Exploring the Relationship between the UKCAT Situational Judgement Test and the Multiple Mini Interview

Data was collected and analysed for the above project in 2014. This report summarises findings from the work undertaken.

INTRODUCTION

In 2013 The United Kingdom Clinical Aptitude Test (UKCAT) introduced a Situational Judgement Test (SJT) alongside its four cognitive subtests (abstract reasoning, decision analysis, quantitative reasoning, verbal reasoning). The SJT intended to provide an assessment of non-cognitive traits including integrity, perspective taking and team involvement.

Before the introduction of SJTs, Multiple Mini Interviews (MMIs) were the only widely-used selection tool to objectively evaluate a range of personal qualities during medical and dental student selection. These MMIs typically measured personal qualities deemed as relevant by the prevailing peer-reviewed consensus and investigated traits such as moral reasoning, communication, critical thinking, teamwork and teamwork.

Previous studies have found correlations between an integrity-focused SJT and MMI scores and it also noted that investigations of SJTs pertaining to postgraduate medical selection have demonstrated concurrent and predictive validity among medical specialty trainees.

This study investigated associations between the UKCAT cognitive component (referred to as UKCAT), UKCAT SJT (referred to as SJT) and MMI (referred to as MMI) scores among candidates at UKCAT consortium member institutions using the tools in selection.

METHOD

All medical and dental schools from the UKCAT consortium with demonstrably reliable MMIs (Cronbach's Alpha reliability ranged from 0.70 to 0.93) were invited to contribute to the study; five medical schools and two dental schools agreed to participate.

Subsequently, two data sets (The UKCAT database held in the University of Dundee Heath Informatics Centre (HIC) and the 2013-14 admissions cycle MMI results from participating medical and dental schools) were matched and the subsequent dataset analysed through a web-based safe-haven, managed under data governance rules established by the UKCAT Consortium.

- The 2013 UKCAT SJT results were used to provide a single scaled score per SJT candidate.
- As the MMIs used at each of the schools were diverse in nature Z-scores were calculated for aggregated MMI scores across all stations for each participating school to allow for combined analysis.
- In addition analysis of demographic markers (gender, age, ethnicity, nationality and socio-economic status) was undertaken to examine potential variances in the UKCAT, SJT and MMI scores.

In order to maintain anonymity for the schools involved in the study, specific identity of the participating schools are omitted in the reporting of results.

RESULTS

The Cronbach's Alpha reliability for the MMIs in the schools participating in the study ranged from .77 to .80 and the distribution of calculated MMI z-scores between the participating institutions shown to have a relatively normal distribution.

95.1% match for the data set was achieved (2874 out of 3015). The mean age for study participants was 17.9 years. Most test-takers were female (56.4%), school-leavers (90.5%), white (68.2%), UK Nationals (92.0%) and from socioeconomic class 1 (85.65%).

It was noted that the UKCAT cognitive scores for the study cohort (2642.8 +/- 317.1) were significantly higher than that of the overall candidate population (2829.7 +/- 198.2) who took the UKCAT. This finding is not surprising as the cognitive components were used by schools to select applicants prior to short-listing applicants for MMIs. The differences between cohort's SJT scores (625.9 +/- 60.1) and the overall population (630.0 +/- 51.0) were small in magnitude.

Table 1 details the UKCAT, SJT and MMI (z scores) by the demographic markers, additional analyses for statistically significant variations within the ethnicity, national identity were completed and these are also included for completeness.

Table 1 UKCAT (cognitive), UKCAT (SJT) and MMI z-score by demographic

				UKCAT (cognitive)		UKCAT (SJT)		MMI (z scores)	
		Total N	N %	Mean	SD	Mean	SD	Mean	SD
Gender	Female	1621	56.4	2807.2	190.9	647	51	0.11	0.98
	Male	1253	43.6	2858.8	207.7	639	53	-0.14	1.01
Age_Group	School-leaver	2592	90.5	2825.9	198.3	641	51	-0.01	1.00
	Graduate/Mature	272	9.5	2862.2	212.6	668	55	0.13	1.02
Ethnicity	White	1729	68.2	2840.3	195.3	653	50	0.07	0.98
	non-White	807	31.8	2789.3	187.4	630	51	-0.15	0.95
Ethnicity Expanded	Asian	651	24.8	2793.4	181.9	627	51	-0.18	0.97
	Black	83	3.2	2715.7	184.6	639	45	0.11	0.80
	Mixed	73	2.8	2836.6	217.2	643	49	-0.14	0.91
	Other	40	1.5	2790.0	291.5	635	57	0.02	0.95
	Unknown	50	1.9	2826.2	149.8	635	55	-0.29	1.27
	White	1729	65.8	2840.3	195.3	653	50	0.07	0.98
National Identity	British/UK	2644	92.0	2824.0	195.3	645	51	-0.01	0.98
	Overseas	229	8.0	2895.7	239.0	628	57	0.07	1.16
National Identity Expanded	British	2627	91.4	2823.7	195.3	645	51	-0.01	0.98
	Irish	26	0.9	2921.5	155.7	653	42	-0.17	0.87
	Europe+Africa Other	145	5.0	2841.8	213.0	624	55	-0.06	1.14
	Singapore	50	1.7	3077.8	194.6	649	60	0.79	1.03
	Malaysian	26	0.9	2804.6	304.7	600	59	-0.46	1.40
	1	2282	85.6	2838.2	196.5	645	52	0.03	1.00
	2	125	4.7	2805.3	200.9	649	52	-0.05	0.93

