Influences on foundation programme doctor's choice of career specialty. Paediatrics as an exemplar case.

MD Medical Education

Newcastle University

Faculty of Medical Sciences

Population Health Sciences Institute

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Sarah Scales

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List of abbreviations

Abbreviation	Meaning
ACCS	Acute care common stem training pathway
Anaes	Anaesthetics
CardioT	Cardiothoracic surgery
BBT	Broad based training scheme
CMT	Core medical training
COTE	Care of the elderly
CST	Core surgical training
CT	Core training (medical or surgical)
F1	Foundation programme year 1 doctor
F2	Foundation programme year 2 doctor
GMC	General Medical Council
GP	General practice/ general practitioner
GUM	Genito-urinary medicine/ community sexual and reproductive health
HEE	Health education England
HENE	Health education North East and Cumbria
Histo	Histopathology
JRCPTB	Joint Royal Collage of Physicians Training Board
KMO	Kaiser-Mayer-Olkin index
KSS	Kent, Surrey and Sussex hospitals trust
LETB	Local education and training board
MaxFax	Maxillofacial surgery
MMC	Modernising medical careers
NeuroS	Neurosurgery
NFS	Northern foundation school
NTN	National training number

O&G	Obstetrics and gynaecology
Opthal	Ophthalmology
Paeds	Paediatrics
PBL	Problem based learning
PG	Postgraduate
PH	Public health
PICU	Paediatric intensive care unit
Psych	Psychiatry
Radio	Radiology
RCPCH	Royal Collage of paediatrics and child health
RIASEC	John Holland's Six Types of Personality codes: realistic, investigative, artistic, social, enterprising and conventional
RVI	Royal Victoria Infirmary, Newcastle upon Tyne
SCI45	Specialty choice inventory 45 (45 subspecialties in results)
SCI59	Specialty choice inventory 59 (59 subspecialties in results)
SJT	Situational judgement test
SPSS	Statistic package for social science
SSC	Student selected components
ST	Specialty training doctor
TF	Teaching fellow
UAE	United Arab Emirates
UK	United Kingdom of Great Britain and Northern Ireland
USA	United States of America
VIF	Variance inflation factor

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1. Background

The specialty in which a doctor chooses to train could be considered a 'calling', an innate belief that one specialty is right for them without an active choice (Smiley, 1956; Yoon et al, 2015; Bott et al, 2017; Jager et al, 2017). However, it is more likely to be a planned decision (Cleland et al, 2014). Currently there are several specialties which have struggled to recruit adequate numbers of junior doctors with associated risks for staff wellbeing and patient care (Department of Health, 2017). Identification of how junior doctors select specialty careers can be utilised to assist in trainee recruitment and retention.

The reasons whereby junior doctors opt for one specialty career or another is an area of particular interest (Allsopp and Taggar, 2018; Nguyen and Bounds, 2019; RCGP, 2020; RCPSYCH, 2020). To that end this thesis will illuminate the medical career decision-making process from the trainees' perspective. This introductory chapter will set out the policy and practice context in which junior doctors are making career decisions, including training pathways, and indicate how this project will add to our current understanding of the phenomenon.

1.1 A history of career pathways in medicine

Modern medical training pathways commonly involve specialisation, and a requirement to make early career choices (Cleland et al, 2014). The time at which a doctor must choose a career training pathway has changed over time. From the 1940s until early 2000s, the usual pathway of

medical training after graduation was to undertake a pre-registration house officer year which included medicine and surgery rotations. This allowed for application to senior house officer (SHO) rotations. Often this followed 2-3 application and interview processes, and there were concerns about the number of junior doctors in non-training posts who may never progress (Cooper and Burr, 2002).

After a minimum of two years of senior house officer positions, many junior doctors were able to apply to specialty training. The choices included General Practitioner (GP) training, which required another 5 years' training; or hospital-based specialty training, which could take between 4- and 8-years' training depending on the specialty. At this point in training, junior doctors were described as 'registrars' or 'middle grade' doctors, and they needed to apply for various stages in their specialty training to become 'senior registrars'. If they wished to change specialty, they would have to start the process again (NHS Highland, 2004).

1.1.1 The MMC training pathway

The current pathway was introduced as part of the policy reform called 'Modernising Medical Careers' (MMC) in 2005. One of the outcomes of the MMC reform was the introduction of a new 2-year foundation programme after graduation from medical school. The first year (F1) was analogous to the 'old' house officer year; the second year (F2) to 'old' senior house officer, though limited to one year. During these two foundation years, junior doctors rotated through 4-month posts in various specialties. Trainees then chose and applied for their higher specialty training path during the F2 year (Figure 1). For some, the end of the foundation programme was identified as a natural point to consider a career break. This may be to take on non-training clinical roles, research, travel, or volunteer work.

Figure 1: Career progression options for doctors who continue to work in medicine or surgery (MMC pathway)

MMC was implemented in response to concerns about poor training opportunities for junior doctors, to streamline the application process to higher specialty training, increase multi-disciplinary working and ensure compatibility with the European Working Time Directive (Department of Health, 2004; Health Committee, 2008). One aspect of this was the introduction of 'run-through' training, whereby once a doctor is in a specialty training programme no further applications are needed to continue progressing, unless there is an interest in sub-specialisation (Fuller and Simpson, 2014). Currently, run-through programmes are paediatrics, obstetrics and gynaecology, ophthalmology, radiology, cardiothoracic surgery, neurosurgery, and general practice (although there are some specialty specific nuances).

Alternatively, specialty training may follow from a 'core' training programme (termed 'uncoupled training') that aims to provide generalisable skills before application to sub-specialty. Core training takes 2-3years followed by a second application to higher specialty training (ST3-8, previously termed 'registrar') which takes 3-5years. Again, following core training, some trainees identify this to be a suitable time for a career break.

The aim of this pathway was to provide fully capable doctors in their chosen specialty, who also have experience of alternatives, to create a highly motivated practitioner who is well suited to their speciality of choice.

1.1.1.1 Unintended consequences of MMC

Unfortunately, there were some negative consequences of MMC. These included a decreased flexibility of training, increased unrest amongst the medical profession due to concerns about applications and academic achievements (Hawkes, 2006), a lack of trainees in certain specialties with decreases in flexibility of changing specialty career, increased difficulty in getting locum work, and overall, a disruption to training and delivery of service (Fuller and Simpson, 2014).

In addition, this process posed some challenges for career decision-making. Foundation programme trainees may not have the opportunity to work in a specialty placement of career interest, since rotations are allocated on the basis of applicant score and popularity of the rotation. Over the 2-year programme, rotations can include any specialty which has access to appropriate supervision, but there is a requirement nationally to include rotations in medicine, surgery, and the community. Some sites, however, include A&E experience as a surgical rotation, whereas others include psychiatry as a community rotation. Limited additional exposure may be achieved through 'taster' experiences (The UK Foundation Programme Office, 2015). As a result, for some trainees, having to a make career decision so early is off-putting and a number choose an out of training post - either in the UK (e.g. teaching fellow) or overseas (Evans et al, 2002; Moss et al, 2004).

Overall, there are fears that the numbers of junior doctors applying to specialty posts each year are not meeting the service needs of the NHS (Barker and Buss, 1993; Yakeley et al, 2004; RCPCH, 2011; Lambert et al, 2012; Sivey et al, 2012). Table 1 shows the total number of posts per specialty in England and their percentage fill rates for 2015 and 2016. This data identifies that some specialties have difficulties in recruiting junior doctors into their training programmes. The Department of Health data documents final recruitment numbers following two rounds of allocations.

Health Education England have expanded the data to show recruitment rates for 2018, 2019 and 2020 following the first round of job allocations as shown in table 1 (HEE, 2020a). In 2017 the state of recruitment was significantly worse, with 908 vacancies from 7487 training posts following the first round of allocations, with almost all those vacancies found in general practice, psychiatry, ACCS acute medicine/CMT and paediatrics (Moberly, 2017). It is notable that there has been significant improvement in recruitment for various specialties in 2020, however this is possibly a response to the COVID-19 pandemic which has prevented many junior doctors seeking alternatives to specialty training outside of the UK.

Table 1: Recruitment to core training and year 1 specialty training posts in England 2015 & 2016 (Department of Health, 2017); overall recruitment following first round of allocations (Moberly, 2017); and recruitment to specialty posts following first round of recruitment in 2018, 2019, 2020 (HEE, 2020a)

Core/ Specialty training posts year 1	2015		2016		2017		2018		2019		2020	
	Posts	Fill rate	Posts	Fill rate	Posts	Fill rate	Posts	Fill rate	Posts	Fill rate	Posts	Fill rate
Cardiothoracic surgery	6	100%	5	100%			9	100%	10	100%	10	100%
Clinical Radiology	212	100%	212	100%			234	100%	250	99.6%	252	99.6%
Community Sexual and Reproductive Health	2	100%	5	100%			9	88.9%	5	100%	6	100%
Neurosurgery	28	100%	23	100%			28	100%	21	100%	22	100%
Ophthalmology	74	100%	61	100%			72	100%	79	100%	59	100%
Oral and Maxillo-facial Surgery	5	100%	3	100%			7	100%	6	100%	9	100%
Public Health Medicine	78	100%	57	100%			72	100%	77	100%	70	100%
Core Surgical Training	508	98.0%	507	99.8%			510	99.6%	515	100%	507	99.8%
ACCS Anaesthetics/Core Anaesthetics	519	100%	487	99.2%			463	99.8%	450	100%	451	100%
Obstetrics and Gynaecology	205	100%	230	99.1%			235	98.3%	231	96.5%	230	97.4%
Acute Care Common Stem (ACCS)- Emergency Medicine	327	99.4%	321	98.8%			325	99.4%	331	97.9%	317	99.4%
Histopathology	74	102.7%	79	98.7%			83	77.1%	76	100%	81	100%
ACCS Acute Medicine/Core Medical Training	1,368	97.9%	1,375	95.2%			1,418	97.9%	1,364	99.5%	1,376	101%
Paediatrics	373	96.3%	379	92.9%			423	81.8%	419	82.8%	394	96.9%
General Practice	3,117	88.8%	3,250	92.9%			3,250	90.2%	3,250	91.7%	3,549	96.9%
Core Psychiatry Training	463	78.4%	506	80.0%			463	79.1%	412	92.5%	349	99.4%
Total	7,359	97.6%	7,500	97.3%	7,487	87.9%	7,601	92.8%	7,496	98.3%	7,682	98.5%

There is evidence that some specialties are oversubscribed at various timepoints, however many more are undersubscribed (Evans et al, 2002; Department of Health, 2017). Unfilled posts have long-term consequences. For example, based on the 2016 average recruitment figure in table 1, 7% of paediatric training posts went unfilled, accounting for about 25 posts not able to recruit. Across the 8 years of paediatric specialty training, this would result in a shortfall of 200 paediatric doctors.

1.1.2 The shape of training review

Acknowledging the problems with recruitment to specialty training posts, the Shape of Training review (Greenaway, 2013) proposed changes that would shorten training overall, decrease specialism and make more junior doctors 'generalised'. The goal was to increase flexibility between specialty programmes, by creating broad based 'themes' such as mental health, women's health and child health as opposed to individual specialties (Greenaway, 2013; Fuller and Simpson, 2014). Hence, if a junior doctor wished to change their specialty career, previous experience could be counted across themes, and length of training would not increase (Greenaway, 2013).

This review aimed to address the concerns about tension between service provision and training (Greenaway, 2013). The Shape of Training review reset medical pathways to the pre-MMC style of training, but without the senior registrar grade (Fuller and Simpson, 2014). However, the Shape of Training review suggestions are not yet formally in place. Rather a steering group has been set up to identify how to implement the 19 recommendations of the review (UKSTSG, 2017) with input from the Royal Collages. Some collages have achieved this through curriculum reforms (RCPCH, 2017; HEE, 2020b). In practice, this means the pathway through foundation training programme to specialty training is the same as identified in figure 1.

1.2 Workforce planning

There are increasing demands on health professionals who provide 'frontline' care. As changes to working patterns continue, and increased numbers of senior medical staff providing out of hours on-site clinical cover, there is a real challenge to ensure that there will be enough staff to provide these 24-7 services (RCPCH, 2019a). This has impact at several organisational levels. Firstly, local education organisers must ensure that there are enough doctors to provide safe patient care and fill staff rotas adequately. Secondly, specialty colleges who oversee training and need reassurance that service pressures do not compromise training of medical staff. Lastly, it also impacts on the Department for Health who need to provide a safe and effective National Health Service. Hence, it is timely to gain a greater understanding of what determines doctors' career choices in the current training landscape (Mullan et al, 1993; Davidson et al, 1998; Cleland et al, 2014).

Whilst historically there have been challenges to recruitment in GP and psychiatry, with subsequent strategies to encourage recruitment (Yakeley et al, 2004; Morra et al, 2009; Lambert et al, 2012), there is evidence that paediatrics may also be teetering on the edge of a similar type of workforce crisis (table 1). Even when considering the impact of COVID-19 on opportunities for junior doctors, table 1 demonstrates that paediatrics is one of the specialties with the lowest recruitment year on year.

1.2.1. Workforce planning in paediatrics

Training post fill rates have declined over time in paediatrics. From 2015 to 2016, the overall uptake of posts decreased, from 360 in 2015, to 348 in 2019 (Department of Health, 2017; HEE, 2020a). This results in consequences for service provision (Barker and Buss, 1993; Fazel and Ebmeier, 2009; RCPCH, 2011). The Royal College of Paediatrics and Child Health (2011) identified that there were staff shortages in junior doctor rotas within the specialty. Furthermore, plans to provide consultant cover '24-7' has been suggested as potentially further impacting on retention within the

specialty (McPhillips et al, 2007; RCPCH, 2015). Thus, consideration of attractors and deterrents to choosing a career in paediatrics may have considerable benefit to inform workforce planning strategies.

There is variation depending on geographical region, as shown in table 2. In 2016, in the regions of Kent, Surrey and Sussex (KSS) as well as Yorkshire and Humber, there were not enough applicants for number of posts available (RCPCH, 2017). Overall, the RCPCH report that in 2020 the competition ratio for paediatric posts was 1:4 but that they were unable to provide regional figures due to changes in the process for application to specialty training (RCPCH, 2020).

Table 2: Total number of paediatric ST1 posts available, number of applicants, competition ratios for 2015 & 2016 in the UK (RCPCH, 2017)

Local education training board (LETB)/deanery	Number of posts (NTN) 2016	Number of applicants 2016	Fill rate % 2016	Competition ratio 2016 (Applicants per post)	Competition ratio 2015 (Applicants per post)
HE East Midlands (North and South)	28	35	89.29%	1.2	1.2
HE East of England	31	35	90.32%	1.1	1.1
HE Kent, Surrey, Sussex	23	21	91.30%	0.9	1.5
London Shared Service (on behalf of the 3 London LETBs)	103	232	100%	2.2	2.2
HE North East	19	31	94.74%	1.6	1.1
HE North West - North West/Mersey	41	72	100%	1.7	2.3
HE South West	22	51	100%	2.3	2.7
HE Thames Valley	14	21	100%	1.5	3.2
HE Wessex	13	20	100%	1.5	2.0
HE West Midlands	36	36	91.67%	1.0	1.8
HE Yorkshire and Humber	49	39	71.43%	0.8	1.1
Northern Ireland	14	23	100%	1.6	2.4
Scotland	22	62	100%	2.8	2.9
Wales	15	30	100%	2.0	1.0
Total	**430**	**708**	**93.95%**	**1.6**	**1.9**

Furthermore, these areas are more likely to be affected by attrition. This has been a reported problem for paediatrics with up to 10% of paediatric trainees dropping out of the programme nationally (Jaques, 2013). In 2017, the president of the RCPCH identified there was a 14% shortfall of paediatric junior doctors (Modi, 2017). A RCPCH cohort study identified that only 37.7% of applicants

had reached ST7; and over 3% of trainees had left the programme each year from those 446 who were ST1 trainees in 2007 (RCPCH, 2016). The costs of unfilled specialty training posts to the NHS are demonstrated by locum doctor fees, which was estimated at £740million per year in 2015 (Rimmer, 2016).

1.3 Career planning

The definition of a career includes the pattern of work-related experiences that span an individual's life and is more than a single 'job'. Rather it is the lifetime process of progression and development (Baruch, 2004).

According to Baruch (2004) there are two aspects to a career. These are firstly, the organisational structure, which supports an individual's development and progression (Baruch, 2004). Secondly, the individual, and how the individual identifies their role, progression, knowledge, and skills (Baruch, 2004). Accordingly, the individual aspect may be different for each member of the team who hold the same position within the organisation (Baruch, 2004).

Often, medical students have preconceived ideas about their future career at the time of application to university (Petrides and McManus, 2004). Previous work has identified that interest in specialties changes though the course of medical education (Mwachaka and Mbugua, 2010). Exposure during undergraduate placements helps form views about specialties (Zhu et al, 2011). However, a review indicated that postgraduate (PG) doctors were best placed to identify differences between specialties that may drive career choice as they were more likely to appreciate the implications of differences between training programmes (Borges and Savickas, 2002).

1.3.1 Planning for paediatrics

As identified in the literature review (chapter 3), there is comparatively little published work looking at the choice of paediatrics as a specialty career. Previous studies considering applications to

paediatrics training have often focused on those still in medical school (Yakeley et al, 2004; Petrides and McManus, 2004; Fysh et al, 2007; Morra et al, 2009). Overall, they have identified that paediatrics was perceived as 'difficult' and has 'highly competitive' entry (Bindal et al, 2011). Paediatrics was regarded as having a high status due to students' beliefs that paediatricians needed to possess particular inter-professional relationship skills, along with intellectual capacity (Bellodi, 2004). Hence while it is important to identify how paediatrics is identified as attractive as a future career, it is also timely to frame this information alongside how specialty choices are made overall.

1.4 Factors affecting career choices

Studies of medical student career choices frequently focus on 'extrinsic' factors, identifying that financial (Morra et al, 2009; Sivey et al, 2012) and lifestyle implications (Buddeberg-Fischer et al, 2006; Fysh et al, 2007), or location of job (Serneels et al, 2010), are significant influences. Comparing perceived lifestyle considerations in paediatric specialty training (Lambert et al, 2003), junior doctors associated the specialty with long hours of work, heavy workload, extended training, and high pressure as a consultant. All these factors were considered negative and deterred applications to the specialty (Lambert et al, 2003).

'Intrinsic' factors refer to the perceived qualities of those who work with in a specialty (O'Reilly and Caldwell, 1980). These can be the perceived attributes of the individuals (e.g. clinical skill ability or ability to work under pressure), the personality of individuals in a specialty (e.g. 'friendly and approachable geriatricians' compared to 'demanding surgeons') (El Sheikh et al, 2014), or stereotypes of those who work within the specialty. Stereotyping might include 'radiologists who like to sit in the dark' or 'anaesthetists who don't like talking patients' (Oxtoby, 2013; Hunter, 2018). The literature base is relatively limited on how intrinsic factors may determine career choices and whether or not they persist. Borges and Savickas (2002) demonstrated that studies have lacked the scope and rigour to investigate why personality differences are found between specialties. It is likely that a

combination of both intrinsic and extrinsic factors influence specialty choice (Cleland et al, 2014) and a systematic literature review is detailed in chapter 3.

1.5 Personal perspective

At the start of this research project, I had completed my foundation training in the North East of England. I had experienced foundation programme rotations in adult medicine, adult surgery, accident and emergency (A&E), adult psychiatry and finally paediatrics. I determined that I needed more experience of paediatrics before I could consider committing to the specialty for my long-term career. This led to taking on a teaching fellow post with clinical commitments in paediatrics with the opportunity to conduct a research Master of Philosophy.

When determining an area of research, I concluded that my interests lay around how and why junior doctors decided upon a specialty career. I had my own personal conflicting assumptions around various specialty choices and hence wanted to explore how others were anticipating the decision. By reflecting on my career decision process, I have identified that I had an unstructured approach to selecting a specialty career. I had not been aware of support systems to assist my decisions aside from my foundation programme experiences and casual discussions with colleagues. I have reflected that I have likely missed many opportunities to develop my own understanding of specialty career options. In addition, through my clinical commitments, I identified some struggles within the paediatric work force and used this as a basis to explore specialty career choice.

Through the early data collection stages of this project, it was apparent that there was a significant lack of understanding in how any specialty career decisions were made, and so, the project scope was expanded to incorporate not only how paediatric specialty careers are selected, but how all speciality career choices are made.

As a junior doctor I have been educated throughout medical school with an unspoken positivist lens. This has created an unacknowledged bias in my understanding to seek out the 'right

answer'. Through an appreciation of medical education literature, it is however more apparent that I interpret the world through a post positivist perspective. This acknowledges that I, as the researcher, cannot be fully detached from the findings as the experiences I have had leads me to interpret the data in one way. If I were a surgical or GP trainee my interpretation of the themes may be different.

My own experience of paediatrics, and difficulties in selecting a specialty career, have undoubtably affected my research choices. In addition, my previous experience of conducting a Masters in Clinical Education led me to an awareness of the repertory grid method (which use is detailed in chapter 5). This experience, along with my clinical experience, has allowed me to be able to ensure adequate responses from participants compared to someone naive to the method.

Finally, as a junior doctor working in paediatrics, I have direct experience of the specialty which has led to some shared understanding that was valuable for the analysis of each stage of data interpretation.

1.6 Aim and research questions

This project will add to the educational literature by examining in detail how junior doctors approach career decision-making. This is important because there is a clearly identified service need to have adequate specialty trainees, and ultimately specialty consultants, which can provide safe patient care. There is an underlying assumption that by choosing a career, a junior doctor is more likely to be satisfied working in that specialty. Following this, there is an assumption that a satisfied junior doctor is likely to be motivated to increase their skill in that specialty, provide effective care and continue to work in that specialty long term. By considering the perspectives of Foundation doctors, the study may offer wider insight into career decision-making processes and provide an evidence base to support specialty recruitment strategies.

A psychological approach was undertaken to ensure the individuality of specialty choice was not lost. Frequently in workforce planning, the individual is removed from the narrative to allow for

large scale system recommendations. However, the impact of this serves to disenfranchise the individual and does not acknowledge the additional important features in specialty decision making. This gap in understanding results in a gap in policy.

The work focuses on paediatrics as an exemplar case. It is an understudied specialty in careers literature. In addition, by considering a specialty 'on the brink' of crisis, findings may allow educators and policy makers to anticipate intervention ahead of workforce need. More broadly, this study will demonstrate the process of choice which is applicable to all medical specialties. This information can be used at different stages to address equity and workforce needs.

1.6.1 Aim

To gain understanding of the process by which junior doctors consider paediatrics as a specialty career choice.

1.6.2 Research questions

1. What factors influenced the career decisions of current ST1/2 doctors in paediatrics?
2. What are the intended future career choices of foundation year 2 (F2) doctors?
3. What factors influence the career decisions of F2 doctors at the point of application, and how?

1.6.3 Plan of thesis

This thesis will first address theoretical perspectives that can be applied to career choices. This is followed by a literature review around medical career decision-making, including international differences. This informs the chapter on methodology, including my epistemological approach, data types and methods. Subsequent chapters will present findings and analysis before the discussion which presents a model for career decision-making, implications for practice and further work.

2. Theoretical perspectives

There are multiple educational theories regarding career planning and progression. Many of these have been revisited and revised, yet there is still not an overall acceptance of one approach (Brown, 2002). The lack of one approach to career decision making is due to a limited understanding of how career choices are made and an oversimplification of the process (Krumboltz, 1994). Current understanding of careers can be considered in the context of 'post-positivism'. Post-positivism is the epistemological belief that the truth is never fully reachable but that it is approached progressively through research (Kennedy and Lingard, 2006). This thesis has taken a post-positivist approach to be most appropriate to determine how a specialty career in paediatrics is selected.

Post-positivism values rigour and objectivity, but there is also a fundamental belief that the results are complex and should be interpreted in context to only the research question (Kennedy and Lingard, 2006). This view shapes the theoretical perspectives, the methods used to collect data and the analysis of data itself. Ultimately the epistemological approach of post-positivism identifies that with more research into the subject matter, there is greater understanding (Kennedy and Lingard, 2006).

Much post-positivist research fits within constructivism, where we build, or construct, our views of the world based on our own perceptions of it (Trochim, 2006). Post-positivism recognises that there are inbuilt errors within any theory or method and therefore we should attempt to address these errors by using multiple measures or observations (Trochim, 2006). By comparing new data to previous work in the same area, overall objectivity is improved (Trochim, 2006).

2.1 Career choice theory

There are multiple theories of career choices and decision making. Many stem from work by Parsons in 1909, who developed a model which described relationships between personal 'fit' to the environment as influencing career choices. Although this model has been since described as too simplified, for example by not including the influence from others at work or home, and instead focusing on the individual act of choice (Hodkinson, 2008), it still appears to form the basis of many more elaborate theories of career decision making.

