

# Intellectual competence

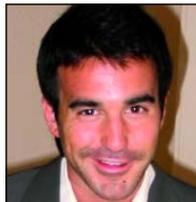
**M**OST applied psychologists – clinical, educational, organisational – feel the need to use cognitive ability tests for specific diagnostic purposes or educational and personnel selection. However enthusiastic or sceptical they may be about the validity of these tests, nearly all acknowledge that there are other individual differences that interact with intelligence to predict particular behaviours they are interested in. This has led researchers to invent new concepts (such as emotional, practical, and successful intelligence) in order to bestride the two great pillars of differential psychology: personality and intelligence.

However, since both personality and intelligence are valid predictors of achievement, there is no need to invent new concepts. Rather, the aim should be to use both established ability and non-ability traits. In this article we argue that an integration of personality and intelligence represents the best way to understand and predict individual differences underlying future achievement.

## **A century on from Spearman**

One hundred years have passed since the first major benchmark in psychometric research, namely the publication of Spearman's (1904) ability theory. Differential psychologists have finally started to admit that although general intelligence (*g*) may be the most powerful predictor of human performance, there is plenty of room for improving this prediction (Lubinski, 2004).

It also seems to be the case that, whilst we have largely succeeded at measuring individual differences in cognitive abilities,



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*understand, assess and predict*  
*individual differences in achievement.*

we are still speculating about some of the most essential aspects of human intelligence – why and how some people end up being smarter than others. And when it comes to the prediction of future achievement, neither lay people nor experts seem able to agree on the identification of all major determinants of future success and failure, let alone to explain them. This is despite the fact that virtually every attempt to measure intelligence has been, is, and will continue to be an attempt to understand and predict individual differences in future achievement.

We believe that an integration of ability and non-ability traits (together with an understanding of the links between different traits and their implications for assessment) represents the most important route towards a comprehensive and effective framework for the prediction of future achievement. We refer to this integration in terms of intellectual competence.

Intellectual competence is an overarching construct comprising cognitive and non-cognitive traits, based on the identification of empirically observable individual differences leading to differences in future achievement. It is aimed at separating those more likely to achieve from those less likely to achieve, not only by considering levels of maximal performance, but also taking into account typical patterns of behaviour (interests and personality traits) as well as self-assessed abilities. Accordingly, intellectual competence results from the product of intelligence (both self-perceived and 'actual') and personality traits.

## **The link between personality and intelligence**

Personality and intelligence have a

historical independence, with personality having more statistical and psychometric origins and intelligence springing from a clinical context. But it ought to be clear that the fact that some people are better than others (at reasoning, learning, or any other skill) is an essential aspect of their personality. This position was expounded as early as the mid-1980s by Eysenck (Eysenck & Eysenck, 1985), who went further to distinguish between temperament (the non-cognitive aspect of personality) and intelligence (its cognitive aspect).

Nonetheless, Eysenck's nomenclature had seemingly low impact, and academics – almost as much as lay people – continued to refer to people's general predispositions and style in terms of personality, and to people's skills, aptitudes, or abilities in terms of intelligence. On a more empirical note, Eysenck (1994) himself explicitly stated that temperament and intelligence are unrelated constructs, leaving little room for a theoretical integration of both disciplines (and concepts).

However, Cattell (who also conceptualised and assessed intelligence as part of personality) speculated on the developmental (causal) effects of non-ability traits on intelligence, arguing that many stylistic attributes may lead to the development of intellectual ability (Cattell 1971/1987). This would take place through investment – the level of effort to pursue new skills and ultimately increase levels of crystallised abilities and acquired knowledge. Thus, although some aspects of cognitive ability remain unmodified and fixed from the influence of temperament, other aspects can be affected and changed by experience, efforts and investment.

Large-scale analyses by Ackerman and Heggestadt (1997) have shown that

## **WEBLINKS**

Intelligence: [www.indiana.edu/%7Eintell/](http://www.indiana.edu/%7Eintell/)

Personality traits: [tinyurl.com/ctbqz](http://tinyurl.com/ctbqz)

Big Five dimensions: [tinyurl.com/bb9p8](http://tinyurl.com/bb9p8)

Cattell: [www.cattell.net/devon/rbcmain.htm](http://www.cattell.net/devon/rbcmain.htm)

Multiple intelligences: [tinyurl.com/6sq7k](http://tinyurl.com/6sq7k)

Openness to Experience, a personality trait referring to people's levels of intellectual curiosity and interests, is positively correlated with cognitive ability tests. Although other personality traits seem only modestly related to cognitive ability measures, most of the major personality dimensions (Neuroticism, Extraversion, Conscientiousness and, again, Openness to Experience) are consistently correlated with indicators of achievement, notably academic exam grades (Chamorro-Premuzic & Furnham, 2005). This not only supports Cattell's theory of investment, but also the idea that future achievement is largely a by-product of ability and non-ability traits.

