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The Newsletter of the
Psychometrics Forum

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THE RED ARROWS

Our April meeting departed from the norm. Instead of someone addressing the meeting to tell us how they use and administer an assessment, we had a victim telling us what it was like to be on the receiving end of the Red Arrows selection process. So what do they look for?

Perfection, that's all.



I am glad of the opportunity to write about the April meeting at which Justin Hughes, a former fighter pilot, spoke about selection issues in the Red Arrows team of which he had been a member.

Justin was asked to address us on the subject of leadership. Something on which we are all experts, eh? Most readers will have attended a seminar – or horror of horrors – a lengthy course - listening to someone droning on about the theories that have been advanced over the years. We've had Max Weber's charismatic leadership, we've had The Great Man Theory, almost certainly advanced by someone who considered himself to be a great man. (You were just born with the necessary qualities that made others fall at your feet in admiration.) There has been the trait theory, motivational and style theory, situational and contingency theories, transactional and transformational theories. Yes, all theories – but what might work in practice, I hear you say.

Well, I was agog to know what style of leadership might have won me a place in the Red Arrows. Certainly not the Great Man theory. Justin's talk embraced ideas on leadership, but also on teamwork, and the process of selection.

Each display pilot flies with the Red Arrows (formally known as The Royal Air Force Aerobatic Team) for three years, ensuring that expertise is passed on from year to year. On completion of their three-year tour of duty, pilots return to their primary Royal Air Force role with front line or instructional squadrons. Therefore each year, three new pilots join the Team and, with the exception of Red 1, the Team Leader, all other pilots change the position they fly within the formation.

So what do the selectors look for in an applicant for this world famous team of fliers?

The first thing to realise is that all applicants will have already been tested and assessed *ad infinitum* because they will all have been fighter pilots. Nevertheless, Justin picked out extroversion; stress tolerance; ability; task tolerance; teamwork; timing, and spatial ability and mechanical reasoning. These are really a given; arguably, all fighter pilots need these.

Some of the other characteristics could be expected – for example an unswerving commitment to perfection. Other factors were less obvious such as a willingness to talk about one's mistakes with absolute honesty. It is not a comfortable process, said Justin. And you benchmark yourself against excellence, not the average. You need to analyse your performance as strictly as an external observer might. And your personal goals need to be aligned to the team goals, including the constant and relentless striving for perfection.

Perhaps that is much as you might expect. But several things are different, from industrial practice. For a start, the leader can admit mistakes. In fact he *must* admit mistakes if he is to maintain credibility, although that may sound like a contradiction. Yes, the boss can get things wrong and must admit it (amazing: I've never experienced that).

The leader of a team is not necessarily the most senior person. In line management, yes, but not in operational management, not when they're flying.

Each year they have about 30 – 40 applicants for the Red Arrows. Only 9 will make it through to the final selection.

So what do they look for, we all wanted to know, thinking of our own unglamorous selection tasks. A pre-requisite was a minimum of 1,500 flying hours; to have completed a frontline tour; to be assessed as above average in their flying role. The Team Leader must have completed a three-year tour as a Team pilot earlier in his career, and is appointed in a separate selection process.

Given that, three things were important:

- a 20-minute interview
- a 20-minute flying test
- socialising – for the rest of the week.

Yes, socialising. Sounds extraordinary? Only until you start thinking about the sort of man on which your life might depend. Then it seems important to know everything about him since he went on solids. They look for honesty and integrity; applicants need to be able to take criticism. There is then a consensus as to who joins the team.

I thought about the assessment centre experiences in industry – and good as many of them might be, can it ever be as effective as spending a week with someone? Justin said that at the end of the week, you knew one hell of a lot

about each other. For those who were unsuccessful, feedback was available if they wished to have it.

Did this laidback approach actually work, we wondered? Of course it does! Would the RAF have used this as part of their selection process for 45 years if it had proved to be ineffective? When you live, work, and relax with someone for one week, you certainly get to know them. Compare it to a conventional interview in which we can adopt what we deem to be an appropriate set of behaviours for an hour or so. Much more difficult to be someone else for a week, isn't it?

Do they have an annual appraisal, someone asked? NO! They are appraised constantly, not just once a year.

Of course no presentation on the Red Arrows would be complete without a film of them in action. We were not disappointed. They seemingly swooped across our conference room, red, white and blue vapour trails streaming from each plane. Sensational!

And why, you may ask do they have the vapour trails? This is where it gets a bit technical.

The vapour trails (often known as the 'smoke') are a crucial element of Red Arrows' displays. The primary reason that the Team use smoke is that of flight safety. The vapour trails allow Red 1 to judge wind speed and direction, and allow the aircraft to locate each other in the second half of the show when different sections of aircraft are frequently several miles apart. The vivid and colourful smoke trails also add a huge amount to the impact of the display when viewed from the ground. Manoeuvres such as the Heart, the Phoenix Split and the Gypo Break would not be the same without the dramatic smoke trails.