Socio-Economic Class	3	140	5.3	2811.8	226.4	635	54	-0.25	1.09
	4	44	1.7	2674.1	249.4	637	57	-0.31	1.04
	5	75	2.8	2808.1	183.3	630	44	-0.21	1.00

UKCAT scores showed a pattern of statistically significant higher scores for candidates who were male, younger, white, overseas and those from higher socio-economic groups (these are highlighted red in table 1). It was also noted that both UKCAT SJT and MMI scores were significantly higher for candidates who were female, older, white, British and those from the higher socio-economic groups (these are highlighted red in table 1).

Pearson's *r* correlations between the demographic variables, UKCAT test scores, UKCAT (SJT and MMI (z scores) for all test-takers was completed and this is detailed in Table 3; table 3 also details the anonymised data relating to comparisons by participating schools (A-G).

Table 2: Pearson's r correlations between demographic, SJT, MMI (all and participating schools A-G) and UKCAT cognitive scores

Measure	Gender	Age group	Ethnicity	N Ident	SEC	UKCAT	SJT
UKCAT	.13**	.05**	-.12**	.10**	-.08**	-	.23**
SJT	**-.07****	**.15****	**-.21****	**-.09****	**-.06****	**.23****	-
MMI	-.12**	.05*	-.10**	0.02	-.08**	.11**	**.12****
A	-0.12	0.05	-.23**	-0.03	-0.08	.13*	**.14***
B	-.31**	0.14	0.1	-0.03	-0.09	0.11	**0.08**
C	-.20**	-0.03	-.12*	-.10*	-.10*	.16**	**0.07**
D	-.14**	0.01	-.15**	0	-0.09	0.05	**.17****
E	-0.01	0.03	-0.01	.19**	0.02	.07*	**0.02**
F	-.12**	.15**	-.13**	-0.07	-0.08	.13**	**.18****
G	-.17**	0	-.20**	-.18**	-.22**	.16*	**.30***

** p<0.1, * p<0.05

A small correlation of 0.12 (p <.01) was observed between MMI and SJT scores overall and the SJT showed higher associations with the UKCAT test results (r=0.23, p<.01) than the MMI total (r=0.11, p<0.1).

It was noted that four of the seven participating schools showed small to moderately significant correlations between the SJT and the MMI ; this ranged from r=.14 (p<.01) to r=.30 (p<.05).

All statistically significant associations were positive. The UKCAT v SJT correlations (r=0.13, p>.05 to r=.52, p <.01) UKCAT v MMI (r=0.06, p >.05 to r=.35, p <.01).

The SJT v MMI association was similar by gender (both .11, p< .05) and ethnic group (White: .06, p > .01; Non-white: .08, p< .01). A small difference is observed by age group with higher SJT v MMI associations noted among older test-takers (0.17, p<.01) when compared to school-leavers (0.11, p<.01).

Associations between SJT v MMI among UK test-takers (0.10, p<.05) were notably smaller than those for Overseas (0.30, p<.01). Higher correlations were observed among less affluent social classes 4 (0.45, p <.01) and 5 (0.28, p<.01) compared to more affluent social classes.

CONCLUSIONS / DISCUSSION

This study has a number of limitations which should prompt further research.

MMIs represent a methodology without recognised development and implementation guidelines, and each school has developed their assessments according to their own ethos and resources available. This may explain why only four of the seven institutions investigated showed statistical significant SJT v MMI associations; there was no evidence to suggest that Cronbach's alpha reliability was related to the observed relationships but it may be that differences between different schools MMIs (some having a greater cognitive component to their design) are having an influence on the findings. It is possible that reducing variability within MMIs as a whole through national and or international collaboration could enhance future findings and provide a more robust foundation for future research.

With reference to SJTs, the item development process should be considered as a potential confounding factor. It is unknown to what extent test-takers' SJT scores are a function of the test creator's unique SJT development methodology, including item construction, expert group selection and scoring methodology.

The perceived lack of clear statistical associations between the UKCAT, SJT and MMIs amongst many of the fields examined most likely highlights that each of these admissions tools are potentially examining much different constructs and areas with each therefore having individual and significant roles during student selection. Where overall mean scores and performances are noted there is clear need for further research and analysis to determine where the effect may arise. To take as an example the noted difference in UKCAT overseas score being skewed by one particular sub cohort within the study e.g. Singaporean test takers.

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COMPETING INTERESTS

RM is a member of the UKCAT Board. RG is the UKCAT Chief Operating Officer. It should be noted that this report has been prepared by RM and RG from a research report submitted to the research group by the lead researcher and is used to highlight some key points.