Parsons' conceptual framework for career choice was expanded into 'trait and factor' theory in the 1930s (Brown, 2002). This developed over time, where understanding of career choice included theories considering how the working environment impacted on career choice (Ginzberg et al, 1951; Arnold, 2004). Super's (1953) developmental career theory extended Ginzberg's work, determining longitudinal models for preferences and skill development. Super also lay some foundations for Kelly's personal construct theory (Kelly, 1955; Gross, 1996), which suggested that similarities and differences in careers could be described as preferable or not. Over time, multiple further theories have formed based on Bandura's work in 1971.

Bandura (1971) developed social learning theory to help explain how people make important decisions. He discussed human behaviours, impulses, personalities, motivations, and influences. He aimed to identify predictive, causal factors that resulted in changed behaviours (Bandura, 1971). He identified that learning through direct experience, with rewards and deterrents as motivations, was one way in which decisions could be made (Bandura, 1971). However, 'modelling' would ultimately have more impact (Bandura, 1971). This modelling may be achieved through observational learning, reinforcement of outcomes, and integration of influences (Bandura, 1971).

This chapter discusses various theories of career decision making, many of which use Bandura's work as a basis. The theories presented here are those which are most established within the subject area, offer an alternative viewpoint or expand on the work of others. In contrast, I have not included theoretical work where careers are allocated as opposed to chosen. This is because the

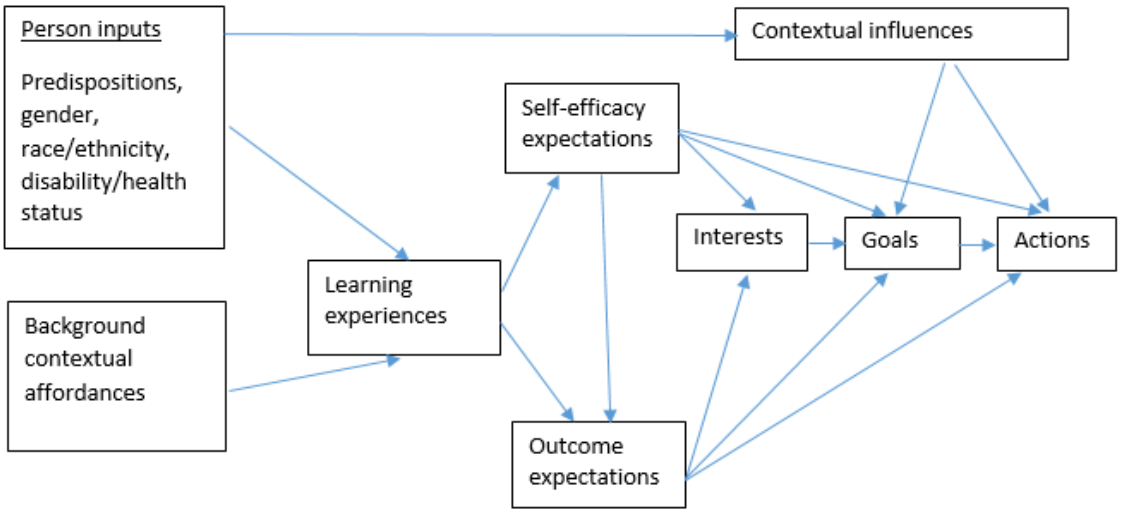
route of specialty selection in UK medical careers is associated with a decision-making process. Instead, I have highlighted work which demonstrates unconscious biases in career recruitment, and as seen in chapter 3, underlying biases are present in specialty selection.

2.1.1 Social learning theory and social cognitive career theory

Social cognitive career theory, based on Bandura's social learning theory (1971) is built upon three areas: self-efficacy beliefs and expectations, outcome expectations, and personal goals (Career Research, 2015a). These three areas result in identification of how interest in careers develops, how choices are made, and success obtained (Career Research, 2015a).

A 'unifying' social cognitive career theory was developed by Lent et al in 1994 building on the work from Bandura, Krumboltz, Holland, Super and many others. This theory aims to bring together the competing theoretical constructs and explain outcomes common to multiple theories (figure 2). Lent et al (1994), reported that this was a first effort of theory integration to explain the dynamic processes whereby career interests develop, choices are made, and outcomes are achieved in early adulthood. Lent et al (1994) identify person, contextual and experiential factors as influencing career interests and behaviour which are discussed in more detail here.

Figure 2: Model of social cognitive influences on career choice behaviours. Adapted from "Toward a Unifying Social Cognitive Theory of Career and Academic Interest, Choice and Performance" (Lent et al, 1994)



2.1.1.1 Person inputs and background contextual affordances

'Person inputs' included the sociocognitive variables (from Bandura's theory of observational learning, 1986; 2001) such as gender, race or ethnicity which have biological, psychological, and social significance. These significances may bias sources of information and have cultural impact. Lent et al (1994) also discussed genetic influences, such as basic skill potential, goal-setting and personal aptitude as part of these 'person inputs' that can affect career decision making.

The use of 'genetics' as an influence raises significant concern. Lent et al (1994) described "genetic endowments", describing the psychological and social implications rather than the biology of gene differences. They acknowledge that gender and ethnicity are often socially constructed aspects of experience and can influence choice behaviours (Lent et al, 1994). Going forward, this thesis will not describe 'genetics' but instead the socially constructed features of demographic features will be touched upon cautiously to attempt to avoid the negative implications associated with selection processes.

Background contextual affordances, based on Astin (1984) and Vondracek et al (1986), were those environments that 'offer and provide'. These are the support, opportunities and barriers that shape learning, interests, and self-cognition (Lent et al, 1994). They could include environmental

features (e.g. financial support available for different training options), exposure to role models, and culturally accepted roles (Lent et al, 1994; Lent et al, 2000). Social learning theory had been used previously to show that positive role models are able to increase training aspirations (Scherer et al, 1989).

2.1.1.2 Contextual influences

Contextual influences occur through decision points which are made by organisations and impact on career choices of individuals. These include organisational barriers (e.g. active discrimination to hire more females to a role) or professional contacts (Lent et al, 1994). These influences can directly impact on a person's career goals and development. In their paper, Lent et al (2000) gave an example of how those applying to medical school may perceive attractions, such as 'helping others' as being offered by the career, but that contextual influences, such as having financial stability to complete medical school will ultimately interact with that consideration to result in a person applying, or not, to medical school and become a doctor. In contrast, Lent et al (1994) echoed the statement from Bandura that '*people do not choose assembly lines for their consuming interest in these occupations'*, i.e. the availability of jobs may indeed have the greater influence on a person's overriding career interests and goals.

2.1.1.3 Self-efficacy

Lent et al (1994) described self-efficacy as the personal judgement of capabilities and that this was the central mechanism of personal agency in career decision making. They described that self-efficacy interacted complexly with person, behaviour, and contextual factors to determine the choice of activity, environment, effort, persistence, thought pattern, and emotional reactions (Lent et al, 1994). Self-efficacy beliefs result from observing others in that role, previously demonstrated abilities and what impact doing those tasks has ('*how I felt doing it'*) (Career Research, 2015a). It also includes

an element of fitting the perceived stereotype (Career Research, 2015a). Ultimately self-efficacy is the question of '*can I do this?*' (Lent et al, 1994).

2.1.1.4 Outcome expectations

This aspect of the framework considered the personal beliefs about probable response outcomes, e.g. anticipation of physical, social, and self-evaluative outcomes (Lent et al, 1994). Outcome expectations are an assessment of reward that will result from that career decision, and therefore relate to how much effort a person would put into achieving it (Career Research, 2015a). Lent et al (2000) identified variables which people can exhibit personal 'control' over when they consider their career development e.g. personal goals, which includes 'what I expect I can achieve by following this career path'. However, it may be equally appropriate to consider this as 'moderation of expectations' as an individual will be shaped by their experiences and self-efficacy beliefs.

2.1.1.5 Interests, goals, and actions

Career interests, or liking career options, lead to a desire to obtain further activity in that career (Lent et al, 1994). People form enduring interest in activities they believe they can achieve and anticipate positive outcomes from, such as financial reward or social standing. Changes to interests later in life usually relate to 'life changes' such as births, physical ailments or technological innovations that result in a need for different competencies (Lent et al, 1994).

Goals are important in self-regulation and therefore a human trait (Lent et al, 1994). These are the self-motivating factors, which may be career plans, aspirations and decisions that guide behaviours or actions (Lent et al, 1994). They are implicit elements of career choice theories (Lent et al, 1994).

2.1.1.6 Limitations of this framework

Lent et al (2000) felt that there was still much to determine. Their original paper described multiple models and hypotheses to how career choices were made (Lent et al, 1994). Career support, as part of environmental influences, can facilitate the pursuit of an individual's career choice and it was identified as an area warranting further study (Lent et al, 2000).

Further models have described medical student career decisions (Bland et al, 1995; Bordage, 2009), drawing on Bandura (1971) and Lent et al's (1994) work, yet these models often report decisions are static. Pfarrwaller et al (2017), felt that Lent's framework was too generalised, incorporating all career choices and therefore not indicative of medical career decision making. In their work focusing on student interest in GP careers, Pfarrwaller et al (2017) and Bennett and Phillips (2010) acknowledged that the processes are both longitudinal and dynamic.

2.1.2 Social learning theory of career development

Bandura's social learning theory has been applied to career development with a greater focus on the feedback from the working environment: how it makes the person feel. Social learning theory states that learning is a cognitive process taking place in a social context (Bandura, 1971). There is a general acceptance that the future is unpredictable, and social learning theory of career development acknowledges this. This theory can be used to suggest that it is impossible to know what interests will persist to the future (Krumboltz, 1992; Career Research, 2015b). This theory is useful in methods of career counselling (Mitchell et al, 1999). It identifies that people encounter many experiences from which they learn more about themselves and career options, but also, that individuals can create opportunities by their actions (Career Research, 2015b). New opportunities might include courses or work experience sessions, but also staff met, and skills gained from day-to-day work. Each of these opportunities provide feedback in some sense, whether it is direct feedback from colleagues, or through reflection on the opportunities once undertaken: did you enjoy it, did you find it exciting or challenging (Career Research, 2015b). The unpredictable events of the future may therefore have less

weighting if the plan for opportunities has been significant. In contrast, unanticipated activities might stem from what was, or was not, achieved from these planned opportunities (Career Research, 2015b).

2.1.3 Motivational theories

Other theories not directly related to Bandura's work include work considering motivation. However, the theories of motivational fit and self-determination reference concepts similar to those found in social learning theory and social cognitive career theory. Comparatively, these motivational theories focus on one area within Lent et al's (1994) model, expanding the influence of self-efficacy and outcome expectations which are demonstrated in the model (figure 2).

2.1.3.1 Motivational fit

As described by Lent et al (1994), self-efficacy describes that if a person has the skills they perceive which fit a role, they are more likely to pursue that role as a career. In contrast, Maslow (1943) described a hierarchy of needs, whereby human requirements of 'belonging', 'esteem', and 'self-actualisation' result in motivation to perform a task. Subsequently, Kanfer and Heggestad (1997) developed a work motivation model based on a framework of person characteristics and situational factors to determine suitability to a career.

In this model, personal traits led to a sense of achievement in completing various tasks, and this achievement resulted in a greater interest to obtain a career containing those tasks (Kanfer and Heggestad, 1997). These personal traits are modified by situational factors, such as organisational practices, to result in a sense of achievement or anxiety which act as motivation and lead to work performance (Kanfer and Heggestad, 1997). The authors identified that both employees and employers are therefore able to modify careers to ensure success (Kanfer and Heggestad, 1997).

2.1.3.2 Self-determination theory

Another theory identified within research into career choices considers what motivates a person to undertake an experience. Self-determination theory is a framework of human motivation (Deci and Ryan, 2012; University of Rochester, 2017). This theory describes goal directed behaviour of individuals, which can be through internal or external motivating factors, but overall aims to fulfil the basic psychological needs of a person which are autonomy, competence, and relatedness (Deci and Ryan, 2012; University of Rochester, 2017). Again, acknowledging the social context of a person's life, and how that relates to their engagement of a particular subject (University of Rochester, 2017). This theory was developed by Deci and Ryan (2012) and builds on multiple previous experimental research styles to create five subsections of the theory. They believe it has multiple applications, including work motivation studies, health behaviour and education-based research (Deci and Ryan, 2012). They originally worked on reward as being a principal motivator, but expanded their description into intrinsic motivators, such as how it makes a person feel, and external motivators, such as financial reward (Deci and Ryan, 2012). Both types of motivators can be enhanced or discouraged by the external environment (Deci and Ryan, 2012). This therefore is related to the work done by Lent et al as it discusses that there are modifiable factors that can be considered when trying to determine why a person would make specific career choices.

2.1.4 Other theories

The earlier parts of the chapter have considered career choice theories based in work by Bandura's social learning theory (1971) or closely related to it. However, there are numerous other approaches that can be considered, some of which are less developed.

Levinson et al's (1978) seasons of life theory, describe transitional stages of development and active assessment of goals (Baruch, 2004). These transitions include the stage where a person leaves adolescence and embarks on an adult life through decisions about education and occupation (Levinson et al, 1978). However, Levinson et al (1978) focused particularly on age as defining when

these transitions happen and is often the basis for when it is considered traditionally appropriate for marriage, children and even a 'mid-life crisis'. Modern life has changed significantly since 1978, and therefore it may not be appropriate to consider these transitions in relation solely to age.

In 1990, Goldberg identified that personality factors influence careers, focusing on the performance ability of a person with certain personality attributes in different career environments (Goldberg, 1990; Baruch, 2004). Unfortunately, the research was not considered appropriate across different cultures or countries (Baruch, 2004). Hodkinson (2008) created "folk theory" which promotes a 'common sense' conception of career choice, including an assumption that careers are linear and rational, with an emphasis that they will progress if a "good" decision is made at the beginning of the process.

Based on Parson's concept of individual fit related to environment, in 1958, Holland developed the RIASEC model (realistic, investigative, artistic, social, enterprising, and conventional) which identifies occupational preferences of an individual and attempts to determine fit with an organisation's characteristics (Baruch, 2004). This is part of the theories of vocational choice, which are common in career counselling research. The models have been used to demonstrate that specific personalities of people do well in environments that 'fit', and therefore the working environments can be described by those personalities that do well within them (Holland, 2008). The RIASEC model is well used and has been assessed using factor analysis methods for validity (Baruch, 2004). Furthermore, the RIASAC model includes the spectral management theory, which has wide support for validation in careers research (Baruch, 2004). Of note, the RIASEC model focuses on the entry stages of careers but has been identified to simplify the number of personalities that a person could have (Holland, 1973; Baruch, 2004).

Further theories of career decision making include Kahneman's (2003) theory of automatic and cognitive systems in decision making; the experimental models or intuitive and rational decision-making processes such as Gelatt's (1989) positive uncertainty model and Colozzi's (2003) depth orientated value extraction theory. There is also the planned happenstance theory (Mitchell et al,

1999) which acknowledges the uncertainty of daily life and promotes the exploration of professions and working environments. There is work that demonstrates the importance of social environment and structural influences in career decisions, such as formal vs informal advice (Law, 1981; Greenbank, 2011) which are again related to social cognitive theory (Bandura, 1971; Lent et al, 1994).

Finally, there are limitations on recruitment that do not form part of an individual's choice. These include institutional culture and bias, and which are commonly discussed in sociology as part of social identity, demographics, or diversity (Allen, 2011). Gender inequality is seen from the early years, through education systems and in careers (Moss-Racusin et al, 2012; Salinas and Bagni, 2017). Identity theory and identity control theory (Stets and Burke, 2000; Burke and Stets, 2009) demonstrate longstanding influence of demographics on behaviours, which is applicable to gender stereotyping (Carter, 2014). However, many of these processes begin prior to school and interact to inform choice subconsciously. In addition, theories that encompass the role of ethnicity in the workplace, such as identity negotiation theory (Ting-Toomey, 1988) and phenomenological variant of ecological systems theory (Spencer et al, 1997) typically address how the unconscious bias of race is overcome in the workplace.

2.2 Application of theory

To conclude, in keeping with a post-positivist stance, many career choice theories will likely be relevant to this research and will be considered in the analysis of findings. The theories described in this chapter were not specific to medical careers and therefore, a dedicated literature review of career decision making in medicine will be detailed in the next chapter.

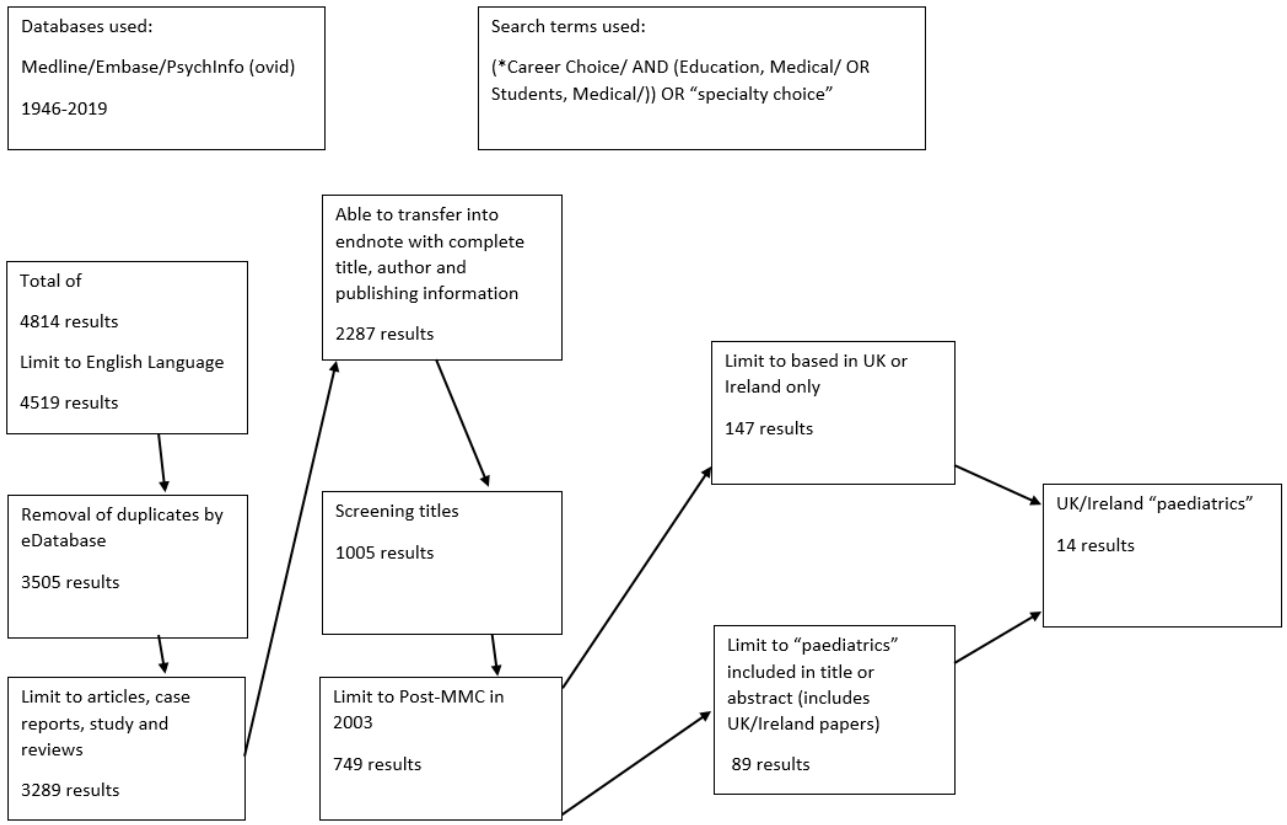
Review of career choice theories has demonstrated that the process of choice is worthy of investigation. The work by Lent et al (1994) will be the primary theoretical model to which the data analysis is based on. Other theories will be considered, and it is also likely that more career choice

theories will become apparent through the process of analysis, hence it is anticipated that the results of this project will draw from a vast area of literature.

3. Literature search

A systematic literature search was undertaken to assess understanding of the current knowledge in medical career choices, with paediatrics as an exemplar of a specialty with recruitment difficulty. By using the online databases of Medline, Embase and PsychoInfo via the Ovid portal (http://ovidsp.tx.ovid.com/sp-3.25.0a/ovidweb.cgi), a total of 4403 relevant articles were found. The search terms used were: (*Career Choice/AND (Education, Medical/OR Students, Medical/)) OR "Specialty Choice". The results were limited to papers written in English, case reports, articles, study, and reviews with a specific focus on those published after 2003 when Modernising Medical Careers (MMC) was proposed. After exclusions, as shown in figure 3, 147 articles identified concerning career choice in the UK following MMC in 2003, were included as part of the literature search for detailed review. A further subset (75), non-UK articles associated with paediatrics internationally as a career choice following 2003, were also identified.

Figure 3: Literature search strategy



The rationale for limiting articles published after Modernising Medical Careers (MMC) was due to the change in specialty training programmes, which required career earlier decision-making and introduced a new structure of specialty training. MMC has been identified as impacting on NHS service provision from the outset, with concerns about how trainees progress through to specialty careers (Clough, 2005; Heard, 2005; Heard, 2006).

Within the review of the literature, there were common themes and discussions. This chapter is presented to firstly outline the methodologies of published work, and to discuss the influences on specialty choice, as well as specialties of interest. Much of the UK literature focuses on how careers are chosen in general. Table 3 demonstrates how many papers focused on career choice in general, in comparison to individual specialties. Only five articles were focused on paediatrics, with an additional 9 which mentioned paediatrics in the abstract of a general career choice paper. Hence there was need to include non-UK papers that discussed paediatrics in order to develop a greater understanding

of the influences on paediatrics as a career choice, whilst acknowledging that international studies were not affected by policy changes in the UK (Greenaway, 2013). Therefore, it was not appropriate to consider international papers which focused on the other specialties.

Table 3: number of papers within the literature search with their primary focus

Article theme	Number of papers (UK based papers)
General career choices in medicine	58
Surgery	24
Psychiatry	17
Hospital medicine specialties	15
General practice	9
Academic interest within medicine	7
Paediatrics	5
Obstetrics and gynaecology	4
Anaesthetics	3
Radiology	2
Public health	2
Community genitourinary medicine	1

3.1 Methodologies

This section of the chapter identifies the common methods employed in the literature to develop understanding about paediatrics as a specialty career choice. It highlights the lack of development in the area, despite many of the papers stating it is an important area to research. The papers often were based on general investigation of specialty choice, with few being related to one specialty. Where an individual specialty was considered, it was often general practice, psychiatry, or surgery.

3.1.1 Participants

Frequently, the literature focused on medical students as opposed to qualified doctors. Of all 222 papers, over two thirds involved medical students (Pawelczyk et al, 2010; Aslam et al, 2011; Boyle et al, 2011; Maric et al, 2011; Al-Fouzan et al, 2012; Beck et al, 2012; Bennet et al, 2012; Bittaye et al, 2012; Scott et al 2012; Ajaz et al 2016; Kao and Jager, 2018). This might be due to students being a

well-defined group and relatively easy to access. By comparison, time to participate in studies may be an issue for junior doctors. Data gathered at specialty courses or conferences demonstrates bias in participant selection as those who are already interested in a particular specialty would be the ones attending such events.

The opinions of medical students inform understanding of choices at the start of specialty career interest. It was frequently stated that these opinions on career choices change over time (Cleland et al, 2016; Dossajee et al, 2016) and therefore basing career guidance and support on work from medical students cannot account for these changes. Research at the point of decision making is therefore essential.

The literature demonstrated that medical students were concerned with prestige of different specialties (Ossai et al, 2016; Assefa et al, 2017; Barber et al, 2018; Reid and Alberti, 2018) and the promotion of health or altruistic features of medicine (Ossai et al, 2016; Puertas and Rivera, 2016; Osborn et al, 2017).Whereas junior doctors were more likely to state previous experiences or exposure to specialties (Ibrahim et al, 2016; Wei McIntosh and Morley, 2016; Parija and Mahajan, 2017), working hours (Cleland et al; 2016; Jovanovic, et al, 2016; Lambert et al, 2017b; Parija and Mahajan, 2017) or their family situation (Cleland et al, 2016; Jovanovic et al, 2016; Lambert et al, 2017b) as influences on their specialty career choices. Finally, junior doctors were more likely to identify subspecialisation as an important factor when considering career choices (Parija and Mahajan, 2017), which was likely due to their greater understanding of training scheme differences (Moore et al, 2016; Spooner et al, 2017b). Therefore, it appears that external influences affect medical student specialty choices, whereas junior doctors describe both external and internal influences in their career decisions.

Few authors discussed *when* specialty careers are chosen. Goldacre has conducted multiple studies to develop understanding in this area, describing that surgeons are more likely to choose their specialty earlier, whereas those who choose medical specialties are more likely to be unsure of careers in their F1 year. He also identified that about a quarter of trainees change their final specialty

between their first year of specialty/core training and completion of training (Goldacre et al, 2007; Goldacre et al, 2008; Goldacre et al, 2009; Goldacre et al, 2010a; Goldacre et al, 2010b; Goldacre et al, 2011; Goldacre et al, 2013).

