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Cognitive ability as a buffer to neuroticism: Churchill's secret weapon?

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Abstract

The combined effects of cognitive ability and neuroticism on performance in military assessment centres were investigated in two separate samples. We hypothesized that individuals with a “stress intolerant” profile of low ability and high neuroticism would perform worst. In Naval ($N = 607$) and Army ($N = 62$) samples this hypothesis was supported: performance ratings were negatively correlated with neuroticism only in the less cognitively able individuals; in the more cognitively able individuals, neuroticism was uncorrelated with performance. These data help to explain variation in associations between neuroticism and performance in applied fields. Taken together with other studies, results suggest that organisations could obtain extra predictive validity by measuring interactions between psychometric variables.

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1. Introduction

Cognitive ability correlates positively with performance in occupational settings (e.g. Schmidt & Hunter, 1998), but the relationship between the major personality dimension of neuroticism and applied performance is less clear: despite its presence in most models of personality, as well

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as its widespread clinical significance, neuroticism does not correlate consistently with performance in applied settings. For example, in a large-scale analysis [Barrick and Mount \(1991\)](#) found no significant relationship between emotional stability (low neuroticism) and job performance, except amongst professionals. More recently, [Barrick, Mount, and Judge \(2001\)](#), in a review of 100 years of research on personality-performance relationships, found that emotional stability was significantly related to performance in some occupations but not others.

One possible explanation for this variability is that high neuroticism individuals are prone to perform poorly in stressful environments (e.g. [McFarlane, 1989](#)); however, in stress-free environments their performance may be unimpaired, or even improved. There is some evidence to support this contention. For example, [Cattell, Eber, and Tatsuoka \(1970\)](#) found that people employed in five hazardous occupations (policeman, fireman, electrical engineer, airline pilot and hostess) tended to be less apprehensive, less tense, less imaginative and more emotionally stable than people employed in five non-hazardous occupations (janitor, nun, priest, foreman and artist). [Hallam and Rachman \(1980\)](#) found that bomb disposal operators were not only significantly more stable than the general population but also the most successful operators were significantly more stable than their lower performing colleagues. In addition, [Bartram and Dale \(1982\)](#) found that, whilst military pilot applicants as a group scored significantly lower on neuroticism than the general population, less neurotic individuals were more likely to pass pilot training - this trend seems to be a product of the additional stress of military aviation rather than flying per se, as civilian amateur pilots tend to be much closer to the general population norms in terms of average neuroticism scores than their military counterparts ([Bartram, 1995](#)).

2. The cognitive buffering hypothesis

These studies support the idea that high levels of neuroticism are debilitating in stressful occupational settings. They cannot, however, account for a subset of people who succeed in stressful occupational settings despite apparently high levels of neuroticism. A well-known historical example of such a person is Sir Winston Churchill who led Britain successfully through the Second World War despite a trait tendency to suffer from the characteristic signs of neuroticism, namely, anxiety, depression, hypochondria and fear of public speaking ([Moran, 1966](#)). Contemporary accounts suggest that Churchill may have succeeded because his cognitive resources buffered his neuroticism. For example, Churchill moderated his fear of public speaking with an elaborate routine of preparation ([Jenkins, 2001](#)), fought depression with physically creative pastimes such as bricklaying and painting, and reduced his tendency to worry with a primitive form of cognitive behaviour therapy that he described to his doctor in 1944: “It helps to write down half a dozen things which are worrying me. Two of them, say, disappear; about two nothing can be done, so it is no use worrying, and two perhaps can be settled” ([Moran, 1966, p. 167](#)). At an anecdotal level, these accounts of Churchill vividly suggest that cognitively able individuals may have a higher level of stress tolerance than their level of neuroticism might indicate.

