

Insights on selection of undergraduate dental students

Claudia Cunningham¹  | Kirsty Kiezebrink²

¹Aberdeen Institute of Dentistry,
University of Aberdeen, Aberdeen,
Scotland, UK

²School of Medicine, Medical Sciences
and Nutrition, University of Aberdeen,
Aberdeen, Scotland, UK

Correspondence

Claudia Cunningham, Dental School,
University of Central Lancashire, Preston,
UK.

Email: CCunningham6@uclan.ac.uk

Abstract

Introduction: The goal of selection to dental education was to find those with the greatest aptitude for dentistry. Recently, schools have introduced a variety of tools; however, these have often been adopted without appropriate evaluation regarding existing evidence for fairness, reliability or validity.

We explore dental admissions staff beliefs about the quality of different selection tools, with the objective of exploring their decision-making in implementing selection practices.

Methods: This qualitative study is underpinned by a social constructionist epistemology, in which our principal concern is “explicating the processes by which people come to describe, explain or otherwise account for the world (including themselves) in which they live.” We conducted individual interviews with 15 of the 16 UK dental admission leads to elicit their views around admissions processes and aims. Data coding and analysis were initially inductive, using thematic analysis. After the themes emerged, we applied a deductive framework of affordances to group themes and then examined these for heuristics.

Results and Discussion: We identified three main themes; “Selection Tool Use,” “Widening Participation Practices,” and “Professionalising the Admission Lead Role.” Admission leads spoke favourably of tools that allowed a “holistic” view of the applicants “potential”. Selection tools were favoured if they enabled “Gut feeling”. Leads spoke of evaluating candidates, making sure they were “rounded”, and “know what dentistry is all about.” In justifying the use of elements of their procedure, the use of heuristics was prominent.

Conclusion: In order to minimise the potential consequences of poor selection decisions, it is important to acknowledge that dental admission leads are at risk of depending on sub-optimal heuristics to make judgements about effective selection (shaped by previous practices) rather than using more rational decision-making processes based on the extant evidence (regarding the quality of different selection tools). Future research may be usefully informed by the knowledge translation literature to offer solutions for improving selection practices in dental education.

KEYWORDS

dental education, heuristics, qualitative, selection

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](https://creativecommons.org/licenses/by-nc/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2022 The Authors. *European Journal of Dental Education* published by John Wiley & Sons Ltd.

1 | INTRODUCTION

Selection and recruitment into dental education and practice is a significant area of endeavour for health professional educators.¹ The ultimate goal of the admissions process is to select those with the greatest aptitude for dental training.^{2,3} There are ethical and economic reasons to select those who will be competent dentists given the association between the health and well-being of individuals and societies, and the financial cost of training to society and individuals.

Historically, selection to dentistry in the UK involved academic attainment combined with a personal statement and reference. In the mid-1990s, selection interviews were added to this process amid concerns that “good” candidates were being missed as procedures did not take important interpersonal skills into account.⁴ Since then, a variety of tools such as the multiple mini interview (MMI),^{5,6} manual dexterity tests^{5,7-13} and most recently the UCAT^{6,7,14,15} have been added to the armamentarium of selection by many dental schools, in a bid to address the need to select students on attributes other than solely prior academic achievement.¹²

However, a search of the sixteen UK undergraduate dental school websites highlighted that academic attainment remains the primary hurdle in selection decisions. This is in contrast to countries such as the USA,¹⁶ Canada¹⁷ and Australia,¹⁸ who typically use a dental admissions test alongside academic achievement.

Recent moves to a varied selection process could be seen as a positive step using more “evidenced-based” approaches.^{19,20} However, a recent review of the predictive validity of dental selection methods in Europe highlighted that tools and processes had often been adopted without piloting or testing, with no knowledge of whether they were fair, reliable or valid.²¹ Moreover, the review showed dental schools in Europe continue to use tools shown in other sectors to exhibit low predictive validity, such as personal statements and references.²²⁻²⁶ The same review²¹ revealed only fourteen of over two hundred dental schools in Europe²⁷ had reported elements of their process (specific tools or combination of tools) over the last 30 years, and there were no reports of the validity of the selection procedure as a whole. Within this research, there was a distinct lack of reference to the psychological theory supporting the use of current methods. This problem is not unique to dentistry,²⁸ but does leave dental schools open to criticism from key stakeholders.

Despite this lack of dental-specific literature, the broader work psychology and medical education fields have a wealth of good quality selection research, including some “best practice” guides.^{1,3} However, this information does not appear to translate into practice in dental selection. This suggests selection leads are relying on something other than evidence to make selection decisions.

