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How do medical schools influence their students' career choices? A realist evaluation

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ABSTRACT

Introduction: The career choices of medical graduates vary widely between medical schools in the UK and elsewhere and are generally not well matched with societal needs. Research has found that experiences in medical school including formal, informal and hidden curricula are important influences. We conducted a realist evaluation of how and why these various social conditions in medical school influence career thinking.

Methods: We interviewed junior doctors at the point of applying for speciality training. We selected purposively for a range of career choices. Participants were asked to describe points during their medical training when they had considered career options and how their thinking had been influenced by their context. Interview transcripts were coded for context-mechanism-outcome (CMO) configurations to test initial theories of how career decisions are made.

Results: A total of 26 junior doctors from 12 UK medical schools participated. We found 14 recurring CMO configurations in the data which explained influences on career choice occurring during medical school.

Discussion: Our initial theories about career decision-making were refined as follows: It involves a process of testing for fit of potential careers. This process is asymmetric with multiple experiences needed before deciding a career fits ('easing in') but sometimes only a single negative experience needed for a choice to be ruled out. Developing a preference for a speciality aligns with Person-Environment-Fit decision theories. Ruling out a potential career can however be a less thought-through process than rationality-based decision theories would suggest. Testing for fit is facilitated by longer and more authentic undergraduate placements, allocation of and successful completion of tasks, being treated as part of the team and enthusiastic role models. Informal career guidance is more influential than formal. We suggest some implications for medical school programmes.

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Career choice; medical school; undergraduate medical curriculum; realist evaluation; decision theory


Introduction

The proportions of medical graduates who chose particular careers varies widely between medical schools [1–5] and, overall, graduates' career choices are not well matched with societal needs [6,7]. Although there have been initiatives to better match career choices with societal needs, in particular the proportion who opt to become general (or family) practitioners [7–9], most medical schools do not aim for their graduates to enter particular specialities. Nevertheless, medical students' career preferences often alter while at medical school and alter in different ways at different medical schools [10]. Only about one in four US medical students who started medical school with a career in mind chose the same speciality on graduating in 2022 [11].

This variation in graduates' career choices between medical schools highlights the importance of understanding the role of learning environments

on the career choice process. There is evidence that some curriculum configurations seem to be associated with a greater understanding and likelihood of particular career choices but we do not have a clear theory of how this works. Students who have early clinical experience in community settings may have a greater understanding of societal needs and the role of general practitioners [12]. High-quality placements in which students engage with authentic clinical activity are major attractors to a speciality [13,14] and an association has been found between the total time spent in primary care placements and likelihood of choosing a career in general practice [2,15] but not for psychiatry, surgery or anaesthetics [2]. Students who undertake extended rural placements were more likely than students from a rural background to choose an internship in a rural area [16]. These findings warrant explanation.

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Informal and hidden curricula at medical school can also influence career choice. Negative comments from academic staff, doctors and other students about psychiatry and general practice influenced up to 50% of students in one study to choose another career [17]. Almost two thirds of medical students at one school perceived general practice to have lower status than hospital specialities and almost half felt that their medical school culture had influenced this view [18]. Foundation (PGY1) doctors have similar views [19]. These negative perceptions of general practice are long standing and widespread [20,21].

Career choice is a personal decision, and although influential factors have been identified, the process is not well understood. Rational choice theories of decision-making such as subjective expected utility theory (SEU) have been used to try to understand the process in medical students in the United States [22]. SEU posits that an individual considers the appeal of each career available to them (its utility) and weighs each choice by their subjective judgement of the likelihood of succeeding in each and that such choices are rational taking into account the decision-maker's resources, consequences of the choice and a logical consideration of likelihood [22]. The context differs in the UK where a state-funded healthcare system limits specialty earning potential and differentials, thus flattening one element of utility in SEU. Also the requirement to complete a 2-year period of generic postgraduate training (Foundation Programme), ahead of eligibility to apply for specialty training may make medical students view career choice differently. Career thinking is however encouraged in UK medical schools, students may well consider how to improve their medical specialty competitiveness and tools based on Person-Environment-Fit theories of career decision-making [23,24] such as Sci59 [25] have been used to guide medical student career thinking. The theoretical proposition that medical career decisions are made by matching personal needs with perceptions of speciality characteristics was supported by a systematic review of educational systems with a Western European curriculum structure [26]. Nevertheless, theories of career choice are insufficient unless contextual factors such as cultural [27] and social [17–19] influences on career decision-making are also included. Bounded rationality models of choice in economics [28] would have it that individuals choose satisfactory results instead of the best, and although rational, they base their choice on what (limited) information is available to them and on their (easily biased) mental capabilities. This might apply to career thinking. For example, medical student perceptions of specialities may be skewed by the exposure students have to different specialities and to different role models within them [14,29].

Career decision-making processes are clearly complex and evolve gradually during and after medical school. The literature suggests that while the process of career

decision-making is not well understood, experiences in medical school including formal exposure and informal and hidden curricula are important. While acknowledging that other factors in an individual's life also affect their career choice, medical educators should be aware of the influence we have. We need more research into the psychological *process* of how and why careers are chosen under these various social conditions. As undergraduate medical educators we deliberately chose to focus on the learning environment as being the context we can change. We set out to improve our understanding of how medical school learning environments influence graduates' eventual career choices. This matters. Medical schools need evidence as to how they can help students make good choices between available opportunities and to help students think about how well those choices 'fit' their attributes and needs. This understanding could inform how curricula, policy and practice might be altered in order to contribute towards filling the intended number of training posts with doctors who are best suited, potentially reducing the current problems of imbalances and drop-outs.