3.1.2 Methods implemented

A large percentage of the literature used survey or questionnaires as a method (AMWAC, 2005; Kolcic et al, 2005; Baboolal and Hutchinson, 2007; Compton et al, 2008; Goldacre 2009, 2010a, 2010b, 2011, 2013; Farooq et al, 2013; Svirko et al, 2013; Farooq et al, 2014; Lucas et al, 2014; Alawad et al, 2015; Bhutta et al, 2016; Funston et al, 2016; Kawamoto et al, 2016; Boyle et al, 2017; Osborn et al, 2017; Barber et al, 2018; Lambert et al, 2018; Mulloa et al, 2018; Ryan et al, 2018). Questionnaires are useful tools to gather large amounts of quantitative data, describe objective responses and are frequently employed as they are comparatively less time consuming. However, by only using questionnaires or surveys, participants are not able to explain their reasoning, which can result in limited interpretation due to the lack of depth available in the responses. One example is the paper by Lachish et al (2016) where F1 doctors were surveyed regarding their enjoyment of training, support received and intentions to work in the UK. The results demonstrated that 63% found support was good within hospital trusts, that the respondents enjoyed their F1 year overall and 8% were unlikely to continue to work in the UK (Lachish et al, 2016). The authors concluded that the "institutional support offered by the trust is associated with job enjoyment", however this is an extrapolated association as the participants were not able to discuss the reasons to why they enjoyed their F1 year.

Notably there were few papers using qualitative methods, and none which focused on paediatrics. Those which were employed were interviews (Gallagher et al, 2015; Basset et al, 2018; Fox et al, 2018) and mixed method studies, which were heavily dominated by survey data, (Moore et al, 2016; Puertas and Rivera, 2016; Brown et al, 2017; Spooner et al, 2017a, 2017b). There were a number of literature reviews (Edmunds et al, 2016; Hau et al, 2017; Tsigarides et al, 2017; Amin et al,

2018), some correlational data studies (Collier and Moreton, 2013; Hays et al, 2017), workshop based or focus group studies (Martin et al, 2018; Reid and Alberti, 2018) as well as some more novel studies.

One novel paper by Ahmed et al (2015) examined attitudes to psychiatry with film and found medical students were more likely to consider psychiatry as a career after watching short films on the subject. Consedine and Windsor (2014) carried out a study into 'disgust sensitivities' of medical students and compared their results to the reported specialty career interests. They reported that those interested in surgical careers were more likely to value technical skills and research compared to those who wanted generalist careers, but that emotional differences also existed. They identified that medical students who were more disgusted by animal remains had a higher interest in paediatrics as a career whereas less overall disgust in all categories was reported in those interested in an emergency medicine career (Consedine and Windsor, 2014).

Finally, the last subset of methods used in the literature to investigate career choices in medicine were those that implemented tests or experiments. Carr et al (2011) used a situational judgement test, a validated test to determine how people would act in certain situations, finding that there were differences in judgement across specialty trainees. Borges et al (2009) used an emotional intelligence test. Sievert et al (2016) used a personality test of American junior doctors to determine character associations with different specialties. Cleland et al (2016; 2017) performed discreet choice experiments with junior doctors and medical students to identify if monetary incentives could outweigh job characteristics. Discreet choice experiments are often used in health economics to look at 'push' and 'pull' factors in decision making, in this case to determine if opportunities for partners or geographical location were more influential (Cleland et al, 2016).

The relevance of the methods employed within the literature indicates a relatively limited depth of current understanding in medical career choices. Although questionnaires are more likely to provide data that is transferrable between cohorts, these give no insight into individual reasoning and only superficial associations can be measured. Interviews, mixed method studies and focus groups are likely to provide deeper understanding, not only to the influencing factors in medical specialty

choices, but also the process of the choice itself. However, this literature search has identified that the number of these studies were relatively few and therefore more work is needed to develop this area of knowledge.

3.1.3 Theoretical relevance

Few of the published papers referenced educational theories when discussing their results. Many made no reference to any theory of career choice. Bhutta et al (2016) linked their findings around the importance of role models and "trying of possible selves" to Burack et al (1997) who had described that there is an imagining of oneself in different career options. Bassett et al (2018) highlighted that medical students 'transition' and specific influences are more or less important at different time points in keeping with Levinson's (1978) transitions of career choice.

Many of the papers included in the literature review were based on quantitative data, showing only statistical trends and associations (Kim et al, 2016; Lachish et al, 2016; Assefa et al, 2017; Hays et al, 2017; Messinger et al, 2017; Talamantes et al, 2017). As there was little consideration of educational theory, the discussions and conclusions were frequently based on correlational data. This has resulted in recommendations which are not directly represented to the findings, instead they are often postulated or presumptions of meaning.

Broadly, taking a post-positivist stance, there is insufficient consideration of the 'meaning' of specialty career choices in the literature to make substantial claims on its process. Drawing on educational theory and career decision making theories to support research will deepen understanding, improve validity and robustness of the conclusions.

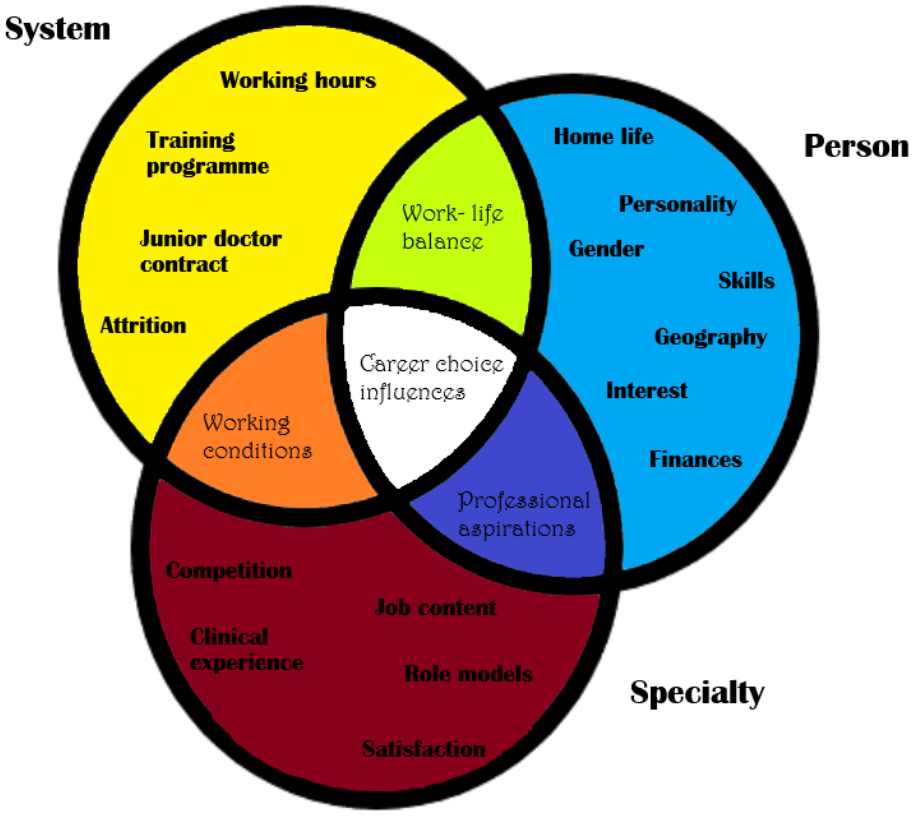
3.2 Influencing factors in specialty choices

Many of the papers in the literature search described influences in the selection of specialty careers for junior doctors. The literature was weighted towards papers which discussed influences in

general, rather than influences for one specialty over another. It is notable that many of the papers focused on the medical student or junior doctor's interest in one specialty (Bhutta et al, 2016; Moore et al, 2016; Jones, 2017; Allsopp and Taggar, 2018), and few papers discussed the process of selection (Dossajee et al, 2016; Kawamoto et al, 2016; Kao and Jager, 2018). This may be due to the lack of studies focusing on junior doctors at the point of application to training programmes. There was evidence that interest in a specialty does not equal selection of that specialty as a training programme (Boyle et al, 2017), and therefore the recommendations need to be framed against this paradigm.

There were common themes within the literature which can be grouped into 'person'; 'specialty' and 'system'. It is notable that in the category of 'person' there was a reference to gender but not ethnicity or race. Each of these themes made up of a variety of influencing factors which frequently related to each other. Figure 4 demonstrates that there was a significant overlap of the influencing factors found within the literature, and therefore this section of the literature search chapter will be framed to discuss the work life balance, the working conditions, and the professional aspirations.

Figure 4: Venn diagram of the influences on medical career decisions



3.2.1 Work life balance

Work-life balance was a key influencing factor. Some papers did not fully define 'work-life balance', whereas others broke the term down. It was frequently stated during the summary of questionnaire studies as an important influence and that it was a feature to be strived for. When the term was broken down, it included working hours compared with their impact on home life; the influence of gender; geography; and finances. These factors are discussed here and combine influences from both person and system themes but also reflect differences between specialties.

3.2.1.1 Working hours vs home life

There were repeated references to long working hours, on call work, antisocial hours which discouraged students and junior doctors when considering their specialty choices (Bindal et al, 2010; Lefevre et al, 2010; Mwachaka and Mbugua, 2010; Bhat et al, 2012; Boyle et al, 2013; Lucas et al,

2014; Correia Lima de Souza et al, 2015; Jovanovic et al, 2016; Osborn et al, 2017; Rukewe et al, 2017; Barber et al, 2018; Bassett et al, 2018). Lambert et al (2017b) described that domestic circumstances were more likely to be important to those selecting general practice as a career, and that GP trainees overall were more likely to pursue part-time working hours (AMWAC, 2005). Currie et al (2007) described that surgical trainees were unlikely to consider subspecialisation to vascular surgery in part due to the intense on-call experiences. One paper acknowledged that students were less likely to report these lifestyle factors as significant as they were less likely to have experienced working life, nor appreciate the differences across specialties for these particular factors (Alawad et al, 2015).

Other influential home life features included their own family and having children (Okonta et al, 2015; Lambert et al, 2017a). In a study looking into burnout associated with attrition amongst psychiatry trainees, having children was considered a protective factor (Jovanovic et al, 2016). Specialties that were considered 'lifestyle friendly' included general practice, family medicine, dermatology, radiology, public health, and ophthalmology (Creed et al, 2010; DeZee et al, 2013; Osborn et al, 2017). One student survey demonstrated that paediatrics was considered less lifestyle friendly, but those who were already interested in the specialty rated the lifestyle quality better than those who were not previously interested (DeZee et al, 2013).

3.2.1.2 Gender

Gender of the medical student or junior doctor was associated with pursuing certain specialties (Fysh et al, 2007; Al-Nuaimi et al, 2008; Di Mario, 2010; Glynn and Kerrin, 2010; Farooq et al, 2014). In particular, women were more likely to select paediatrics (Khader et al, 2008; Fukuda and Harada, 2010; Lefevre et al; 2010; Mwachaka and Mbugua, 2010; van Tongeren-Alers et al, 2011; Mehmood et al, 2012; El Sheikh et al, 2014; Jagsi et al, 2014; Dossajee et al, 2016; Kawamoto et al, 2016; Kim et al, 2016). Not only were women more likely to select certain specialties, one group of researchers concluded that being female, and the 'feminisation of the profession', resulted in unbalanced interest in different specialties (Lefevre et al, 2010). This may be through evaluating

career motivations and life goals in the context of gender (Buddeberg-Fischer et al, 2006; Barber et al, 2014). For instance, men were associated with focus on 'career opportunities' (van Tongeren-Alers et al, 2011) which could include private work (Subba et al, 2012), whereas women reported concerns about lack of access to female mentors (Biondi-Zoccai et al, 2015). However, it was also important to consider the context of being a female doctor, whereby the biological impact of having a child and the subsequent societal assumption of raising children still lies with women (Dossajee et al, 2016). This may be seen as a deterrent for female doctors to a specialty which neither has female role models or flexible working hours.

Drinkwater et al (2008) surveyed medical students and reported both genders valued 'work-life balance' but that women were more likely to make professional sacrifices to ensure this balance. This can be seen in India, where Subba et al (2012) identified that female medical students were more likely to pursue a career in government-funded hospitals or research institutes, which were more likely to accommodate part-time working and provide maternity pay, compared to male students who had higher interest in private or corporate hospital work. Some female trainees therefore rejected specialty careers as "not suitable realistically for a working mum" and subsequently applied to specialties which were not their first choice in compromise to achieve their home life aspirations (Goldacre et al, 2012).

3.2.1.3 Geography

The location of practice was important when choosing a career specialty (Smith et al, 2009; Crump et al, 2013; Puertas and Rivera, 2016). Cleland et al (2016) deemed that a desirable geographical location was weighed up against the opportunities for partner's careers by junior doctors when considering specialty training options.

International papers provided a greater insight into the impact of geography when considering medical careers. Sub-Saharan Africa has one of the highest disease burdens in the world but has extreme difficulty in ensuring physicians remain once qualified (Burch et al, 2011). Outward

migration of recently qualified doctors was associated with lack of training facilities, personal safety, social conditions, and personal freedom (Burch et al, 2011). In Australia there were specific issues concerning location of the medical workforce. There was a distinction between urban and rural practice, where rural practice was less desirable; only 14% of trainees planned to work in rural practice and these were mostly GP trainees (AMWAC, 2005). Hays et al (2017) identified that medical school graduates in Australia were likely to continue to practice medicine in the same locality as the medical school attended.

In the UK, medical students associated working in rural areas with social isolation and reduced career opportunities (Edwards et al, 2015). Students reported that it was more important to be near to their family's or partner's location when considering applications (Edwards et al, 2015). It is therefore important to consider the relationship to specialty selection. Some specialties are not present in all hospitals. Those who wish to pursue a career in, for example, paediatric intensive care (PICU), are limited to which hospital locations to apply to. Whereas those interested in general practice, for example, need to consider if being in a rural practice is acceptable, or if they consider it to be too isolated. This 'isolation' includes separation from secondary care and therefore the different skills they may need to have, but also for the opportunities available to their partner, the housing market, schools for their potential children, or even their leisure activities.

3.2.1.4 Finances

Financial implications of specialty selection were often cited in the literature (Bhat et al, 2012; Subba et al, 2012; Correia Lima de Souza et al, 2015; Okonta et al, 2015; Ossai et al, 2016; Bassett et al, 2018). Most of the papers which referenced financial differences in specialties were non-UK based, which was unsurprising as the NHS has a structured trainee salary scheme which is the same across specialties. Some UK specialties however may be able to supplement their NHS salary with private work, most frequently the surgical specialties (Morris et al, 2008). Work by Puertas and Rivera (2016) documented that there was a perception that salaries are lower for general practice compared to

other specialties and this was seen as a deterrent to GP applications. The discreet choice experiments by Cleland et al (2016; 2017) demonstrated that junior doctors would consider moving to a job with poor working conditions if there was an associated 50% increase in average pay. This highlights that significant financial differences may be considered as 'pull' factors to overcome less desirable features of different jobs.

3.2.2 Working conditions

When considering the 'working conditions' of medical careers, the literature identified key themes of clinical experience; training programmes; competition and strategy; attrition; and the influence of the 2016 junior doctor contract dispute in the UK.

The proposed changes to specialty training in 2016, and the junior doctor contract dispute resulted in mass outcry from medical staff, with numerous protests and strike action. This resulted in low morale of doctors (Bassett et al, 2018). Spooner et al (2017a) found that the contract dispute resulted in increased intentions for application to community-based specialties and that overall junior doctors felt less valued within the NHS than they did prior to the contract conflict.

3.2.2.1 Clinical experience

Experience of specialties was seen in multiple articles as influential in the choice of specialty career. There remained myths about needing to have foundation programme working experience to be considered eligible to apply to some specialties (Bindal et al, 2011; Okonta et al, 2015; Funston et al, 2016).

Overall, interest in a specialty increased following clinical exposure, usually medical school placements (Maidment et al, 2004; Goodyear, 2009; Bindal et al, 2010; Cheema et al, 2011; Chew et al, 2011; Albert 2012; Farooq et al, 2014; Edmunds et al, 2016; Ibrahim et al, 2016; Kawamoto et al, 2016; Cleland et al, 2017; Allsopp and Taggar, 2018; Amin et al, 2018), optional additional modules (Boyle et al, 2017) but also during work rotations (Briggs et al, 2006; Goodyear, 2009; O'Donnell et al,

2010; Moore et al, 2016; Emmanouil et al, 2017). Firth and Wass (2011) described that medical student experiences of general practice was often negative when comparing it to working experiences as a foundation doctor in GP. They commented that this was likely to be a positive change associated with MMC on recruitment to general practice as it included a requirement to have a foundation programme rotation in a community specialty.

Conversely, some of the literature identified that clinical experience of a specialty could reduce interest in the specialty as a career. Albert (2012) found that medical students' interest in psychiatry as a career was reduced following clinical placements in the specialty.

Many of the papers expanded on this reporting that good quality experiences, rather than just having experience, were associated with increased interest in that particular specialty (Budd et al, 2011; Ekenze and Obi, 2014; Wimsatt et al, 2016; Brown et al, 2017; Amin et al, 2018). Patient contact was related to a 'good experience' while on placement (Lefevre et al, 2010), including exposure to acutely unwell patients (Bindal et al, 2011; Farooq et al, 2014).

Length of experience was also important, students reported that short rotations in specialties was detrimental to their interest in the specialty. Collier and Moreton (2013) published a limited study of correlational data showing increased time spent on psychiatry teaching in foundation programme training was associated with higher numbers of Foundation Programme trainees applying to psychiatry.

3.2.2.2 Training programme

The nature of the training programme structure and quality was also of relevance. It was reported that Modernising Medical Careers overall had a detrimental effect on surgical training (Chand et al, 2010). Some studies documented that trainees were concerned that the structure across different training programmes was different, and that trainees preferred different types of training programmes (Ibrahim et al, 2014; Spooner et al, 2017b). Boyle et al (2013) identified that medical students found unstructured career paths off-putting, and that this was perceived in surgical

specialties. This was also a situation expressed by anaesthetic trainees who valued structured training programmes when considering their specialty career (Moore et al, 2016). Other papers compared interest in particular specialties based on additional training programme components (Robbins et al, 2005; Hau et al, 2017; Young et al, 2017). Shortland et al (2015) also demonstrated that once in a specialty training programme there are still multiple career decisions that trainees need to make, which could be off-putting when deciding on a career to commit to.

The quality, as well as structure, of the training was important. Students were aware of perceptions of poor training experienced by core medical trainees (China and Burn-Murdioch, 2015). They were concerned about the anticipated pressure associated with taking on the 'medical registrar on-call' role (China and Burn-Murdioch, 2015). This is likely related to the role encompassing service provision, supervision of juniors, and level of responsibility rather than the clinical skills involved for training. Others identified that there may be a lack of training facilities, high service demands or the length of training programmes across different specialties which can contribute to low training quality (Burch et al, 2011; Moore et al, 2016; Osborn et al, 2017).

3.2.2.3 Attrition

Attrition is a problem for workforce planning (BMA, 2016). Appreciation of drop out amongst paediatric trainees was needed for workforce planning as well as training requirements (Shortland et al, 2015). Junior doctors were aware of specialty drop out, and their perceptions of attrition also affected their interest in that specialty as a career (Jovanovic et al, 2016). Attrition can increase the clinical service requirements of trainees, reduce the opportunities to develop skills, is seen as detrimental to training programme quality and ultimately lead to further attrition. Some trainees may favour specialties that have lower attrition rates despite other influencing factors, such as personal interest. It was reported that junior doctors choose to have time out of training mostly for 'personal' reasons (Agius et al, 2014). In contrast, one paper felt that "inspirational teaching" was sufficient to

reduce rates of attrition in anaesthetics, however the authors did not demonstrate how the data was directly related to this conclusion (Emmanouil et al, 2017).

3.2.2.4 Competition and strategy

The final key theme when considering the working conditions was that of competition and strategy among trainees. There were different levels of competition for places between different specialties (Bindal et al, 2010; Goldacre et al, 2012; Svirko et al, 2013), which could result in trainees making strategic choices when considering specialty applications. For example, the application to multiple specialties to ensure at least one is achieved (Svirko et al, 2013), or the specific enhancement of their portfolio (Bannard-Smith et al, 2012). One key finding by Svirko et al (2013) was that general practice was rarely chosen as a 'first choice specialty'. Many more junior doctors considered it as a 'back up career' and intended to apply to it as well as another specialty (Svirko et al, 2013).

3.2.3 Professional aspirations

The themes of person and specialty overlapped to describe the professional aspirations of junior doctors. These were the features which the literature described as goals to achieve to ensure satisfaction with the chosen specialty, often built upon the personal interests of the individual and the relationship to the clinical content of different specialty jobs. Professional aspirations were also created through consideration of an individual's personality and suitability for one specialty over another, and that this was projected through identification of role models, who themselves were able to provide career advice.

3.2.3.1 Personal interest

Many of the papers in the literature search described that interest in a specialty was the single most influencing factor when deciding on a specialty career (Huda and Yousuf, 2006; Al-Mendalawi, 2010; O'Donnell et al, 2010; Subba et al, 2012; Okonta et al, 2015; Smith et al, 2015;

Edmunds et al, 2016; Ossai et al, 2016; Assefa et al, 2017; Lambert et al, 2017b; Rukewe et al, 2017). None of these papers defined interest past 'personal interest'.

O'Donnell et al (2010), used the psychometric assessment tool "SCI45" to determine which specialty career was suitable for junior doctors based on personal interest. SCI45 specialty choice inventory is a psychometric assessment tool which was designed to assist with career counselling (Gale and Grant, 2002). Its purpose therefore makes suggestions of which specialty careers would be suitable for respondents based on their personal interests or perceived skills. However, it does not include any items which relate to past clinical experience (Gale and Grant, 2002) and therefore the results often lack robustness, especially considering that experience has been shown to have a significant influence on specialty choice as discussed in the earlier part of this chapter.

Lambert et al (2017b) described that those intending on hospital specialty careers were rating enthusiasm for the specialty as the most important influence in specialty selection, whereas those selecting GP were describing domestic circumstances as more influential. In contrast, it was felt that medical students were likely to have developed personal interest in career specialties early on, reasoning that the intrinsic factor of personal preference was more significant to students than junior doctors who were more likely to evaluate extrinsic factors such as working hours when selecting a specialty career (Alawad et al, 2015). Smith et al (2015) concluded that enthusiasm for a specialty was the most significant influence for a junior doctor on whether or not to pursue a specialty career, and that personal fulfilment as a factor increases in importance each year following qualification from medical school.

3.2.3.2 Job content

Some of the literature was partially able to describe what features increased a personal interest in a specialty. The content of the clinical work, including the number of clinical procedures (Ibrahim et al, 2016) and type of patient interaction were important (Ibrahim et al, 2014; Osborn et al, 2017). French medical students felt that interesting diseases and patient contact were positive

influences whereas hospital careers and little patient contact were negative influences (Lefevre et al, 2010). Clinical activities and 'job content' were frequently reported in the literature as influential (Briggs et al, 2006; Goldacre et al, 2012) which could include a requirement for research experience (Currie et al, 2007; Kawamoto et al, 2016). Some papers described that it was perceived characteristics within specialties which were influential in specialty choice (Ibrahim et al, 2014; Cleland et al, 2016; Moore et al, 2016). Whereas other work demonstrated that intellectual challenge was a feature that both medical students and junior doctors valued when considering specialty career options (Khader et al, 2008; Mwachaka and Mbugua, 2010; Goldacre et al, 2012; Reid and Alberti, 2018).

3.2.3.3 Personality

Numerous papers within the literature search referenced the personalities of doctors within specialties, the suitability of a personality or an individual's attributes to a particular specialty (Khader et al, 2008; Borges et al, 2009; O'Donnell et al, 2010; Carr et al, 2011; Consedine and Windsor, 2014; El Sheikh et al, 2014; Alawad et al, 2015; Duignan et al, 2015; Shortland et al, 2015; Mullola et al, 2018).

Survey based testing has been popular in assessing personalities and personal attributes. O'Donnell et al (2010) used the "SCI45" specialty choice inventory to determine if a particular specialty would best fit a junior doctor's 'personal profile'. A situational judgement test was administered to junior doctors, to identify differences in empathy and sensitivity, vigilance/situational awareness, professional integrity and coping with pressure as an assessment of personal attributes (Carr et al, 2011). Differences in scoring showed those intending to pursue an anaesthetics career had high scores, whereas those interested in paediatrics or GP careers scored lower (Carr et al, 2011). A "temperament and character inventory-revised" survey identified that risk taking was a personality trait associated with an interest in 'surgical specialties' but those considered more 'co-operative' were likely choose a specialty with larger amounts of patient contact, such as general practice (El Sheikh et

al, 2014). Finally, Mullola et al (2018) used the 'big5 inventory' (extraversion, conscientiousness, openness to experience agreeableness and neuroticism) of personality to determine personality of physicians in Finland. They found paediatricians had high extraversion and conscientiousness scores (Mullola et al, 2018). Interestingly in male paediatricians there was also high neuroticism (Mullola et al, 2018).

Some papers discussed attributes in the context of clinical skills and ability (Khader et al, 2008; Parija and Mahajan, 2017; Rukewe et al, 2017; Fox et al, 2018). One paper debated that emotional intelligence was a measure of intrinsic skills, and therefore used three emotional intelligence tests to identify if there was a link to medical student choice of specialty (Borges et al, 2009), although no significant link was demonstrated.

