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Brief Report

Hope uniquely predicts objective academic achievement above intelligence, personality, and previous academic achievement

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ABSTRACT

A 3-year longitudinal study explored whether the two-dimensional model of trait hope predicted degree scores after considering intelligence, personality, and previous academic achievement. A sample of 129 respondents (52 males, 77 females) completed measures of trait hope, general intelligence, the five factor model of personality, divergent thinking, as well as objective measures of their academic performance before university ('A' level grades) and final degree scores. The findings suggest that hope uniquely predicts objective academic achievement above intelligence, personality, and previous academic achievement. The findings are discussed within the context of how it may be fruitful for researchers to explore how hope is related to everyday academic practice.

1. Introduction

Trait hope has been described as a cognitive personality trait around motivations towards goals that comprise two particular orientations to thinking around achieving those chosen goals; *agency*, which reflects an individual's determination that those goals can be achieved, and *pathways*, which reflects an individual's belief that successful plans and strategies can be generated, or are available, to reach those goals (Snyder et al., 1991). Theoretically, hope should be positively related to academic achievement because, if academic achievement is assumed to be a goal, hope is conceptualized as creating adaptive goal-specific expectancies and behaviors, which leads to a positive outcome of that goal. A number of studies have supported these theoretical predictions (e.g., Curry, Snyder, Cook, Ruby, & Rehm, 1997; Snyder et al., 2002), however it is not clear from these studies whether: (a) the relationship between hope and achievement is unique or simply due to third variables, and (b) which facet of hope is responsible for this effect.

Snyder et al. (2002) conducted a 6-year longitudinal study into the impact of hope on academic achievement. Participants were subdivided into high, medium, and low hope groups using the Dispositional Hope Scale (Snyder et al., 1991). Hope was correlated with mean grade point average (GPA) scores ($r = .21$), and led to a higher GPA 6 years later after controlling for baseline scores. Curry et al. (1997) compared hope scores amongst American college athletes and found that trait hope significantly predicted end of semester GPA scores ($R^2 = .08$). However, it is not clear from this research whether it was hope leading to improved academic performance, or whether these findings were simply a reflection of the effects of general intelligence or other personality traits such as conscientiousness. Finally, Ciarrochi, Heaven, and Davies (2007), Leeson, Ciarrochi, and Heaven (2008) and Rand (2009) have found that trait hope predicted academic achievement, both when considered as part of a 'positive thinking' second order personality factor (alongside either optimism or self-esteem and attributional style) or as a distinct variable (independent of measures verbal and numerical intelligence).

This latter study brings forward a first consideration to make when comparing hope with academic achievement. The literature suggests that intelligence and personality variables are related to both hope and academic achievement, thus testing the theoretical role of hope requires demonstrating incremental variance beyond these third variables. General intelligence is strongly related to academic achievement. For example, Jencks (1979) reported correlations between general intelligence and academic achievement ranging from $r = .40$ to $r = .63$ for six longitudinal studies in the USA, and Kaufman and Lichtenberger (2005) provide a review of key papers examining general intelligence and school attainment and achievement and conclude that the average correlation between general intelligence and a number of school indicators is around $r = .50$. In addition, there is a descriptive resemblance between one of the hope traits, pathways (belief in the ability to

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generate creative ideas by exploring many possible solutions), and a specific intelligence, *divergent thinking* (the ability to generate creative ideas by exploring many possible solutions). Consequently, hope pathways traits may simply reflect aspects of divergent thinking. Additionally, research suggests there is a significant positive correlation between divergent thinking and academic achievement (Feldhusen, Treffinger, Van Mondfrans, & Ferris, 1971). Given the actual and possible shared variance between hope, academic achievement, and intelligence, be it general intelligence or divergent thinking, it is not clear whether hope *per se* leads to higher academic achievement, or whether more hopeful people do better academically simply because they are more intelligent. Therefore, it is important to control for both general intelligence and divergent thinking when examining the relationship between hope and academic achievement.