This study was approved by the School of Medicine Ethics Committee June 2015

Methods

Aim

To improve understanding of how medical school learning environments and curricula influence graduates' eventual career choices.

Objectives

- (1) To conduct a realist evaluation of the experiences that junior doctors recall as being important to their career choice, with a focus on influences and events in medical school.
- (2) To produce recommendations for medical school formal and informal curricula

Theoretical orientation

We chose realist evaluation because it is suitable for studying complex human programmes such as medical education and seeks to explain causal links between context and outcomes rather than simply describing the factors considered to be influencing outcomes. Realist evaluation asks 'What works for whom under what circumstances, in what respects and why?' and develops theories (often in the form of Context-Mechanism-Outcome (CMO) configurations) that seek to explain causation from what participants say about their experiences [30,31]. A realist approach is theory-driven, starting with theories to be tested, and interprets data to develop these hypotheses with an

explicit eye for the way context affects whether and how individuals react in certain semi-predictable ways (mechanisms) to produce the outcomes of interest. Programmes (interventions) work by changing participants' decisions ([30], p. 66). Recurring CMO configurations are examples of Middle Range Theories (MRTs), explaining how and why an intervention works and the influence on this of other elements in the context. While MRTs require 'abstraction [they] ... should be close enough to observed data to be incorporated in propositions that permit empirical testing' and can be refined by subsequent analysis ([32], p. 39). By making the relationships between context mechanisms and outcomes explicit, an 'Initial Programme Theory' about these relationships is refined to set out a 'Final Programme Theory' which can be used to provide targeted suggestions for adjustment of the complex intervention under study [31]. We have used the RAMESES II standards for reporting realist evaluations to report this work [33].

The initial programme theory for a realist evaluation is often drawn from the guiding documents of the programme being studied. In studying the influence on career choice of UK medical schools, the stated aim of undergraduate medical programmes is to produce doctors who are capable of any medical career. Career information and advice is however part of what UK medical schools are required to provide [34] but little guidance on how this is done is provided. This lack of prescription may be why the informal curriculum about career choice is important [18,21,26].

Our initial programme theory (about how career choice is made) was constructed by four members of the research team (JL RK RM SY) in a series of 5 meetings over 2 months drawing on our various understandings of career decision-making including our own and our students' and junior colleagues' experiences, SEU and Person-Environment-Fit theories, socio-cultural theories of experiential learning in workplaces [35] and an exploratory search of relevant literature about career decisions in medical students and graduates as outlined in the introduction.

Initial programme theory

Figure 1 provides a visual representation of our agreed initial programme theory.

Recruitment and selection

This is an extension to a previously reported study [36,37] of the transition from being a medical student to being a doctor. Those who consented to their initial transition into practice being studied in 2015 were invited to consent to further follow-up a year later (FY2 or PGY2) when they were applying for speciality training and had hence made a firm career decision. Additional participants at the same career stage were recruited from the local

Foundation School by email, by advertising at training days and from other Foundation Schools via ad hoc contacts. Potential respondents were asked to categorize their chosen career as 'General practice', 'Hospital practice' (medical and surgical specialities, anaesthetics, imaging and pathology) and 'Other' (public health and psychiatry) and we then purposively sampled respondents by career choice to ensure representation of a range of career choices. Interviews were conducted in 2017 and 2018.

Data generation

We wished to elicit explanations of doctors' career choices by asking them to recall times before, during and since medical school when they considered particular careers and try to identify what had triggered those thoughts and how they were influenced. For the purposes of this study, the main focus of the interview was on their time at medical school. To this end, we used semi-structured interviews to explore the participants' decision-making. We used telephone interviews because participants were scattered across the UK and scheduled these to suit participants. Interviews were conducted by HT and AT who used an interview framework consisting of 5 open questions with follow-up probing questions to guide their interviews (see Appendix). HT and AT were clinical teaching fellows at the local medical school and neither knew the participants nor were involved in their career progression. Interviews were audio-recorded and transcribed verbatim by an independent transcription service. During transcription, all data was made anonymous for analysis by the authors and for publication.

Data analysis

Realist evaluation is an 'iterative explanation-building process' (pg 93 [30]). For each transcript, two members of the research team identified and coded CMO configurations in the text in which career thinking was described. AT coded all the transcripts and one or other of the team members independently coded each transcript. They then discussed in researcher meetings differences of coding and agreed what was being described and how it should be coded. They extracted recurring CMO configurations into a spreadsheet with their accompanying quotes. CMO configurations were grouped in the spreadsheet by sub-sections of the Initial Programme Theory. Any CMO configurations which did not fit were put into a 'basket' column for further analysis to determine whether there was scope to develop new theory. The CMO configurations in each column of the spreadsheet were analysed to refine theory. Quotes were labelled by the participants Medical School (K for home, N for other), the serial code for the transcript and the participant sex eg K15F.