In support of this possibility, [Eysenck \(1947\)](#) found that the cognitive ability scores of 5000 soldiers invalided out of the British Army for psychiatric reasons during World War II (the so called ‘war neurotics’) were on average significantly lower than the scores of 3665 normal soldiers. Eysenck was aware of the potential importance of ability in defining stress tolerance in interaction

with neuroticism, suggesting that “. . . army training imposes a considerable stress on the dull person, who may find difficulties in understanding and following instructions; this strain may lead to break-down in persons constitutionally disposed towards neuroticism” (Eysenck, 1947, p. 112). Unfortunately, Eysenck could not test this hypothesis because his subjects’ cognitive ability scores were obtained after they became ill and may have been an outcome rather than a cause of their breakdown. In recent years, however, this methodological problem has been rectified by several studies that related the incidence of posttraumatic stress disorder (PTSD) amongst Vietnam veterans to their cognitive ability scores measured prior to the onset of illness. These studies show that high pre-morbid ability seems to buffer PTSD (Macklin et al., 1998; McNally & Shin, 1995; Pitman, Orr, Lowenhagen, Macklin, & Altman, 1991; Watson, Davenport, Anderson, Mendez, & Gearhart, 1998).

If the evidence presented so far is taken as valid, and both high neuroticism and low ability reduce stress tolerance, then the poorest performers in stressful occupational environments should have a “stress intolerant” psychological profile of both low ability and high neuroticism (see Fig. 1). Three studies conducted in occupational environments have produced results consistent with this hypothesis. Allender and Greig (2000) found a statistically significant cognitive ability \times neuroticism interaction in a sample of trainee army officers, showing that neuroticism significantly correlated ($-.460, p < .05$) with performance, but only in the officers in the bottom 25% on cognitive ability; for officers in the next 50%, the correlation between neuroticism and performance declined to $.07 (p > .05)$; and for those in the top 25% on cognitive ability, neuroticism and performance were unrelated.

Corr and Gray (1995) found a significant interaction between ability and negative attributional style (a facet of neuroticism linked to self-blame and pessimism) on sales performance. This cross-over interaction revealed that high negative attributional style damaged sales in low ability sales-

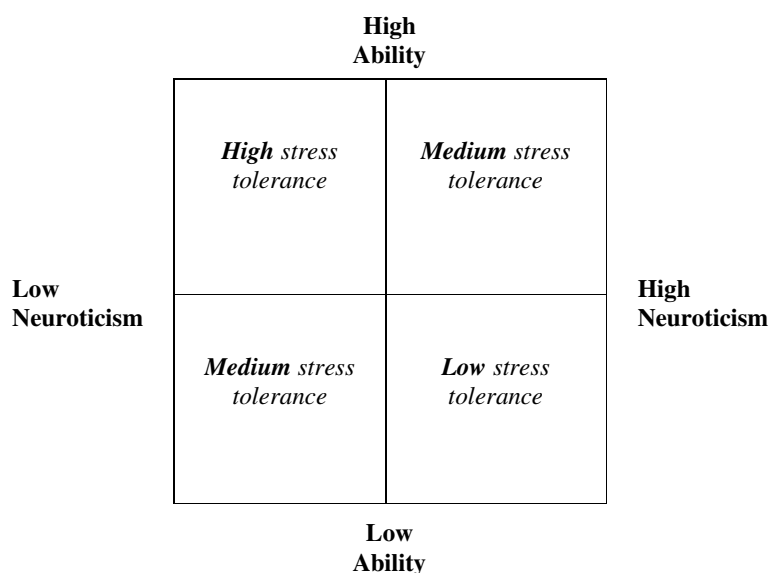


Fig. 1. Hypothetical relationship between stress tolerance, cognitive ability and neuroticism.

men but boosted sales in high ability salesmen. Perkins and Corr (2005) found a significant interaction between ability and worrying in a sample of financial sector managers. As in Corr and Gray (1995), this interaction was also of a crossover type: high worrying damaged performance, but only in low ability managers; in high ability managers, performance was boosted. In each of these three studies, the worst performers occupied the high neuroticism and low ability quadrant.

We here hypothesize that the worst performers in two samples of military officer candidates attending two different assessment centres will possess a “stress intolerant” profile of low ability and high neuroticism. This performance criterion, whilst inherently less meaningful than actual job performance, has the practical advantage of sampling the behaviour of individuals undergoing an intensive 3 day job selection process that is more objective and closely monitored than the ordinary workplace and that is generally regarded as one of the most useful and valid predictors of subsequent job performance (e.g. Gaugler, Rosenthal, Thornton, & Bentson, 1987).

