting to improve (Bernard, 2010; Clark and Schroth, 2010; Komarraju and Karau, 2005). Consistent with this, openness is the FFM factor that has the strongest correlations with learning goal-orientation (Payne et al., 2007), and learning goal-orientation appears to mediate the association between openness and learning, and hence educational outcomes (Steinmayr et al., 2011). This focus on learning for its own sake operates independently of formal learning, with students higher on openness demonstrating greater learning in fields independent of their studies (Hambrick et al., 2008).

Students, who are higher on openness also adopt more effective learning strategies, such as greater use of meta-cognitive learning, elaboration on learned information, and effective time management and effort regulation (Bidjerano and Dai, 2007), as well as adopting a deep learning approach to study (Chamorro-Premuzic and Furnham, 2009), all of which reliably affect learning (Graesser, 2009). Taken together, these observations support the conclusion of De Raad and Schouwenburg (1996) that students, who are high on openness appear to reflect the 'ideal' student.

Alternative Personality Models

The advent of the FFM reduced the use of personality measures that fall outside that framework. Although it once was one of the dominant tools for personality assessment, the Eysenckian personality scales (Eysenck and Eysenck, 1975) are rarely used in educational research when compared with FFM measures. Two of the Eysenckian scales, extraversion and neuroticism, correspond closely to scales in the FFM, but although the Eysenckian psychoticism scale has overlaps with conscientiousness it is substantially less strongly correlated with educational outcomes, and further appears to be psychometrically unsound in educational environments (Poropat, 2011a).

The model of personality based upon Reinforcement Sensitivity Theory (RST) was explicitly linked to behavioral learning theory (Corr, 2004). Despite this, much remains to be done to establish RST as a compelling account of learning (Matthews, 2007), and surprisingly little research has been reported that

has tested RST in educational settings, so its relevance to learning and education beyond the psychological laboratory remains to be established.

Moderating Factors

The relationship between personality and educational outcomes has been shown to systematically vary depending on a range of factors. As with correlations with intelligence, correlations of academic performance with self-rated measures of most of the FFM dimensions decline from primary through to tertiary levels (Poropat, 2009). The declines in correlations with intelligence are often attributed to range restriction resulting from reductions in enrollments at higher levels of education, and these range restriction effects seem to also apply to correlations with personality. This makes the lack of significant reduction in correlations with self-rated conscientiousness notable, suggesting that its true relationship with academic performance may actually increase at higher educational levels.

Measurement also has a substantial effect on the size of correlations between personality and academic performance, with other-rated personality typically having significantly larger correlations. In the case of conscientiousness, other-rated measures have correlations with academic performance at both primary (50: Poropat, 2014a) and secondary/tertiary level (38: Poropat, 2014b) that are of similar magnitude to some of the largest effect sizes for influences on educational outcomes, those for class attendance (Credé et al., 2010) and feedback (Hattie and Timperley, 2007). Likewise, openness has substantially higher correlations with academic performance when other-rated, both at primary (43: Poropat, 2014a) and higher educational levels (28: Poropat, 2014b). The reasons for these moderating effects are complex but are likely to include the extent to which different raters use different sets of observations as the basis for their assessments and the extent to which they are differentially affected by desires to present the target of their ratings based on social desirability concerns (Poropat, 2014a,b).

Conclusions

It is a long time since the first systematic study aimed at identifying noncognitive predictors of academic performance, during which personality has mostly been treated as of lesser concern than have cognitive variables, especially intelligence. Recent reviews have clearly demonstrated that this neglect of personality within educational settings has been misplaced, with conscientiousness especially, but also openness and to a lesser extent emotional stability, having important consequences for students' outcomes. These consequences extend beyond the classroom, as has been shown by the now substantial body of research on the consequences of personality for work, health, and social outcomes (Roberts et al., 2007). Careful consideration of the role of personality within educational settings is therefore likely to provide similar benefits to students and society as have earlier efforts inspired by an appreciation of the strengths and limitations of other measures of individual differences.

See also: Academic Self-Concept and Achievement; Agreeableness; Conscientiousness; Extraversion; Five Factor Model of Personality, Assessment of; Intelligence: History of the Concept; Intrinsic Motivation: A Cultural Perspective; Motivation, Learning, and Instruction; Neuroticism; Openness to Experience; Person Perception, Accuracy of; Personality Development and Temperament; Personality and Adaptive Behaviors; Personality and Economics; Procrastination; Self-Concepts: Educational Aspects; Self-Regulated Learning: Theories, Measures, and Outcomes; Self-Regulated Learning; Systematic Reviewing and Meta-Analysis; Temperament and Motivation; Temperament.

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