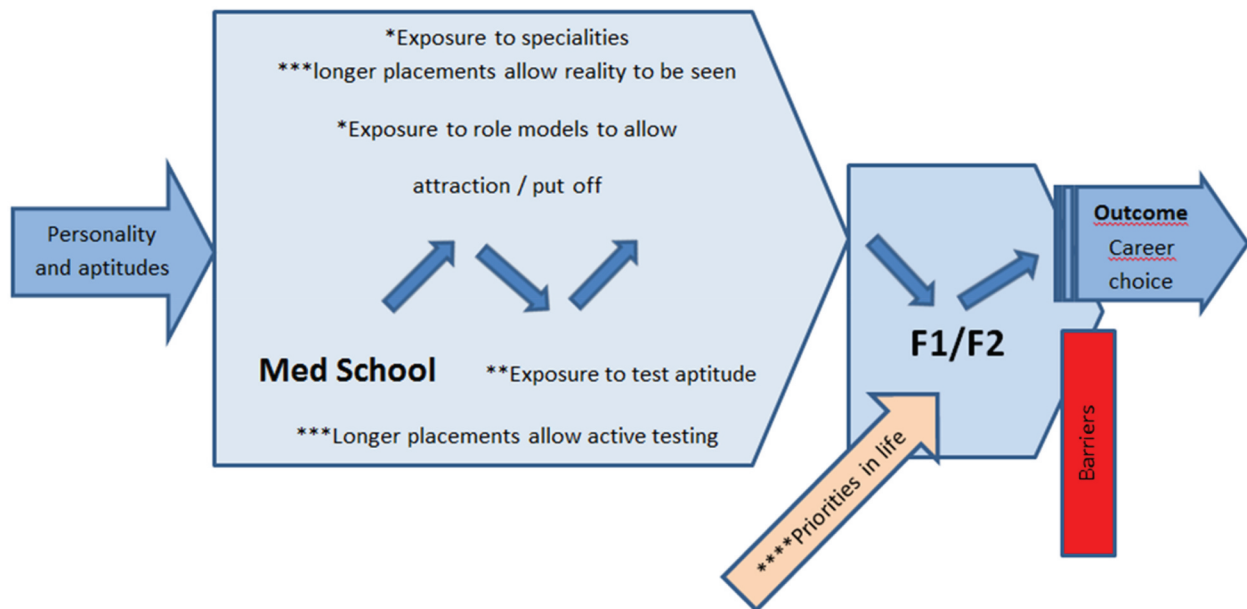


Figure 1. Initial programme theory of how career preferences are formed in medical school.

Results

We recruited 46 FY2 doctors (eight from the original study cohort and another 11 local and 27 graduates of other UK medical schools) who all provided data about their career preference on entry to medical school and at recruitment to the study (FY2). From these recruits we sampled purposively to get a spread of interviews of those choosing GP and other careers. Our final sample of 26 participants included the eight volunteers from the original study cohort plus another five local and 13 graduates from 11 other UK schools. For six of them, career preference was unchanged since entering medical school. Ten had changed preference during medical school and ten recalled no career preference at entry to medical school. Although all participants had stated career choice at recruitment, at interview two participants revealed they did not have firm career preferences and three were considering delaying entry to speciality training. This trend to take a training break at the end of foundation training rather than continuing with specialty training immediately is recognised [38,39] and is designated 'F3' in Table 1.

Main findings

In this section, the overarching process of career decision-making as described by our participants is outlined. Then the complex influence of the medical school programme on that process is set out. A total of 14 recurring CMO configurations were identified (Tables 2 and 3) which explain how medical school curricula, placements, role models, peers, career guidance and culture affect the career decisions of students who came to medical school

with more or less formed interests, aptitudes and career dreams.

The process of career decision-making: testing for fit involving 'easing in' or 'ruling out'

Unlike students of most other university courses, participants arrived at medical school with the big decision already made – they wanted to be doctors. In addition, 16 of 26 also had some idea at that stage, often vague, of their preferred speciality.

Participants described choosing a speciality as 'testing for fit' of the career with their own aptitudes and needs. Although a few participants had been testing a strong speciality preference for fit before entering medical school, few did so during the first two years of the course unless triggered by a significant event.

I didn't really think about the future. I don't think anyone really does in the first year at Medical School. You kind of just crack on with it and just try and pass each year.

It generally started when more time was spent on clinical placements and many felt they needed to start the process of testing for fit in year 3 or 4 (of five-year courses), at least 3 years before the point in F2 when they apply for speciality training posts.

The concept of testing for fit was described as a more or less active process of appraising the speciality and their aptitude for it. Ruling in and out however were asymmetric processes. Ruling out was generally described as a first impression decision without much testing and was often based on a single negative or boring experience or negative impression from others.

I think I probably more worked on a process of ruling things out rather ruling something in 'cus [because]

Table 1. Participants' stated career choice at the start of medical school and at interview (FY2).

Participant	Career intention pre-med school	Intended Career at interview
K01m	none	GP/Medicine
K04f	Psychiatry	Psychiatry
K15f	Neurology	Pathology
K17m	none	Orthopaedics
K23m	GP	Acute Care Common Stem
K28f	none	Acute Care Common Stem
K30m	Psychiatry	Acute Care Common Stem
K33m	GP	GP
K38m	none	Medicine
K40f	Hospital doctor	F3/GP
K42f	Obstetrics&Gynaecology	Obstetrics&Gynaecology
K43f	none	Emergency Medicine
K44f	histopathology	GP
N03m	none	Surgery
N04m	Obstetrics&Gynaecology	Obstetrics&Gynaecology
N05f	Pathology	Medicine
N07f	none	Neurology
N08m	none	Paediatric Surgery
N09f	Paediatrics	Paediatrics
N13f	none	F3/Acute Care Common Stem
N14f	none	GP
N17f	Surgeon	GP
N19f	GP	GP
N24m	GP	Acute Care Common Stem
N25m	Trauma	Obstetrics&Gynaecology
N26m	Psychiatry	F3/Acute Care/GP

Table 2. Exposure to specialities.