When making the decision to utilise knowledge or not, humans rely on various cognitive processes for which there are a plethora of psychological theories. Heuristics are simple, intuitive or common-sense approaches,²⁹ which people rely on to make quick decisions in everyday life. Heuristics work well in some, but not all circumstances,³⁰ depending on factors such as the information available, time and cognitive capability of the individual.²⁹

Reliance on “gut feeling” or heuristics in relation to selection has been alluded to within dentistry³¹ and medical education.^{19,32} However, to our knowledge, there is no exploration of heuristics in the enactment of selection procedures in dental or medical education. There is a gap in the literature and, a compelling case for, further theoretical and empirical literature to understand the role of selectors in the development and enactment of dental selection.¹⁹ To address this, in this study we explore dental admissions' staff beliefs about selection and selection tools, with the objective of identifying whether and how heuristics may be used dental selection.

2 | METHODS

2.1 | Methodology

This qualitative study is underpinned by a social constructionist epistemology, in which our principal concern is “explicating the processes by which people come to describe, explain, or otherwise account for the world (including themselves) in which they live”.³³

Ethics approval for this study was granted by Aberdeen University College Ethics and Research Board (CERB/ 2018/7/1625). To ensure study quality, we also followed the Standards for Reporting Qualitative Research recommendations.³⁴

2.2 | Participants

We approached admission leads from all 16 dental schools to take part in this study. Participants were identified through the Dental Schools Council Admissions Deans' group, or by obtaining email addresses from individual dental school webpages. In early August 2018, we emailed admission leads to provide study information and to ask whether they were willing to take part and give consent to have their interviews recorded for later transcription.

2.3 | Data collection

We interviewed fifteen of the sixteen (93.75%) UK dental admission leads. Their characteristics (e.g. time in role) were obtained via a short socio-demographic questionnaire and a recorded semi-structured interview as we believe the interaction between the researcher and the interviewee is crucial.³⁵

We developed a semi-structured individual interview schedule to explore the views and experiences of admission leads with regard to the admission process used at each school. This interview guide (Appendix A) was modified from one used in an earlier study of medical school admissions by JC.³² The modified interview schedule was piloted and refined with one dental school lead. The result of this piloting was that one question was added to the topic guide to reflect an area of interest (national recruitment) that had not been considered in the previous study.²⁹ All interviews were carried out by CC.

2.4 | Data analysis and analysis approach

Interviews were recorded with permission and transcribed verbatim for analysis. Using Nvivo qualitative data analysis software, we completed a primary-level thematic framework analysis to identify, analyse and report patterns within the dataset in rich detail.³⁶ Familiarisation was achieved by listening to the audio recordings and reading the transcripts in full. The first two interviews were analysed independently by all three authors (CC, JC and FP) to identify key themes in the data and develop a coding framework. Content and process-related themes started to emerge, and these were discussed within the research team. Further modification and checking, both with the coded extracts and against the entire dataset, was completed. We then organised the data to allow further exploration of the dimensions of each theme by applying the conceptual framework of “affordances” to examine factors within the dental admissions environment that may facilitate, constrain or inhibit the planning and decision-making in relation to selection (33). These can be seen in Table 1.

Following the organisation of the themes into affordances, we examined the data to look for evidence of heuristics to explore whether this way of thinking may explain some of the affordances uncovered.

2.5 | Reflexivity

The authors of this study work in higher education across the UK and have experience of admissions both as admission selectors and researchers. CC is a PhD candidate in Dental Education and Specialty Trainee in Restorative Dentistry and was able to provide contextual and experiential understanding, having worked within dental undergraduate education for over 10 years. JC and FP are psychologists by background. They have extensive knowledge of medical school and postgraduate medical selection. Throughout the process of data collection and analysis, we were cognisant of our positions in relation to dental education and dentistry and tried to be aware of how these positions may be influencing what we saw in the data.

3 | RESULTS

Fifteen of a possible sixteen admission leads from separate undergraduate dental schools took part in the study from across the

UK. Eleven interviews were conducted in person with the remainder carried out over the telephone. Median interview length was 34 min (range 15–51 min). The recordings were assigned a letter by random A-O during transcription. Each quotation below is labelled with this letter plus a unique reference indicating the line within the interview the quote was taken (i.e. A13 shows respondent A, transcription line 13).

Eight female and seven male participants were interviewed. Interviewees had worked in academia for between 2 years and 30 years and had been in the role of admission lead for between 1 year and 16 years. Ten leads held a senior position in addition to their role as admission lead, five were Senior Clinical Lecturers, one an Associate Professor and four Consultants (2 Restorative Dentistry, 1 Paediatric and 1 Dental Public Health). Two of the consultants also held the role of Director of either Undergraduate or Postgraduate Education. The remaining five leads held a variety of roles, two Clinical Lecturers, two Technical Managers and one Administrator. Eight interviewees continued to see patients as part of their position.

We identified three main themes; “Selection Tool Use,” “Widening Participation Practices” and “Professionalising the Admission Lead Role.” We present facilitating, constraining and inhibiting affordances of each theme. We have highlighted heuristic phrases throughout this text in **bold** and show further heuristics at the end of the results section.