Finally, a group of papers discussed that the medical school attended was likely to impact on specialty career selection (O'Donnell et al, 2010; Cleland et al, 2014; Duignan et al, 2015; Reid and Alberti, 2018), as well as attendance at community college in the USA (Talamantes et al, 2017). Reid and Alberti (2018) describe that there was a process of medical school socialisation where a hidden curriculum and 'medical school culture' predispose beliefs about specialty prestige. A literature review to determine if problem-based learning (PBL) curriculums in medical school predisposed to specific specialities identified three papers demonstrating an increase of primary care careers in graduates of PBL courses, but that overall, there were too few studies to make significant claims (Tsigarides et al, 2017).

3.2.3.4 Perceived satisfaction

When considering specialties, junior doctors and medical students were influenced in their career decisions through their beliefs on which specialty will provide personal fulfilment (Smith et al, 2015), allow them to achieve their life goals (Buddeberg-Fischer et al, 2006) and ultimately give them career satisfaction (Leigh et al, 2009; Bhat et al, 2012; Subba et al, 2012; Moore et al, 2016; Barber et al, 2018). Some of this was determined by the perceptions of specialties through stereotyping (Hill et

al, 2011) and development of specialty stigma (Brown et al, 2017; Barber et al, 2018). There is evidence that trainees aim to have a rewarding career, no matter which specialty they end up in (Shortland et al, 2015; Barber et al, 2018). Some papers discussed that job security was also an aspirational feature of specialty careers (Subba et al, 2012; Takeda et al, 2013). In addition, career prospects, and overall attractiveness of NHS general practice posts, were identified to be important in the future (Bhat et al, 2012; Amin et al, 2018) especially when determining intention to practice in the UK (Lachish et al, 2016).

Looking wider than the personal satisfaction of the individual, the impact and perceived influence on a community have been considered. A New Zealand based study evaluated the importance of heritage when considering treatment of patients. There was a belief that Māori doctors treating Māori communities was beneficial, as they were more able to appreciate the specific nuances of the culture (Lucas et al, 2014). The authors found that the role in the community was more important to Māori heritage doctors, but they often felt there were additional expectations placed upon them, such as advocacy roles, which deterred them from specialising in paediatrics or adult general medicine (Lucas et al, 2014).

3.2.3.5 Role models

Numerous papers described the impact of 'role models' in specialty selection (Maidment et al, 2004; Senf et al, 2004; Briggs et al, 2006; Drinkwater et al, 2008; Cheema et al, 2011; Ravindra and Fitzgerald, 2011; Lucas et al, 2014; Okonta et al, 2015; Edmunds et al, 2016; Kawamoto et al, 2016; Reid and Alberti, 2018). Overall, there was an increase in interest in pursuing a specialty career when students or junior doctors could identify role models within a specialty (Drinkwater et al, 2008; Mwachaka and Mbugua, 2010). It was more important for women to have a female role model (Mwachaka and Mbugua, 2010), likely to demonstrate suitability or alleviate concerns about juggling domestic responsibilities as highlighted earlier in this chapter. Role models provided a mentoring role

which also allowed the individual to project their ideas about working in a particular specialty and their sense of suitability to that career (Bhutta et al, 2016).

Advice and career guidance

Role models were also able to provide direct advice in specialty career selection (Mellon and Murdoch-Eaton, 2015). However, it is not the only source of career guidance available. Ossai et al (2016) described that students sought out careers' advice during clinical years during medical school, and Ahsan et al (2007) discussed how students prefer to receive careers information.

Kawamoto et al (2016) described that female students reported advice on career selection was a separate influence to the observation of role models, whereas Goodyear (2009) stated educational supervisors and mentoring systems positively influenced career choice as well as provided career guidance. Available career information is focused on written and online resources; planning tools and courses are increasing but require support from qualified careers counselling services to be effective (Goodyear, 2009). Bindal et al (2011) demonstrated that medical students perceived a lack of paediatrics-specific career guidance as a barrier to pursuing the specialty for a career.

3.3 Specialty specifics

Overall, there was less specialty specific research published. The more popular specialties to consider included adult hospital medical specialties, psychiatry, and surgery (with its subspecialties). This section of the chapter will describe the influences associated with paediatrics as a career, as well as other notable specialty choices. Much of the literature on paediatrics has come from non-UK papers and therefore it is important to consider if there are any other influences specific to UK practice which are not addressed.

3.3.1 Paediatrics

There were only five articles identified to be solely concerned by paediatrics as a career choice after MMC in the UK literature, with a further 9 UK papers that mentioned paediatrics in the abstract. There were some additional papers which discussed paediatrics within the main body of the text, but often focused on stereotypical opinions of paediatrics, indicating that paediatrics is either not prominent enough in British medical literature or that it is not an area of interest to others outside of paediatrics. The 5 paediatrics-specific articles had a greater focus on career guidance and support in comparison to the papers on career choice as a whole but were still able to identify specific influences in the selection of paediatrics as a specialty career.

The papers by Goodyear (2009) and Mellon and Murdoch-Eaton (2015) focused on career guidance in paediatrics, offering that educational supervisors and mentoring systems were able to positively influence career choice as well as provide career guidance. A lack of career guidance in university was a compounding factor to why medical students did not wish to pursue paediatrics as a career and in some cases, they had already applied for the Foundation Programme before their medical school rotation resulting in no interest to obtain a job within the specialty (Bindal et al, 2011).

A postal questionnaire demonstrated that only 7% of new UK medical graduates consider paediatrics in the F1 year, dropping to 5.5% at the end of the F2 year (Goodyear, 2009). This was corroborated by Lambert et al (2018), where 6.8% of F1 doctors were interested in a paediatrics career, however there was increasing interest in non-medical careers compared to the study by Goodyear (2009) (Lambert et al, 2018). Furthermore, only 44% of those who chose paediatrics were still working within the specialty 10 years later, attributing this to workload and on call commitments (Goodyear, 2009). Shortland et al (2015) demonstrated there was a high rate of attrition with paediatric trainees but related this to the numerous career decisions still needed once in a training programme.

When considering why medical students and junior doctors were specifically interested in paediatrics, there was little discussed in the literature past generic influences on specialty choice.

Medical students were interested in paediatrics as a career following clinical rotations in paediatrics (Chew et al, 2011) or for "personal reasons" (Fukuda and Harada, 2010; Bhat et al, 2012; Subba et al, 2012). Describing paediatricians as enthusiastic, keen on teaching, and that they worked in a good ward atmosphere, the student's interest in a paediatric career would be increased by earlier clinical exposure to paediatrics (Bindal et al, 2010). Again, paediatric trainees confirmed this influence when stating previous positive experiences in paediatrics were influential, but also that paediatrics suited their personality or attributes (Shortland et al, 2015).

Negative features of paediatric careers were highlighted, whereby students perceived a paediatrics career to be associated with long hours, high competition, with a large emotional impact, and they felt that they had limited clinical experience of the specialty (Bindal et al, 2010). Other work described that junior doctors reported that they would "miss adult patients" if they became paediatricians (Chew et al, 2011). High competition, workload, and lack of exposure to paediatrics was enough to reject a paediatric career (Goldacre, 2012). As described earlier in the chapter, gender differences were influential as was lack of clinical experience (O'Donnell et al, 2010). More men rejected paediatrics as a career choice (Buddeberg-Fischer, 2006; Fysh et al, 2007; Khader et al, 2008; Lefevre et al, 2010; van Tongeren-Alers et al, 2011; Svirko et al, 2013), with a specific need for same gender role models within paediatrics (Mwachaka and Mbugua, 2010).

3.3.2 Psychiatry

Psychiatry has been identified as an 'at risk' specialty due to lack of applications to training programmes (Lambert et al, 2018). Overall psychiatry is a polarising career choice, associated with strong feelings towards it being a positive career or an unappealing career according to junior doctors (Goldacre et al, 2013).

Again, clinical experience in psychiatry was associated with greater interest in the specialty as a career (Maidment et al, 2004; Cheema et al, 2011). Specific influences in psychiatry careers included previous experience of illness, female gender, and good placements as a student with exposure to

acutely unwell patients (Farooq et al, 2014; Gallagher et al, 2015). Focus groups of medical students discovered six themes of psychiatry perceptions: exposure, organisational issues, positive experience, stigma, conflict to the rest of medical understanding and emotional burden (Brown et al, 2017). Students who were uninterested in psychiatry early in medical schools discounted it as a career and did not consider obtaining additional psychiatry experience (Brown et al, 2017).

3.3.3 General practice

Research into general practice is likely to be representative of the total number of jobs in GP available and the percentage shortfall in recruitment expected. In addition, general practice appears to be considered very different from other specialties, as it is mainly community based compared to secondary care specialties. It was expected that influences that attract junior doctors into general practice would be different to those which attract into hospital specialties such as continuity of care or integration within the community (Sinclair et al, 2006). Yet the literature demonstrates the same influences of work life balance, gender, previous experience, competition, and personal interest (Sinclair et al, 2006; Firth and Wass, 2011; Allsopp and Taggar, 2018). However, students perceived GP to lack prestige and challenge, coming from a process of medical school socialisation, adopting role model's perceptions or values, and the hidden curriculum in medical school culture (Reid and Alberti, 2018).

3.4 Summary of literature

This literature review has identified important factors in determining career choices of medical students and junior doctors. It has also demonstrated that there has been a reliance on questionnaire or survey-based investigation, and although this can give some insight by providing large scale, standardised responses for analysis, conclusions on influencing factors to specialty careers are often limited due to a lack of depth in understanding. Use of questionnaires, aiming to achieve

high response rates in large samples, is possibly related to the perennial problem of higher value being placed on statistically significant quantitative data in medicine. Although qualitative studies are becoming more widely accepted, the impact on literature reviews like this will take time.

Some work has been published using alternative methods, such as interviews or focus groups, which has highlighted the complexity of medical career choices. Also, validated psychometric tools have been employed, but there is still a risk that not all influencing factors can be addressed. Going forward, it is important to consider that complexity in the decision-making process is an influencing factor itself on the choice of career.

A large percentage of the work has focused on the opinions of medical students. Although this has some merit, as many of the papers have described that students evaluate specialties during medical school, but the ultimate choice is not made until they become doctors and have had specific experiences of working within the NHS.

Several influencing factors spanned all specialty careers. The work-life balance, working conditions and professional aspirations of doctors were broadly considered, irrespective of specialty. Overall influencing factors included gender differences, personal interest, location of jobs, practicality of the specialty, role models within the specialty, and working patterns. Barriers to some specialties were seen, such as lack of exposure to smaller specialties, lack of support within the role, training programme structure, perceived stereotypes and assumed boredom. There were some differences between UK and international studies, however the categories of influencing factors were similar. International papers were more likely to identify that financial prospects were significant influences in comparison to UK studies, relating to the fixed salary structure of the NHS compared to private work across the globe. Overall, there was discussion of suitability when selecting a specialty career, and both modifiable and non-modifiable factors were influential in the choice of specialty.

Most of the papers considered specialty choice in general, surgical careers or psychiatry. As psychiatry is a specialty with poor recruitment rates, it is unremarkable that the specialty is investigated extensively. Paediatrics by comparison is under-represented in the literature suggesting

it could be an overlooked specialty. Paediatrics accounts for 5% of available training posts, however, there has been significant reduction in recruitment (Department of Health, 2017) and is anticipated to suffer further problems due to attrition (Jaques, 2013). This literature review identified few paediatric specific influences: gender had more importance to those selecting paediatrics as a specialty and that medical students have limited experiences of paediatrics which was associated with disinterest in the career. Hence, it is pertinent to identify additional features that attract junior doctors to paediatrics.

4. Methodology

It is clear from the existing literature that further investigation is needed into the factors influencing specialty career choices. The literature search identified a need to consider the epistemology of existing work as well. Most of the published work approached investigation through a positivist framework, although this was not directly declared. Positivism, the philosophical standpoint of science, values a large sample size, generalisable results, replication of findings and controlled experimentation (Caldwell, 2015; Park et al, 2020) to ultimately find the 'correct' answer. However, real-life situations and complex human decisions are not black and white with singular 'answers'. Therefore, a post-positivist framework is more appropriate as identified in chapter 2. The impact of this project has real-life value and is socially influenced; hence validity and critical realism is considered. To achieve this, consideration of methods and data types are important as well as the analysis needed.

4.1 Mixed methods research

This study adopts mixed methods to collect and analyse related quantitative and qualitative data (Creswell and Plano Clark, 2007). Comparatively, multi-method studies typically involve different techniques to obtain either qualitative or quantitative data within a single project (Hesser-Biber, 2010; Mills et al, 2010). It is notable that much debate exists on the difference between mixed methods and multi-method research. Some report that mixed methods is one category of multiple

methods research (Molina-Azorin and Fetters, 2016), but that mixed methods studies go deeper not just as a data collection method, but also methodology, data type, paradigm, and integration of analysis (Creswell and Plano Clark, 2007; Greene, 2015; Molina-Azorin and Fetters, 2016). Mixed methods research crosses multiple epistemological perspectives including post-positivism, social constructivism, and pragmatism (Creswell et al, 2011). Mixed methods approaches are helpful when the research questions are complex, such as those involved with attempting to understand the real world (Creswell et al, 2011).

4.1.1 Benefits of different data types

Qualitative data are focused on context or meaning (Creswell et al, 2011). Quantitative data are better at describing information and identifying relationships between variables (Creswell et al, 2011). Mixing data types can be by merging, connecting, or embedding; and using multiple studies or phases is commonplace in large-scale health sciences mixed methods research (Creswell and Plano Clark, 2007). Combining quantitative and qualitative data allows better understanding of research problems, supports the integration of various aspects within the research process to ensure effective analysis of phenomena (Plowright, 2011), and can offset weaknesses in both types of data collection (Creswell and Plano Clark, 2007).

Mixed methods support triangulation, where the different sources confirm that the data gathered are relevant (Shelley et al, 2009). Triangulation aims to obtain complementary data on the same topic, which can validate or expand on quantitative results with qualitative data (Creswell and Plano Clark, 2007). Traditionally triangulation is a one-phase design but there are various models, which include the use of different methods and collection of results that are then merged to provide one overall interpretation of an answer to the research question (Creswell and Plano Clark, 2007). In a one-phase design, all the data is analysed together at the end of data collection, no matter on the methods used to collect that data. Sequential designs encourage one type of method to inform the next - frequently a qualitative phase initially to allow for design of a quantitative questionnaire

(Creswell et al, 2011). An embedded design, where one data set provides a supportive role to the rest of the data type, is appropriate when the research questions require different types of data, such as a questionnaire during a focus group to provide topics for discussion (Creswell and Plano Clark, 2007).

By conducting mixed methods research in this phenomenon, our understanding of what career choices are made by junior doctors and why those choices are made can be amplified. However, there is a risk during the analysis phases that data might produce contradictory results, and further data collection would be required (Creswell et al, 2011).

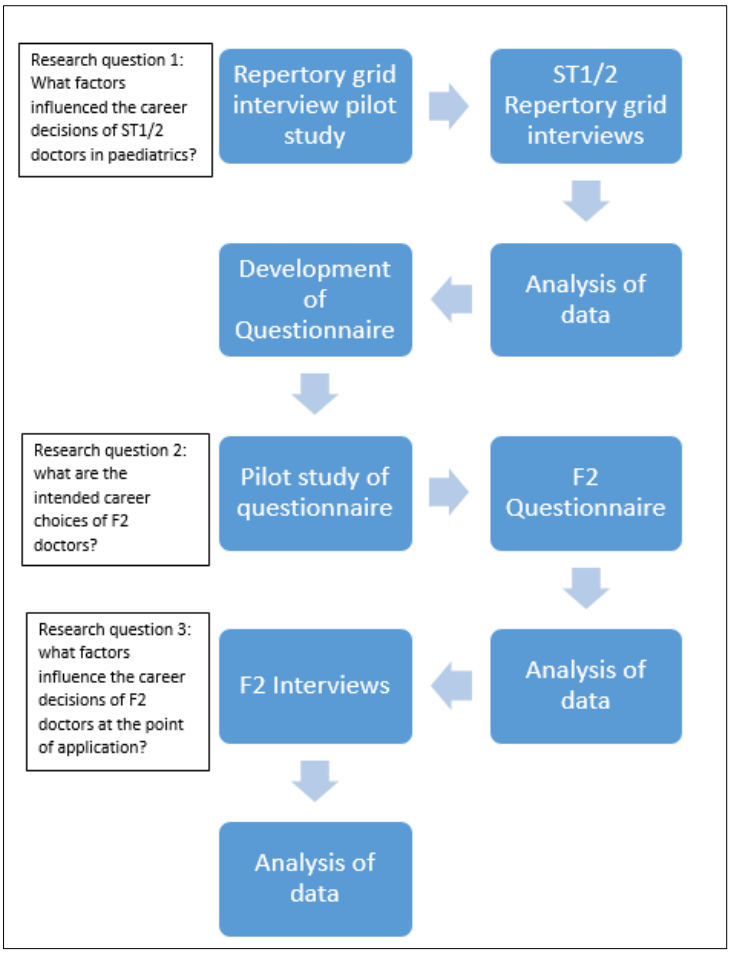
4.2 Overview of methods and rationale

The benefits of a mixed methods approach are detailed in the previous section. The individual methods employed to achieve this approach, in keeping with post-positivism (Sofaer, 2002), were two types of interview and a questionnaire (Trumbull, 2005). These methods created both qualitative and quantitative data using a sequential project design. The quantitative data were needed to demonstrate breadth of understanding, whereas the qualitative data were used to demonstrate depth of understanding. Medical literature often focuses on quantitative data, with a need for reproducible results, as part of a positivist epistemological approach. By supplementing this data with qualitative data, this adds dimension and therefore fits with the post-positivist stance through progressive research and use of multiple measures (Trochim, 2006).

Sequential designs involving use of both qualitative and quantitative data are commonplace in medical education research (Creswell and Plano Clark, 2007). Gathering qualitative data facilitated development of a research tool (questionnaire), ensuring its validity during phase 2 of the project. Sequential design can also add depth by elaborating on the first phase, amplifying our understanding, and therefore was more likely to achieve the aim of the project in comparison to a study with only one type of data or phase (Creswell and Plano Clark, 2007; Plowright, 2011).

Figure 5 demonstrates the different phases of this study. Each stage of the project is detailed in separate chapters that set out data collection, analysis, results, and discussion of findings. The initial interviews (chapter 5) addressed the first research question: What factors influenced the career decisions of ST1/2 doctors in paediatrics. This informed a new questionnaire tool that provided quantitative data (chapter 6) to answer research question 2: What are the intended career choices of foundation year 2 (F2) doctors? Interviews were then used in the final stage to determine *what* and *how* factors influence the career decisions of F2 doctors at the point of application (research question 3, detailed in chapter 7 and chapter 8).

Figure 5: Flow chart of research steps



4.2.1. Interviews

Interviews give more detailed contextual information and provide a deeper understanding of issues than questionnaires, although they do not provide generalisable data (Plowright, 2011).

Interviews, employing a repertory grid technique were conducted to answer research question 1 and inform development of the questionnaire in stage 2. Research question 1 was concerned with the opinions of paediatric trainees, and what they think about specialties as well as what they identify as relevant to a career in paediatrics. This therefore needed an assessment of deeper thinking and assumptions needed to be challenged.

Semi-structured interviews were used to address research question 3, where detail on the factors influencing specialty decisions of Foundation doctors was needed. These interviews allowed individuals to describe their personal influences. Focus groups might have been an alternative. However, as the primary concern was the personal influences reported by individual F2 doctors, this detail may have been compromised in a group discussion.

4.2.1.1 Repertory grid

A repertory grid technique was employed for the interviews with ST1 and ST2 paediatric trainees. Repertory grids interviews are a structured interview format, and a detailed explanation of the technique is described in chapter 5.2. Repertory grids were chosen as the interview method as they enable exploration not only of how participants view different specialty careers but also the context and structure of interviewees' beliefs (Fransella et al, 2004). By using this technique, knowledge about the participant's perceptions of personality, attitudes, habits as well as personal philosophies, may be obtained with little influence of the researcher (Fransella et al, 2004).

4.2.2 Questionnaires

Surveys using questionnaires can gather large amounts of data, are efficient, and can allow for generalizable data interpretation (Plowright, 2011). A questionnaire was thus an appropriate

method to achieve research question two - 'What are the intended career choices of foundation year 2 (F2) doctors?', which required a larger amount of more generalizable information. It also provided some superficial free text answers, which were developed further by interviews in stage 3.

The questionnaire, developed from stage 1 interview data, used quota sampling to target specific groups of F2 doctors (Plowright, 2011). Construct validity determines the appropriateness of a method to gather results which are relevant to the aim of a project. This questionnaire has high construct validity because of its timing, use of quota sampling and was created from responses in the first phase of the study.

This questionnaire differs from the 'career destination survey' that is completed currently by F2 doctors at the end of their programme. That questionnaire focuses on *where* trainees will work, rather than the influences, or *reasons* for proposed career choice. This study intended to capture influencing factors which led to selection of paediatrics. Some F2s did not intend to apply for paediatrics but may have identified influencing factors that were similar to those noted by paediatric specialty trainees. This latter group of F2s may be open to career-planning interventions, which may encourage further consideration of paediatrics as a specialty option.

4.3 Limitations, assumptions, and mitigation

Limitations associated with this project include my personal bias, given that as a paediatric trainee who has spent 2 years following foundation training as a teaching fellow, I have previous experiences and assumptions. My own experience of selecting a specialty to pursue led to an interest in specialty career choice but also an assumption that other junior doctors would go through a process of assessing a specialty, evaluating its merits, and determining if it was worth pursuing or not. This was demonstrated during the F2 interviews phase, whereby I actively sought participants' opinions of specialties, and chosen training paths. These interview schedules were based on the individual's questionnaire responses, and hence mitigate against my own biases towards different

specialties as the interviews explore the respondent's position on the career options. Use of supervisors to review work has been invaluable to reduce the impact of personal bias. Strategies linked with rigour in qualitative studies were adopted, including use of well-established methods such as repertory grids and questionnaires, triangulation of data and peer review (Shenton, 2004) to reduce any adverse effects.

4.3.1 Assumptions

An underlying assumption of this project is that selection of one specialty over another, and being successful in its application, creates junior doctors who are content in their chosen working specialty. In turn, this assumes that happiness with specialty choice equates to motivated trainees, who are likely to be retained in the specialty and will work to provide effective care for patients.

In some instances, participants' views of different specialties can only be described as stereotyping. However, if stereotypes are the way that people judge a specialty, junior doctors may be discouraged from applying to that training programme due to a lack of perceived suitability. In addition, if applicants are only those who deem themselves as 'fitting' this stereotype, little can be done to change the stereotype. Again, there is an assumption that a diverse workforce is a better workforce to address the needs of all patients. This is an underlying principle of most widening participation studies (Garlick and Brown, 2008; Griffin and Hu, 2014; Martin et al, 2018).

Widening participation schemes often try to address the inherent competition associated with application to medical school based on an individual's (or their family's) background. Examples of this cultural capital include being a child of medical professionals as it is likely that they have access to a wider range of medical work experiences prior to university based on their parents' contacts. Frequently those who attend private education schools can benefit from extracurricular activities which are identified as strengths during medical school application. A limitation of this work is that the degree to which these underlying benefits and cultural capital influence specialty selection. It was beyond the scope of this project to assess the impact of this influence.

Furthermore, several key additional assumptions in the process of the project were identified:

- Influences on career choice are fixed for an individual for a time period which would allow them to recognise and record these views.
- Opinions of participants are factual and recorded accurately.
- Identification of influences to junior doctors could be used in future to encourage others into a specialty choice.

These assumptions were acknowledged and are considered in the discussion of results. There was an inherent trust that the participants could identify potential influences in their career making processes, and that by use of multiple methods of investigation the description of these influences were credible. Individual method assumptions are listed in the corresponding chapters.

4.3.2 Limitations and mitigation

Several limitations exist with the methods used. Assumptions for the individual methods are identified in the corresponding chapters (chapters 5, 6 and 7).

Purposeful sampling could add to researcher bias as the sample selected had already been identified as beneficial to the study (Tongco, 2007). However, it was more valuable to use this type of sampling to ensure that the study aim was achieved. To minimize the effect of bias, the selection process was anonymous, all those who were available for interview participated, and interviews were conducted with participants who indicated an interest in paediatrics, as well as with those who did not want to pursue this specialty.

Participants were given written information and consent gained ahead of the interviews. To ensure sufficient participation numbers for the qualitative phase, support from the Northern Foundation School and the School of Paediatrics was given to assist with recruitment. By enlisting the help of the education centre teams at each trust site, distribution of the questionnaire to F2 doctors was effective and encouraged participation.

4.4 Ethical considerations

Approval from the Faculty of Medical Sciences ethics committee was sought and granted prior to study commencement. Ethics reference number 3634/2016. National research ethics approval was not required.

5. Specialty trainee repertory grid interviews – Spring 2016

What factors influenced the career decisions of ST1/2 doctors in paediatrics?

This chapter details the repertory grid interview study carried out to address research question 1: What factors influenced the career decisions of ST1/2 doctors in paediatrics? This produced three distinct outputs: a) identification of features perceived to differentiate specialties; b) the association of those features with particular specialties; and c) how those features influenced individual preferences. The features identified were subsequently used in the development of the questionnaire described in the next chapter.