CMOc	Illustrative quotes
1a. A brief exposure to a few aspects of the speciality (C) if it is appealing to that individual (C) is not sufficient in itself to trigger a career choice but can result in a desire to test for fit (M) by choosing a longer exposure (O).	<i>We weren't actually really exposed to anaesthetics during Medical School until our final year when we did ... a week of A&E, a week of anaesthetics, a week of ITU. I hadn't really found anything as enjoyable as I did find that so I chose that for one of my foundation jobs just to get a bit more exposure to it ... and that was it. I knew pretty much after that that's the career for me and then subsequently since I've done other jobs during F1/F2, I realise that nothing's actually come up to that level for me in terms of enjoyment K23m</i>
1b. Brief exposure to a speciality (C) if it is not appealing to that individual (C) or the providers are not engaging with student needs (C) may trigger discomfort (M) or boredom (M) which may result in immediate ruling out without further consideration of testing for fit (O)	<i>Psychiatry I just hated ... I remember we spent an hour in the morning having little ward rounds and we spent 40 minutes of that talking about the furniture in someone's room and I just thought, no. This isn't for me. So that's one speciality that got ruled out fairly quickly. The second was paediatrics. I did paediatrics in xxxxx and there wasn't really that much engagement to teach us. N03m</i>
2a. Long placements give adequate exposure to the realities of a speciality (C) to enable testing for fit (M) both of aptitude for it and satisfaction in doing it which may lead to contemplating it as a career (O) if the fit is good.	<i>I enjoyed my GP placement as a fifth year and then I enjoyed it as an F2, which has consolidated my decision really. But I'd say there wasn't like an epiphany moment. It was kind of a gradual, 'Yeah, I think I want more people' K44f</i>
2b. Adequate exposure to the realities of a speciality (C) will allow realisation that the fit is not actually good (M) if there is lack of task interest (C), lack of personal aptitudes(C), or wrong level of challenge/pace(C). This may cause ruling out (O) and seeking a career with the opposite characteristics (O)	<i>Even though I enjoyed the actual placement, for me that really did make up my mind. Maybe if that had been a shorter placement I probably would have still kept that as an option but because it was so long I think that really did let me almost become a GP for that length of time and then after that you realise I can't do that forever. K23m</i>
3a. In students who already had a career preference on joining medical school (C1) exposure to that speciality especially in early years (C2) may be strongly and memorably confirmatory (O) through enhancing the existing interest (M1) and fit may be perceived (M2) without much evidence. Consideration of alternatives may therefore be blocked (M3).	<i>The last block in the first year was female anatomy and all that sort of stuff and that was like my favourite block of the year so I guess that cemented it and I remember X coming in one day and just being like, sorry guys I'm late I was elbow-deep in placenta and everyone else was like ewwww and I was like I want to do that! That's what I want to do so, and then it's just kind of gone on from there K42f</i>
3b. If the original career preference is weak (C1), exposure to other specialities (C2) and discovering more about their original speciality of interest (C3), triggers testing for fit (M) which may lead to altered preferences (O).	<i>In the pre-clinical years, there was quite a lot of histology and I actually really enjoyed that so that kind of consolidated the fact that I wanted to do it. I did an SSC in it in third year. And I think at that point I was kind of realising that I actually quite like people alive. So then it was sort of go down that route. K44f</i>

I enjoyed pretty much everything I did at Medical School. I just managed to rule some things out as I went along because I couldn't rule everything in. K17m

By contrast, the process of making a positive choice was usually prolonged. It was initiated by an initial attraction, enjoyment or interest which was sufficient

to make the student consider testing it for fit. This initial attraction occurred before medical school for 16 of our 26 participants and for six their preference did not change through testing. All participants however described being attracted to a number of specialities. Crossing the threshold of initial attraction triggered active seeking of further exposure,

Table 3. Being given an active role and exposure to role models.

CMOc	Illustrative quotes
4. Being given an active role (C) and discovering enjoyment of it (M1) and getting self-efficacy (M2) are powerful emotional triggers to finding 'fit' and developing a career preference for that speciality (O)	<i>On the five week emergencies block, my week in anaesthetics I actually really enjoyed and I was given a fair amount of responsibility on the practical procedures and started to really enjoy that K30m</i>
5. Being cared for socially/being treated as a legitimate part of an attractive community of practice (C1) and receiving approval in the role (C2) was another emotional reinforcement (M) of the sense of 'fit' for that speciality (O)	<i>So it definitely was a sense that this is a speciality where I felt kind of valued and I felt like the other juniors were valued and it was quite a friendly environment to be in so that definitely influenced me, yes N09f</i>
6a. Medical students may be inclined to identify with (M) attractive, successful, knowledgeable, enthusiastic role models who involve and encourage them (C) and therefore may want to follow their career (O1) or may on reflection wish to adopt their attributes but not their career (O2).	<i>There's some really interesting consultants that were really kind of inspiring actually and really dedicated to the job and seeing that made me realise that maybe I would want to be like that but erm I think it's more the personalities rather than the science that I enjoyed in renal. We all got along really well which was really nice. But I don't think I'm a renal physician at heart. I think I just really liked the team. N04m</i>
6b. Observing an role anti-model (C) may cause antipathy to joining their community of practice (M) resulting in ruling out their speciality (O)	<i>She was a female surgeon and she was I think quite honestly the rudest person I've ever met in my entire life and she put me off wanting to do surgery. Just if people are like her, I want nothing to do with it K04f</i>