3.1 | Selection tool use

The decision to use a selection method was reliant on a complex interplay between “facilitating” affordances (positive drivers for selection tool use), “constraining” affordances (limiting factors) and “Inhibiting” affordances (barriers to using a selection tool).

3.1.1 | Facilitating affordances of selection tool use

Given the vast numbers of applicants and the limited resource in terms of faculty time, methods that quickly reduce applicant numbers have remained at the forefront of selection processes in UK dental schools. The use of academic grades as a first step in the admissions process offers a quick, objective solution with a discriminate cut-off

TABLE 1 Affordances

Placement on enablement gradient	Definition
Facilitating Affordance	Engage the skills and/or volition of an actor within a given context to resource his/her optimal performance of a given activity
Constraining Affordance	Limiting an individual's ability and/or volition to engage his/her skills within the given context, thereby resulting in sub-optimal performance of a given activity
Inhibiting Affordance	Bring an individual to a permanent standstill or stalemate within the given context and thereby prevent even minimal engagement of their skills and volitional effort toward performing a given activity

Source: Cronshaw SF, Ong PY, Chappell DB. Workers' adaptation enables work functioning. *Psychol Rep.* 2007; 100: 1043–1064 (45).

point and selection leads feel comfortable that this is an external process unlikely to result in challenge from the applicant. Similarly, aptitude tests have been introduced by UK dental schools as they feel they are an objective way of narrowing down the applicant pool.

we were having 1200 applicants, say for 63 places, and the Dean at the time said, well you can either use the UKCAT, or you can pick all the ones that play the violin, **it is up to you, you know, and, you know, what are you going to choose, you've got to use something**
N297.

Several admission leads spoke of “feeling” that the selection process performed well which in turn positively reinforced its use. Applicant and staff satisfaction in the selection tool also featured, with many relying on feedback as a source of evidencing the validity:

they think that it's well run, it's fair, that they quite enjoy it, and the staff feedback is very good as well actually, the staff quite enjoying getting involved with it, and they think it's a fair way to select people
B186.

3.1.2 | Constraining affordances of selection tool use

In contrast to factors encouraging the implementation of a selection tool, there were several factors limiting the application of new tools. Dental selection leads expressed concern about the reduced availability of sound empirical knowledge in selection research. Selection leads believe existing research does not provide adequate evidence to inform their practice. Indeed, this perceived lack of evidence was cited as a reason for using selection methods with known poor validity in other sectors, over any alternative.:

the evidence isn't really out there, as far as I'm aware...
I think the conclusion is, if you use it, carry on using it, but if you don't, don't worry too much, I think was the last thing I read
G167.

Furthermore, staff resistance to change, combined with the notion that each school, should be “*individual*” to attract the students “*right for them*” led to a reluctance to improve current processes. However, we noted that once the change was implemented there was a positive response:

There was a huge amount of negativity about the move to MMI's, because we had panel interviews for so long, so from some of the older members of staff, but once we ran it, actually they quite enjoyed it, yeah
J220.

3.1.3 | Inhibiting affordances of selection tool use

All interviewees discussed the use of academic grades as a first step in the admission process. No alternatives were presented or considered. It was inferred, or stated, that this was something out with the control of the admission lead:

So initial selection, I don't get involved in, it's based on academic performance
C53

Lack of resource in terms of time, money and staff was also a barrier to change, and in some circumstances had prevented the implementation of a new method:

it's a logistical nightmare, even for four members of staff, on an afternoon, so the thought of doing an MMI really does send cold shudders down my spine
K309.

3.2 | Widening participation practices

3.2.1 | Facilitating affordances to widening participation practices

Most of the admission leads appeared committed to the principle of widening access, and many saw this as integral to their role. Widening access was described as “*appropriate*,” A338 a “*good idea*” I210 and “*fair*” K346. Many leads acknowledged the “social justice” element of widening access initiatives in providing an opportunity to all regardless of background.

Leads recognised the social accountability of dental educators in providing a “*dental workforce that represents the population*” F248 who have a “*unique understanding of the issues faced by some of their patients*” F251 Once admitted to dental school one Lead described widening access students as “*so passionate, and grateful for the opportunity that they actually work 110% and get there*” L221.

Organising work experience was highlighted as a specific facilitating affordance to widening participation. Most schools offered a degree of help with arranging work experience if asked, although this was often signposting to another service. Widening access programmes often incorporated work experience, but this was not available for students from other backgrounds.

3.2.2 | Constraining affordances to widening participation practices

The primary constraining affordance was the perceived additional support needs of widening participation applicants when they gained entry.

Do you think the widening access students generally struggle? **From my experience**, I would say yes

E514.

3.2.3 | Inhibiting affordances to widening participation practices

Despite some positive attitudes, in many cases, the discourse concerning widening access applicants appeared to emphasise the “otherness”³⁷ of underrepresented applicants, which may maintain social exclusion³⁸. In some cases, this seemed to be well-intentioned or supportive in meaning:

to deny young people from those backgrounds, the opportunity to become a dentist, is probably missing a trick really

F249.