The Red Arrows are renowned throughout the world as ambassadors for both the Royal Air Force and the United Kingdom. Since the Team was officially formed in 1965, the Red Arrows have completed over 4,000 displays in 53 countries.

And of course their success is all down to careful selection.

*David Roberts
Editor*

NEW COMMITTEE MEMBER

Lynne Hindmarch has been co-opted to the Committee. Lynne is a business psychologist, a Principal Member of the Association of Business Psychologists, and a Member of the BPS Special Group in Coaching Psychology. She is an independent practitioner whose work includes coaching and coaching supervision, facilitation, team development, career counselling and assessment for selection. She uses psychometric tools extensively as part of her practice. Welcome aboard, Lynne!

The higher order structure of personality
Hugh McCredie – Hugh will be chairing the seminar on New Frontiers in Psychometrics at The Park Crescent Conference Centre on 3rd December

In the course of his presentation on the Saville Consulting WAVE® Performance 360 measure, Rainer Kurz presented an interesting review of the higher order structure of personality. Because this structure transcends a wide range of personality instruments, I thought it worthwhile to write this short piece based on the presentation and an article by Rainer in the first issue of *Assessment & Development Matters*. The paper was of considerable interest to me but also a source of great frustration since, rather than include the diagrams which Rainer had prepared, the publisher referred readers to a website on which the graphics were not to be found.

The meeting of the Forum last October saw demonstrated how the NEO PI-R questionnaire revealed both data on the Big Five personality factors and also on the 30 facets of these factors. Similarly, we saw how Big Five scores could be obtained from 15 primary scales of 16PF5 and the 32 scales of OPQ32. Taking the Big Five factors as his starting point, Rainer showed how these had been found to map in turn onto Eysenck's three even broader factors:

Eysenck's three personality dimensions	Big Five components		
	NEO-PI R	16PF5	OPQ32
Broad Neuroticism	Neuroticism Conscientiou' (-)	Anxiety Self-Control (-)	Emotional Stab'(-) Conscientious'ss(-))
Broad Psychoticism	Conscientiou's (-) Agreeablenes(-) Openness(-)	Self-Control (-) Independence Tough-minded	Conscientiou'ss(-) Agreeableness(-) Openness(-)
Broad Extraversion	Agreeableness Openness Extraversion	Independence(-) Tough-min'd (-) Extraversion	Agreeableness Openness Extraversion

Rainer went on to report how Broad Neuroticism (-) and Broad Psychoticism (-) mapped onto an even higher order factor that Dignam¹ called the Alpha factor whilst Broad Psychoticism (-) and Broad Extraversion mapped onto the Beta factor. DeYoung et al.² renamed the Alpha and Beta factors as Stability and Plasticity. They suggested that stability was a positive predictor of conformity and that plasticity was a negative predictor. When I read the original DeYoung et al. paper, I also discovered links between stability scores

and the production of serotonin and plasticity scores with the production of dopamine. The production of both of these neurotransmitters has mental health implications.

The Saville Consulting WAVE® instrument is based upon an alliance with the Alpha/Stability and Beta/Plasticity factors and the People Orientation and Task Orientation constructs which were much publicised in the 1970s.

Finally, Rainer told us of a recent paper by Musek³ reporting the existence of the ultimate personality factor, The Big One, reflecting high scores for both stability and plasticity. In Musek's words this overarching personality factor '...is associated with social desirability, emotionality, motivation, well-being, satisfaction with life, and self-esteem. It may also have deep biological roots: evolutionary, genetic, and neurophysiological.

Thanks to Rainer for directing my attention to these papers. Anyone who takes the trouble to track down and read the originals will obtain some very deep insights into the structure of personality.

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Hugh McCredie
Co-ordinates

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PROJECTIVE TESTS

I imagine that few members of our group will have had much opportunity to use projective tests – I am thinking specifically of the Rorschach Inkblot Test and the Thematic Apperception Tests. The training for each is long and there are many doubts about their validity. Nevertheless they hold a fascination for me, and I guess, for many of our members also.

Certainly they will have been mentioned *en passant* in psychometric training courses, and there the matter rests. Since my own heady days of qualifying I have only had one brief glimpse of these tests – far too short to make any useful comment about them.

However – you knew there was a ‘however’ coming, didn’t you? – earlier this year I was sitting in the study of an eminent Romanian psychometrician talking about his range of assessments, and I was pleased to see some old familiar names – the Romanian version of NEO, the California Personality Inventory (CPI), and Watson-Glaser etc. He had the Singer-Loomis, which is a type assessment, similar to MBTI, and the Jackson Vocational Interest Inventory, which is apparently very popular in Romania. Several others rang a bell. I couldn’t help but wonder whether in my now far-off days of embarking on this career, I could have ever imagined that one day I’d be sitting in an office in an Eastern European city discussing projective and other tests.