comparison with previously favoured specialities and multiple tests and checks. A career option could fail any one of these and be ruled out. These tests included features of the career (interest, variety, prestige, lifestyle, requirements) and of how the individual felt in the workplace and their self-efficacy for the activities (are they suited to the role and could they see themselves doing this for the rest of their career?) and continued after leaving medical school.

I'd say that by the end of your Medical School, you've spent enough time in clinical scenarios to understand the difference between each speciality and what that might entail in terms of the general shape of training and the type of job you'd do. I don't know if you have a good understanding of . . . things like the workload and how it affects family life and possible earning potential. N03m

The influence of the medical school programme on the process of testing for fit

Our realist evaluation coded text where it was clear that some aspect of the medical school formal or informal curriculum had influenced the process of testing for fit described above. In total, 14 Context-Mechanism-Outcome (CMO) configurations where the same influence recurred multiple times through the data are listed in six main clusters but there is overlap between them:

- Exposure to specialities (CMO configurations 1–3) clustered in [Table 2](#)
- Being given an active role (CMO configurations 4 and 5) clustered in [Table 3](#)
- Exposure to role models (CMO configuration 6) [Table 3](#)
- Student choice (CMO configuration 7) see [Table 4](#)
- Medical school culture and the hidden curriculum (CMO configurations 8–11) clustered in [Table 5](#)
- Career guidance (CMO configurations 12–14) clustered in [Table 6](#)

Most of our CMO configurations confirm the expectations in our initial programme theory but there are four key concepts which explain how these influences work which were helpful additions to our initial programme theory. These were:

- Exposure to careers during medical school is incomplete but is enhanced by active participation and by interactions with role models (CMO configurations 1–7).
- Student selected components (SSCs), electives were recalled as times when fit was found (CMO configuration 7)
- Perspective was biased by various contextual factors (CMO configurations 1–11)
- Career advice (CMO configurations 12–14)

Each CMOc is illustrated with one of the supporting quotes. Where the same trigger in different contexts moves medical students in different directions the CMOcs are paired a) and b).

Exposure during medical school is incomplete but is enhanced by active participation and by interactions with role models (CMO configurations 1–7)

When interviewed, participants had progressed to F2 and, in hindsight, saw how partial their view of specialities was during medical school. They were now aware of working hours, responsibilities, patient complaints and task repetitiveness, things they had not always perceived as medical students.

Realistic testing for fit during medical school had been enabled by being given the tasks of a doctor in that speciality. Longer placements (four weeks or longer) made it much easier to test for fit and career decisions were made with more confidence. An element of testing by identification with a role model ('Could I be him/her?') was apparent for some. Less commonly, there was a description of a role anti-model ('If that is what they are like I do not want to be one').

Table 4. Student choice.

CMOc	Illustrative quotes
7. The option of Student Selected placements (SSCs)/Electives (C1) and voluntary extracurricular activities (C2) enable students to actively seek exposure to test for fit (M) with the outcome of clarity about a career in that speciality (O)	<i>I think in my head I was basing my placements around, oh yeah they'll be useful for GP. So for my other SSC I chose ENT and ... I did another paed one as well because it is useful for GP, erm, I quite liked being in community and the range of patients and, I quite liked going out for home visits, I quite like seeing people in their home environment that was quite nice! K40f</i>

Table 5. Medical school culture, the hidden curriculum.