However, this was not always the case:

for any increase in widening access places, there should be an increase in the overall total, rather than punishing, or penalising another group of applicants

E168.

you shouldn't get there in my opinion, if you're not putting the effort

D271.

it's politically, it's just a political football, it's the thing that's the flavour of the month at the moment

D230.

Confidence in current selection procedures and support mechanisms for widening access applicants confounded this barrier.

No, I don't think we disadvantage lower socio-economic groups whatsoever

M211.

All schools shortlisted candidates using initial prior academic attainment, and there appeared to be no acknowledgement that widening access students may struggle to attain the grades required:

I think if they need any softening of the academic requirements, would need to be backed up with solid evidence, to make sure staff are happy with that A369.

it's not an alternative for somebody who done poorly in their A levels

I202.

All but one school followed academic achievement by assessing the personal statement either before or alongside results of an aptitude test (usually the UKCAT $n = 14$) before inviting a fixed number of candidates to a final stage selection method; either a multiple mini-interview (MMI) ($n = 12$) or a traditional interview ($n = 3$).

Personal statements were used to evidence a variety of personal attributes, such as motivation, leadership and commitment to the profession. Fourteen of the fifteen schools looked for evidence of work experience within the personal statement. Despite acknowledging that candidates “*have a lot of trouble getting the work experience*” B216, there was reluctance from some to facilitate this as “*We like them to be able to show their own initiative, in terms of organising work experience*” A247. Validation of work experience was completed at the interview, with some candidates being rejected if they could not discuss this.

3.3 | Professionalising the role of admission lead

“Professionalising” refers to the values, commitment and experiences in the role of admission lead. It is not about leadership per se but about the individual's outlook and attitudes and how these might influence the role. In other words, this contextual dimension centres on the position of the individual as an actor in the process of playing out the admission lead role. It encompasses personal emotions and beliefs related to admissions, as well as attitudes toward the usefulness of medical school selection activities.³⁹

3.3.1 | Facilitating affordances to professionalising the role

We identified two facilitating affordances. The title being “Lead” or “Director” and the need for clinical faculty to deliver an additional “academic” role.

I had to do something else as well because most staff in the dental school have several hats they wear and I felt this was one that would fit me quite well

A62.

3.3.2 | Constraining affordances to professionalising the role

How the leads viewed the job emerged as the most commonly discussed constraining affordance in professionalising the role.

I oversee the admission cycle... **just making sure that we've got enough bums on seats**

B20.

Lack of accountability was also identified. Many interviewees stated that decisions about selection were made solely by the leads.

They pretty much just, they leave it up to the admissions tutor

B147.

it's about their insight and reflection in the personal statement as well

I156.

It was me, the school didn't decide

D80.

Personal statements were also used as a method to assess work experience. However, this assessment was an intuitive, simple or common-sense approach over a more objective measure.

3.3.3 | Inhibiting affordances to professionalising the role

The role came with a lack of formal appointment, and there appeared to be little or no training available. Admission leads had either volunteered for the role as an adjunct to a current position or were asked to do the role when appointed to a senior position. Shadowing a predecessor was the primary method of induction, with no other formal training accessed or available.

it's not a very attractive role to many people in dental school, because a lot of people have said you must have done something wrong to get this role

K29.

it's pretty easy usually to tell whether they've actually done the work experience

E96.

i think training would have been good, but I don't know who would have delivered it

A71.

we're more interested in the sort of quality of it[work experience], rather than the quantity of it

G175.

We explored the use of traditional interviews and MMIs in the process. Schools that used traditional interviews favoured them because of their subjective nature.

"good way of actually trying to find out what that person is really like"

M165.

3.4 | Heuristics

Heuristics were woven throughout the conversations. Viewing through this lens allowed for a deeper understanding of the underlying influences in each of our themes.

As discussed, the ability of a selection tool to narrow down numbers emerged as the primary affordance. However, admission leads spoke favourably of tools that allowed a "holistic" (J68) view of the applicants "potential" (C324). Selection tools were favoured if they enabled "Gut feeling" (A195). Leads spoke of evaluating candidates, making sure they were "rounded" (H77) and "know what dentistry is all about" G102. In justifying the use of elements of their procedure, the ability of the tool to facilitate heuristics was prominent. This was particularly the case when discussing personal statements.

we're looking at personal qualities and values

N118.

Of the schools using the MMI, leads spoke of the objective nature of this test informing their decision. However, on further discussion, leads spoke of subjectivity as reinforcing their choice.

MMI's in dentistry, we took it on, because it, we feel that it gives us much more of a chance to get an all-round kind of view of what the applicants are all about

H76.

Some even discussed introducing measures into the MMI process so that heuristic processes could influence the overall outcome.

