#5E  Research Papers: Selection and Prediction

**Location:** Hall 3d

**#5E1 (91)**

Publication during medical studies as a predictor of post-M.D. publication careers

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**Introduction:** Clinicians should be able to critically appraise scientific research in order to practice evidence-based medicine. It is also imperative that a sufficient number of clinicians remains scientifically active in order to advance medical knowledge. However, several studies have noted a decreased interest in research among clinicians in Europe, the USA and Canada (1-2). This decreased interest might be counteracted by early involvement in the scientific process. Therefore, we assess whether early involvement affects the involvement in science of clinicians later in their career. Specifically, we study the following questions: does publishing before graduation (1) increase the likelihood to publish after graduation, (2) does it increase the number of papers published after graduation, and (3) the quality of these papers in terms of citation impact?

**Methods:** Medical school in Netherlands is comprised of six years of study, of which four are pre-clinical (including a compulsory research project of at least 14 weeks) and two are clinical. From the 2005-2008 M.D. graduates from all eight Dutch university medical centers we selected the graduates with rare last names to ensure accuracy in the assignment of publications to individuals. Rare last names were defined as occurring in fewer than ten last name-initial(s) combinations in the Web of Science (WoS), which resulted in a sample of 2,411 graduates. The names were matched to WoS-indexed articles, reviews and letters published between six years before and six years after graduation. Our used measures are (1) whether an M.D. graduate has published before and after graduation, (2) the number of publications published after graduation, and (3) the mean citation impact of the papers published after graduation, normalized for scientific field.

**Results:** Of all 2,411 graduates in the selected sample, 887 (37%) had published one or more papers in the six years before and after graduation. Of those, 312 (13% of the selected sample) had published before graduation; 792 (33%) had published after graduation. The “relative risk” of publishing after graduation of graduates who had published before graduation compared to graduates who had not, was 2.54. Graduates who had published before graduation were also more productive after graduation: on average they published 7.03 papers compared to the 1.77 papers published after graduation by graduates without pre-graduation publications. Graduates with pre-graduation publications also had a higher mean normalized citation impact than graduates without pre-graduation publications: 1.36 versus 1.06 (where 1.00 is the world average).

**Discussion and Conclusion:** In this study, we found that early involvement in science, as measured by having published scientific papers, is a predictor of involvement in science later in the career. M.D. graduates who have published before graduation, (1) are approximately 2.5 times as likely to publish after graduation, (2) publish more papers after graduation, and (3) have a higher citation impact. Therefore, if medical students are involved in science early in medical school, it could have a profound effect on their later careers in (academic) medicine.


#5E2 (215)

Unravelling the mechanism underlying motivation for the medical study: interviews show a negative effect of selection

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**Introduction:** The medical admissions system in Netherlands has recently moved from a weighted lottery to a qualitative selection procedure. It makes for a good context to study the effects of introduction of a qualitative selection procedure on the motivation of the applicants and how they prepare for the selection. The framework of Self-Determination Theory (SDT) (1) of motivation was used in the current study to answer the following questions: i) What types of motivation do high school students’ have for applying to medical school? ii) What are the factors that influence the development of these types of motivation? What are the underlying mechanisms?, and iii) What are the effects of selection on high school students’ motivation for the medical study?

**Methods:** A qualitative study using semi-structured interviews was set up using a constructivist approach. In 2015, study counsellors and 3rd-6th year students from one predominantly White and one multi-ethnicity high school in Amsterdam were purposefully sampled. Interviews with study counsellors yielded inputs for
Introduction: The SJT is reported to have less adverse impact on minority groups (Lievens et al., 2008). It is also considered to be fairer than other selection tools, less susceptible to social bias, and equitable with regard to applicant demographic status (Patterson et al., 2016). This study investigated the impact of demographic characteristics (age, gender, language) on SJT scores and test completion time in Australian graduate nurses entering their first year of registered employment. Many nurses come to Australia to train, hence the impact of English as a second language on test scores was of interest.