5.1 Repertory grids

Identification of influencing factors in specialty preference was achieved using the repertory grid method. This technique is an interviewing method designed by Kelly in 1955 to identify how people interpret their experiences, and originally used as part of personality assessments (Gross, 1996). The repertory grid technique is a flexible instrument that allows subjects to uncover the "fundamental constructs they use for perceiving" (Gross, 1996 p 761). These constructs are the features of a particular subject which identified by an individual and helps to discriminate and assign a preference. For example, how an individual considers an item of clothing may be through its

functionality outdoors e.g. warm or cool; its purchase price e.g. expensive or cheap; or colour e.g. red or blue. This then allows for a decision to which item is best for that person. In the clothing example, an individual may choose a warm, blue shirt for a winter's day even though they consider it too expensive. Although this method was developed in accordance with Kelly's Personal Construct Theory, it can be used without this theoretical framework depending on what constructs are to be considered (Gross, 1996).

During a repertory grid interview, the participant initially compares three items, termed 'elements', and describes ways in which they are similar and different. These similarities and differences are the individual's 'personal constructs'. In the context of this thesis, these will be the features associated with different specialty training careers. The second part of the process is to identify how each element accurately fits each construct. Using the earlier example of clothing, a woollen shirt would be warmer than a cotton shirt. These constructs determine what the participant considers are the most influential factors that shaped their choice. Each construct must have an opposite; therefore, they are referred to as bipolar constructs or construct pairs (Fransella et al, 2004).

There are various benefits to the use of repertory grids. The process allows for standardisation of participant responses, with each construct being created of two poles. This allows for comparable analysis between individual grids. However, the grids also enable the interviewer to explore the context and structure of the interviewee's beliefs, and incorporate personality, attitudes, habits as well as personal philosophies, with little influence of the researcher (Fransella et al, 2004). This method therefore fits within the post-positivist perspective, by demonstrating methodological rigor and objectivity, in addition to having a low researcher bias. As identified by Kuipers and Grice (2009), repertory grids are seen as a method that crosses from interpretivist to positivist paradigms. The method has been used by others to conduct post-positivist research (Moon et al, 2017) and have been used in career counselling making repertory grids a suitable tool to identify relationship patterns associated with different careers (Fransella et al, 2004).

5.1.1 Assumptions and limitations of repertory grids

There were various assumptions acknowledged with the use of repertory grids. As detailed above, there were many benefits of using the technique for the interview of ST1 and ST2 doctors.

The first assumption is that by identifying the similarities and differences of individual career options, ST doctors can differentiate between the careers. This is a necessary assumption for understanding how different specialties are considered. There was a risk that by only including six specialties during the interview, some opinions on specialty would be missed. This was mitigated by the project aiming to identify *how* career specialties are chosen, rather than provide a review of opinions of all specialty careers. Nonetheless, during the second phase of the project, participants were able to consider all specialties and hence this limitation has further offset.

Other assumptions were related to the use of the data collected to create the questionnaire for the second phase of the study. The number of potential constructs generated through the repertory grid interviews was huge and if all were included in a questionnaire, the questionnaire would be too lengthy for participants to complete. Therefore, prioritisation of constructs was needed using the principles:

- Identification of a construct preference is equivalent to a need for greater focus in the questionnaire
- Larger number of constructs per category, is proportional to the importance of that theme
- Constructs repeated by different participants demonstrates key factors, which warrants their inclusion in the questionnaire

Finally, the repertory grid method required comparison of two poles of a construct. This meant that participants were forced to consider what was opposite to their beliefs about a specialty. In some instances, this meant that participants described features that were only tenuously linked to a specialty. However, as part of the ranking process (detailed in chapter 5.2.3) the participant could rank the construct as strongly, slightly, or not associated with the specialty, hence the impact of this limitation is lessened.

5.2 Method

This section describes the interview technique of a repertory grid, the piloting process, the data collected and analysis of the results from this phase of the mixed methods process.

Repertory grids work well with 5-6 elements to compare in 'triads' (Fransella et al, 2004), which provides 20 possible triad combinations. However, the Health Education England website in 2017 identified 17 training programmes to which an F2 doctor can apply to continue training (appendix A, Table 1), which would result in an unmanageable 680 possible triad combinations. Therefore, to identify which 5 or 6 of these training programmes would be the most useful to compare as elements in the ST1/2 repertory grid interviews, an operational pilot study was conducted. This also ensured that the process of the interview was logical, identified the length of time needed to create constructs by the interviewee and allowed for an assessment of participant fatigue.

5.2.1 Pilot study

The interview was first piloted with paediatric teaching fellows. This group were used as they have some similar experiences to ST1 paediatric doctors but would not be included in the main data collection, therefore allowing for all ST1 and ST2 paediatric doctors in the North East and North Cumbria region to be considered for the main interview stage. Furthermore, the paediatric teaching fellows were easily accessible as they all worked at Newcastle upon Tyne Hospitals trust alongside the researcher. Two paediatric Teaching Fellows (TF), post-F2 doctors who had secured paediatric training posts to start in September 2016, participated. At the time of the study there were only four paediatric teaching fellows at Newcastle upon Tyne Hospitals trust, one of whom was the researcher.

5.2.1.1 Pilot procedure

In most respects, the procedure was as described in chapter 5.2.3 below. The procedure of the repertory grid involved taking three cards, with the names of training programmes written on, from an envelope at random and then describing ways in which each pair differed from the third – each of these similarities/differences being a construct. The researcher first demonstrated how to generate constructs, using fruit as an example (appendix A, Table 2).

If a TF struggled to describe a construct, they were asked, "Are the people in these jobs similar to each other but different to the last?". Once each combination of the three cards had been considered, they were returned for the next random selection. Each TF continued this process until every training programme had been used at least once. The first TF carried out this process 7 times and the second TF, 8 times. The constructs generated are shown in appendix A, Tables 3 and 4.

The next step was to rate each element, on a scale of 1 to 5, to determine how much it fitted with the construct to create the repertory grid. The detailed stepwise process is explained in section 5.2.3. Following the creation of the grids, each TF was asked a set of questions:

1. Which were the easiest to make comparisons with?
2. Which were the most difficult?
3. Which of the training programmes have you ever considered as a specialty job?
4. Which of these training programmes do you think would be best to compare if you could only pick five or six?

Those elements that were identified as the 'best' to compare, easy to compare and specialties considered for a career were to be used for the main study. Those elements identified as difficult to compare were deemed to be least useful for the main study.

5.2.1.2 Pilot results

The TFs commented that the method was a good way to compare different specialties and that it provided a way to identify important considerations in choosing specialties, demonstrating

acceptability of the method. The pilot study confirmed the need to have a prompting question to ensure constructs were generated to include the type of people within the specialty and not just the technical skills perceived to be important to the different specialties.

The TFs described that generating constructs was difficult as they struggled to articulate what they thought. Therefore, there was a risk of fatigue. By limiting the time for generation of constructs in the main interviews, the impact of this would be reduced. In addition, the TFs found it difficult when there were multiple elements that were significantly different from each other; or felt they had little experience of the specialty, such as neurosurgery or ophthalmology, as these were described as "specific".

Following the pilot study, the 6 training programmes chosen by the TFs as elements to use in the main interviews were: paediatrics, surgery, general medicine, GP, acute care common stem (ACCS) and radiology.

Based on previous literature, it was expected that elements selected would include paediatrics, surgery, general medicine, GP and ACCS. These training posts are quite generic and junior doctors are likely to have had some experience working with people in these posts. They are also a large focus of the undergraduate medical degree; therefore, the interviewee will have some direct experience to allow comparison of the roles. Psychiatry is a more prominent feature in the literature and its exclusion, at the expense of radiology, was therefore unexpected. Further piloting to consider other elements to include was not required, as the maximum number of workable elements had been achieved with most being selected by both participants in the pilot (Fransella et al, 2004). Psychiatry did not produce any significantly different constructs when included in the pilot.

5.2.2 Main repertory grid interview participants

ST1 and ST2 doctors were selected because they had recently started their training and were therefore more likely to remember the application process and their own application decisions, but

they have also had working experience of the training programme which allowed the participants to consider if they still had those same perceptions of specialties.

A limitation may be considered that only those who had been accepted onto a paediatric training programme and had carried through to this were included. Pragmatically this was the only way to identify who had chosen a paediatric career in the North East and North Cumbria region. As competition rates are lower in this area (figure 2) it is unlikely that anyone wanting to do paediatrics would not get a place here. The decision to focus on paediatrics was intentional due to the need to address the research question: to find out influences of paediatric ST1/2s. An alternative study could be considered by including non-paediatric ST1/2s to identify if perceptions of specialties would be different, however this is outside the scope of this project.

The number of paediatric trainees in the region is small, and hence consideration of participant work schedules was employed to ensure adequate opportunities for participation. All ST1 and ST2 paediatric doctors within the Health Education North East and North Cumbria region were sent an email requesting volunteers to take part in the interviews. Interested persons emailed with availability and interviews took place at the most convenient time for both parties. A total of 8 trainees responded, however three were unable to confirm availability. Therefore, five interviews were carried out with 2 ST1 and 3 ST2 paediatric trainees (Table 4 and Appendix B) with the potential for further interviews if necessary. A total of 162 constructs were generated by the 5 interviews, and no new categories of construct were generated after the third interview, hence an acceptable level of data saturation was presumed.

Table 4: Repertory grid interview participants including current working role and where the interview took place

Participant	Current specialty	Current working location	Interview setting
1: ST1	Cardiology	Tertiary hospital	Researcher's home
2: ST2	Neonates	Tertiary hospital	Researcher's home
3: ST2	General paediatrics	District general hospital	Interviewee's home
4: ST2	Mixed specialty and general paediatrics	Tertiary hospital	Ward interview room
5: ST1	Mixed specialty and general paediatrics	Tertiary hospital	Ward interview room

5.2.3 Repertory grid interview procedure

Interviews were limited to 30 minutes to decrease the impact of participant fatigue. After explanation of the study and the process of repertory grids, participants completed written consent forms. The process was as follows (Jankowicz, 2003; Fransella et al, 2004):

1) Comparison

a) The interviewer had a pre-printed grid produced for the interview with the six elements listed across the top and space available for multiple construct pairs (Figure 6)

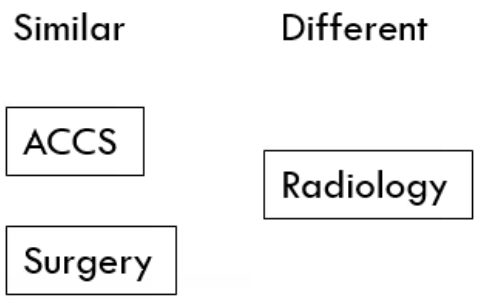
Figure 6: Blank pre-printed grid for interview

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct

b) The participant selected 3 cards at random from an envelope. The cards were the elements as identified in the pilot study. These cards were arranged on a table between the participant and the interviewer, so that two were on one side and the third on the

opposite side. The interviewer recorded which three elements had been selected for this triad (Figure 7).

Figure 7: Example selection of 3 elements



c) The participant was asked "in what way are these two specialty jobs similar to each other but different from this third specialty".

d) Any voiced descriptions (constructs) were recorded on the pre-printed grid by the interviewer. If the participant only provided a similarity, they were prompted to describe the opposite pole of the construct (Figure 8).

Figure 8: Example recorded constructs for comparison of ACCS & surgery being similar to each other but different from radiology

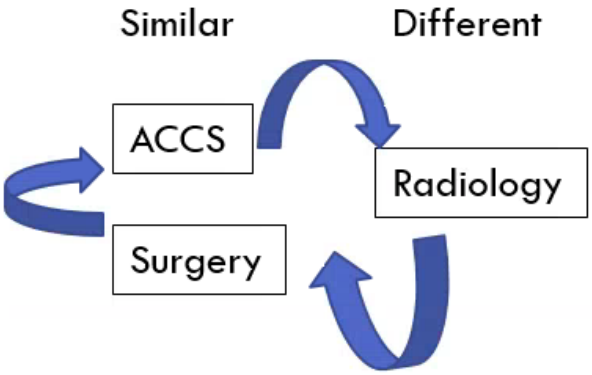
construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct
See patients							Pictures
Unwell patients							Any patient
Like pressure							Like to take time
Like practical							Don't like practical

*Interview 1 data. Demonstrating the generated similarities of ACCS and surgery to be 'see patients' compared to the difference of 'pictures' in radiology

e) Once the participant was unable to think of any further constructs, the arrangement of the cards was rotated so that the second and third cards were placed together, and the first

card was considered the element which as different (Figure 9). The same process as in step d was repeated to record constructs.

Figure 9: Rotation of elements



f) Once the participant was unable to think of any further constructs, the arrangement of the cards was rotated again so that the third and first cards were placed together, and the second card was considered the element which was different. Again, the same process as in step d was repeated to record constructs.

g) All cards were returned to the envelope and the participant selected another three elements at random, which were recorded by the interviewer. If the cards selected were the same as the ones in a previous comparison, they were returned, and the envelope jumbled up to allow alternative selection.

h) This process continued for 30 minutes, regardless of how many triads were reviewed but ensuring that each element had been used at least once. At this point, the interview moved onto the next stage.

i) The completed grid was placed between interviewer and participant. This allowed the participant to review the responses recorded prior to explanation of the next stage of the interview: rating.

2) Rating

a) The participant rated the elements using a five-point scale to indicate how much the element fitted the constructs. The left side of the grid was formed by the 'similar' construct pole, whereas the right side was the 'different' construct pole in the earlier stage. If the participant felt an element was strongly to the left side of the bipolar construct, they awarded it a rating of 1. Strongly to the right side of the bipolar construct was 5. Slightly to the left was 2, and slightly to the right was awarded 4. The rating of 3 was awarded if the participant identified the specialty element as not fitting either pole of the construct.

b) This rating process was conducted for all constructs recorded (Figure 10). Once completed the final stage was carried out: identification of preference.

Figure 10: Example of grid ratings

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct
See patients	1	1	1	1	1	5	Pictures
Unwell patients	2	2	4	3	2	5	Any patient
Like pressure	2	1	4	2	1	4	Like to take time
Like practical	3	1	4	3	2	3	Don't like practical
On call	3	3	2	3	5	1	Shift work

*Interview 1 data. To demonstrate, this individual considers Radiology as a specialty that uses pictures (rating 5) rather than seeing patients (rating 1)

3) Identification of preference

a) The participant was asked "in your ideal specialty job, would you prefer…" and then the construct was listed. For example, if the bipolar construct was 'Like pressure' vs 'Like to take time', the participant was asked "in your ideal specialty job, would you prefer pressure or would you rather take your time?"

b) If the participant stated that they preferred the left sided pole of the construct, it was circled. If they preferred the right side, it was circled instead. If they felt neither or a balance of both, "3" was documented at the side of the grid alongside the construct (Figure 11).

Figure 11: Identification of preferences by participant

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	
See patients	1	1	1	1	1	5	Pictures	
Unwell patients	2	2	4	3	2	5	Any patient	
Like pressure	2	1	4	2	1	4	Like to take time	3
Like practical	3	1	4	3	2	3	Don't like practical	
On call	3	3	2	3	5	1	Shift work	3

*Interview 1 data. To demonstrate, this individual reported they would prefer to see patients (rating 1); but also take their time (rating 3) which they do not identify with any of the listed specialties

Following the interviews, the researcher transcribed all the paper grids to a Microsoft Word document. Instead of maintaining the circles for identification of preference, the grid was shaded to identify preference. This allowed for the first stage of analysis, to identify which elements fitted the participants' preference, where a left sided preference applied to any elements with rating of 1 or 2, and a right sided preference for elements rated 4 or 5. Again these were shaded for simplicity as shown in figure 12. At this point, using Kelly's personal construct theory (Gross, 1996) the grid could be assessed to determine how much the participant's preferences fitted with each element and inferences could be made on suitability to each element. For example, using figure 12, the participant has 5 shaded boxes under surgery and therefore it could be considered that surgery was a more suitable career for them based on the constructs identified.

Figure 12: Example of the first stage of grid analysis- identification of preferences

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct
See patients	1	1	1	1	1	5	Pictures
Unwell patients	2	2	4	3	2	5	Any patient
Like pressure	2	1	4	2	1	4	Like to take time
Like practical	3	1	4	3	2	3	Don't like practical
On call	3	3	2	3	5	1	Shift work

5.3 Data analysis

Repertory grids contain both qualitative and quantitative data. For this project, analysis focused on the qualitative data to develop items for the subsequent questionnaire. Whereas analysis of quantitative data allows for statistical analysis and how much a construct was associated with a single element (Fransella et al, 2004).

The repertory grid qualitative data was analysed using a type of thematic analysis (Braun and Clarke, 2006). In repertory grids this is known as the 'core-categorisation procedure' (Jankowicz, 2003). The whole data set of generated constructs was used, and initial descriptive codes were systematically applied based on interpretation of constructs generated by the repertory grids (Silverman, 2011). Once the initial code was created, the constructs were grouped together based on similar codes and reviewed, with support from the project supervisors, to refine the codes which resulted in the final categories (Jankowicz, 2003; Silverman, 2011).

Analysis started with a grid-by-grid basis, where initial categories were identified within the constructs generated by an individual participant. Each line of the grid was isolated, and then assigned a code based on the content of the construct. For example, if the construct stated long working hours vs short working hours, the descriptive code would be 'working pattern'. Once all grids were coded in this way, codes were grouped together from multiple interviews and reviewed to ensure clarity to

create an initial category. These initial categories were discussed with the supervisor team, resulting in modification of the category coding. Furthermore, with constructs that appeared to be able to fit one or more categories, the construct categories were discussed for conflict of meaning and following this a final category was selected.

5.4 Results

Appendix B details each of the ST repertory grid interview data. The first step of data analysis was to describe the individual grids, to identify how many constructs were generated and number of preferences expressed by participants.

Table 5 details the number of constructs generated in each interview, and on how many participants expressed a preference. Across all five repertory grids, 162 constructs were generated; participants tended to prefer one pole of most constructs, although this varied from 59% to 92% (interview 3 and 2 respectively) of constructs identified. Most of these preferred construct poles were associated with paediatrics. In addition, some specialties were associated with preferable construct poles, and these are also listed in table 5.

Table 5: Eyeball analysis of repertory grid contents for each interview

Interview	Number of construct pairs generated	Number of times a preference for one pole identified	How many preferred constructs within paediatrics	Next specialty with number of preferred constructs
Interview 1	32	25	23	Core medical training (18)
Interview 2	37	34	32	Core medical training (31)
Interview 3	34	20	17	General practice (13)
Interview 4	27	24	17	General practice (16)
Interview 5	32	20	16	ACCS (16); core medical training (15)

Across the five interviews there were some constructs on which the ST doctors did not identify a pole preference. Individuals reported that they would prefer a mixture of staff genders, acuteness of the patient interactions, consideration of work life balance compared to training but also training that was neither considered long or short. One participant identified that she did not want to experience high competition for training places but also that she did not want training posts to be under filled.

5.4.1 Analysis of results: what factors influenced the career decisions of ST1/2 doctors in paediatrics

The generated constructs described how different specialties are seen. By creating constructs, features associated with specialties were described, and through the repertory grid rating process, how much each specialty was associated with each construct. This process identified important features of specialties as well as which features were preferred by paediatric trainees irrespective of which specialty they initially were described with. In this section, specifics of paediatrics will be considered: what constructs defined paediatrics, and which were preferred by paediatric trainees. There were constructs which are preferred by trainees, but not associated with paediatrics; these were also considered.

5.4.1.1 Categories of constructs

From the constructs, ten categories were identified as shown in Table 6. These categories were used to develop the items for the questionnaire, but also to summarise the constructs for analysis of preferences. As demonstrated, there were considerably more constructs associated with the categories of skills involved and working environment compared to personality and competitiveness. The value of identifying this was to begin the construction of the F2 questionnaire, giving more focus to items which would address the categories with more constructs.

Table 6: 10 categories generated from the ST repertory grid interviews

Categories	Number of construct pairs within category
Skills involved	34
Patient type	19
Working environment	30
Working pattern	10
Knowledge base	18
Patient interaction	19
Personal circumstances	10
Personality	3
Competitiveness	4
Training scheme	15

5.4.1.2 Identifying preferences within constructs

A key finding was the identification of a preference from most construct pairs, demonstrating what individuals would like to be a feature of their ideal career. This was termed the 'preferred construct'. In some instances, participants determined that they would either like a mixture of both construct poles, or that they do not prefer either construct pole.

All the participants described preferred constructs within the categories of skills involved, patient type, working environment, and knowledge base. This included practical skills, working with children, ward-based environments with predominantly medical problems. Only interviews 3 and 4 identified preferred constructs within the personality and competitiveness categories such as relaxed personalities and well filled posts. Interviews 3, 4 and 5 described preferred constructs within working patterns and training, with preference for not having out of hours work and flexible training. For the categories of patient interaction and personal circumstances, four of the five interviews identified preferred constructs within each such as longevity of patient care and ability to take career breaks.

Overall, the number of preferred constructs were different in each category. Table 7 documents the number of preferred constructs in each category, compared to the total number of constructs within each category. Categories with more preferred constructs were deemed more relevant to the individuals and therefore more likely to be influential factors.

Table 7: Total number of identified construct pole preferences from all bipolar construct pairs across all interviews

Category	Preferences/Number of construct pairs
Skills involved	25/34
Patient type	17/19
Working environment	22/30
Working pattern	7/10
Knowledge base	17/18
Patient interaction	15/19
Personal circumstances	5/10
Personality	3/3
Competitiveness	2/4
Training scheme	10/15

5.4.1.3 Defining paediatrics

The ST doctors identified features which fitted with their perception of paediatrics. They described the skills involved in paediatrics as practical and procedure heavy, with a strong emphasis on communication skills. They identified there was a co-ordination role and input into safeguarding. Overall, they felt there were a range of skills, including resus management, which were built with experience. The patient type in paediatrics were those who are under 18yr old, but a mixture of chronic or long-term patients with acutely unwell and sick patients. The ST doctors also described that the patient and the wider family are under their care.

When describing the working environment of paediatrics, the ST doctors identified that it was mostly a hospital team-based specialty, with a focus on acute care or intensive care; a female environment; service based; high-pressure, but that it was also a safe environment for patients which was separate from the rest of the hospital. One ST commented that paediatric trainees cover a wider geographical area during training. Overall, the ST doctors described the environment as fun. One aspect of this may be that they described paediatricians as nice or relaxed in personality.

Considering the 'working pattern' of paediatrics, there was an emphasis on the amount of on call or out of hour's shifts. Overall, the ST doctors described the working rotas as demanding, with a poor work life balance. One ST did feel however, that it was easy to become part time in paediatrics. The STs identified that there was less competition in paediatrics and that there were poorly filled

posts. Considering the training programme, they described run through training as long, and less flexible to change to another specialty but that there was flexibility within the specialty itself. This impacted on personal circumstances, where the STs described it was difficult to have career breaks and that there were lots of exams to sit, but overall, they considered paediatrics to be more family friendly compared to other specialties.

The knowledge base associated with paediatrics was described as structured, 'mostly medicine with specific illnesses'. The STs felt that paediatrics had a broad range of knowledge with a focus on generalism, but that subspecialisation was a feature. They felt it was a people orientated specialty, usually interacting with women and children. They identified that it was associated with developing long patient relationships whereby the patient was the focus, ensuring holistic care. They also identified that there was significant interaction with complex patients.

Preferred constructs in paediatrics

The participants identified many positive career features within paediatrics. For interviews 1-4, most of the preferred constructs were a feature of a paediatrics career. Interview 5 identified an equal number of preferred constructs for paediatrics and ACCS. Preferred features of paediatrics may be the individual reasons for the ST doctors to select paediatrics as a career. In addition, some of these preferred features may combine to create a greater pull towards paediatrics.

Table 8 demonstrates the positive aspects of paediatrics per each category as identified by each interview. The individual constructs are documented in appendix B. The frequency of positive constructs per category were recorded. Interviews 1 and 5 identified skills involved as positive features of a paediatric career most frequently; Interview 2 identified working environment; patient interaction was identified by interview 4. During interview 3, the participant did not identify any one category strongly as being a feature of paediatrics. Overall, the skills involved and working environment were the categories which were associated with paediatrics.

Table 8: Categories of positive features of paediatric careers based on each interview

Category	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Total
Skills involved	6	7	1	2	9	**25**
Patient type	2	5	3	2	2	**14**
Work environment	3	10	3	3	2	**21**
Working pattern	1	0	1	0	0	**2**
Knowledge base	4	4	2	2	0	**12**
Patient interaction	4	5	0	6	2	**17**
Personal circumstances	2	1	0	1	1	**5**
Personality	0	0	2	1	0	**3**
Competitiveness	0	0	2	0	0	**2**
Training	1	0	3	0	0	**4**

Constructs not found in paediatrics

From the constructs listed by the participants, some preferred features of careers are not found in paediatrics. Some of these are found in other specialties but some are not featured in any of the specialties assessed, and therefore may be un-obtainable features of a medical career. This highlights that preferred features are not always linked to the choice of specialty. Therefore, additional factors are involved, or the value of preferred features is not equal.