We had a secret station on registration, so like a bit of a global, did you like them, did you not like them, were they rude, were they polite, friendly, smiley, or whatever

L326.

we're looking for content to make sure that they have demonstrated that, you know, that they know what dentistry is all about

G100.

When discussing the UCAT, used by some schools as part of an initial screening procedure, mental shortcuts or quick options, such as taking the top-scoring candidates until their offers were full were favoured over a robust "cut-off."

we take more of a holistic view of, there's no cut off, but particularly in the SJT section, if you're doing quite poorly in that, you're unlikely to be selected for interview

J67.

The overall procedure of making offers also appeared to be influenced by heuristics.

we then have to do a slightly complicated guessing procedure

F81.

The admission leads expressed confidence in being able to identify those candidates who would be best suited to dentistry.

They just stood out as exceptional people

N439.

we're very good at seeing when somebody is a good communicator

F152.

Several other conversations highlighted the importance of "soft-skills" or characteristics that would influence the overall selection decision.

looking to see that they've got evidence of a caring nature

I81.

I think we're looking for a rounded student

I298

4 | DISCUSSION

Selection to dental education has undergone some positive changes over the last few years with the addition of evidence-based tools to inform selection decisions. However, dental admission leads are at risk of depending on sub-optimal heuristics to make judgements about effective selection (shaped by previous practices) rather than using more rational decision-making processes based on the extant evidence (regarding the quality of different selection tools).

Our study offers a novel perspective on the decision-making processes of admission leads in dental selection processes in the UK. Using the affordances model to analyse our data, we were able to identify features of the dental admission lead practice, which either facilitate, constrain or inhibit "Selection Tool Use," "Widening Participation Practices" and "Professionalising the Admission Lead Role." These features support the belief that environmental and contextual factors have an impact on Admissions Deans' use of evidence-based practice in each of these areas.⁴⁰

As anticipated, dental admission leads expressed concern about the reduced availability of sound empirical knowledge in selection research. Few studies exist within dental selection, and of those that are available, few employ robust empirical designs²¹ leading dental admission leads to believe existing research does not provide

adequate evidence to inform their practice. Although the evidence is scarce within dentistry, there are multiple examples within the wider medical education field and beyond. However, the Deans' appeared to privilege knowledge from their own discipline over that from another, close, disciplines.

Theories of learning and knowledge in the management literature can provide some insight in this respect. Oborn et al.⁴¹ succinctly summarise relevant theories of learning and knowledge in the management literature. They highlight three overlapping themes: knowledge boundaries, organisational learning and absorptive capacity. "Knowledge boundaries in the management field problematises the nature of boundaries, the stickiness of knowledge that prevents its movement, and the role of boundary objects in facilitating this process. Organisational learning conceptualises the need for organisational wide systems to facilitate learning processes; it also draws on a more expansive view of knowledge that incorporates tacit and explicit components of knowledge and how these might convert from one to the other. At a more strategic level, absorptive capacity focuses at the firm level on the role of developing organisational capabilities that enable the identification, assimilation, and use of new knowledge to enable innovation."⁴¹ Our results confirm knowledge barriers exist; however, future research is needed to identify the specific boundaries of knowledge translation into dentistry, drawing on the management research field to provide insight and possible solutions to bridge this gap.

In cases where a participant did have knowledge of selection "best-practice," putting this into place was often constrained by external factors, for example, staff resistance to change. The nature of decision-making in higher education, typically by a committee, means that complex group dynamics, differences of opinion and conflicts of interest must be negotiated before the enactment of change in selection procedures. Moreover, the demands of the job, lack of time and perceived financial barriers may impede seeking and integrating empirical knowledge.⁴⁰ Indeed, our findings reinforce Onyura et al.⁴⁰ summary that "difficulties with securing institutional support can relegate the use of empirical knowledge to a low-priority, extra role status as available resources are focussed on activities critical to day to day operations." We also agree with the need for financial resources and related supports, including protected time and administrative aid for clinical faculty. However, caution is advised in the current climate as it is possible that financial support and increased resource may reinforce current practice. There is a need to further understand and manage the underlying processes that influence decision-making in this context to achieve the step-change required in moving away from low-validity methods.

The selection of dental students is not straightforward.⁴² Often marked by uncertainty, multiple often contradictory performance criteria,²¹ and limited resource, optimal (and rational) decisions may not exist or be identified within practical or realistic constraints. In noisy or complex contexts, such as selection, there is a recognition that decision-makers often resort to "simple, sub-optimal strategies that have variously been characterised as intuitive, muddling through, heuristic, fuzzy, boundedly rational, situated or recognition

primed".²⁹ When harnessed effectively, these "common sense approaches" (heuristics) work well.³⁰ Indeed, heuristics are being embraced within the medical education literature as "smart adaptations to the complexities of a specific domain".^{43,44} However, if not used with caution whilst ensuring the management of errors, heuristics may reinforce underlying bias.