Regarding personality, conscientiousness has emerged as a particular predictor of academic achievement, with the other Big Five traits implicated to a lesser degree. O'Connor and Paunonen's (2007) review of major studies in the area found that academic achievement was consistently significantly correlated with conscientiousness (average r = .22), but inconsistently related with openness to experience, extraversion, agreeableness, and neuroticism (average rs for each trait ranged from |.05| to |.06|). Hope has also been found to load on a conscientiousness factor (Cartwright & Peckar, 1993). As with the intelligence variables, it is possible that hope only appears to lead to greater academic achievement due to more hopeful people also being more conscientious. Therefore, it is also important to control for conscientiousness when examining the relationship between hope and academic achievement.

A second consideration in the literature is the consideration of which facet of hope is related to academic achievement. It seems incongruous that, given the theoretical distinction between hope agency and hope pathways, that previous studies look at the relationship between hope and academic achievement (Curry et al., 1997; Snyder et al., 2002) have simply aggregated the agency and pathways facets to a single total score. Furthermore, recent studies have suggested that the two facets have meaningfully different correlates and outcomes. Day and Maltby (2005) found that agency and pathways hope had different sized correlation with anticipated completion of academic goals. Creamer et al. (2009) investigated trait hope among injury survivors and found that agency and pathways hope had different sized correlations with a variable related to childhood trauma. Geraghty, Wood, and Hyland (2010) showed that the hope facets can be dissociated with both the facets predicting dropout from self-help interventions but in opposite directions. Theoretically, agency and pathways may have a positive impact on academic achievement, but in different ways. First, agency may predict future higher academic achievement via a determination that academic goals can be achieved. Second, pathways would predict future higher academic achievement via a belief that successful plans and strategies can be generated and are available to achieve academic goals.

This study aims to determine whether hope can provide incremental validity in predicting future academic achievement over general intelligence, divergent thinking, and conscientiousness, to test theoretical predictions that trait hope uniquely predicts academic achievement. In addition, this study explores whether a distinction can be made between which of the hope facets is responsible for this effect.

2. Method

2.1. Sample

One hundred and twenty-nine respondents (52 males, 77 females) were sampled from two university undergraduate student cohorts in the United Kingdom. Ages ranged from 18 to 21 years at the start of the study (M = 18.56, SD = .7). Participants were predominantly White (82.9%), with the next highest represented ethnicities being Asian (10.9%) and Black (3.9%). Participants volunteered for the study after being approached for their potential participation in a first year class taught by one of the authors. Respondents were given full disclosure about the nature of the study and consented to being re-contacted at one subsequent time point.

2.2. Measures

Data collection corresponded to three time points in the students' undergraduate degree path. The first time point was the students' entry points into university derived from their 'A' level grades; the United Kingdom equivalent to USA college testing scores. Students provided written permission for this to be obtained from their academic records.

The second time point was during students' first year of undergraduate academic study. At this point the students completed the following measures.

2.3. Hope

The *Trait Hope Scale* (Snyder et al., 1991), comprising the 4-item Agency subscale (e.g., 'I energetically pursue my goals' [item 2]) and the 4-item Pathways subscale (e.g., 'There are lots of ways around any problem' [item 4]). Items are scored on an 8-point Likert scale, anchors ranging from '1 = Definitely False' to '8 = Definitely True'. Both subscales have adequate internal reliability, with Cronbach's alphas ranging from .70 to .84 for the Agency subscale, and from .63 to .86 for the Pathways subscale (Snyder et al., 1991).

2.4. Personality

The *Five Factor Model of Personality* was assessed via the 50-item International Item Personality Pool Five Factor Personality Measure of Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to Experience (Goldberg et al., 2006). These five subscales each comprise 10 items to measure the five main personality domains. Items are scored on 5-point Likert scale, anchors ranging from '1 = Very Inaccurate' to '5 = Very Accurate'. Internal reliability for the scales has been demonstrated to range from .77 to .86. Convergent validity for the scales has been demonstrated through correlations ranging from .85 to .92 with the NEO Personality Inventory (Goldberg et al., 2006).