3. Study 1

3.1. Sample

Participants were 607 candidates attending the Admiralty Interview Board (a well-validated assessment centre used to select Royal Navy officers). They were 98% white, 90% male, and aged between 17 and 26 years, with an average age of 22. During the assessment centre, as part of a research program, officer candidates also completed a paper-and-pencil measure of personality that did not count towards their performance ratings. All candidates possessed at least two A levels (roughly equivalent to graduating from high school), making this sample somewhat range restricted with respect to ability.

3.2. Psychometric predictors

3.2.1. Cognitive ability

Cognitive ability was measured with a written test battery comprising verbal reasoning, non-verbal reasoning, and spatial ability questions. Scores on this test have been shown to correlate around 0.30 ($p < .01$) with later academic performance at the Britannia Royal Naval College, the training establishment for Royal Navy Officers (Jarman & Abram, 1998).

3.2.2. Personality

The Trait Self-Description Inventory (TSDI; Collis & Elshaw, 1998; Roberts, Zeidner, & Matthews, 2001) measures the Big Five personality dimensions of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Tupes & Christal, 1961). TSDI consists of 172 items in two sections, the first containing 62 trait descriptive adjectives such as “cautious” to which the participant responds using a seven point scale where 1 represents “extremely not characteristic of me” and 7 represents “extremely characteristic of me”. The second section contains 110 statements (e.g. “I get rattled when I am under time pressure”) and the participant responds using a nine-point scale where 1 represents “very strongly disagree” and 9 represents “very strongly agree”. Internal consistency coefficients (Cronbach’s alpha) for TSDI lie between .80

and .96 (O’Keefe, 1999) with test-retest reliabilities of around 0.75 when administered over a 9 month interval in the UK (Schmit, 1997). Elshaw (unpublished analysis) found substantial overlap between scores on TSDI and the Gordon Personal Profile-Inventory (GPP-I): conscientiousness (TSDI) and responsibility (GPP-I) correlated .86, extraversion (TSDI) and sociability (GPP-I) correlated .69, agreeableness (TSDI) and personal relations (GPP-I) correlated .69, neuroticism (TSDI) and emotional stability (GPP-I) correlated $-.58$ and openness (TSDI) and original thinking (GPP-I) correlated .57. O’Keefe (1999) found some evidence for overlap with the NEO-PI-R in terms of predictive validity: the neuroticism factor of both questionnaires correlated negatively with performance in Canadian armed forces officer cadets ($-.42$ TSDI and $-.19$ NEO-PI-R).

3.3. Performance criterion

The assessment centre used to measure performance in this study originated early in the second world war, when the generally poor combat performance of British officers relative to their German counterparts had led the British authorities to suspect that the interviews then used for officer selection had worse validity than the assessment centre methods used by the German armed forces. In response to this situation, the British armed forces created their own group exercise-based assessment centre that has gone on to be refined into the present sophisticated 3 day procedure that uses interviews, group exercises and standardised cognitive ability tests to generate a final mark that is a moderately valid predictor of overall performance during Royal Navy officer training ($r = .37, p < .01$; Jarman & Abram, 1998). This final mark is unsuitable as a performance criterion because it takes into account the cognitive ability scores that form one of the predictor variables in this study. Instead, the mean of performance ratings on the two assessment centre group exercises (the command task and the group discussion) was used as the performance criterion. This variable has the benefit of not incorporating cognitive ability scores and yet has a very strong association with the final assessment centre mark ($r = .91, p < .01$).

The raters in the assessment centre were experienced officers from the Royal Navy and Royal Marines who received training in assessment best practice and used behaviourally anchored rating scales covering oral communication, problem solving, direction/influence that have acceptable inter-rater reliabilities of around .85 (Thomas, 1999). These procedures render the group exercises more objective than the interviews (known to be subject to many biases) that also feature in this assessment centre and so interview performances were not used in the criteria. Using this performance criterion rather than AC dimension scores had the additional advantage of avoiding the well-known problem with assessment centres whereby ratings of different AC dimensions tend to converge within exercises but not across the whole assessment centre (for a review, see Lievens & Klimowski, 2001).