The participants all selected a paediatrics career despite the lack of the positive features shown in table 9. Again, the detailed constructs are documented in appendix B. Overall positive training, skills involved and working environment were the categories which were associated with non-paediatric careers. It is notable that improving work life balance and fewer antisocial working hours was repeated between different participants as ways to increase positivity towards paediatrics.

Table 9: Categories of constructs associated with each participant's preference but not identified as being present in paediatric careers

Category	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Total
Skills involved	2	0	3	3	1	**9**
Patient type	2	0	1	1	1	**5**
Work environment	2	1	5	1	0	**9**
Working pattern	1	0	4	1	2	**8**
Knowledge base	1	2	1	0	2	**6**
Patient interaction	1	1	0	0	0	**2**
Personal circumstances	0	1	2	0	2	**5**
Personality	0	0	0	0	0	**0**
Competitiveness	0	0	0	1	1	**2**
Training	0	0	1	3	7	**11**

When comparing how frequently the preferred construct categories appear in paediatrics careers or not, two categories are identified as less likely to be in paediatrics. The preferred working pattern and training categories were less like to be found in a paediatrics career. This suggests that these two areas were most likely to be sacrificed by paediatric specialty trainees for the other preferences, or that these are considered less important when comparing careers as a whole.

5.5 Summary of chapter

The first research question for this project was: "what factors influenced the career decisions of ST1/2 doctors in paediatrics". To address this question, constructs related to different specialties were obtained. This allowed for identification of constructs which determined individuals' preferences based on their perceptions of specialties, and of constructs that defined paediatrics as a specialty.

The constructs generated by the participants identified ten areas in which specialty careers can differ from each other. The repertory grids obtained constructs that fitted within the categories of skills involved, patient type, working environment, working pattern, knowledge base, patient interaction, personal circumstances, personality, competitiveness, and training scheme. In most instances, the ST doctors were able to identify a preference for these differences, whereby the

categories of skills involved, patient type, working environment and knowledge base were unanimously described as containing preferred constructs.

The ST doctors identified that ideal features of careers were often found in paediatrics, which is unsurprising as they have selected this as their career path. Ideal constructs fitted within categories they felt were well represented in paediatrics. These were skills, working environment and patient interaction. The interviews also highlighted that there were some less-desirable features of paediatric careers, which the trainees were aware of but happy to accommodate due to their overall opinion of a paediatric career. These were predominately found within the areas of work environment, skills, and training.

The ST repertory grid interviews have generated results that allowed for development of the questionnaire, which is described in the next chapter.

6. F2 questionnaire – Autumn 2016

What are the intended career choices of foundation year 2 (F2) doctors?

This chapter considers the specialty training choices of a cohort of trainees: what specialties they choose, and what features of specialties, as identified in the previous chapter, influence those choices. Using the process of sequential methods, the information gathered from the repertory grid interviews was used to develop the questionnaire.

This chapter details the development and piloting of the questionnaire, data collection and statistical analysis. The questionnaire data also partially was able to answer research question 3: what factors influence the career decisions of F2 doctors at the point of application, and how? However, the detail of free text responses was not substantial and required more investigation from the third phase of the mixed methods project.

6.1 Questionnaire development

The questionnaire was designed taking account of relevant literature and using the constructs identified in the ST repertory grid interviews to ensure content validity (Evans et al, 2002; Petrides and McManus, 2004; Lambert et al, 2006).

The initial draft used the 10 construct categories from the repertory grid data to create questionnaire sections (figure 6). For each of the sections, several item responses could be selected. The number of available item responses was directly proportional to the total number of constructs and number of preferred constructs in the repertory grid categories. It was assumed that categories with many constructs, or many preferred constructs, were more important to the ST doctors.

In addition, there were some 'unique constructs' which were included as questionnaire items. Unique constructs were those identified within a category but offered an alternative perspective or meaning. There were six unique constructs identified, each in different categories. These were 'co-ordination role', 'minor illness', 'on site consultants out of hours', 'complex patients', 'exams' and 'academic expectation'.

Figure 13 is an example of the first questionnaire draft, showing the sections of skills, patient type and work environment. Appendix C contains the first draft of the questionnaire.

Figure 13: Example first draft of the questionnaire showing three sections based on the construct categories from the ST interviews

4. Of the below aspects of a specialty, which are more important to you?
    a. Doing something practical
    b. Emphasis on communication skills
    c. Many opportunities for "resus"
    d. Having a single specific role
    e. Lots of procedures
    f. Involved in co-ordination of other specialties or teams
    g. Interpretation of data
    h. Scientific

5. Of the below aspects of a specialty, which are more important to you?
    a. Chronic illness care
    b. Age of patient
    c. Interaction with patient and wider family
    d. Acutely unwell patients
    e. Gender of patient
    f. Minor illnesses

6. Of the below aspects of a specialty, which are more important to you?
    a. High pressure job
    b. Hospital based
    c. Community based
    d. Ward based
    e. Working anywhere
    f. Individual clinical decisions

After review with the supervising team it was identified that further data could be collected by identifying if each item were an attractant or deterrent when considering careers. Therefore, the items were redesigned so that participants could rate each one on a Likert scale from a 'strong

positive effect', 'slight positive effect', 'neutral/no effect', 'slight negative effect' and to 'strong negative effect'. To reduce respondent bias, as grouping questions with similar answers would likely result in minimal consideration of each question, all items were listed alphabetically. This final draft of the questionnaire was used in the piloting stage.

6.1.1 Assumptions and mitigations

As highlighted in chapter 4.3, the methods utilised in this project required acknowledgement of assumptions made. Overall, there were assumptions that use of a questionnaire was worthwhile and suitable to answer the research questions. Some assumptions regard the use of questionnaires as a tool:

- Completion of the questionnaire was a true and accurate representation of the individual F2's thoughts about differences between specialty careers
- All participants understood the items consistently

Questionnaires are considered appropriate tools for developing knowledge on respondents' opinions (O'Donnell et al, 2010; Cleland et al, 2014), although there is a risk that participants shield the truth for fear of judgement (McLeod, 2014). To overcome this, use of anonymization was key, and voluntary participation ensured that only interested persons participated. By including explanatory text at the start of the questionnaire, and the use of piloting, improved the comprehension of participants (Family, 2012; McLeod, 2014).

Other assumptions regard the data collected:

- F2 doctors were able to identify factors across specialties which may have a positive or negative influence on their perception of the specialty as a career
- There was value in identifying F2 opinions on different factors which may or may not be present across multiple specialty careers
- There was a relationship between the choice of specialty career and a variety of factors which may or may not be perceived in that specialty

Questionnaires have been used extensively to gather the views, opinions, and beliefs of participants (Boynton and Greenhalgh, 2004). Previous research has shown that medical students and junior doctors evaluate and compare different specialties (Albert, 2012; Goldacre et al, 2012). It was therefore appropriate to identify how these comparisons were made and through statistical analysis methods, determine relationships between these features and specific specialties.

Finally, there were assumptions regarding the analysis of the data:

- Specialties were discreet enough to be compared based on a number of aspects which could then be rated by participants
- Statistical analysis methods were robust enough to identify which are the most influential factors when selecting paediatrics as a specialty career

The data collected was statistically analysed using recognised techniques, a statistical computer package and support from experts was sought. The justification of the statistical techniques is addressed in chapter 6.3.3.1.

6.2 Pilot questionnaire

To ensure that the questionnaire sent to F2 doctors was appropriate, a pilot study was conducted first. As described by Plowright (2011), piloting of questions is a valuable endeavour and can ensure clarity, design and style are correct. Simmons (2001) advised that conducting a pilot with about 1% of the intended sample size is advisable, ensuring that the group have similar characteristics to the population which is to be studied. This ensures the content validity and acceptability of the questionnaire.

6.2.1 Participants

Foundation year 2 (F2) doctors in the Newcastle upon Tyne Hospitals foundation trust were contacted by email to ask if they were willing to participate in a pilot questionnaire. Five pilot

participants, four of whom were female completed the pilot study. Three of the participants had applied to specialty training posts.

These pilot participants were in the cohort ahead of that intended for main data collection and completed the pilot questionnaire in July 2016. An added benefit of conducting the pilot before F2 changeover in August 2016 was to allow time to review the pilot results and any operational concerns, before planned distribution to F2 doctors during the specialty training application in autumn 2016. As the pilot study was not a real-time equivalent to the data collection, participants had to imagine they were completing the questionnaire during their own specialty training application period (autumn 2015) and therefore there was potential for difficulties to remember influences in detail.

6.2.2 Procedure

The pilot questionnaire was completed on paper in the presence of the researcher to allow recording of comments and suggestions for improvement. Whether each section was completed was noted to determine if the questionnaire would be feasible and acceptable.

6.2.3 Pilot findings

Details of the completed pilot questionnaire results are documented in appendix C. The participants deemed the pilot acceptable, and few queries were raised. Most of the participants found it easy to answer as if it were October/November 2015, to reflect their earlier decision-making around specialty training applications.

Broad based training was included in the pilot questionnaire specialty options as previously it had a competition ratio of 4.37 demonstrating its popularity (Health Education England, 2015). One participant was unaware of this option and another participant indicated an interest in broad based training but that it was removed for their application period.

The third section of the questionnaire consisted of 61 aspects of specialty jobs as derived from the ST repertory grid interviews. Overall, the participants found most of the aspects have a positive effect when considering an application to a specialty training post.

Based on pilot responses, some changes were made to wording of the 61 questionnaire items. Some changes required clarification of an amount, for example the aspect 'number of exams' was quantified to 'multiple exams'. The item 'working anywhere' aspect was changed to two aspects of 'working anywhere (geographically)' and 'working anywhere (workplace environment)'. Furthermore, formatting changes were needed to improve the clarity in the third section of the questionnaire to ensure it was easy to complete.

6.3 Main questionnaire study method

This portion of the chapter addresses the method of the questionnaire study. This includes the procedure undertaken, distribution of the questionnaire, participants, and data analysis methods.

6.3.1 Procedure and distribution

The final questionnaire (appendix D) was distributed to all foundation year 2 doctors in the Northern Foundation School (NFS, covering the Health Education England North East and North Cumbria region) before the submission deadline for specialty applications (October- November 2016). Responses were therefore given when specialty choices were being actively considered by F2 doctors.

Because NFS spans multiple hospitals across the North East of England and North Cumbria, education departments at each hospital trust were contacted to assist with questionnaire distribution and confirm the number of questionnaires required.

Paper questionnaires were delivered in September 2016 to a link person at each site. The F2 doctors were then given the questionnaires by the link person, or the researcher in the case of Newcastle F2s, to fill in at the beginning of their biweekly mandatory teaching sessions in all trusts

except Newcastle. In Newcastle, teaching sessions were weekly but voluntary and therefore attendance was much lower than in other hospitals. However, because attendance was not guaranteed, an online version of the questionnaire was also emailed out to the F2 doctors to all trusts with completion rates below 50%.

Completed questionnaires were collected by the researcher or returned as batches by post in October-November 2016. Unfortunately, in the Queen Elizabeth hospital, the questionnaires were accidently distributed to Foundation year 1 (F1) doctors by mistake, therefore there was a lower return rate of paper questionnaire completion for this hospital.

Data obtained from the questionnaires was entered into a Microsoft Excel spreadsheet for basic analysis and storage, then imported to SPSS to allow for more detailed statistical analysis.

6.3.2 Participants

Questionnaires were completed as shown in table 10. As noted above, at the Newcastle upon Tyne hospitals, F2 teaching was voluntary and therefore only those who were able to remove themselves from clinical work were able to attend. Those that were able to attend were often only the F2 doctors on the academic training programme as they had fewer time-pressured commitments. It appears that the questionnaires did not reach any F2 doctors in County Durham and Darlington hospitals as this was the only trust where no paper-based questionnaires were completed, and all blank forms were returned to the researcher. However, some F2 doctors from this trust did complete the online version of the questionnaire.

Table 10: Completion of questionnaire by F2 doctors

Main site	Number of F2 doctors within trust	Number completed and returned	Response rate
RVI, Newcastle upon Tyne Hospitals	76	13	17%
North Tyneside, Northumbria	50	13	26%
Carlisle, Cumbria	39	20	52%
South Tyneside	25	17	68%
Sunderland	30	19	64%
Queen Elizabeth, Gateshead	29	8*	28%
Durham, County Durham and Darlington	62	0	0
North Tees, North Tees and Hartlepool	46	19	42%
James Cook, Middlesbrough	67	43	65%
Online version		23	
Total	**424**	**175**	**41%**

* Accidently distributed the questionnaires to F1 doctors therefore only 8 completed by F2 doctors

6.3.3 Data analysis

The questionnaire had both quantitative data and qualitative data which needed separate methods of analysis.

6.3.3.1 Quantitative analysis

Analysis of quantitative data had two purposes: to establish the construct validity of the questionnaire and to explore relationships between variables. Firstly, descriptive statistics were used to summarise the demographic data and specialty career interests.

Secondly, to determine if any of the 62 items based on specialty features derived from the repertory grid study would predict a choice of paediatrics for a specialty career, binary logistic regression was applied to the individual questionnaire items. All statistical analysis was carried out using SPSS v24 (IBM Corp, 2016).

Binary logistic regression

Binary logistic regression is a modelling technique used when there are two possible outcome (response) variables: in this case the respondent choosing paediatrics or not choosing paediatrics. It allows for assignment of probability of an outcome based on the values of 'predictor' variables, i.e. how likely is a trainee to fall into either of the two outcome categories. There are few distributional assumptions made with this method; it is applicable with either continuous or discrete variables; it is easy to use- once parameters are estimated, allocation of a fresh individual or item to a population requires only the calculation of a linear combination of its observed explanatory variables.

Statistical procedure

As binary logistic regression has only 2 possible outcome variables, consideration of the third questionnaire 'undecided' option was needed. The outcome variable was coded such that those choosing paediatrics were coded as 1 and those not choosing paediatrics were coded as 0. Those who were undecided were coded as 0 (against paediatrics) to maximise data usage by inclusion of all respondents. The rationale for this is that those who were undecided had not made the choice to select paediatrics. Considering there was no limitation to select multiple specialties, it represents the real-life dichotomous decision of career choice: to apply or not apply.

Using SPSS v24 (IBM Corp, 2016), the worksheet was created using all questionnaire responses and categorical data coded numerically, for example gender was either documented '1' for male or '2' for female whereas age was documented as '1' for less than 24 years old, '2' for 25-27y ears old, '3' for 28-30 years old and '4' for over 30 years old. The regression model was then performed using all the questionnaire items as predictor variables against the dependent variable of selecting paediatrics. The method selected was the forward likelihood ratio which uses a stepwise method based on significance of score statistics (IBM Corp, 2016). The SPSS settings for regression were:

- Analyse; regression; binary logistic

- Dependent= recoded paediatrics (undecided coded as 0)
- Covariates= all questionnaire items (variables)
- Method= forward likelihood ratio
- Save predictor value probabilities

The output created by SPSS v24 (IBM Corp, 2016) resulted in graphical demonstration of which questionnaire item responses were associated with a choice of paediatrics as a career.

The original model was modified following consideration of multicollinearity (the cases where two or more predictor variables are closely related, which can distort the regression model), through examination of variance inflation factors (VIF) for each variable. Those with a VIF of > 5 were removed (Rogerson, 2001) and the model calculated again until there was no evidence of multicollinearity (Appendix E).

6.3.3.2 Qualitative data

There were small amounts of free text data in the first section of the questionnaire, where F2 doctors identified why they were not intending to take on specialty training posts following the completion of foundation training. A second free text responses at the end of the questionnaire whereby participants documented any other influences on their choice of specialty. Free text data was analysed using content analysis (Hsieh and Shannon, 2005).

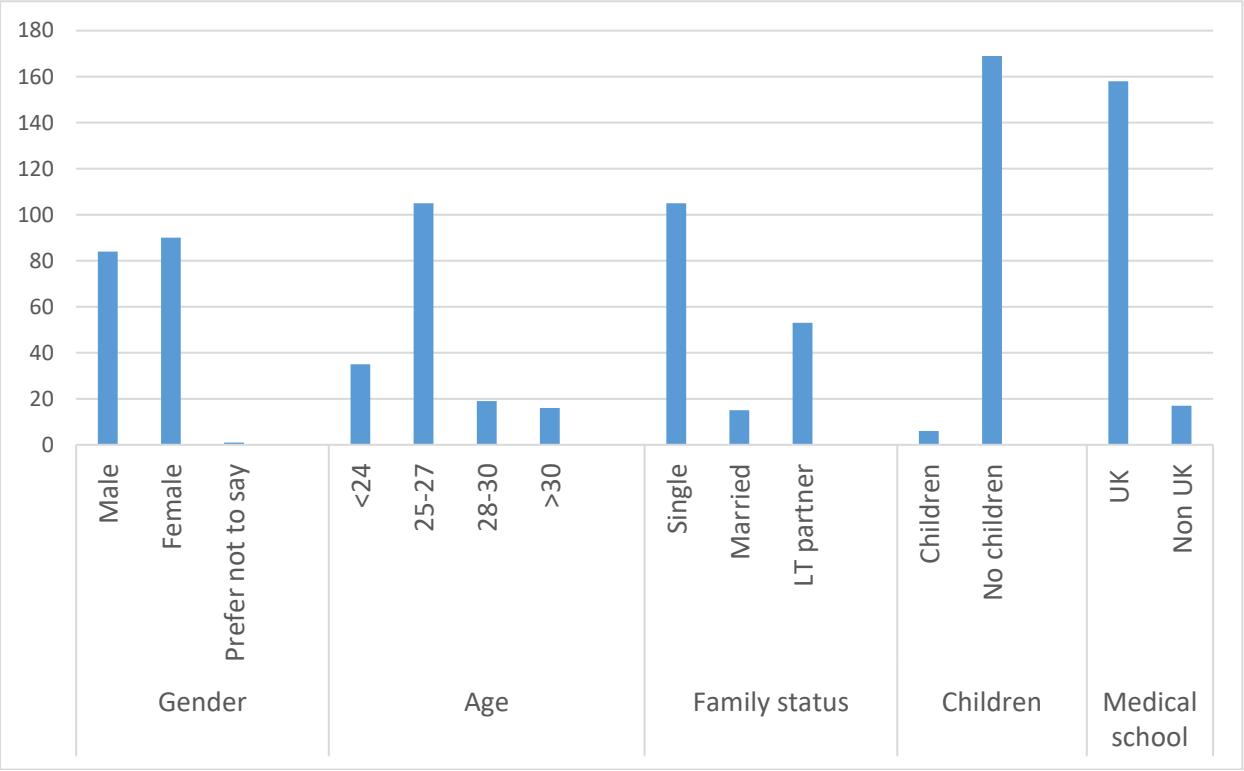
Content analysis using a closed coding schedule can be objective, comprehensive, and systematic to provide an overview of the data as a whole (Plowright, 2011; Silverman, 2011). This was achieved by combining free text responses to the 'alternatives to specialty training' question, documenting the frequency of each comment and then assigning descriptive codes demonstrating shared meaning. In cases where multiple alternatives to specialty training were documented, these were spilt into the individual activities. In some instances, no reason was given to why the participant had selected an alternative to specialty training. If there was information, this was reported individually and then assigned a code if similar responses had a shared meaning. The final

questionnaire item of additional influences was documented individually. Few had shared meaning to other responses and hence little grouping was possible.

6.4 Results

The sample contained slightly more female participants (51%), most were aged 25-27yr (60%), mostly single (60%) with no children (97%) and a small proportion who did not attend medical school in the UK (10%), (figure 14).

Figure 14: Demographics of paper questionnaire: gender, age, family status, children, and medical school



6.4.1 Specialty intentions

Only 47% (83) of respondents intended to apply to any type of specialty training in that academic year. It has been reported in previous years that around half of all F2 doctors plan to go straight into specialty training, but this has been in decline since 2012 (Rimmer, 2016; Rimmer 2017). When considering specialty posts, the overall response is shown in table 11.

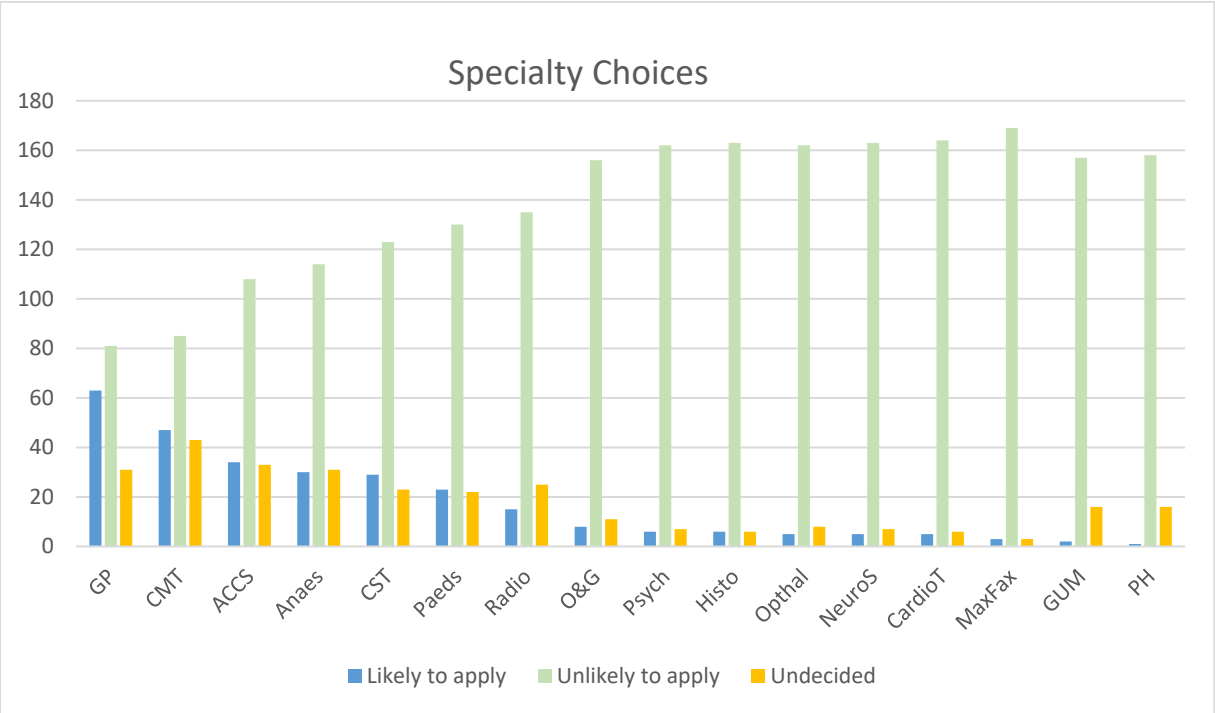
Table 11: Specialty choices of F2 doctors

	Definitely not applying to	Unlikely to apply to	Undecided about application	Likely to apply to	Definitely applying to
Core medical training	51	30	43	31	20
Core surgical training	107	16	23	12	17
Obstetrics and gynaecology	131	25	11	4	4
General practice	47	34	30	34	30
Paediatrics	99	31	22	17	6
ACCS Emergency medicine	67	41	33	23	11
Anaesthetics	79	35	31	18	12
Clinical radiology	104	31	25	10	5
Neurosurgery	145	18	7	4	0
Oral and maxillofacial surgery	153	16	3	2	1
Core psychiatry training	141	21	7	3	3
Public health	139	19	16	1	0
Community sexual and reproductive health	137	20	16	2	0
Histopathology	150	13	6	1	5
Ophthalmology	152	10	8	2	3
Cardiothoracic surgery	152	12	6	3	2

When considering specialty careers (Table 11 and figure 15), F2s were most likely (that is most frequently responded ‘definitely’ or ‘likely’) to apply for General practice (36%) followed by core medical training (27%), ACCS (emergency medicine training, 19%), core surgical training (17%), anaesthetics (17%) and then paediatrics (13%). The least popular choices (‘definitely not’ or ‘unlikely’ responses) were the surgical sub-specialties of maxillofacial (3%), cardiothoracic (6%), and neurosurgery (7%) followed by psychiatry, ophthalmology, and histopathology (all 7%). F2s were most undecided regarding applications to core medical training (25%), ACCS (19%), general practice (18%), anaesthetics (18%), and radiology (14%). In some cases, there were almost equal numbers of F2s

likely to apply for a specialty as undecided, for example core medical training, ACCS and anaesthetics. Many of the specialties which F2s were likely to apply to, also had higher numbers of F2s undecided about the application to that specialty.

Figure 15: Specialty choices of F2 doctors



Paediatrics was the 6th most popular specialty choice. Twenty-three F2s indicated they would select paediatrics as a specialty career, however only 7 of those were intending to apply for the current academic year (30%). Seventeen of those who would select paediatrics as a specialty career would also select another specialty – most frequently general practice, CMT, ACCS or anaesthetics. Of those seven F2s intending to apply to the upcoming academic year, only one stated that paediatrics was their sole specialty application.