Methods: Over two half-day workshops, nurses, paramedics, radiation therapists, dieticians and physicians developed a 33 scenario SJT across four domains (empathy, integrity, collaboration, resilience), each with six associated rating statements. Seven items were deleted due to subjectivity of scenario interpretation. Of the 24 remaining items, seven were contextualised for each discipline and 17 were generic in the situation, but contextualised for the depicted character. Here we present results for N=261 first year out nurses (13.8% male; age range 20-54 years) in a large metropolitan hospital. This was the first exposure to an SJT for all participants. Age was categorised as 20 to 24 (n=159) and ≥25 years (n=99). English as a First Language (EFL n=217) and English as a Second Language (ESL, n=41) were determined. Associations between participants’ total score on the SJT (SJTTS) and their gender, age, ESL, and test completion time (TCT) were explored through correlations and non-parametric tests.

Results: SJTTS didn’t differ by gender or age. Age correlated with TCT (r = .32, p < .001). SJT negatively correlated with SJTTS (r = -.17, p = .004), Empathy (r = -.12, p = .04), Integrity (r = -.22, p < .001), Collaboration (r = -.08), but not Resilience. SJTTS for ESL were lower in domains except Resilience. ESL negatively correlated with TCT (r = -.27, p = .008). Difference in median TCT minutes was found between older (MdnTCTmins = 33.49) and younger (MdnTCTmins = 26.48) test takers in the ESL (U = 96, z = -2.860, p = .007) and EFL groups (older Mdn = 26.02; younger Mdn = 23.89; U = 4161 z = -2.506, p = .012). Effect size was medium in the ESL group (r = -.42) and small in the EFL group (r = -1.7).

Discussion and Conclusion: Our findings in first year registered nurses completing an SJT for the first time indicate no relationship between SJT scores, gender and age. Older participants took longer to complete the test and longer test completion time was associated with lower scores for most domains. Nurses for whom English is a second language scored lower. Since comprehension of scenarios in English depends heavily on language skills, these findings indicate ESL as a potential source of bias in SJT scores. Nurses in the ESL group were older, and took longer to complete the test compared to nurses in EFL group, indicating an age by ESL interaction. SJT may be a useful tool in selection of post-graduate nurses. Caution is required given the potential disadvantage of ESL.

The value of Situational Judgment Test for selection into medical school: evidence from UKCAT validation studies

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Introduction: The UK Clinical Aptitude Test (UKCAT) is a test series used by a consortium of universities for entry into medical and dental education and training, and is completed by over 20,000 candidates annually. In 2013, a Situational Judgment Test (SJT) was developed as part of the UKCAT to assess important non-academic attributes necessary for effective performance as a medical student, e.g. integrity. Preliminary validation studies in 2014 and 2015 provided support for the SJT predicting in-training performance of students one year into the programme. To understand the extent to which SJT performance at selection predicts subsequent performance throughout the degree program, it is essential that ongoing validation research examines this relationship at other time points.

Methods: Participants were medical and dental students from participating schools in the UK who entered the program in 2014. During their 2013 selection process, the participants completed the UKCAT SJT, which comprised 66 items designed to measure three domains (Integrity, Team Involvement and Perspective Taking). Performance on the SJT was correlated against outcome data across the students’ first and second years in the programme. Outcome data included peer and tutor performance ratings and end of year exam performance. Peer and tutor ratings were collected using the Relative Percentile Method (RPM), whereby participants were scored in comparison to their cohort across the three domains targeted by the SJT (Integrity, perspective taking and team involvement). Exam data were collected for performance across three areas (Applied Life Sciences, Clinical Skills & Reasoning, and Health & Society and Professionalism).

Results: Research conducted in 2015 (N=218) found significant positive correlations between SJT performance and tutor ratings (corrected r= .34). Moreover, students identified as ‘likely to struggle’ scored significantly lower on the SJT compared to those who were not identified as likely to struggle. Research conducted in 2016 (N=123) showed a significant positive correlation between the SJT and performance on the Health & Society exam (the most criterion-relevant exam to the SJT domains). When Clinical Skills & Reasoning performance for both years was combined with Health & Society performance, this also presented a significant positive correlation. The SJT has also demonstrated consistently good levels of reliability (Cronbach’s alpha = .77). Importantly, the SJT produced smaller group differences compared to cognitive ability tests.

Discussion and Conclusion: This paper strengthens early predictive validity research with new evidence from these students in their second year. The results from these validation studies provide evidence to suggest the SJT has predictive validity across first and second year performance. Taken together, these findings demonstrate encouraging support for the use of this SJT in the UKCAT as a non-academic selection method that predicts later performance, and also has potential to widen access to candidates historically disadvantaged by traditional medical school selection methods.