3.3.1. Command task

This exercise directly examined skills required for work as an officer, through the completion of a series of tasks requiring each candidate to lead a team across a physical obstacle under stress caused by time pressure. For example, a typical command task might require a candidate to lead a team and a burden, such as a weighted stretcher, across a gap of five yards (representing a river), using only limited bridging materials such as ropes and wooden poles. Each candidate had 15 min

to plan a solution to the problem and 8 min to implement that plan. The quality of each candidate's plan and ability to direct and motivate the team was rated by the assessment personnel.

3.3.2. Group discussion exercise

This exercise was a leaderless task, assessing the extent to which a candidate could influence and take command of an unorganised/unstructured situation and help the group to reach a satisfactory solution to a set problem such as an imaginary survival situation arising from a plane crash on a deserted island. The candidates had 15 min to study the problem, 15 min to discuss it, 5 min to plan a presentation of their solution and 2 min to give that presentation. During the group discussion candidates had to solve time and distance problems as well as communicate effectively with other candidates and were rated on these behaviours by the assessment personnel.

3.4. Statistical analysis

Hierarchical multiple regression was used to test for the cognitive ability \times neuroticism interaction with cognitive ability and personality predictors being entered in step one and the hypothesised interaction term in step two of the analysis. Three-dimensional surface graphs were used to plot the interactions. Prior to analysis all data were standardised (Cohen, 1968) and then the interaction term was calculated; thus in step two of the hierarchical multiple regression, the predictive power of the interaction could be determined relative to the additive terms by inspection of the unstandardised *B* coefficient.

3.5. Results

Table 1 presents descriptive statistics and inter-correlations for personality, cognitive ability and performance ratings. Significant correlations were observed between performance and cognitive ability, extraversion, and agreeableness. There are also significant correlations among the personality dimensions, as well as between cognitive ability and personality (although these coefficients were modest in magnitude).

Table 2 presents the results of the hierarchical multiple regression analysis. Highly significant ($p < .01$) main effects of cognitive ability, extraversion, and agreeableness were observed, as well

Table 1
Descriptive statistics and inter-correlations for predictors and performance ratings in Study 1

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Openness	119	21	–					
2. Conscientiousness	157	18	.193**	–				
3. Extraversion	32	21	.013	.209**	–			
4. Agreeableness	152	20	.167**	.418**	.350**	–		
5. Neuroticism	127	27	.019	–.265**	–.339**	–.257**	–	
6. Cognitive ability	140	24	.123**	–.138**	–.112**	–.179**	.026	–
7. Performance	4.4	1.2	–.054	.001	.161**	–.099*	.013	.321**

Note: $N = 607$.

* $p < .05$.

** $p < .01$.

Table 2
Hierarchical multiple regression of predictor variables with performance in Study 1

Predictor of performance	<i>B</i> coefficients
<i>Step 1</i>	
Cognitive ability	.342**
Openness	-.100*
Conscientiousness	.088*
Extraversion	.257**
Agreeableness	-.130**
Neuroticism	.086*
<i>Step 2</i>	
Cognitive ability × Neuroticism	.071*

Note: $N = 607$.

Adjusted R^2 for Step 1 = .16, Adjusted ΔR^2 for Step 2 = .01 ($p < .05$).

* $p < .05$.

** $p < .01$.

as smaller effects of openness, conscientiousness, and neuroticism. The hypothesized cognitive ability × neuroticism interaction was also statistically significant ($p < .05$).

3.5.1. Cognitive ability × neuroticism interaction

Fig. 2 suggests that the lowest rated performers possessed high levels of neuroticism and low cognitive ability. This was confirmed by statistical testing which revealed a significant negative relationship between neuroticism and performance for officer candidates scoring in the lowest 25% on cognitive ability, $F(2, 156) = 4.72$, $p < .01$. For the remaining 75% of candidates, scoring higher on cognitive ability, the interactive impact of neuroticism declined and no further significant relationships were found.