2.5. General intelligence

The *Raven's Advanced Progressive Matrices* (Raven, Raven, & Court, 2000) was used to measure general intelligence. The advanced form of the matrices contains 48 items, presented as a set of 12 (set I), which familiarize people with the test, and then a set of 36 (set II) items, which can be computed to produce raw scores to measure general intelligence. Items become increasingly difficult as the participant progresses through set II. It is regarded as the best psychometric measure of general intelligence (Jensen, 1998).

2.6. Divergent thinking

Divergent thinking was assessed by three 5-min tests using Guildford's (1967) unusual uses for three inanimate objects that are presented as a stimulus. For this study we used three of the five suggestions of Hudson (1967), a brick, a blanket, and a paperclip

(with the two remaining items, a tin of boot polish and a barrel, omitted because they were considered out of date terms). Participants were asked to list as many unusual uses for each of the objects, and divergent thinking was scored by a frequency count of unusual uses.

The third time point was to obtain the final degree mark for each student. Students provided written permission for this mark to be obtained, both in their first year and after graduation. Final degree marks were determined from students' performance in their second and third year of undergraduate study.

3. Results

Mean (SD) scores, internal reliability statistics for, and zero order correlations between, the trait hope, intelligence, personality, 'A' level point scores, and final degree mark are documented in Table 1. All the scales show satisfactory internal reliability statistics above the well used criteria of $\alpha = .7$. Among the correlations, both measures of trait hope, 'A' level point scores, general intelligence, extraversion, conscientiousness, and divergent thinking shared a significant positive correlation with final degree mark. Furthermore, both trait hope measures shared a significant positive association with 'A' level point scores, general intelligence, and divergent thinking, and a significant negative association with neuroticism, with hope agency additionally sharing a significant positive association with extraversion. Finally it is important to note the high correlation ($r = .80$) between hope agency and hope pathways.

To test the hypothesis that trait hope is a unique predictor of academic achievement a hierarchical regression analysis was conducted in which final degree score served as the dependent variable and each of the predictor variables were entered into the model in the following order: (1) sex, age, 'A' level point scores, Raven Progressive Matrices raw scores, divergent thinking scores; (2) the five factor personality variable scores; and (3) agency and pathways trait hope scores. Table 2 shows the results from the final model with the unstandardized regression coefficient (B), standardized regression coefficients (β), t-test scores, and probability variables for each predictor variable for the regression.

Sex, age, 'A' level point scores, Raven Advanced Progressive Matrices raw scores, and divergent thinking were the first to be entered into the regression equation. These variables were able to predict final degree mark ($F = 14.09$, $df = 5, 123$, $p < .001$, $r = .60$, $r^2 = .36$, adjusted $r^2 = .34$), with 'A' level point scores and Raven Progressive Matrices raw scores demonstrating regression coefficients which reached statistical significance. Next, the five factor personality variables were entered, and it was found to provide an R^2 change = .10, which reached statistical significance (F change = 4.33, $df = 5, 118$, $p = .001$, $r = .67$, $r^2 = .46$, adjusted $r^2 = .42$), with conscientiousness and extraversion demonstrating regression coefficients which reached statistical significance. Finally the two hope subscales were entered, and they were found to provide an R^2 change = .03, which reached statistical significance (F change = 3.29, $df = 2, 116$, $p = .041$, $r = .70$, $r^2 = .49$, adjusted $r^2 = .44$) with the pathways trait hope measure demonstrating regression coefficients which reached statistical significance.

Table 2
Final model for the regression analysis with final degree mark used as a dependent variable and demographic, previous academic achievement, intelligence, personality, and hope scales used as predictor variables.