CMOc	Illustrative quotes
8. A culture of encouraging individual students to discover their interests (C) will promote testing for fit (M) with the outcome of more exploration of the clinical environment (O1) and questioning of senior colleagues (O2)	<i>I think xxx were quite good actually cus they just said ... keep thinking about it and enjoy the placements you go to, if you know what you're gonna do, fair enough, do a bit of work towards it ... they encouraged you to kind of get going with stuff that would help for your career but probably were less pushy about making decisions. They were very open that probably most of the people who make a decision at Medical School might change it in F1 or F2 N05f</i>
9a. The shape of the curriculum (C1), statements suggesting a career in GP (C2) can feel affirming (M) and make the choice more settled (O) for students who were wanting to be GPs (C3)	<i>K is always going to encourage people to be GPs because of the way the course is designed. They've invested heavily in GP placements. They're very good placements ... I think the course lends itself well to being a GP and I'm sure that's one of their underlying aims. I don't know. Lots of our most influential tutors are GPs. Lots of the higher Faculty are GPs. K01m</i>
9b. To students who were wanting to keep options open (C4) (C1) & (C2) and peer opinion that it is the fall-back option (C3) can feel like pressure needing to be resisted (M) and cause a stronger resolve not to pursue that career (O)	<i>There might have been the occasional remark off lecturers and things, er, but there was a general student consensus that we were a heavily general practice university and a lot of us turned out to be GPs. And it was almost like a negative thing, like if you're a xxx graduate ... you're going to be a GP, and a lot of people were trying to fight against that and I think I was as well. I was like, 'Well I'm not going to be a GP if that's what everyone else does'. Erm, so when (we) left medical school there were very few of us who were actually going to do GP and actually now, erm, my cohort's got to the end of F1 a lot of them are doing GP. Erm, it was almost like it was looked down on at medical school. N14f</i>
10. Missing elements of a curriculum (C) effectively minimize by omitting opportunity (M) the possibility of certain careers (O)	<i>One thing you'll notice is we didn't really have that much GP compared to a lot of Medical Schools, or that much community placement. Nothing to do with palliative, you know nothing in hospices but yes, a lot of the focus was on being a hospital doctor or surgeon I think. N04m</i>
11. Medical schools representatives' voiced opinions (C) may colour (M) the forming perceptions of stigmatized careers making them appear unattractive (O)	<i>In the first six months of medical school I had already got that impression that if you were a smart doctor you did hospital medicine and if you were not so good you ended up in general practice. I remember, on the open day for xxx University, erm, the opening lecture they made a point about saying, 'At least half of you will become GPs and you won't want to be'. xxx University's quite snobbish in a lot of ways, erm, and there were quite a few times when they, someone would say a line about, 'Well a certain percentage of you will by necessity become GPs but xxx tends to have a higher proportion of hospital doctors than, than general practice doctors, and that reflects the quality of the students we have'. N24m</i>

Student selected components (SSCs), electives were recalled as times when fit was found (CMO configuration 7)

SSCs (placements selected by the student) were often strategically used by participants to test for fit but, even if they chose the SSC or elective for other reasons, some were surprised by the sense of fit. The combination of a student who has chosen a speciality for any reason and a supervisor who gives them special attention and includes them in the team seems to put the speciality in a favourable light and cements the career preference.

Perspective was biased by various contextual factors (CMO configurations 1–11)

Several participants described their view of a career as being 'rose tinted' by their preconceptions and the positive experiences described above.

Conversely many felt they were biased against a career largely because of peer and medical mentors' opinions about it, and to a lesser extent by the institutional culture. These negative perceptions were generally not part of the participants' preconceptions on starting medical school and instead arose from the medical school and its placement providers. Participants were asked about official or unofficial messages they got in medical school about career choice. All those from the home school (K) and some from other schools believed that their school wanted to produce GPs. Some described this as understandable but others as a pressure to be resisted. This belief was underpinned by statements from school staff such as '60% of you will become GPs' but was sometimes inferred from the school's heavy investment in GP placements or the faculty make-up. Two medical schools were described by their graduates as

Table 6. Career guidance.

CMOC	Illustrative quotes
12a. Personalised one-to-one discussions with a career advisor (C1) and the Sci59 career aptitude questionnaire (C2) may enhance self-awareness (M1) and encourage testing of fit (M2) with particular career options leading to looking into them more (O1) and provide material for application forms (O2).	<i>I had a meeting with the careers adviser so I did the Sci 59 thing and then I had the opportunity to meet with someone and go through my results and try and make sense of them all and that was actually really useful because ... the Sci 59 comes out with specialities that might suit you and rather than just going through and saying oh well this speciality does this and this speciality does that, she actually looked through and worked out the pattern. Which helps you sort of understand yourself a bit better and why you might be suited to certain specialities. ... (and) certainly when you're doing your applications and it says why do you're think you're suitable for this specialty? Actually a lot of that probably came from sitting down and thinking about it with the careers advice back at Medical School K28f</i>
12b. The Sci59 suggestions (C2) may be difficult to interpret (M3) and get discarded (O3)	<i>I did do the SCI 59 and spoke to somebody at the University from the career support team but I didn't find that particularly helpful the sSci 59. I think they told me that I should be a haematologist in super rare blood conditions (laughing) which you know, had never appealed and I've never really thought about since K17m</i>
13. Informal career guidance solicited (M1) from doctors in that job (C) may be valued (M2) more than formal for some students and FY doctors in order to find out what a job feels like (O)	<i>Senior Registrars or Consultants will have done a bit of training in another speciality and changed and seen that it's not for them and sometimes those conversations can be quite useful because you find out why it wasn't for them and you can consider whether that will be a factor for you K28f</i>
14a. Unsolicited informal advice about how to choose a career from trusted clinical supervisors (C1) may facilitate testing for fit (M1) and refine the decision (O)	<i>I think one of my old bosses just said that you need to decide what's important for you whether that's, you know, the type of patient, whether it's doing practical stuff, whether it's prestige or lack of prestige, whether it's lifestyle stuff ... So for her it was the kind of patient mix that she got. For other people it's doing procedures. For other people it's not being in a job that's looked down on or whatever so you just decide based on that. N08m</i>
14b. Doctors' unhappiness in their speciality (C2) influences students powerfully (M2) and can trigger ruling out (O2)	<i>He said it's a changing specialty and it's not what it used to be and maybe you should stay away from this one ... so I think he sort of helped in terms of putting me off general practice as a speciality, partnership disputes and all sorts of ugly stuff like that so he advised against GP which I will listen to his advice on N03m</i>

emphasising hospital careers and claiming that they produced medical leaders in contrast to other schools which produced more GPs. Two schools were described by three participants as promoting individual discovery of the right career which was appreciated by those participants.