4. Study 2

The main aim of Study 2 was to replicate the cognitive ability × neuroticism interaction found in Study 1 in a separate military sample using different performance criteria.

4.1. Sample

Participants were 62 candidates who attended the Regular Commissions Board, a well-validated assessment centre used to select British Army officers. They were 95% white, 79% male, and aged between 17 and 26 years, with an average age of 20. As with Study 1, participants attended the assessment centre for 3 days during which they completed the interviews, group exercises and pencil-and-paper measures of cognitive ability that make up the officer selection process. During this period, as part of a research program, officer candidates also completed a paper-and-pencil measure of personality. The sample was moderately range restricted on ability as all candidates possessed at least two A levels (roughly equivalent to graduating from high school).

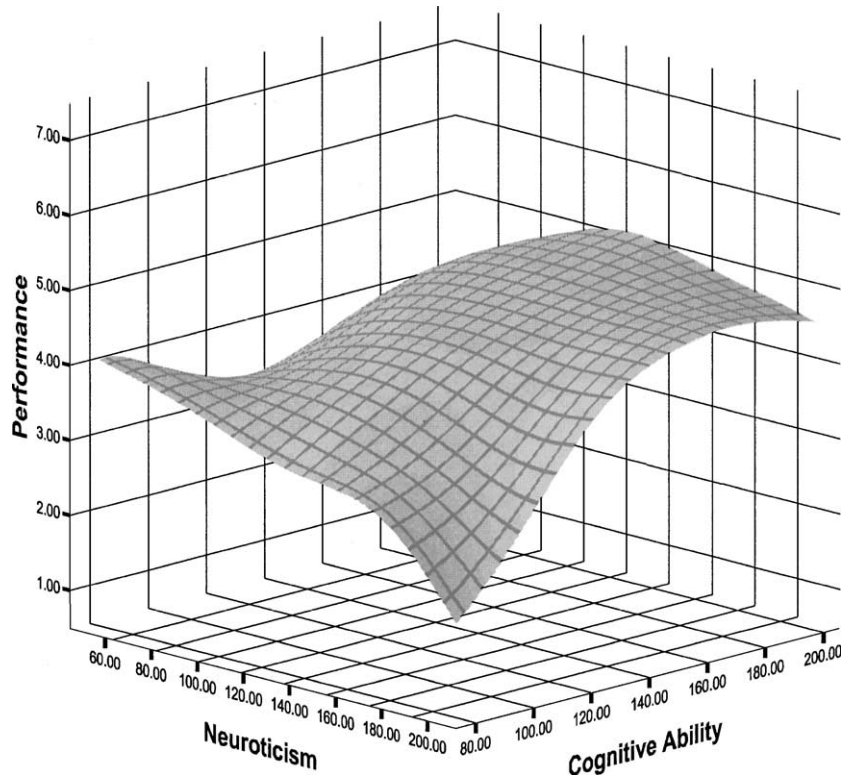


Fig. 2. Cognitive ability \times neuroticism interaction on performance ratings in Study 1.

4.2. Psychometric predictors

4.2.1. Ability

Cognitive ability was measured using a written test similar to that used in Study 1.

4.2.2. Personality

As with Study 1, neuroticism was measured with the TSDI personality inventory, however time limitations required that a short scale version of TSDI be used, consisting of 62 adjectives. This has not been used before but has an acceptably reliable neuroticism scale (Cronbach's alpha = .79). A factor analysis carried out during the initial development of OCEAN ($N = 1279$) and quoted in the OCEAN manual (Collis & Elshaw, 1998) shows that all but two of the adjectives used in the neuroticism scale had loadings of .5 or above on factor 1 (neuroticism), suggesting it measures similar qualities to the full scale.