### **The criterion is future achievement, not IQ!**

A great deal of the dispute concerning the relationship between personality and intelligence (and their surrogate concept of performance) is simply semantic disagreement and untidiness. Further, the emphasis on either personality or cognitive ability has simultaneously overlooked the most important (and original) variable at the centre of differential psychology – future achievement.

In the case of intelligence research and theory, the aim has always been the prediction of performance (specifically in academic, but more recently in occupational, settings). However, the enthusiasm in having identified a powerful predictor of performance has shifted interest from goals (achievement) to means (IQ). In the case of personality theory and research, the criteria have been much wider, but it has become clear in the last 20 years or so that self-reported inventories can predict individual differences in performance almost as accurately as cognitive ability tests.

If non-ability traits such as Neuroticism, Extraversion, and Openness to Experience are related to established measures of intelligence, it ought to be clarified whether they affect merely test performance, or whether they have long-term causal effects on the development of skills and crystallised abilities (either way, they are relevant). If, on the other hand, non-ability traits are unrelated to *g*, they are still important because they account for unique additional variance in performance outcomes, such as academic achievement and occupational success. Any of these possibilities would indicate that an

individual's likelihood to succeed in real-world settings – their intellectual competence – would be best estimated by assessing both intelligence and personality.

Now is the time to tackle this challenge. After long years of theoretical and methodological debate on the assessment of personality traits, the consolidation of the Big Five personality framework (Costa & McCrae, 1992) has provided researchers with a common currency to trade findings, and a shared language to communicate them. In psychometric terms, this means we no longer have to demonstrate that there are consistent and measurable patterns underlying behaviour; we can finally focus on investigating and exploring the importance of personality in everyday life.

Similarly, the validity of IQ in the prediction of achievement remains strong:

### **Have we improved predictive understanding since Spearman?**

most claims against the usefulness and meaning of cognitive ability are unfounded and unjustified. Theories of 'hot intelligences' (such as emotional, practical, social, and successful intelligence), albeit important in the sense of encouraging a search for determinants of achievement beyond IQ, are flawed in their efforts of replacing the *g* factor, and have mostly relied on self-reports and therefore assessed a combination of already established personality attributes.

### **Self-assessed abilities**

The role of self-assessed abilities in determining levels of performance has been extensively discussed and demonstrated by the once pioneering (and now familiar) work of Bandura (1986); specifically the concept of self-efficacy, which refers to

an individual's subjective evaluation and expectations of their ability to effect desired outcomes.

Several current research paradigms within differential psychology have conceptualised a number of related constructs and theories to emphasise the role of self-expectations and subjective evaluations of abilities. Some examples are trait emotional intelligence (or emotional self-efficacy), metacognition, the distinction between entity and incremental conceptions of intelligence, and, recently, subjectively assessed intelligence (SAI).

The concept of SAI is not only relevant in terms of improving the prediction of performance, but also for its position as mediator between established personality traits and ability measures. Psychometric studies have shown that SAI is significantly related to both ability and established personality dimensions (this evidence is consistent with Eysenck's idea that self- and other-assessed intelligence is affected by both personality and 'actual' abilities). In addition, it can be hypothesised that SAI may, like other personality traits, play a relevant role in determining investment.

### **Intellectual competence and the achievement spiral**

Differential psychologists ought to decide whether their priority is to continue to validate the (already established and validated) construct of *g*, or attempt to maximise their understanding and prediction of future achievement. Furthermore, despite the conclusive evidence for the genetic basis of *g*, the identification of the factors and processes underlying individual differences in crystallised abilities (notably knowledge) remains an unaccomplished mission. Both issues may be clarified by an integration of ability and non-ability determinants of future achievement.