As expected, the trade-off between career and life ideals was a consideration mainly after graduation. Some participants, who as medical students had met doctors whose priorities had changed and were struggling with managing family life, reported that they did not necessarily change their own view of the career at the time.

Career advice (CMO configurations 12–14)

There were mixed responses as to what form official career guidance took and how useful it was. The most useful official advice was one-to-one from a career advisor or a personal tutor. Informal guidance was also sought (and given unsought) from multiple seniors on placements and was sometimes found most useful. Listening to the talk of the team was also important for some, with career information gleaned particularly from junior doctors. Doctors' opinion about their own speciality carried a lot of weight with students and influenced them more than their opinion of the specialities of others which may be expected to be

disparaging. If the doctor was unhappy in their own career the negative effect was particularly powerful and can trigger ruling out.

Discussion

Our initial programme theories about what might cause medical students to rule in and rule out career options and the processes by which this might happen were tested by asking junior doctors who were graduates of 12 UK medical schools to recall such times when they were at medical school.

As expected from the literature, their choosing of a career involved deliberative decision-making processes. These calculated decisions, weighing up attributes in themselves and in the potential career would agree with rational choice theories of decision-making such as Subjective Expected Utility theory [22] and Person-Environment-Fit theories of career decision-making [23,24]. We found however that there are also faster, less thought-through decisions being made when ruling out career choices, and that both the deliberative and the less thought-through types of decision-making are triggered by elements in the context. Most participants were not thinking about speciality choice in their first two years at medical school, but once they started encountering specialities on

placements they found themselves continually collecting evidence to cautiously explore careers which were attractive on first encounter. We have therefore called this rational choice process 'easing in' rather than 'ruling in'. Easing in is a process which takes time and active information-gathering. Conversely, ruling out is often quick and may use what may appear to be flimsy evidence. One reason for this asymmetry between easing in and ruling out may be that students encounter a number of the 65 medical specialities [25] while in medical school and may feel the need to narrow down the field so that they can focus on a few choices. Rather than making effortful rational decisions, heuristics such as ruling out a speciality which evoked a negative emotional response on first encounter may be adopted to identify unsuitable careers. Brief experiences in medical school may therefore be important because they can trigger ruling out of a career choice which is then unlikely to be considered again. Brief encounters are less important in the easing in process which requires sufficient exposure for aptitude-testing and developing a sense of fit. This may help to explain why placements in which students engage with authentic clinical activity are major attractors to a speciality [13,14] The opinion of others was found to be influential both to easing in and ruling out, but the same asymmetry may operate here with a positive opinion forming part of a body of evidence being gathered in favour of a career option while a negative opinion might be sufficient to trigger a ruling out decision. Pertinent to this, as found in previous studies [17–20], there was a general sense of a hierarchy of careers which was influential and may have discouraged consideration of some career options.

Our final programme theory is that: The process of career decision-making involves the testing for fit of potential careers by either easing in or ruling out. This process is asymmetric with multiple positive experiences needed to ease in but only a few negative experiences needed for a choice to be ruled out. Testing for fit is facilitated by longer and more authentic undergraduate placements, being allocated tasks which are successfully completed, being treated as part of the team and an enthusiastic role model. These may contribute to biased perceptions but may also help students to assess their aptitudes and to get a good enough impression of the speciality to develop a sufficient sense of fit. This often seems to happen during SSC placements. Ruling out is also promoted by a negative perception of a speciality in medical school culture and peer pressure.

The parameters of fit which are being tested may change with career progression: a full awareness of the

demands of a career or the importance of lifestyle may not become apparent until the young doctor has started work when a previous fit becomes a misfit.

Medical schools affect these processes though curricular design choices for example placement length, the strength of their mandate for student participation in care and the profile given to different role models.

Our final programme theory is illustrated in [Figure 2](#).

There is a 'comfortable fit' or a 'best fit' in the perception of the participants in this study but this perception may change either positively or negatively with context over time. The eventual decision after starting work as a doctor may become subject to further constraints such as life priorities and rather than being the idealised best fit is a compromise.

We did not include life priorities in the CMO configurations for this study of medical school influences on career choice since it was clear that most participants only consciously considered these after starting work as a doctor. Its importance should not be underestimated, however, as a large majority of the interviewees cited it as a significant but late driver for career choice. This is an area for further research.

Strengths & Weaknesses: This study has used in-depth interviews to explain career decision-making. The retrospective approach has advantages of identifying the recollections felt to be important to eventual career choice, but some influences may have been forgotten or distorted in recollection. A longitudinal set of interviews might have uncovered other less memorable influences. A rigorous theoretical framework and methods were applied to data analysis. The large data set of 26 interviews samples graduates of 12 UK medical schools who have a range of career preferences. An even larger data set might have discovered other contextual influences. The study is based in the UK medical careers system so findings may not be directly applicable to other contexts. The researchers are reflexive about their own positioning on the medical education and medical careers stage. The group includes hospital doctors and GPs both junior and senior which broadens their perspective as researchers .