4.3. Performance criterion

A composite of ratings obtained on exercises similar to those in Study 1 formed the performance criterion (further description would add little to that given in Study 1). These ratings cor-

relate around 0.35 with later officer performance (Elshaw, Abram, & Weston-Lovelock, 1997), and have moderate to good (.4–.9) levels of inter-rater reliability (Weston-Lovelock & Abram, 1996). As with Study 1, the assessors were experienced officers who assessed the participants over 3 days and used behaviourally anchored scales (BARS) for ratings: the main difference between the two assessment centres is that the assessors in Study 2 placed greater emphasis on physical strength and fitness, reflecting the less sedentary nature of the army officer role compared to that of a naval officer.

4.4. Statistical analysis

Inclusion of the complete big five personality model in the regression in Study 1 permitted the assessment of the predictive power of the cognitive ability \times neuroticism interaction relative to the factor space of personality defined by the five factor model, and to discount the possibility that the significant cognitive ability \times neuroticism interaction might be more parsimoniously explained by variance in one or more of the other four factors. This procedure however has a cost: the inclusion of four personality factors other than neuroticism inflated the experiment-wise error rate in this regression. The hierarchical multiple regression used in this replication study therefore contained only cognitive ability and neuroticism (in step one) and the hypothesised interaction term (in step two) in order to provide a much lower experiment-wise error rate than Study 1 and so a more rigorous test of our interaction hypothesis. All other statistical procedures were the same as Study 1.

4.5. Results

Table 3 presents descriptive statistics and inter-correlations for neuroticism, cognitive ability and performance. There was a significant ($p < .01$) correlation between cognitive ability and performance. Table 4 presents the results of the hierarchical regression analysis. A significant main effect of cognitive ability was observed ($p < .01$). The cognitive ability and neuroticism interaction was also statistically significant ($p < .05$).

4.5.1. Cognitive ability \times neuroticism interaction

As in Study 1, low levels of performance were associated with a combination of high neuroticism and low cognitive ability (the graph is omitted to save space). Statistical testing showed that

Table 3
Descriptive statistics and inter-correlations for predictors and performance ratings in Study 2

Variable	<i>M</i>	<i>SD</i>	1	2	3
1. Neuroticism	35	9	–		
2. Cognitive ability	4.2	1.4	–.022	–	
3. Performance	3.2	1.7	.012	.468*	–

Note: $N = 62$.

* $p < .01$.

Table 4
Hierarchical multiple regression of predictor variables with performance in Study 2

Predictor of performance	B coefficients
<i>Step 1</i>	
Cognitive ability	.416**
Neuroticism	.009
<i>Step 2</i>	
Cognitive Ability × Neuroticism	.255*

Note: $N = 62$.

Adjusted R^2 for Step 1 = .19, Adjusted ΔR^2 for Step 2 = .07 ($p < .05$).

* $p < .05$.

** $p < .01$.

there was a significant negative relationship between neuroticism and leadership potential only in officer candidates scoring in the lowest 25% on cognitive ability, $F(1, 13) = 4.28$, $p < .05$.

5. General discussion

Our aim was to test the hypothesis that the poorest levels of performance in military officer selection, which is a good predictor of operational performance, would be associated with a “stress intolerant” profile of low ability and high neuroticism. Support for this hypothesis was found in two separate samples, in which neuroticism was negatively correlated with ratings of performance only in candidates at the lower end of the ability scale. Overall these results suggest that individuals with low cognitive ability and high levels of neuroticism are less suited to stressful occupational environments, especially military ones, than individuals with other combinations of cognitive ability and neuroticism.

These findings are in broad agreement with the view of Claridge and Davis (2001), who argue that neuroticism acts mainly in interaction with other psychological variables, as well as with earlier studies showing significant interactions between cognitive ability and negative emotion (e.g. Allender & Greig, 2000; Corr & Gray, 1995). However, these studies show variation in the specific shape of the interaction, suggesting that other factors, possibly the situation, may play a role in determining the precise effect on performance of ability and neuroticism factors.