Twenty-two F2s were undecided about applying to paediatrics, 18 of whom indicated that they liked another specialty. However, 9 of those undecided F2s (41%) were intending to apply to specialty training in an alternative specialty for the upcoming academic year.

6.4.2 Statistical analysis: factors which predict specialty choice (individual item predictors)

To explore relationships between variables, binary logistic regression was performed. This investigated if any questionnaire items could predict selection of paediatrics as a career choice. The main details of analysis are described here – additional tables and graphs as produced by SPSS are documented in appendix E for reference. The process of binary logistic regression using SPSS statistics adds the questionnaire items which have shown to demonstrate an association with selection of paediatrics until there is no longer a statistically significant result. Therefore, at step five of the model, results are significant (<0.05) for 5 questionnaire items.

Table 12 highlights variables (questionnaire items) which had the greatest association with choice of paediatrics as a career. In this, 'B' is the coefficient and indicates the change in odds of outcome (1 or 0) with a change in the value of each predictor (odds value); 'S.E' is the standard error; 'Wald' is the wald chi square test which is a statistical test to assess the contribution of individual predictors; 'df' is the degrees of freedom from the wald chi square test; 'Sig' is the p value (determines how significant the result is; a value less than 0.05 is deemed statistically significant); and 'Exp(B)' is the exponent of the B coefficient, which is an odds ratio (Laerd statistics, 2020; UCLA, 2020).

Table 12: SPSS statistics individual item predictors using binary logistic regression

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 5	Age of patient	-.833	.349	5.712	1	.017	.435
	Flexibility of training	-1.660	.518	10.256	1	.001	.190
	Individual clinical decision making	.697	.341	4.179	1	.041	2.009
	Sub-specialisation	.770	.291	6.991	1	.008	2.159
	Ward based	-.773	.281	7.543	1	.006	.462
	Constant	1.514	1.451	1.090	1	.297	4.547

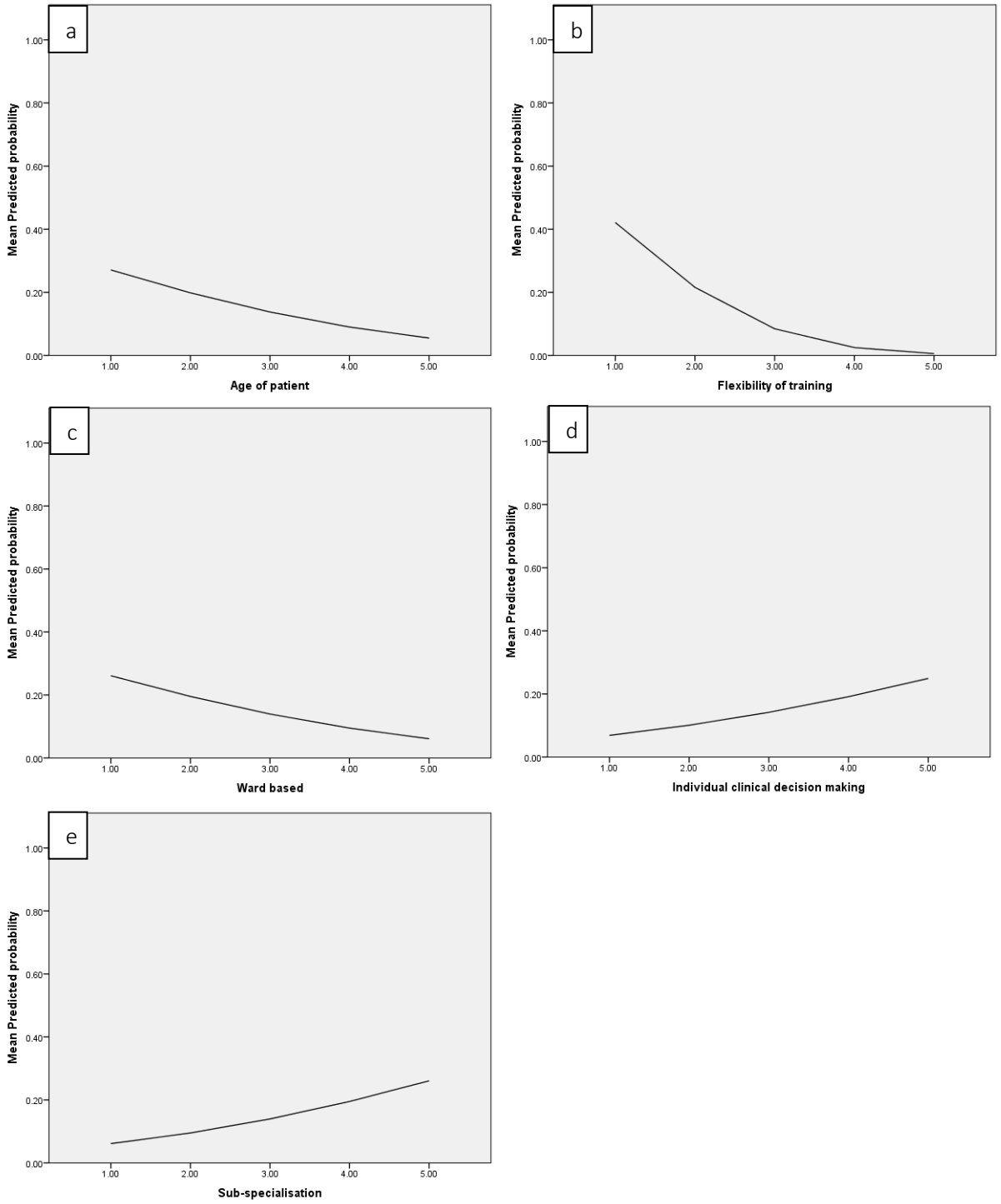
The questionnaire used a bipolar scale to determine influence, with positive or negative effects on specialty choice. Responses to the questionnaire indicating influencing factors had a positive effect on choice (i.e. attraction) were coded as lower values (1 or 2), and negative effects

(deterrent) as higher values (4 or 5). In this model, the odds values (B) were inversely proportional to the positive effect that the questionnaire item had, i.e. smaller the value the more positive the effect. Therefore, when the odds ratio (Exp (B)) was less than 1, those selecting paediatrics as a career were likely to describe the questionnaire item as an attractant. In contrast, when the odds ratio (Exp(B)) was greater than 1, those selecting paediatrics were more likely to describe the questionnaire item as a deterrent.

Figure 16 demonstrates the relationship between these five questionnaire items and selection of paediatrics as a career as visualisation of predicted probability. For example, the age of a patient was an attractant to paediatrics (Fig 16a), as a questionnaire response of a positive effect was associated with a high mean predicted probability. This was also true for flexibility of training (fig 16b) and ward based (fig 16c), as both features were attractants to paediatrics. It is notable that none of the respondents described flexibility of training as a deterrent irrespective of the specialty career chosen, but from this model it appears that flexibility of training is a greater attractant to those who are considering paediatrics as a career.

In contrast, figure 16 also demonstrates that those who selected paediatrics as a career were likely to identify the questionnaire items of 'individual clinical decision making' (fig16d) and 'subspecialisation' (fig16e) as a deterrent. None of the questionnaire respondents identified individual clinical decision making as strong deterrent irrespective of specialty chosen.

Figure 16: Questionnaire items demonstrating prediction for selecting paediatrics as a career: a) age of patient, b) flexibility of training, c) ward based, d) individual clinical decision making, e) subspecialisation



These plots show the idealised model with control for each other variable to create a linear relationship. The steeper the line the bigger the impact of changing the questionnaire response (1=strong positive, 2=slight positive, 3= neutral, 4= sight negative, 5= strong negative impact). These plots demonstrate that when the mean predicted probability was high (y axis), it was more likely an individual was to select paediatrics.

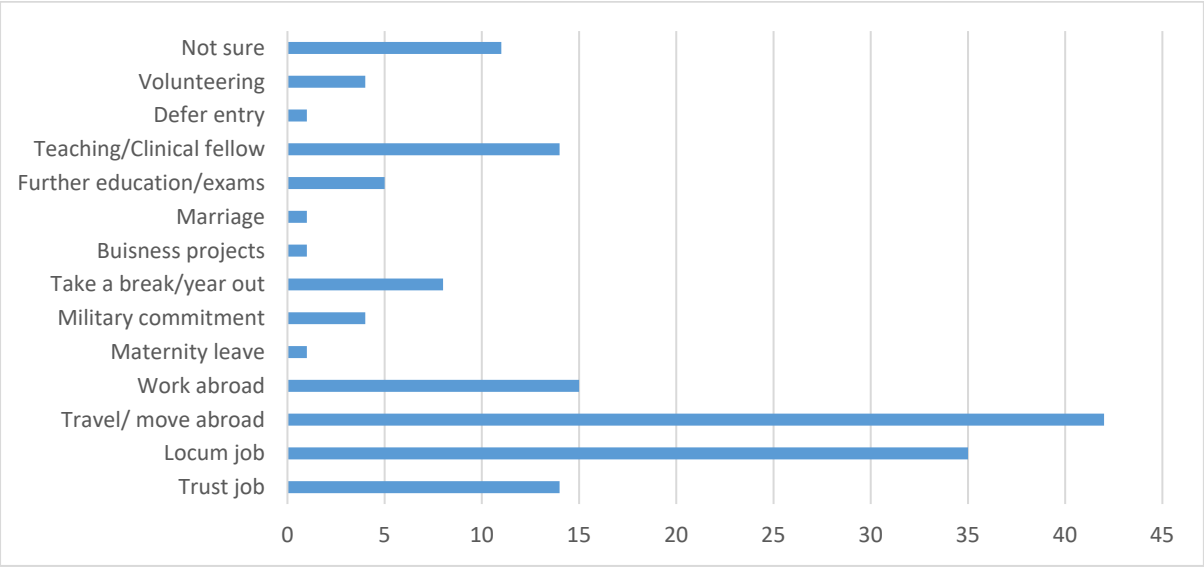
Overall, the quantitative data describes that paediatrics is a specialty which is considered by some foundation doctors for a career, however they often defer application to specialty training or would also apply to another specialty training scheme at the same time. There were five questionnaire items which demonstrated patient factors, environment factors, training factors and clinical skills that were associated with selection of paediatrics.

6.4.3 Qualitative data: alternatives to specialty application and additional influences on specialty selection

The F2 questionnaire also had two areas to record free text comments. The first asked F2 doctors who are not applying for specialty training what they intend to do instead, and why. The second asked about any other influences on specialty career selection that had not been included already.

A total of 93 comments were recorded regarding alternative plans to specialty training, including one person who intended to defer their entry to the training programme. Most frequently responses included multiple options for activities other than specialty training. The most frequently recorded alternative to specialty application was to travel or move abroad (41 instances). This was followed by obtaining a locum job (35 cases) and working abroad (15 cases) as shown in figure 17.

Figure 17: Recorded free text answers of alternative plans when F2 doctors do not intend to apply for specialty training



Comments below show examples of how the F2 doctors have multiple, but often unspecified, plans instead of application to training.

"Locum and hoping to move abroad for 1-2years"- James Cook F2

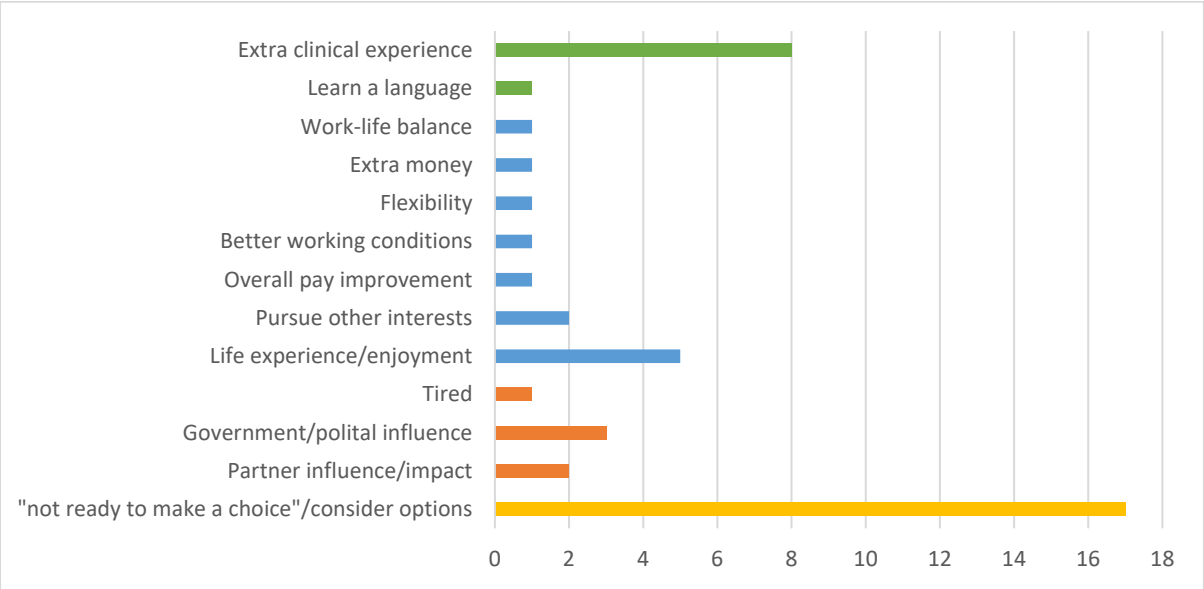
"Locum and business projects other than clinical medicine; getting married"- James Cook F2

"Unsure what to do, ?teaching fellow role/ travelling"- Cumbria F2

"Locum and travelling and volunteer/work in lower income setting." – QE F2

The most frequent reason for not applying was that the F2 was "not ready to make a choice" or considering their options (17 instances). This was followed by wanting to gain extra clinical experience (8 cases) or to increase life experience/enjoyment (5 cases) as shown in figure 18. These responses can be grouped into four categories: not informed enough to make a choice; outside influences; self-improvement; and that there are better options compared to specialty training. Using these 4 categories, it may be possible to consider strategies to improve applications to specialty training, which is discussed in chapter 6.5.

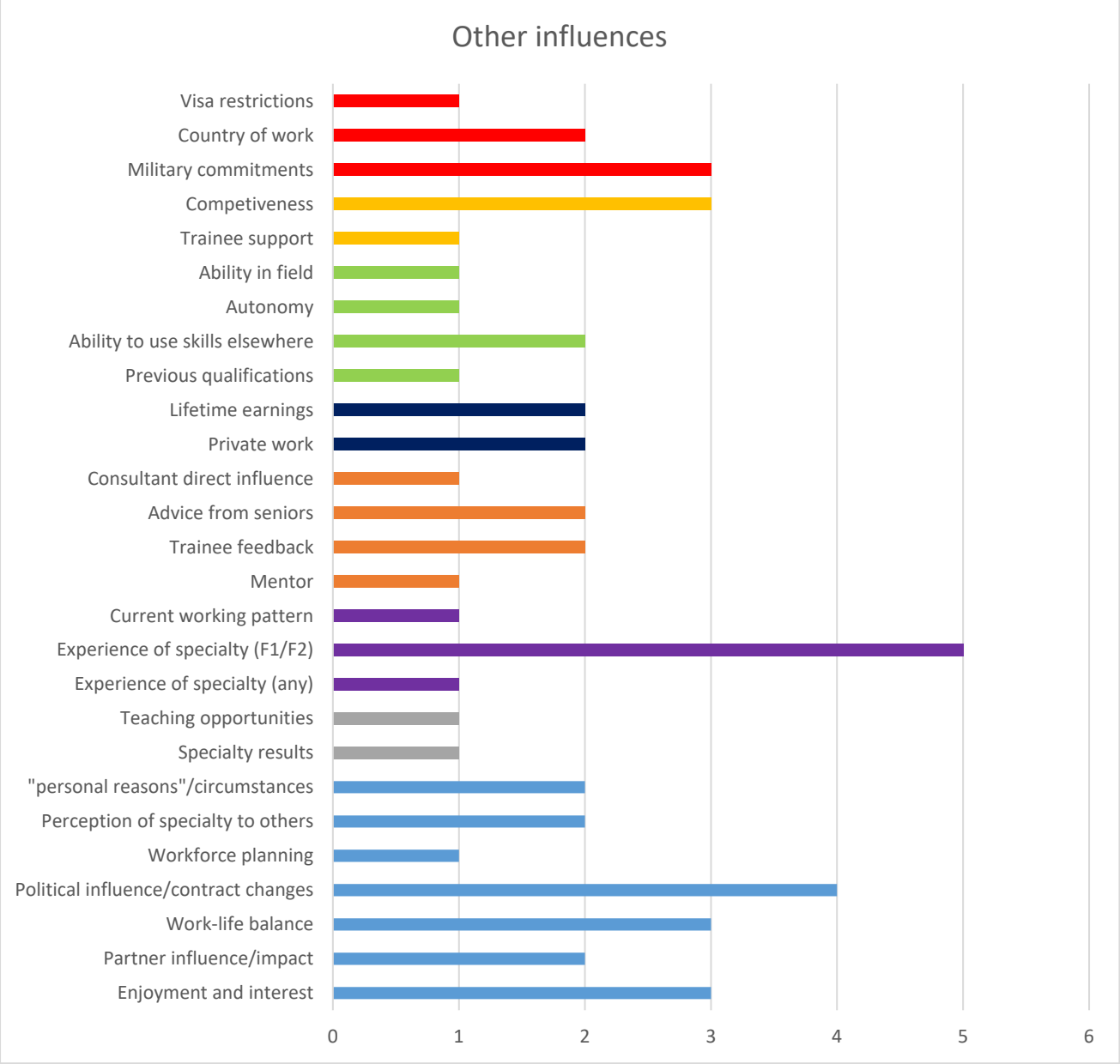
Figure 18: Recorded free text answers of reasons behind alternative plans to specialty training



Free text answers grouping self-improvement (green), better alternatives (blue), outside influences (orange) and not informed enough to make a choice (yellow).

Finally, a total of 37 participants recorded influences which they felt had not been addressed in the earlier part of the questionnaire. Within this section, there were a total of 27 areas identified from the responses as shown in figure 19; however, 5 of these areas were contained within the previous questionnaire items. These were work life balance, personal circumstances, competition, country of work, and perception of specialty by others. Overall, the free text responses can be re-grouped into categories: other commitments/implications, impact of seniors, external influences, nuances of specialty, own skills, previous experiences, financial reasons, support and competition.

Figure 19: Themes identified from free text response to other influences on specialty choice



Categories of other influences from free text responses: other commitments/implications (red), support and competition (yellow), own skills (green), financial reasons (navy blue), impact of seniors (orange), previous experience (purple), nuances of specialty (grey), and external influences (blue).

Some comments directly related to reasons for not applying to specialty training posts e.g.

"Defence deanery specify which specialty"- James Cook F2

This example demonstrated that certain F2 doctors had additional working commitments which are not addresses by the standard process of specialty training application.

In addition, some comments show the importance of the current political climate and its influence on the structure of the NHS, including the changes to junior doctor contracts, which had not been previously addressed in the influencing aspects portion of the questionnaire:

"uncertainty re future direction of NHS and contracts therefore not prepared to sign up to a 5-7yr training post at this point"- Sunderland F2

6.5 Summary of chapter

The questionnaire provided information on the demographics of F2 doctors within Health Education North East and North Cumbria. The questionnaire data was mostly representative of the UK F2 cohort, although there were significantly fewer non-UK graduates (10%) in comparison to the national average, where 26% of F2 doctors went to medical school outside the UK (Baker, 2017).

6.5.1 Choosing specialty training

Less than half of F2 doctors intended to go straight into specialty training posts, echoing published literature (Rimmer, 2016; Rimmer, 2017). The F2 doctors who planned to defer training attributed this to wanting to either work in trust/locum posts, travel or move abroad. There is a risk associated with those who move abroad, that they may never return to work in the UK and therefore could be considered as lost from the NHS workforce system (Jaques, 2012; Wild, 2012). Considering the cost of training a doctor to both the individual, and to the state, this can only be detrimental (Wild, 2012).

The F2s documented that the main reason for not wanting to apply to specialty training was because they did not feel that they were informed enough to make a selection. As described earlier, within the literature it was often stated that within the first four-month rotation of F2 was too early to make a decision that would then impact for the rest of their working life (Jaques, 2012).

The questionnaire data records which specialty the F2s would plan to enter as a specialty career, either straight after the foundation programme, or in the future for those who intend to defer training. The most popular specialty choices were general practice and core medical training programmes. This is reassuring when considering the national demands for general practitioners (RCGP, 2017). The least popular specialty choices were the surgical subspecialties: maxillofacial, cardiothoracic and neurosurgery.

Paediatrics was the 6th most popular choice, and this differs from much of the literature published, however there are differences based on country of origin with non-UK paediatrics being more popular (Compton et al, 2008; Goodyear, 2009; Bindal et al, 2010; Chew et al, 2011). It is notable that an equal number of respondents were intending to apply to paediatrics to those who were undecided about paediatrics as a specialty career. However, most of those who stated they were interested in applying to paediatrics were not intending to apply for the upcoming academic year and most were equally, or more, interested in another specialty.

6.5.2 Influences on choice of paediatrics as a specialty

Statistical analysis identified 5 items from the questionnaire associated with the choice of paediatrics. Those who responded that flexibility of training, being ward based, or age of patient had a positive influence on their specialty selection were more likely to be interested in a paediatrics career. In addition, those who recorded that sub-specialisation and individual decision making had a negative influence when considering specialty careers were more likely to select paediatrics. The results highlighted substantial complexity of influences on specialty career choice. Furthermore, there was a lack of detail when considering the free text responses and therefore it was important to follow up with interviews to gain further information which is addressed in the next chapters.

It is unmistakable that age of patients is influential on those selecting paediatrics. Paediatric patients include those from birth to 16yr (or in some places 18yr) only, and both the anatomy and physiology of children is different to that of adults (Foster and Cabral, 2006). Paediatrics is the only

specialty where patients are restricted by age. For example, anaesthetists are likely to provide care mostly for adults, but may become involved in intubation of children in an emergency; A&E doctors frequently need to assess paediatric patients in terms of injuries. However, it is expected that paediatricians have skills that are specific to the ages of their patients; these may be practical, communication or management skills (Dube et al, 2003; Foster and Cabral, 2006; Lammers et al, 2009; Khoo and Kutzsche, 2018).

In addition, the repertory grid interviews demonstrated that paediatrics frequently uses a multi-disciplinary approach to patient management and therefore often is considered highly as a 'team-working' environment (Patterson et al, 2012; Barbosa, 2013).

The literature states that paediatrics is perceived to be a specialty that is flexible (Bindal et al, 2011). However, this contrasts with the data provided by the paediatric specialty trainees, who felt overall it was inflexible. It is interesting that the questionnaire has identified that ward-based work is associated with paediatrics along with a dislike of subspecialisation. This implies that F2 doctors are not aware of the clinical opportunities available in paediatric careers. Currently the RCPCH offers subspecialisation for paediatricians into 17 specialties, including paediatric community child health; paediatric respiratory medicine; paediatric oncology; and paediatric inherited metabolic medicine (RCPCH, 2019b). Frequently these roles are based in tertiary paediatric departments, of which there are 45 in the UK (RCPCH, 2011). In addition, those working in the community subspecialisation have little to no ward-based work.

In summary, the questionnaire data provided some insight into influencing factors when selecting a specialty career, how many F2 doctors were likely to pursue specialty training and what alternative options were considered by the F2s at the point of application. It highlighted the need for further investigation through interviews with F2 doctors to develop understanding.

7. Foundation doctor interviews – Spring 2017

What factors influence the career decisions of F2 doctors at the point of application and how?

Chapter 7 documents the interviews undertaken with foundation year 2 doctors, detailing the process of recruitment, participants, data collection and data analysis. This chapter deepens understanding of research question two "What are the intended career choices of foundation year 2 (F2) doctors?" and answers research question three "What factors influence the career decisions of F2 doctors at the point of application and how?".

While the questionnaire identified the importance of patient features, training structure, location of work and clinical skills when selecting paediatrics for a career; it did not provide understanding was achieved of *how* these features became influential or how they interacted in the process of selecting a specialty. To explore this, semi-structured interviews (Trumbull, 2005) were used to gain more detailed information regarding influencing factors and perceptions of the intended career specialty of F2s.

7.1 Participants

Interview participants were sampled from 62 volunteers who had provided an email address at the end of the questionnaire. Invited participants were purposefully sampled to ensure a range of

paediatric career preferences (keen, not keen, or undecided about a career in paediatrics) were all included (Tongco, 2007). This was necessary to consider the viewpoints of members of each of these categories. Alternative purposeful sampling could have been performed based on any of the demographic data, however this was not the focus of the interviews. There is therefore a risk that the views of certain groups were not included, particularly those of differing race/ethnicity, hence these findings may be considered in relation to this region only. By inviting all who provided email contact based only on career ambition these features were not anticipated. As discussed in chapter 9 as a limitation, it would be beneficial to carry out this study again in another UK region to determine any additional impact of these features. Participants could choose a face-to-face or a telephone interview, which was especially useful to gain the views from F2s who were working at the remote trust sites. 16 F2 doctors arranged interviews, although two did not attend and did not respond to follow up contact to rearrange.