		B	β	t	Sig
Step 1	Sex	−1.23	−.08	−1.15	.254
	Age	−.30	−.03	−.39	.701
	'A' level point scores	.33	.22	2.72	.008
	Raven Progressive Matrices Raw Scores	.34	.32	3.71	.000
	Divergent thinking	.02	.04	.42	.675
Step 2	Neuroticism	−.03	−.03	−.37	.709
	Extraversion	.19	.17	2.37	.020
	Openness to Experience	−.04	−.03	−.45	.652
	Agreeableness	.05	.05	.64	.523
	Conscientiousness	.28	.29	3.94	.000
Step 3	Hope – agency	−.16	−.16	−1.36	.177
	Hope – pathways	.30	.27	2.46	.015

4. Discussion

In this study, higher scores on trait hope facets, agency and pathways, for students in their first year of undergraduate study both shared a significant positive relationship with final degree mark at the end of 3 years of study. This supports the a priori prediction that both hope dimensions will have a positive association with future academic achievement. When these relationships were controlled for general intelligence, divergent thinking, personality, and previous academic achievement, within the regression model, both hope measures predicted future academic achievement, with the regression suggesting pathways hope was a distinct predictor of academic achievement. However, there was a large degree of overlap ($r = .80$) between hope agency and hope pathways, and this correlation questions, at least for the current sample, whether these constructs are separate. Therefore, we would suggest caution in the interpretation of the current findings regarding the separate hope subscales, and would suggest that the finding that both hope measures predict future academic achievement when entered into the regression model after controlling for the other variables included here is the most salient finding. Therefore the findings of the current study are unable to inform the a priori aim of exploring whether the distinction can be made between which of the hope

Table 1
Mean (SD) scores and alpha coefficients for, and zero order correlations between, trait hope measures, Raven Progressive Matrices raw scores, divergent thinking, personality, 'A' level point scores, and final degree mark.

	Mean (SD)	α	1	2	3	4	5	6	7	8	9	10	11
1. Final degree mark	59.82 (7.6)	N/A	–	.23**	.31**	.52**	.46**	.31**	−.08	.28**	.16	.04	.38**
2. Hope agency	18.85 (7.7)	.90		–	.80**	.27**	.21*	.28**	−.38**	.19*	−.07	−.07	.02
3. Hope pathways	17.44 (6.9)	.87			–	.26**	.22*	.22*	−.32**	.12	−.01	−.07	.03
4. 'A' level point scores	271.16 (51.0)	N/A				–	.43**	.20*	−.11	.19*	.18*	.07	.31**
5. Raven Progressive Matrices raw scores	23.69 (7.2)	.92					–	.49**	−.06	.07	.28**	.05	.01
6. Divergent thinking	25.59 (12.2)	.88						–	−.06	.30**	.19*	.15	.02
7. Neuroticism	22.79 (7.7)	.74							–	.05	.15	.03	.03
8. Extraversion	31.33 (7.1)	.78								–	−.09	−.01	.11
9. Openness to Experience	32.63 (7.0)	.72									–	.05	.21*
10. Agreeableness	34.65 (7.0)	.71										–	−.16
11. Conscientiousness	32.95 (7.9)	.76											–

* $p < .05$.
** $p < .01$.

facets is responsible for any effect on future academic achievement.

The magnitude of the relationship between both aspects of hope and future academic achievement is notable. Hunsley and Meyer (2003) consider that an incremental validity of $r = .15$ should be considered 'a reasonable contribution' (p. 451) when other variables are controlled. Two hope facets together explained an R^2 of .03, which is equal to $r = .17$, exceeding Hunter and Meyer's criterion for a reasonable contribution.

Further research is now needed to detail some of the processes that are involved in the relationship by exploring how hope is related to academic self-efficacy, academic endeavors, or academic practice within this time period. Notwithstanding these future considerations, the current results suggest that hope may be important in predicting future academic achievement in tertiary level education, when a number of alternative explanations have been considered.

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