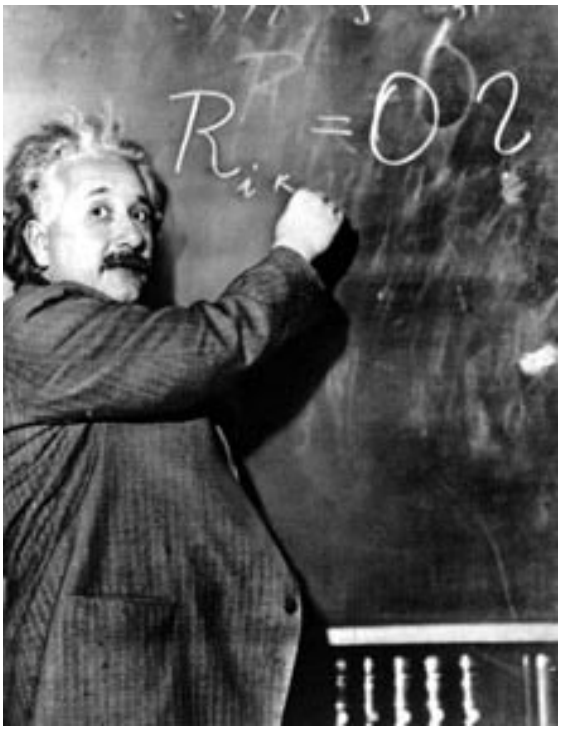

Beyond IQ – Advances in Assessment of Intellect

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The traditional view of intelligence and its applications are challenged by a new model based on the capacity to handle complexity. The paper explores the validity of the 8-layer complexity model. While traditional measures of intelligence explain success up to technical-expert level and early management levels, they bear hardly any relationships with success at higher organisational levels. The complexity model was correlated far strongly with success across the all organisational levels

Introduction

The mainstream study and application of assessment of intellectual capability has not progressed much since the pioneering work of Wechsler and Galton. An examination of early books on human intellect (Board of Education, 1924; Vernon, 1938; Welton, 1891), suggests that many of the ideas and their applications are still relevant and current in the 21st Century. More specifically, the concept of IQ and the components of human intelligence developed a century ago are still prominent in the field of assessment of intellectual capability.

Test publishers managed to package test items in far more appealing and modernised ways, they have significantly improve presentation and language used, they introduce far more interactive IT driven test items, and they might as well used different terms instead of IQ (e.g., critical analysis and the like). However, conceptually, there is not much difference in what early ability tests measured and what contemporary ability tests measure nowadays. The application of psychometric instruments used in the 1st world war to select British Pilots, seems applicable to current requirements.

This paper explores a preliminary work using a different model of assessing human capability. The model uses the work of Elliot Jaques (1989) as a starting point, but progresses into different routes. It departs from the traditional model of the G factor, and the content-specific sub-sets that distinguish between various forms of reasoning (e.g., verbal, numerical, abstract, or mechanical). And looks at more eclectic approach, examining the ability to understand, and manage complexity. It shifts the emphasis from what can be called 'Academic Intelligence' (IQ) into the more business environment of 'Executive Intelligence' and complexity of business decision making. It departs from the view of evolutionary nature of human capability and suggests discontinuous and distinct steps in human capability.
More specifically, the proposed model suggests that there are 8 discontinuous and distinct layers of potential capability and that people develop by discontinuous periodic jumps (rather than linearly) from one complexity state to the next. The 8 layers are universal and cuts across organisations, industries, and nations. The ability to handle complexity is not static. It matures with age in a predictable manner. For applied purposes, the level

of work complexity should be in line with the person's potential capability. There are 8 parallel level of complexity in organisational roles that correspond with complexity of mental processes (see Box #1).

BOX #1 The 8 levels of the Complexity Model:

1. **Retrieval Thinking –** Best Practice. Operating in a structured methodical way, covering all the relevant information, and interpreting the information correctly.
2. **Affirmative Thinking –** Pattern Recognition. Creating a potential logical explanation or solution, based on a series of independent pieces of data. It is about bridging gaps in information, by seeking linkages between independent pieces of information.
3. **Convergent Thinking –** Critical Analysis. Examining and evaluating given hypotheses. Using systematic reasoning to identify a correct answer from a series of available options. It involves verification of hypotheses. It equates what in everyday language is referred to as pure intellect.
4. **Divergent Thinking –** Creativity. It involves the opening up or creation of new hypotheses, using induction – exploring the mass of information to identify possible trends and patterns – Thinking of many original, diverse, and elaborate ideas. Taking separate elements and blending them into something completely new and original. Combining previously unconnected ideas, information and elements to create something new.
5. **System Thinking –** Innovation. It involves the application of creative ideas into the wider system and ensuring that these are viable, by exploring elements as a whole (or holistically) including the various types of relationships between the many elements in a complex system. Turning new ideas into practical reality, by understanding of the system in which the creative input will be placed, and their immediate and long-term implications.
6. **Transformation Thinking –** Reframing. It involves visioning a new future, and repositioning of systems of information in a new perspective. It gives a new life and meaning to well-established structures, arrangements, and systems, by turning these on their head or viewing them from a completely different perspective, that enable them to achieve future vision.
7. **Reconstructive Thinking –** Re-forming. It involves dismantling complex settings and re-building as something quite different. It takes the reframed reality, breaks it to pieces and re-models it to be fit for purpose. It involves inducing and deducing global information systems to solution routes.
8. **8. New World Thinking –** Revolution. The creation of a new body of knowledge that takes our current understanding of the world to a new level. It involves challenging the most fundamental building blocks of our reality, and replacing them with something rather different, new, and unexpected. It replaces old world with a new one, a world that is significantly different (never the same) from what was known before.