All this stimulated my curiosity, so I decided to dig.

Thematic Apperception Test (TAT)

My first stop was *A Clockwork Orange*, by Anthony Burgess. I had never read it, but now a quick bit of homework told me that a character called Alex was given the TAT. Now for the detail, I thought. Off to the library. How did the character react to it, and what was his problem anyway? Alas, I was to be disappointed. There was only a brief reference to Alex being given a test that featured film – not pictures. The psychiatrist makes Alex watch various horrific scenes as part of an aversion therapy programme. Not what I had in mind at all so I felt I was going to disappoint my Psychometrics Forum readership. Except for this gem, straight from the pen of Anthony Burgess who has a prison governor saying:

“... an eye for an eye. If someone hits you, you hit back do you not? Why then should the state, very severely hit by you brutal hooligans, not hit back also? But the new view is to say ‘no’. The new view is that we turn the bad into the good. All of which seems to me grossly unjust” (and stupidly overoptimistic, one might add).

Well, this was written in 1963. Could that date have been the watershed between the old style justice (which the ‘authorities’ said did not work) and the

new style justice (which the public says most certainly does not work)? I think I'm in danger of digressing here!

The received wisdom is that the TAT is less credible now as it is based on the Freudian concept of repression, which no longer has the support that it once did. Can any reader comment on this?

The Rorschach Inkblot Test

This is a method of psychological evaluation in which subjects' perceptions of inkblots are recorded and then analyzed using intuitive insight, complex scientifically derived algorithms, or both. Some psychologists use this test to try to examine the personality characteristics and emotional functioning of their patients. It has been employed in diagnosing underlying thought disorder in cases where the patient is reluctant to admit openly to psychotic thinking.

The test dates back to 1921, and was devised by a Swiss psychiatrist, Herman Rorschach (below). It is amazing to think that 88 years on, this test is still discussed and used - and is *still* the subject of controversy.

The test consists of a set of 10 inkblots. Five inkblots are black ink on white paper. Two are black and red ink on white paper. Three are multicolored. After the individual has seen and responded to all the inkblots, the tester then gives them to him again one at a time to study. The test subject is asked to note where he sees what he originally saw and what makes it look like that. The blot can also be rotated. As the subject is examining the inkblots, the psychologist writes down everything the subject says or does, no matter how trivial. Methods of interpretation differ. Rorschach scoring systems have been described as a system of pegs on which to hang one's knowledge of personality.

Herman Rorschach



The originality of the method and Rorschach's penetrating thinking on problems of interpretation, have influenced research from the beginning. The first English publication came out in 1924 and is (I understand) still the basic reference and the arbiter on many questions. Many clinical psychologists viewed the Rorschach with great scepticism and although controversy still persists, issues now revolve more around questions of reliability and validity, and over inferences drawn from the use of the Rorschach in isolation.

The essence of the test is that the responses to a series of apparently meaningless and ambiguous shapes can have objective meaning. The reliability of the test has been questioned when two independent testers produce somewhat different interpretations from the same responses.

While working in a psychiatric hospital with adolescents, Rorschach noticed that certain children gave characteristically different answers to a popular game known as blotto. In his original publication he characterized the blots as a "Form Interpretation Test, and cautioned that his findings were preliminary

and stressed the importance of much more experimentation.” Unfortunately he died at the age of 37, just a year after he devised the test. Inevitably, his work was taken up by others, notable John Exner.

With no clear leader to take the helm, at least four separate "systems" were developed to administer, score and interpret the test. Needless to say, questions and concerns regarding the test's reliability and validity were eventually brought into question. Beginning in the late 1950's, Exner, David Rapport, Bruno Klopfer, Marguerite Hertz, Zygmunt Piotrowski and Samuel Beck each contributed to compile many systems into some sort of more cohesive whole. Each system "had considerable merit, but that each were also seriously flawed in one way or another" according to Exner. The result of addressing these concerns is the Comprehensive System. The project grew into a multivolume work that has spanned at least four editions.

There are several other projective tests – the Blacky Pictures, for example, The Picture Arrangement Test, and the Holzman Inkblot Test (which aims to compensate for shortcomings in the Rorschach).

One Internet article claims that “*Exner has almost single-handedly rescued a drowning beast and breathed life back into it. The result is the resurrection of perhaps the single most powerful psychometric instrument ever envisioned.*”

Information for this has been drawn from a variety of sources including Buros Mental Measurement Yearbook, The Rorschach Society and the Internet.

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