A possible causal mechanism for interactions between ability, neuroticism and situational factors is provided by findings that anxiety has an adverse effect on cognitive performance, particularly in complex tasks that require the use of working memory under stressful conditions (Darke, 1988; Dutke & Stoebber, 2001; Eysenck, 1985; MacLeod & Donnellan, 1993; Sorg & Whitney, 1992). If individuals scoring lower on tests of ability do indeed have fewer cognitive/intellectual resources (e.g. working memory) with which to absorb the cognitive load imposed by anxiety (e.g., rumination and worry) and still leave sufficient resources to attend to the task, low ability individuals’ performance should be more impaired by neuroticism under stressful conditions than that of higher ability individuals.

Why then, are cognitive ability and neuroticism interactions not commonly reported in occupational samples? Aside from the obvious reason that few studies have looked for them, a problem in typical employment situations is the effect of non-random attrition, whereby underperforming employees are selectively removed from the sample over time. Thus, if a study is undertaken several years after recruitment, this non-random attrition may increase the homogeneity of the sample with regard to performance-related individual differences variables so that these variables no longer possess sufficient variance to predict performance (this especially applies to interactive effects that may require greater statistical power than additive effects to be detected; Aguinis & Stone-Romero, 1997; Wahlsten, 1990). In the present samples, such attrition was not a problem as assessment centre performance was measured during selection.

In summary, results from two separate studies reveal a statistically significant and practically useful interaction between two of the most important psychological variables that predict organisational behaviour better than additive effects alone, with the interaction terms accounting for 1% incremental variance in Study 1 and 7% in Study 2 (values as low as 1% have utility in large scale selection scenarios, Schmidt & Hunter, 1998). We have not investigated the causal processes underlying these factors, which call for further research. We predicted and confirmed the cognitive ability \times neuroticism interaction and then replicated it on a different sample. We suggest that future validation studies may also benefit from testing this interaction, especially in stressful settings, where “stress intolerant” individuals may impair organisational performance.

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References

- Aguinis, H. G., & Stone-Romero, E. (1997). Methodological artifacts in moderated multiple regression and their effects on statistical power. *Journal of Applied Psychology, 82*, 192–206.
- Allender, C., & Greig, J. (2000). Does the army need an OCEAN? In *Proceedings of the 42nd annual conference of the International Military Testing Association* (pp. 208–221).
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel Psychology, 44*, 1–26.
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *Personality and Performance, 9*, 9–29.
- Bartram, D. (1995). The predictive validity of the EPI and 16PF for military flying training. *Journal of Occupational and Organizational Psychology, 68*, 229–236.
- Bartram, D., & Dale, H. C. A. (1982). The Eysenck Personality Inventory as a selection test for military pilots. *Journal of Occupational Psychology, 55*, 287–296.
- Cattell, R., Eber, H., & Tatsuoka, H. (1970). *Handbook for the Sixteen Personality Factor Questionnaire*. Windsor, Berkshire: National Foundation for Educational Research.
- Claridge, G., & Davis, C. (2001). What's the use of neuroticism? *Personality and Individual Differences, 31*, 383–400.
- Cohen, J. (1968). Multiple Regression as a general data-analytic system. *Psychological Bulletin, 70*, 426–443.
- Collis, J. M., & Elshaw, C. C. (1998). *The development of the trait self description inventory: results of US/UK collaboration*. TTCP/HUM/98-001.