Figure 1 presents a graphical depiction of the concept of intellectual competence. The spiral represents the process of growth and evolution, from the more biologically based cognitive processes and fluid abilities (*gf*), to the more experienced-based stages of knowledge (*gc*). The passage from *gf* to *gc* is multi-determined and several non-ability traits are involved, from the more biologically influenced individual differences in Neuroticism and Extraversion, to the more acquired ones in Openness, Conscientiousness, and SAI. Individual differences in *gf* and

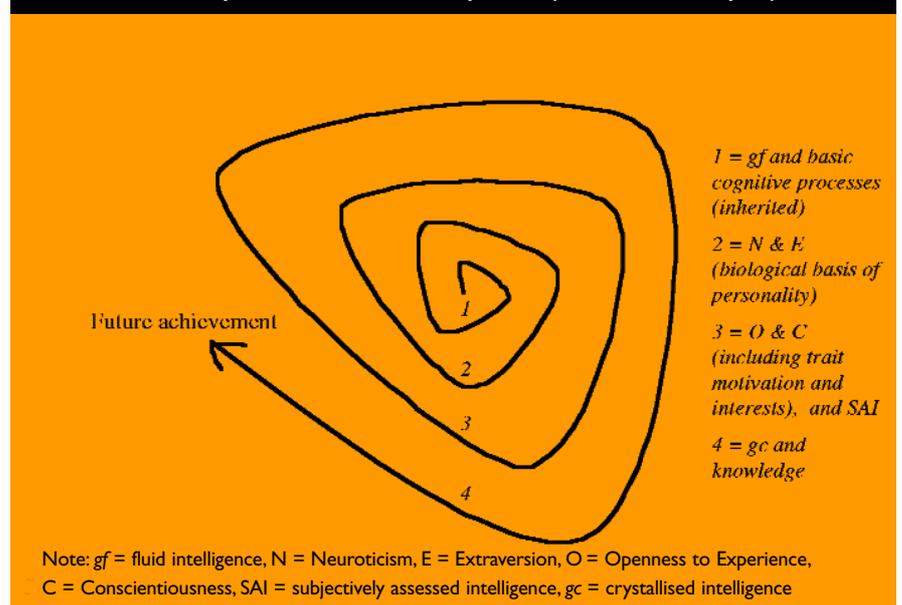
cognitive processes determine an individual's capacity to learn new things and solve novel problems. Neuroticism and Extraversion may affect an individual's level of confidence (SAI) and their interests in studying (higher in the case of introverts). A combination of high Openness and high Conscientiousness will lead to higher levels of typical intellectual engagement (Goff & Ackerman, 1992): Openness may be specifically relevant in shaping interests and boosting creative work, whilst Conscientiousness may determine work ethic and achievement motivation. SAI, which is higher at higher levels of *gf* and Extraversion, and at lower levels of Neuroticism, will play an important role in determining an individual's decision to pursue ambitious goals and have self-fulfilling effects on performance. Finally, individual differences in *gc* and knowledge, which develop from all previous traits and stages of the spiral, represent our best estimation of an individual's potential for future achievement.

Our own programme of research (summarised in Chamorro-Premuzic & Furnham, 2004, 2005) has made significant progress in identifying psychometric empirical links between the different

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**FIGURE 1** Development of intellectual competence (the achievement spiral)



components of the spiral, although longitudinal and experimental studies are deemed necessary.

### A third way in differential psychology

A comprehensive evaluation or assessment of the problems and potential of any individual inevitably must include assessing the cognitive abilities, traits, motives and self-concept (Chamorro-Premuzic & Furnham, 2004). The various factors are related and operate over time together to predict stable patterns of behaviours clearly observable in the clinic, classroom and office.

We have used the term intellectual competence both to acknowledge the primacy of cognitive abilities and the longstanding developmental effects of personality traits, which, through investment, may determine level of future achievement. Intellectual competence may therefore represent a third way in differential psychology: it is not supportive of the old 'right' claim that biologically inherited abilities are the major determinant of future success, but it is not in agreement with the more recent 'left' claim that traditional (psychometric) abilities are useless to predict achievement in the real world.

The division between *g* advocates (who refuse to look beyond psychometric intelligence and think everything can be explained in terms of differences in IQ)

and the creators of 'hot intelligences' (who seem more aware of the commercial profitability of attacking IQ than of the longstanding evidence for its predictive power) can, and must, be overcome. In the concept of intellectual competence, we envisage a robust theoretical framework that is capable of bridging the gap between the left and the right and bringing real progress to differential psychology.

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### DISCUSS AND DEBATE

Do you think there are sex differences in intelligence?

What do you understand by the word 'competence'?

What are the crucial individual differences factors in (a) work settings and (b) academic settings?

Do you think companies should use more or fewer IQ tests when recruiting?

Have your say on these or other issues this article raises. Write to our Letters page on [psychologist@bps.org.uk](mailto:psychologist@bps.org.uk) or contribute to our online forum on this or any other topic – go to [www.thepsychologist.org.uk](http://www.thepsychologist.org.uk) and follow the links.