Human decision-making is prone to bias, fallibility and irrationality.^{45,46} In selection, this may lead to the maintenance of accepted norms to the detriment of underrepresented groups.⁴⁷ This appears to be the case in dentistry. Despite efforts, the social demographic of dental students remains disparate from the population.^{48,49} An over-reliance on heuristics in selection processes may be contributing to this.

However, rather than trying to circumvent heuristics or correct deviations from logic and probability theory, "The most promising way to train (future) physicians and other health professionals in clinical decision-making is... to enhance the use of heuristics by improving *perspicacity*, that is, by tuning the (recognition) processes that underlie the domain-specific adaptive selection of heuristics and management of ensuing errors." Feufel and Flach.²⁹ Maximising learning from errors and minimising potential consequences of poor selection decisions can therefore only happen if we embrace and learn from heuristics.

4.1 | Strengths and Limitations

The major strength of our study is the inclusion of fifteen of a possible sixteen dental schools and the wide range of views that were captured. The methodological strength of our study is its foundation in a solid theoretical framework which seems to be innovative and original compared with the current research on dental school selection. The qualitative design allowed the exploration of the complex mechanisms underlying the enactment of dental selection processes by dental admission leads in the UK. The inductive analysis and organisation in the affordances model highlighted the key themes which in turn facilitated secondary analysis using the conceptual framework of heuristics. The authors believe this is the first time that heuristics has been applied to a study of this type in dentistry.

Using interviews with admission leads yielded richer data than would have been expected had we employed a less personal approach; however, we acknowledge that lack of anonymity may have been off-putting to some participants.⁵⁰

5 | CONCLUSION

The addition of evidence-based tools over the past few years to inform selection decisions in dental education is a positive change. However, judgements about effective selection are shaped by previous practices rather than using more rational decision-making processes. Reliance on sub-optimal heuristics, rather than utilising the extant evidence regarding the quality of different selection tools,

risks jeopardising selection decisions. To minimise the potential consequences of poor selection decisions, future research should look to the knowledge translation literature that may offer solutions for improving selection practices in dental education.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Claudia Cunningham  <https://orcid.org/0000-0003-1674-8278>

REFERENCES

- Patterson F, Roberts C, Hanson MD, et al. 2018 Ottawa consensus statement: selection and recruitment to the healthcare professions. *Medical Teacher*. 2018;0(0):1-11. doi:10.1080/0142159X.2018.1498589
- Dental Schools Council. *Guiding Principles for the Admission of Dental Students*. Dental Schools Council; 2012.
- Patterson F, Cleland J, Fran C. Selection methods in healthcare professions: where are we now and where next? *Adv Health Sci Educ*. 2017;22:229-242. doi:10.1007/s10459-017-9752-7
- Hoad-Reddick G, Macfarlane TV. Organising the introduction of, and evaluating interviewing in, an admissions system. *Eur J Dent Educ*. 1999;3(4):172-179. doi:10.1111/j.1600-0579.1999.tb00088.x
- Foley JI, Hijazi K. The admissions process in a graduate-entry dental school: can we predict academic performance? *British Dent J*. 2013;214(2):E4-E4. doi:10.1038/sj.bdj.2013.56
- McAndrew R, Ellis J. An evaluation of the multiple mini-interview as a selection tool for dental students. *British Dent J*. 2012;212(11):331-335. doi:10.1038/sj.bdj.2012.267
- Lambe P, Kay E, Bristow D. Exploring uses of the UKclinical aptitude test-situational judgement test in a dental student selection process. *Eur J Dent Educ*. 2016;22:1-7. doi:10.1111/eje.12239
- Christersson C, Bengmark D, Bengtsson H, Lindh C, Rohlin M. A predictive model for alternative admission to dental education. *Eur J Dent Educ*. 2015;19(4):251-258. doi:10.1111/eje.12129
- Kothe C, Hissbach J, Hampe W. The Hamburg selection procedure for dental students - introduction of the HAM-Nat as subject-specific test for study aptitude. *GMS Z Med Ausbild*. 2013;30(4):Doc46.
- Buyse T, Lievens F. Situational judgment tests as a new tool for dental student selection. *J Dent Educ*. 2011;74(3):743-749.
- Beier US, Kapferer I, Ostermann H, Staudinger R, Dumfahrt H. Impact of a novel dental school admission test on student performance at Innsbruck medical university, Austria. *J Dent Educ*. 2010;74:531-538.
- Kay E, Bennett J, Allison P, Coombes LR. Evidence-informed dental student recruitment techniques. *British Dent J*. 2010;208(3):127-131. doi:10.1038/sj.bdj.2010.105
- Röding K. A new admission procedure to dental education at the karolinska institute an initial evaluation. *Eur J Dent Educ*. 1997;1(3):114-122. doi:10.1111/j.1600-0579.1997.tb00020.x
- Lala R, Wood D, Baker S. Validity of the UKCAT in applicant selection and predicting exam performance in UKdental students. *J Dent Educ*. 2013;77(9):1159-1170.