Conclusions

Our study suggests that UK medical student thinking about career preference seems to align with Person-Environment-Fit decision theories more than with Subjective Utility Theory. Ruling out a potential career can however be a less thought-through process than rationality-based decision theories would suggest and can be triggered by contextual factors such as medical

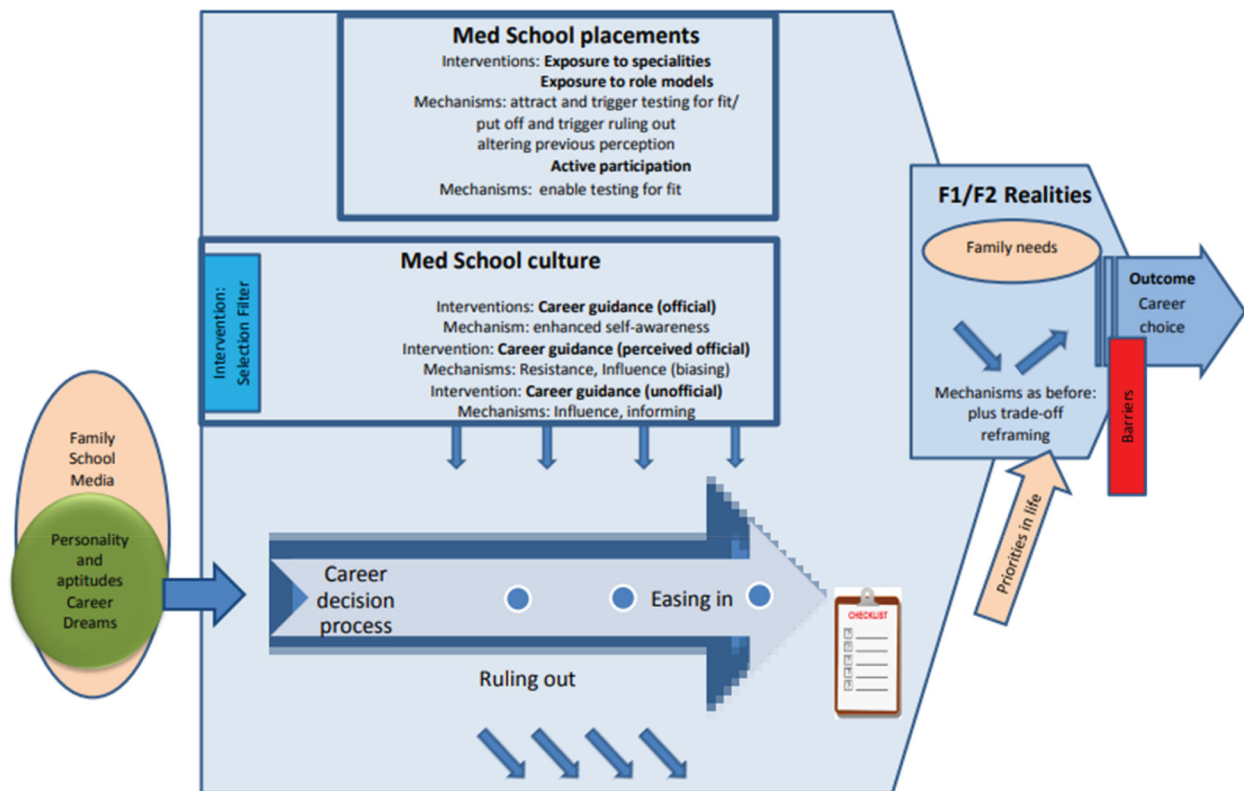


Figure 2. Final programme theory Model of how career preferences are formed in medical school.

Box 1. Implications for policy/practice.

- (1) Medical student clinical placements are important times for forming career preferences. As this is usually not of the formal curriculum it may need to be recognised as such and thought given to what students are learning. A short exposure to limited aspects of the career may give a distorted perception which could trigger ruling out of that career as an option.
- (2) Longer placements (4 weeks or more) with authentic experiences of the career such as performing tasks, being involved in the delivery of patient care and being included in the team permits students to test for fit which is a better way of ruling out or easing in.
- (3) Testing for fit ideally includes understanding a career 'warts and all', but this needs careful consideration since ruling out of career options can be triggered easily, for example by an experience of boredom or by disparagement of the career especially by a senior who is working in that career themselves.
- (4) Career orientated SSCs (Student Selected Components) offer important opportunities to enable testing for fit. Multiple SSCs would expose students to a variety of careers.
- (5) Medical schools must be aware that their students perceive them to be giving out messages about careers. These messages come from student peers, students' perceptions about the emphasis of the curriculum and it steering them towards GP or hospital careers and by faculty comments rather than through official school communications. Students seem to appreciate intentional statements of the school's desire to encourage them to explore and find their best personal fit. Such messages need to be strong and supported by curricular measures to promote career exploration and test for fit in order to overcome the hidden curriculum.
- (6) Career advice is appreciated if one-to-one and at the point of need. Career events are unlikely to provide this but personal tutors, career advisors and informal discussions with seniors on placements are valued as informative. Prompting of discussions of work-life balance may not be welcomed by students who are not currently grappling with that dilemma.

school culture and fleeting placement encounters. Realist evaluation identifies the contextual factors which change participants' decisions and thinking and can therefore be used to develop recommendations for programmes wishing to help students to find a good career 'fit'. Implications for medical school planners are in Box 1.

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Author contributions

AT conducted some of the interviews, led data analysis and wrote the initial draft of the manuscript as a masters dissertation. JL led the research team which devised the study and were awarded the research grant and revised the manuscript into this paper. All authors contributed to initial programme theory, did coding, discussed modifications of the programme theory and edited drafts of the paper

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