- Corr, P. J., & Gray, J. A. (1995). Attributional style, socialization and cognitive ability as predictors of sales success: a predictive validity study. *Personality and Individual Differences, 18*, 241–252.
- Darke, S. (1988). Effects of anxiety on inferential reasoning task performance. *Journal of Personality and Social Psychology, 55*, 499–505.
- Dutke, S., & Stoebber, J. (2001). Test anxiety, working memory, and cognitive performance: supportive effects of sequential demands. *Cognition and Emotion, 15*, 381–389.
- Elshaw, C. C., Abram, C. M. & Weston-Lovelock, K. (1997). *The validation of the behavioural anchored rating scales and the overall assessments at the Regular Commissions Board*. DERA/CHS/HS3/CR97022/1.0.
- Eysenck, H. J. (1947). *The dimensions of personality*. London: Kegan Paul, Trench and Trubner.
- Eysenck, M. W. (1985). Anxiety and cognitive-task performance. *Personality and Individual Differences, 6*, 579–586.
- Gaugler, B. B., Rosenthal, D. B., Thornton, G. C., & Bentson, C. (1987). Meta-analysis of assessment centre validity. *Journal of Applied Psychology, 72*(3), 493–511.
- Hallam, R. S., & Rachman, S. J. (1980). Courageous acts or courageous actors? *Personality and Individual Differences, 1*, 341–346.
- Jarman, J., & Abram, M. (1998). *Validation of the Admiralty Interview Board 1996/1997*. DERA Report DERA/CHS/HS3/CR97025/1.0.
- Jenkins, R. (2001). *Churchill*. London: MacMillan.
- Lievens, F., & Klimowski, R. J. (2001). Understanding the assessment centre process: Where are we now? In C. L. Cooper & I. T. Robertson (Eds.). *International review of industrial and organizational psychology* (Vol. 16, pp. 245–286). Chichester: John Wiley & Sons, Ltd..
- Macklin, M. L., Metzger, L. J., Litz, B. T., McNally, R. J., Lasko, N. B., Orr, S. P., et al. (1998). Lower precombat intelligence is a risk factor for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 66*, 323–326.
- MacLeod, C., & Donnellan, A. M. (1993). Individual differences in anxiety and the restriction of working memory capacity. *Personality and Individual Differences, 15*, 163–173.
- McFarlane, A. C. (1989). The aetiology of post-traumatic morbidity: predisposing, precipitating and perpetuating factors. *British Journal of Psychiatry, 154*, 221–228.
- McNally, R. J., & Shin, L. M. (1995). Association of intelligence with severity of posttraumatic stress disorder symptoms in Vietnam combat veterans. *American Journal of Psychiatry, 152*, 936–938.
- Moran, Lord (1966). *Winston Churchill: The struggle for survival 1940–1965*. London: Constable.
- O’Keefe, D. F. (1999). Investigating the use of occupational personality measures in the Canadian forces. In *Proceedings of the 41st International Military Testing Association Conference, Monterey CA, November 1999*.
- Perkins, A. M., & Corr, P. J. (2005). Can worriers be winners? The association between worrying and job performance. *Personality and Individual Differences, 38*, 25–31.
- Pitman, R. K., Orr, S. P., Lowenhagen, M. J., Macklin, J. L., & Altman, B. (1991). Pre-Vietnam contents of posttraumatic disorder veterans’ service medical and personnel records. *Comprehensive Psychiatry, 32*, 416–422.
- Roberts, R. D., Zeidner, M., & Matthews, G. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotion, 1*, 196–231.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*, 262–274.
- Schmit, V. P. (1997). *Personal communication quoted in the OCEAN manual*. DERA Report DERA/CHS/HS3/CR97072/1.0.
- Sorg, B. A., & Whitney, P. (1992). The effect of trait anxiety and situational stress on working memory capacity. *Journal of Research in Personality, 26*, 235–241.
- Thomas, L. J. (1999). *Reliability of the RN Admiralty Interview Board*. DERA Report DERA/CHS/MID/CR990179/1.0.
- Tupes, E. C., & Christal, R. E. (1961). *Stability of personality factors based on trait ratings*. USAF ASD Technical Report No. 61–97, Lackland Air Force Base, TX: US Air Force.
- Wahlsten, D. (1990). Insensitivity of the analysis of variance to heredity-environment interaction. *Behavioral and Brain Sciences, 13*, 109–161.

- Watson, C. G., Davenport, E., Anderson, P. E. D., Mendez, C. M., & Gearhart, L. P. (1998). The relationships between premilitary school record data and risk for posttraumatic stress disorder among Vietnam war veterans. *Journal of Nervous and Mental Disease*, *186*(6), 338–344.
- Weston-Lovelock, K., & Abram, M. (1996). *Establishing the reliability of behaviourally anchored rating scales at the RCB*. PLSD/CHS/HS3/CR96055/1.0.