15. Foley JI, Hijazi K. Predictive value of the admissions process and the UKclinical aptitude test in a graduate-entry dental school. *British Dent J.* 2015;218(12):687-689. doi:10.1038/sj.bdj.2015.437
16. Rowland KC, Rieken S. Rethinking dental school admission criteria: correlation between pre-admission variables and first-year performance for six classes at one dental school. *J Dent Educ.* 2018;82(4):411-416. doi:10.21815/JDE.018.042
17. Smithers S, Catano VM, Cunningham DP, et al. What predicts performance in Canadian dental schools? *J Dent Educ.* 2004;68(6):598-613.
18. Gardner SP, Roberts-Thomson KF. Predicting high achievers in the University of Adelaide, Australia, bachelor of Oral health program, 2002-09. *J Dent Educ.* 2012;76(12):1646-1656.
19. Patterson F, Roberts C, Hanson MD, et al. 2018 Ottawa consensus statement: selection and recruitment to the healthcare professions. *Med Teach.* 2018;40(11):1091-1101. doi:10.1080/0142159X.2018.1498589
20. World Federation for Medical Education. The Edinburgh declaration. *Med Educ.* 1988;22(5):481-481. doi:10.1111/j.1365-2923.1988.tb00788.x
21. Cunningham C, Patterson F, Cleland J. A literature review of the predictive validity of European dental school selection methods. *Eur J Dent Educ.* 2018;23:73-87. doi:10.1111/eje.12405
22. Schmidt FL, Hunter JE. The validity and utility of selection methods in personnel psychology: practical and theoretical implications of 85 years of research findings. *Psychol Bull.* 1998;124(2):262-274.
23. Robertson I, Smith M. Personnel selection. *J Occup Organ Psychol.* 2001;74:441-472.
24. Hough LM, Oswald FL. Personnel selection: looking toward the future—remembering the past. *Annu Rev Psychol.* 2000;51:631-664.
25. Sackett P, Lievens F. Personnel selection. *Annu Rev Psychol.* 2008;59:16.1-16.32.
26. Van Der Vleuten CPM, Dolmans DHJM, Scherpbier AJJA. The need for evidence in education. *Medical Teacher.* 2000;22(3):246-250. doi:10.1080/01421590050006205
27. European Orthodontic Society. Dental Schools in Europe. 2018. https://www.eoseurope.org/useful_links/dental_schools. Accessed July 6, 2018.
28. Schuler R, Jackson S, eds. *Strategic Human Resource Management*. Blackwell; 2007.
29. Feufel MA, Flach JM. Medical education should teach heuristics rather than train them away. *Med Educ.* 2019;53(4):334-344. doi:10.1111/medu.13789
30. Gigerenzer G, Hertwig R, Pachur T. *Heuristics: The Foundations of Adaptive Behavior*. Oxford University Press; 2016.
31. Cunningham C, Patterson F, Cleland J. A literature review of the predictive validity of European dental school selection methods. *Eur J Dent Educ.* 2019;23:73-87. doi:10.1111/eje.12405
32. Cleland J, Dowell J, Mclachlan J, Nicholson S, Patterson F. *Identifying best practice in the selection of medical students (literature review and interview survey)*. 2012.
33. Gergen K. The social constructionist movement in modern psychology. *Am Psychol.* 1985;40(3):266-275.
34. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research. *Acad Med.* 2014;89(9):1245-1251. doi:10.1097/ACM.0000000000000388
35. Lincoln Y, Guba E. The only generalization is: there is no generalization. In: Gomm R, Hammersley M, Foster P, eds. *Case Study Method*. SAGE; 2002:27-44.
36. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77-101. doi:10.1191/1478088706qp0630a
37. Cleland J, Fahey PT. "Aspirations of people who come from state education are different": how language reflects social exclusion in medical education. *Adv Health Sci Educ.* 2018;23(3):513-531. doi:10.1007/s10459-018-9809-2
38. Wertsch JV. *Mind as Action*. Oxford University Press; 1998.
39. Cleland JA, Nicholson S, Kelly N, Moffat M. Taking context seriously: explaining widening access policy enactments in UK medical schools. *Med Educ.* 2015;49(1):25-35. doi:10.1111/medu.12502
40. Onyura B, Légaré F, Baker L, et al. Affordances of knowledge translation in medical education. *Acad Med.* 2015;90(4):518-524. doi:10.1097/ACM.0000000000000590
41. Oborn E, Barrett M, Racko G. *Working Paper Series Knowledge Translation In Healthcare: A Review Of The Literature*. Cambridge Judge Business School; 2010.
42. Cleland JA, Patterson F, Hanson MD. Thinking of selection and widening access as complex and wicked problems. *Med Educ.* 2018;52(12):1228-1239. doi:10.1111/medu.13670
43. Eva KW, Norman GR. Heuristics and biases - a biased perspective on clinical reasoning. *Med Educ.* 2005;39(9):870-872. doi:10.1111/j.1365-2929.2005.02258.x
44. Hertwig R, Grüne-Yanoff T. Nudging and boosting: steering or empowering good decisions. *Perspect Psychol Sci.* 2017;12(6):973-986. doi:10.1177/1745691617702496
45. Kahneman D, Slovic P, Tversky A, eds. *Judgement under Uncertainty: Heuristics and Biases*. Cambridge University Press; 1982.
46. Schut S, Driessen E. Setting decision-making criteria: is medical education ready for shared decision making? *Med Educ.* 2019;53(4):324-326. doi:10.1111/medu.13826
47. Macduff C, Stephen A, Taylor R. Decision precision or holistic heuristic?: insights on on-site selection of student nurses and midwives. *Nurse Educ Pract.* 2016;16(1):40-46. doi:10.1016/J.NEPR.2015.06.008
48. Bowes L, Thomas L, Peck L, Nathwani T. *International Research on the Effectiveness of Widening Participation*. Higher Education Funding Council for England; 2013.
49. Garcia RI, Blue Spruce G, Sinkford JC, Lopez MJ, Sullivan LW. Workforce diversity in dentistry - current status and future challenges. *J Public Health Dent.* 2017;77(2):99-104. doi:10.1111/jphd.12219
50. Braun V, Clarke V. *Successful Qualitative Research*. Sage; 2013.

