



## Intelligence, “Big Five” personality traits, and work drive as predictors of course grade

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### Abstract

General intelligence, Big Five personality constructs, and a measure of work drive were studied in relation to course grade in an undergraduate psychology course taught by the same professor for 175 students over a 5-year period. Using a hierarchical multiple regression analysis, general intelligence accounted significantly for 16% of the variance in course grade; Big Five personality measures accounted significantly for an additional 7% of the variance; and work drive accounted significantly for an additional 4% of the variance. However, when work drive was entered before the Big Five variables, the Big Five variables did not add significantly (either as a set or individually) to the prediction of course grade. Results were discussed in terms of the importance of personality constructs in uniquely predicting academic performance and the need for additional study using more diverse predictors and aggregated criterion measures.

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The prediction of college grades from individual differences variables has been extensively researched, with a recent shift in emphasis from studying cognitive predictors to examining the role of personality constructs. A number of studies have examined the relationship between grades and cognitive ability measures, with most finding a significant positive correlation (e.g. Mathiasen, 1984; Mouw & Khanna, 1993; Passons, 1967; Schneider & Overton, 1983; Wolfe & Johnson, 1995). As noted by Rothstein, Paunonen, Rush, and King (1994) there are logical and empirical grounds for the prediction of academic performance from personality variables. For example, students who are: more open to new learning, discovery, and exploration (see *openness*

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as conceptualized by McCrae & Costa, 1997); higher on self-control, orderliness, and achievement striving (see *conscientiousness* as reviewed by Hogan & Ones, 1997) and lower on anxiety, impulsivity, hostility, and vulnerability (see *neuroticism* as discussed by Wiggins & Trapnell, 1997), would be more likely to perform well academically. Indeed, a number of studies have examined the predictability of collegiate grades from personality variables (Boyer & Sedlacek, 1988; Brown, 1994; Dollinger & Orf, 1991; Dyer, 1987; Musgrave-Marquart, Bromley, & Dalley, 1997; Okun, & Finch, 1998; Omizo, Ward, & Michael, 1979; Pfeifer & Sedlacek, 1974; Rainey, 1985; Rothstein et al., 1994; Wolfe & Johnson, 1995).

Among the personality traits most frequently found to be significantly (and positively) related to course grades and grade point average are the “Big Five” constructs of Conscientiousness (e.g. Dollinger & Orf, 1991; Musgrave-Marquart et al., 1997; Paunonen & Ashton, 2001) and Openness (e.g. Paunonen & Ashton, 2001), though Rothstein et al. (1994) found Agreeableness to be significantly related to grade point average in a sample of business school graduate students. A few studies have examined the unique effects of personality constructs in predicting college grades (Brown, 1994; Wolfe & Johnson, 1995). For example, Wolfe and Johnson (*ibid*), found that SAT scores and Conscientiousness both correlated 0.34 with college GPA for a sample of 201 undergraduates. After controlling for high school grades, Conscientiousness accounted for 9% unique variance in college GPA whereas SAT contributed an additional 4% unique variance.

Few published studies have examined the incremental validity of personality variables above and beyond cognitive ability in predicting academic performance (exceptions include Brown, 1994; Roessler, 1978; Wolfe & Johnson, 1995). None of the above studies have examined general intelligence as a predictor of college grades. Rather, most studies have focused on ACT and SAT scores as cognitive predictors and, in some cases, as proxies for general intelligence, even though, in the case of the SAT, the Educational Testing Service makes no claim that it measures general intelligence, but it measures verbal and mathematical reasoning abilities. With few exceptions (*viz.* Dollinger & Orf, 1991; Paunonen & Ashton, 2001), most studies have examined as the criterion variable collegiate grade-point-average (GPA) summated across courses. However, overall GPA contains between-teacher and between-major variability, which represent uncontrolled sources of variance. These sources of variance may have attenuated estimates of the validity for personality and mental ability variables in predicting course performance.

The present study addressed the above concerns by using a recognized measure of general intelligence as a predictor and the grade received in a single course as the criterion variable. In view of the widespread recognition of the Big Five personality model (Costa & McCrae, 1985; Digman, 1990; Goldberg, 1992; John, 1990), we examined the “Big Five” traits of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness in relation to course grade. We investigated the joint and unique effects of predicting college course grade from intelligence and personality constructs. More specifically, we examined: (1) the predictability of course grade from intelligence; and (2) whether the Big Five personality variables of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Costa & McCrae, 1985; Goldberg, 1992) together added incremental variance to the prediction of course grades above and beyond that attributable to general intelligence.

We also addressed one other personality trait in addition to the “Big Five”: work drive. As defined by Lounsbury, Loveland, Sundstrom, Gibson, Drost, and Hamrick (*in press*), *work drive* represents an enduring motivation to expend time and effort to finish projects, meet deadlines, be

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