One of the key challenges that the complexity model poses to the traditional view of human intelligence is that it focuses only on Convergent Thinking – Pure logic and systematic verification of hypotheses. It is about narrowing down options to a single logical and correct answer. This is typifies in the common way of assessing Convergent Thinking – i.e., seeking a single correct answer from 4 possible options (multiple-choice method). The complexity model recognises the importance of Convergent Thinking, but views it as only level 3 on the 8-level model. Consequently, it suggests that Convergent Thinking will explain success and high performance in roles that require and heavily reliant on Convergent Thinking – i.e., technical-expert roles or lower management roles. For higher level roles, convergent thinking will have importance, but other levels of thinking or handling complexity become more important. The higher the hierarchical role, the less importance is placed on Convergent Thinking.

A secondary challenge explores the effect of age. While traditional measures of intelligence are known to have a negative correlation with age; the complexity model explicitly suggests that the ability to handle complexity improves with age. Thus, the pure use of traditional measures of intelligence will show bias in favour of young

people. Consequently, a hiring recommendation based on traditional measures of ability will favour young candidates. This seems counter-intuitive as it neglects the knowledge and experience that more mature candidates bring. The complexity model accounts for knowledge and experience.

Objectives

Explore the validity of the complexity model and contrast it with the validity of traditional measures of human intelligence in explaining success and high performance in a business context.

Hypothesis #1: While traditional measures of human intelligence will explain success up to a technical-expert level, their ability will decrease linearly from that point as a function of role complexity. Measures of complexity, on the other hand, will explain success across all hierarchical levels.

Hypothesis #2: The predictive validity of traditional measures of intelligence is impaired by the effect of age; whereas the predictive validity of complexity measures is not negatively affected by age.

Design

The study is of 70 managers from 5 different organisations.. It used regression and correlation approach to explore and contrast the effect of traditional versus complexity measures of intelligence in explaining success and performance in a business environment.

Method

Sample: The sample included 70 participants who took part in a talent identification and management programmes. Participants were from 5 different organisations.

Predictors: (a) 2 Traditional measures of intellect (verbal and numerical) – Watson and Glaser Critical Thinking Analysis and Rust Advanced Numerical Reasoning Appraisal (RANRA). (b) 2 sets of measures of handling complexity. First, complexity profile – scores on each of the 8 levels of the complexity model; second, a single aggregate score base don the 8 scores.

Criterion: The hierarchical level of the participant, using the 8-level organisational role complexity scale.

Control Variables: Age and the 28 personality measures derived from the Hogan instruments (HPI, MVPI, and HDS).

Results

Table #1 displays a correlation matrix amongst the study variables. Further analysis controlled for the effect of age through partial correlations. The results suggested that the Complexity Score correlated strongly with the success criteria (r = .80, $p< .0001$). The traditional intelligence measure (verbal and numerical reasoning) were barely significant (r = .27 and .29), and just below significance level when controlled for age (r = .23 and .24). As expected, the traditional intelligence measure correlated strongly with level 3 of the complexity model – namely 'Convergent Thinking' (r =.80 and .75). These correlations with higher thinking levels dropped in a relatively linear fashion.

A stepwise regression analysis explained 68% of the criterion's variance, R^2 =.678, $F(2,69) = 69.9$, $p < .0001$. Only 2 predictors entered the regression equation, namely – Complexity Score (β = .52) and Level 5: System Thinking (β = .31).

TABLE#1: Correlations and Partial Correlations Matrix for key variables (*n* = 70)

	Bivariate				Partial: control for age			
	1	2	3	4	1	2	3	4
Criteria								
1. Role Level								
Predictors								
2. Verbal Reasoning	.27				.23			
3. Numerical Reasoning	.29	.87			.24	.85		
4. Complexity Score	.80	.29	.26		.80	.27	.24	
Complexity Levels								
5a. #1 Retrieval Thinking	.29	.44	.42	.23	.26	.40	.37	.21
5b. #2 Affirmative Thinking	.50	.59	.61	.52	.28	.56	.59	.51
5c. #3 Convergent Thinking	.41	.80	.75	.36	.36	.78	.70	.35
5d, #4 Divergent Thinking	.66	.30	.24	.84	.68	.33	.27	.85
5e. #5 System Thinking	.76	.29	.32	.81	.76	.25	.27	.81
5f. #6 Transformation Thinking	.58	.19	.21	.73	.58	.18	.21	.73
5g. #7 Reconstructive Thinking	.49	.18	.19	.63	.49	.18	.20	.64
5h. #8 New World Thinking *	--	--	--	--	--	--	--	--

r ≥ . 25, p ≤ .05; r ≥ . 30, p ≤ .01; r ≥ . 38, p ≤ .001

** No variance was found for Level 8 Thinking (New World Thinking)*

Conclusions

The findings demonstrated that while traditional measure of intelligence are repeatedly quoted as the single best measure of performance, their effect is somewhat limited to certain hierarchical levels within organisations. The complexity model seems to provide a better framework to explain high performance and success, as it is designed and cover the full range of hierarchical levels.

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