How to cite this article: Cunningham C, Kiezebrink K. Insights on selection of undergraduate dental students. *Eur J Dent Educ.* 2022;00:1-10. doi: [10.1111/eje.12834](https://doi.org/10.1111/eje.12834)

APPENDIX A

INTERVIEW GUIDE

Anonymity

- Despite being recorded, I would like to assure you that the discussion will be anonymous

QUESTIONS

Personal

- Can you tell me your name and your primary role?
- What are your key responsibilities and/or interests in relation to selection for dental school?
- How long have you held the role of admissions dean/ or similar?
- How did you end up in this role?
- What training or induction did you have for this role?
- How long have you worked in academia?
- Do you still practice as a dentist/ see your own patients?

General

- Is your school undergraduate or graduate entry, or do you offer both?
- What number of home and overseas students do you accept into Year 1?

Selection

- What is the selection procedure for dentistry (list steps, ascertain order)?
- What weighting is given to each in the final decision-making?
- How did your School decide on which selection procedures to use, and how they are used?
- Why do you think things are done like that around here? (Local prejudices?)
- Explore whether the following factors were relevant in decision-making:
 - Guidance Evidence
 - Acceptability to colleagues Acceptability to applicants and parent
 - MoneyTimeFacilities
- How confident are you that these procedures identify the best candidates for dentistry? (on a 0–10 scale) (if not very confident, ask whether they can think of better ways to do this).

Work Experience

Is evidence of work experience an important part of application?* How does your dental school or local NHS support potential applicants in accessing? * In your view, how do most of your applicants arrange work experience?* Are there any barriers to gaining work experience for specific groups of applicants? (i.e. student who lives

in a small remote town where dental practice will not offer work experience due to confidentiality issues)* (If applicable) can you think how to facilitate work experience for potential applicants?

Widening Access/Diversity

- Do you think any of your selection criteria limit successful applications from lower socio-economic groups?
- Do you have a specific WP Policy for entry to dentistry? If so can we access it?
- What widening access initiatives does the dental school take part in or run?
- What do you believe are the purposes of such initiatives?
- How do the initiatives attempt to address any issues perceived to disadvantage WP candidates?
- Do you make any concessions in terms of entry requirements, tariff, interview scores, offers to WP students? for example *a quota system, additional points at any stage?*
- Do students from WA background get specific support when they come to dental school?
- Do you carry out any formal evaluations of how WA students manage at dental school?
- For example, do you compare the performance of WA students with the general dental student population?
- Do you compare use of student support services of WA students compared with the general dental student population?
- *If neither, ask their impression as to how WA students manage once in*
- Views on the “politics” of WA (e.g. Kickback from middle-class parents or pressure to be seen to do stuff of no proven value??).*ok you have this here??
- Ask whether there are any barriers to taking a different approach to a) selection and/or b) widening access whether this seems appropriate given the responses to this point.
- Have you any data on the relationships between performance on the admissions process and performance as a dental student and dentist?

ANYTHING TO ADD?

National Recruitment

- What role, if any, can you see for national recruitment for dental selection?

Concluding question

- Of all the things we have discussed today, what would you say are the most important issues, in terms of ensuring selection tools are valid and reliable, as well as open, objective and fair?

Conclusion

- Thank you for participating