Details of the 14 participants are summarised, with pseudonyms, in Table 13. There were equal numbers of male and female participants, undertaking their Foundation training throughout the region. Most of the participants indicated on the questionnaire that they did not intend to specialty training to start in 2017. Just two had indicated on the questionnaire that they were planning on applying to paediatrics, and two were undecided.

Table 13: F2 Interview participants and their demographics

Fictitious name	Applying to specialty training post for 2017	Interested in paediatrics	Current foundation training hospital trust	Telephone or face to face interview	Length of interview
Amy	Yes	No	South Tees	Telephone	13min
Brenda	Yes	No	Northumbria	Telephone	11min
Chris	No	Yes	Newcastle	Face to face	33min
David	No	Undecided	Durham-Darlington	Telephone	29min
Evan	No	No	Durham-Darlington	Telephone	30min
Frank	No	Undecided	Sunderland	Telephone	32min
Gemma	Yes	No	South Tees	Telephone	38min
Harry	No	No	South Tees	Face to face	42min
Izzy	No	Yes	Newcastle	Face to face	41min
John	No	No	Cumbria	Telephone	30min
Kate	No*	No	Newcastle	Face to face	26min
Liam	No	No	South Tees	Telephone	44min
Marnie	Yes	No	Cumbria	Telephone	32min
Nina	No	Undecided	Newcastle	Face to face	24min

*Questionnaire response indicated not applying to a specialty training post for 2017 but at the time of the interview had made an application for specialty training

Interviews took place in February and March 2017. The first two were brief at 11min and 13min respectively, they followed the interview schedule relatively strictly, and hence were considered as pilot interviews. Following these, review with the supervising team allowed for further training in interview technique. Subsequent interviews lasted between 24min and 44min, which encouraged more depth of discussion, and expanded on the interview schedule by responsive questioning style. Interviews were recorded using downloadable apps from the Google Play store and recorded by the researcher's smartphone.

7.2 Interview schedule

Preparation for each interview involved the development of the interview schedule. This was customised for each participant, drawing on their individual responses to the questionnaire, focusing

on whether or not they were applying to specialty training for August/September 2017 and their consideration of paediatrics as a career choice.

Example interview schedules can be reviewed in appendix F. For those intending to apply to a specialty, the initial questions focused on why and how they were interested in that specialty as a career; and whether this had always been the intention. For those not applying, they were still asked what specialties they would consider in the future and how they developed their ideas about the specialty. Those not applying to a specialty were asked what benefits they anticipated from not applying, what influenced their decision, and if they had always planned to take time out of training. All participants were asked about their opinions on paediatrics, regardless of whether they were considering it. All were asked how they would describe a paediatrician and what exposure to paediatrics they had. Those who had indicated that they were either not applying or undecided about applying to paediatrics, the questions focused on what they thought about it as a career, why they did not think it was a career for them, what would need to change or if they could identify downsides to a paediatrics career.

7.3 Data analysis

Thematic analysis is a process widely used in psychology and health sciences. This analysis method allows for rich interpretation of qualitative data, although due to different approaches there is an inherent risk of over-interpretation and hence input from supervisors was useful (Braun and Clarke, 2006). The process used for this project was an inductive approach that started with data familiarisation, free coding, coding refinement, theme development and then revision (Braun and Clarke, 2006).

Data familiarisation was achieved by having the same researcher conducting the interviews. The researcher also transcribed 8 interviews, to immerse themselves in the data (Braun and Clarke, 2006), but due to time constraints had to seek additional support with the remaining 6 interviews. For those not transcribed by the researcher, transcripts were reviewed for accuracy against recordings.

Following transcription, 2 interviews were picked at random for free coding. Free coding is the development of succinct labels which describe an area of the data. The process was inductive, whereby the content of the data determined the free coding labels (Braun and Clarke, 2006). Once completed these descriptive labels were grouped together to form codes, the label which attempts to identify important features of the data which may assist with answering the research questions (Braun and Clarke, 2006). The supervising team reviewed the codes, with their definitions, to ensure clarity, accuracy and then this allowed for the rest of the transcripts to be coded.

Once all the transcripts were coded, individual quotes were sorted under each code allowing for ease of theme development. Using each individual code, the data was examined to identify patterns of meaning, which in turn were described as the initial themes (Braun and Clarke, 2006). Initial themes were reviewed with the supervising team for viability (Braun and Clarke, 2006). This was done through creation of small descriptive summaries for each code, developing the patterns of meaning, refinement, and re-examination of the data.

Following on from the identification of these initial themes, further literature was reviewed to add clarity and build on interpretation. Repeated review and refinement cycles were conducted, with support from supervisors, to ensure transparency and depth. This allowed for a model of understanding, which in turn enabled documentation of data interpretation through diagrammatic examples. Again, review and refinement were conducted, comparison of themes to the dataset to ensure the 'story' of the data was expressed and then each theme was defined (Braun and Clarke, 2006).

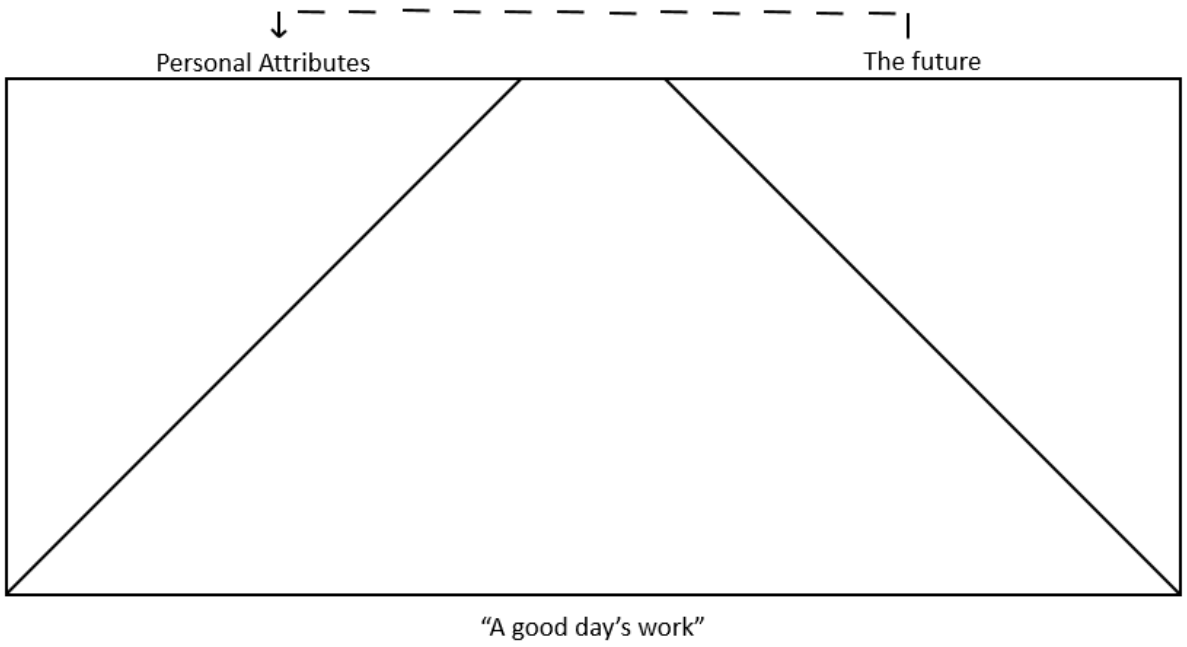
7.4 Results

The F2 interviews provided a lot of data which clarified how the F2 doctors had made career decisions. This chapter initially discusses where, how, and when participants are exposed to influences on their career choices, which impacts the F2 at every stage of their decision-making

progress. The chapter then moves on to describe what the different influences are when making a specialty career choice.

The influences fall into three areas (figure 20). Firstly, the personal attributes of the junior doctors are considered. This ultimately leads to a development of awareness of choices. Secondly, the influences which would identify a preferred specialty as a career, summarised as 'a good day's work'. The final theme of 'the future' is presented in chapter 8. This illustrates a longer-term view by respondents, whereby perceived future events which may be affected by career decisions, and therefore is a different perspective on specialty career influence. Finally, there is a feedback process from these future influences on to the personal attributes which is discussed further in chapter 8.

Figure 20: Diagram of influences on career decisions of F2 doctors

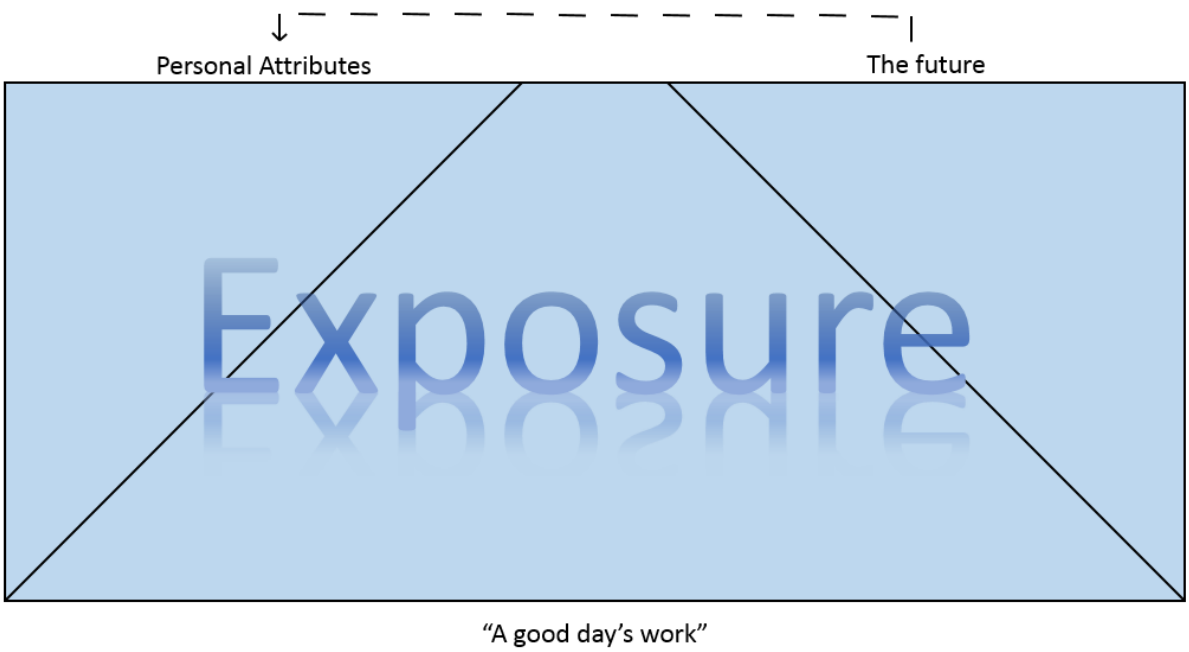


7.4.1 Exposure

The first area to consider was where, how, and when the junior doctors obtain their information about what specialty careers involve. The understanding of medical careers was directly influenced by what each individual has been exposed to, and this shaped how they develop their

opinions on which specialty may be right for their career. It is in the background of every active and subconscious decision made (Figure 21).

Figure 21: Diagram of how junior doctors are influenced in their specialty career choices- theme of exposure underlying all further influencing factors



The interviews found that exposure to specialties started with experiences before medical school, before developing during medical school and into foundation training. This exposure was evaluated as positive or negative with opinions forming about specialty options. These opinions are developed through organisational, structural, and clinical influences and leads to development of familiarity of different specialties. In addition, there was a significant influence of accessibility to specialties which was described by F2 doctors.

7.4.1.1 Experiences before medical school

To obtain a place at medical school, prospective students must have work experience within the medical field. Work experience develops understanding of a medical career but also the work

environment and the roles an individual has within that career. Price (2008) detailed that greater understanding of nursing careers prior to application to nursing courses was associated with greater job satisfaction once qualified. For some of the F2s the motivation to obtain these experiences was access to medical school overall, with little consideration to specialisation.

"I've always wanted to be a doctor since I was very little,"- Harry

Others felt that medicine offered a way to achieve other interests within a career such as team-based working and an interest in the science behind medicine.

"I went to do a biology degree… to have a good time, but as I got a bit older I kind of realised what kind of things draw me in, and it was, like I say I like working with people"- Frank

These early experiences shaped the perception of medicine as a career for the F2 doctors, with some of the F2s reporting interest in specialties based on their work experience prior to university.

"I did most of my work experience in paediatrics, it was a specialty that I was looking towards"- David

However, this was frequently based on opportunity and who the student knows, typically friends or family.

"My friend's dad worked on a paeds research project and I did like a week [work experience] with him" - Izzy

7.4.1.2 Factors shaping experience during medical school

A larger influence came during medical school. The F2 doctors were able to describe their experiences of specialties during medical school as having an emotive influence, either positive or

negative, when considering career choices. The F2s reported that small positive experiences could have large influences on specialty choice. Some F2s described their student placements as helping to rule out specialties for future careers. They described that experiences needed to make an impact, and those which did not achieve this would be excluded as a career. Rarely specialties were perceived as uninteresting due to the clinical content. Overall F2s identified that as a medical student, they were impressionable from various sources and were seeking out understanding of specialties.

"People want to look for positives… they're looking for reasons to do something" –Harry

Overall, during medical school there are two key aspects to consider. The medical school curriculum, which could be explicit such as time spent on a subject which was perceived as proportional to its value, or implicit such as the location of placements. The second aspect considered was the role of clinical learning environments which included factors such as patient exposure, as well as involvement and interaction with specialty teams.

Medical school curriculum

There were some influencing factors on specialty selection based on experience of the medical school curriculum. This included the engagement with specialties, whether through placements or exams, as well as the clinical environment itself. Many of the F2s reported that 'genuine' experiences were difficult to achieve as medical students.

F2s acknowledged that many student placements were not representative of the specialty as a career, with some showing only the 'best side' instead of the reality. The F2s identified that this may have been enough of a starting point to generate an interest in a career specialty. Some F2s felt that students were protected from the harsh realities of the specialty and did not acknowledge that these events were rarities. Instead, they wanted to see everything possible, a true 'warts and all' experience.

"I've not really seen any, to be fair I've not really seen any deaths or many sick children as a med student"- Evan

The F2s recalled that the artificial nature of placements was exacerbated by the length of time allocated in the clinical environment as part of the medical school curriculum. This was compounded by how they were allocated placements, knowing that the medical school curriculum is large resulting in subspecialties getting minimal time or no time at all for the students to experience the clinical environment. This subsequently resulted in discarding specialties which they felt they had no significant knowledge of for careers.

"[Paediatrics] is probably underrepresented in the curriculum. I don't think there is enough time to fit that kind of stuff in"- Harry

F2s identified that student exams created a contrived learning environment, believing this impacted on their understanding of some specialties. Some reported only interacting with a specialty enough to pass their assessment and not looking deeper into what else was involved in that specialty.

"I think you're only going to ever get really tested on quite basic paediatric stuff in an OSCE or MOSLER situation that I think you only really look at the real basics of it" – Harry

In contrast, SSCs (student-selected components) and extracurricular activities that allow students to develop interests within a specialty helped to remove the pressure of exams, improve feelings of inclusion, and ultimately encouraged F2s to consider that specialty for a future career. Many SSCs were selected based on previously identified interest in a specialty, and hence includes influences of involvement, exposure, interaction with clinical teams and availability which are described throughout this chapter. The F2s spoke about how they were able to focus their own learning experiences better through SSCs and therefore consider the specialty as more flexible to their interests. Some of the F2s spoke about setting up university societies which were associated

with a particular specialty or those who identified that enjoying an SSC led to their interest in gaining further experience within that environment.

> *"I really enjoyed my A&E SSC at north Tyneside and I think that's what put me onto the idea of doing A&E and definitely made me want to have a job in that" – David*

However, others identified that the SSCs could be allocated on a 'what's left' availability and that might have resulted in the student being allocated a placement which was not what they wanted to do.

> *"I did want to do neonatal SSC but was not able to do it…just the way the rankings worked out"- Liam*

Clinical learning environments

Clinical learning environments are some of the key areas where medical students develop their understanding of working as doctors, specialty nuances and resulted in an appreciation for one specialty career over another. These learning environments combined elements of organisational, clinical, and interpersonal factors which affected choice, but were all rooted within the workplace.

Clinical involvement and specialty interest

Some F2s acknowledged they were already interested in specialties following their non-clinical years of medical school and this increased their enthusiasm to do their student clinical placements. The F2s acknowledged that most enjoyment stemmed from being interested in a subject overall, but this could be influenced by other areas of their student experience. In particular, being able to contribute to clinical activities as a student was seen as positive and resulted in F2s evaluating those specialties as better.

"When I was at University, I thought I would want to do Obs and Gynae [for a career] as I had a good block at university in it… spent a lot of time showing me different procedures so that I could get involved"- John

Alternatively, some specialties were identified as not able to include students in clinical activities. Despite features which were typically considered as memorable, often due to the severity of patient illness or complexity of intervention, when students believed they were unable to engage or contribute, they developed less positive views about those specialties.

"[General surgery placement] was a lot of standing as a student, lots of standing around, not doing a lot, watching things happen in front of you, not really knowing what's going on. It was just really dull." - John

Patient exposure

Participants described their exposure to patients within different specialties as an important feature. They reported a need to see a wide variety of patients, including those who were acutely unwell, to develop an understanding of a specialty. Having greater patient contact was associated with shaping a preference for that specialty. Some described that this exposure was a direct consequence of organisational features of the medical schools attended. Students were placed in different hospitals for placements, some in small local hospitals and others in tertiary centres which impacted on the patient population students were exposed to.

"I was one of the few students who were not at the big tertiary centre in Glasgow, and they got a lot of exposure to things"- John

Some of the F2s identified that there was a lack of patients in non-tertiary hospitals. Those who had placements in smaller hospitals described a feeling of either missing out, or that they did not have enough experience of a specialty to consider it as a career.

"My medical student experience was not the best, just by chance, in third year, as I was in South Tyneside for it, which was small paeds centre, not that busy, I did not see many kids"- Liam

At different times of year, the opportunities for patient exposure were different. Often winter rotations were busier with patient numbers, giving greater chance of patient exposure, but other considerations, such as exam pressure over summer placements driving a need to seek out patients to assist with revision, were considered.

"when I was doing my surgical part of final year…it was like the four weeks before exams, so whether that's given me a kind of, made me think that surgery is busier than it is, or was I not particularly concentrating on it at the time" – Harry

Interaction with clinical teams

The F2s indicated that observation of seniors, feedback given to them as a student and interaction with the medical teams while they were students were all influential. Observation of the senior staff involved in their student placements provided role modelling, guidance, and encouragement into a specialty.

There were positive and negative influences. The F2s commented that additional inspirational role models were often those consultants or senior registrars who were able to further their specialty, usually by discovering new methods or treatments, but also by tackling difficult cases.

"After my SSC I felt that I would like to do a job like he's got in future… they discuss patients who have either, been brought up to a transplant or a complicated case and you have lots of different, like intelligent people discussing something" – Chris

In contrast, some of the F2s described that they felt 'in the way' or an added distraction to the clinical staff as a student. Frequently this related to specialties that the F2s considered 'acute' (such as surgery or in the resus department of A&E), but occasionally this was a feature of all hospital-based placements. This resulted in the student not considering that specialty, or that environment, for a career.

"as a medical student it's quite difficult to get an idea of the acute stuff, it is quite daunting as feel like you might get in the way"- Liam

Overall, the F2s reported that medical students have fleeting experiences of specialties which prevented their integration into the specialty team or working environment.

"when you see hospital patients through medical school you are often only spending like a day or two in each department and you always felt like a bit of an outsider, a spare part"- Marnie

7.4.1.3 Foundation programme exposure

Following on from factors identified in medical school, there were two main areas of exposure to specialties that were influential to F2s during their foundation training when considering specialty careers. These were the familiarity of specialties and the accessibility of specialties during foundation training. Again, these echo similar influences of curricula and exploration of interests as experienced by students.

Familiarity

When considering the exposure to specialties, the F2 doctors were concerned with the familiarity they had with specialties which they considered for a career and was often a consequence of a positive experience. They acknowledged if something was interesting, they were more likely to undertake further investigation into the specialty and that it was easier to learn when a specialty was enjoyed.

The F2s described that the best experience of a specialty, available to them so far, was to have a foundation training rotation in a specialty so that they could make a more informed choice to whether or not to pursue that specialty for a career. Commenting that the length of time involved was representative of how familiar they become with a specialty, F2s reported that a 4-month foundation programme training was more influential than short medical school placements. This was felt to allow for some development of familiarity, whether that was with the working environment, or the specialty itself.

> *"I think that's the main important factor to trial a career, to immerse yourself in the specialty and get the most experience of it as you can and speak with the doctors who are doing it" – David*

Some of the doctors identified that working in a specialty increased the depth of knowledge of the specialty and therefore it was more likely to represent the specialty as a potential career compared to student experiences.

> *"I got a lot of exposure to that sort of thing first-hand that you feel that you are doing a lot so it made you more inclined to enjoy the specialty I think, and you will be able to see what it's like as a career in the long term" –John*

Some F2s felt that 4-month rotations were still short experiences, not long enough to truly get an appreciation of a specialty. In particular, they reported that they spent most of the rotation

getting used to the practical differences, the 'settling in' period, which were a distraction from understanding about the specialty as a career.

> *"A 4-month placement is not actually that long erm when you're doing it, to get to grips with it, to feel like you're part of a team and to not feel like you're shifted around all the time, 4months isn't that long" – Frank*

Accessibility

Competition was inherent in specialty selection, and it could limit access to specialties. As identified earlier, direct experiences of specialties were the most influential aspect to selecting a specialty career, and therefore not having access to a specialty may have deterred foundation doctors from making a specialty career choice.

Competition started early in the working career, as there were not equal numbers of foundation rotations in each specialty to the number of potentially interested persons. Therefore, it might have been considered necessary to work at sites that were less preferred, or to compromise with other rotation choices. Some of the F2s reported that this was an important consideration when picking Foundation Training jobs and that there was a sense of needing to deserve access to the most popular rotations.

> *"I think that the paeds jobs especially at the RVI are very sought after… probably not as many jobs as there are people who would like to do paeds, or people who like it but maybe aren't sure. I think it ends up being a few people like me who are willing to compromise on a job that they really don't want to do, just so that they could get paeds because they were really keen. Whereas I think the ones who aren't as sure, maybe let it slip because they didn't want to do other jobs" – Izzy*

This competition resulted in many F2s not being able to obtain a rotation in a specialty that they may have been interested in as a career, and a compromise accessed by some was a 'taster week' experience.

"Try and get some sort of exposure, either by picking it as one of your foundation jobs or doing a taster week"- Frank

This would have ideally involved working as a foundation doctor in a specialty department which they did not have in their foundation training rotations for one week, which allowed them to gain greater understanding of the role, workload, and clinical activities.

"I've found out a bit more about anaesthetics because of [a] taster week"- Nina

A number of the F2s identified that taster experiences during foundation training were helpful when they considered their specialty career options. However, others described that the opportunity to have a taster week was itself minimal, requiring not only co-ordination of their own rostered working pattern but also the department staffing numbers where they wanted a taster experience. Furthermore, some F2s did not pursue obtaining taster week experiences as they believed it would not add much to their previous student experiences of a specialty, as the F2s felt that they would not have a realistic role in the department while on a taster week.

"you can't throw someone into making decisions when they have not got clinical experience"- Liam

Lack of experience in specialties

Overall, it was apparent that the F2s felt that they were able to apply to specialties when they knew 'enough' about them. Many reported that that they had good experience of adult medicine and

surgery careers, although not necessarily about the sub-specialties such as immunology, haematology, ENT or cardiothoracic surgery.

The F2s discussed their exposure, or lack of, to different specialties influenced their career choices. Many of the F2s acknowledged that there was not the ability to experience all specialties, but if they were undecided about a few, the timing of their rotations lead to a decision on whether or not to take time out of training as they wanted to experience the job before applying to specialty.

> *"Also, I didn't want to apply without having done GP. GP is my last rotation this year, erm, and GP is one of the things I was potentially considering, and I didn't want to apply for it without having done it, but I would have had to obviously if I was applying for this year" – Frank*

Some of the F2s identified that paediatrics was a possible career choice, but if they had not held a rotation in the specialty, it was relatively hidden from their experiences, and they could not identify the positive features of the specialty as a career. When asked specifically about their familiarity with paediatrics, some F2s reported that it was very different from other specialties. They commented that this meant they were less comfortable with the procedures or assessment of patients, resulting in additional referrals to senior team members, which did not help their understanding. This resulted in a lack of confidence about their skills in paediatrics and feeling that they would have less responsibility in the specialty.

> *"You can say that about everything, but in paeds, it is a little bit of an enigma. Surgery, you know general surgery, I found that I could do a bit of it without calling the surgical registrar to get admitted… but then paeds was pretty much they're fine or they've got to go upstairs to see the paediatricians"- Harry*

As identified earlier, F2s felt they were protected from seeing unwell patients. In particular, they felt that sick paediatric patients were actively avoided due to the emotional burden and hence paediatrics was not considered for a career to these F2s.

"Watching a child deteriorate will be very difficult"- Marnie

Some of the F2s were aware that most paediatric care was segregated from the rest of the hospital. Following this, some F2s believed they had missed out on skill development and knowledge of differences to adult patient care.

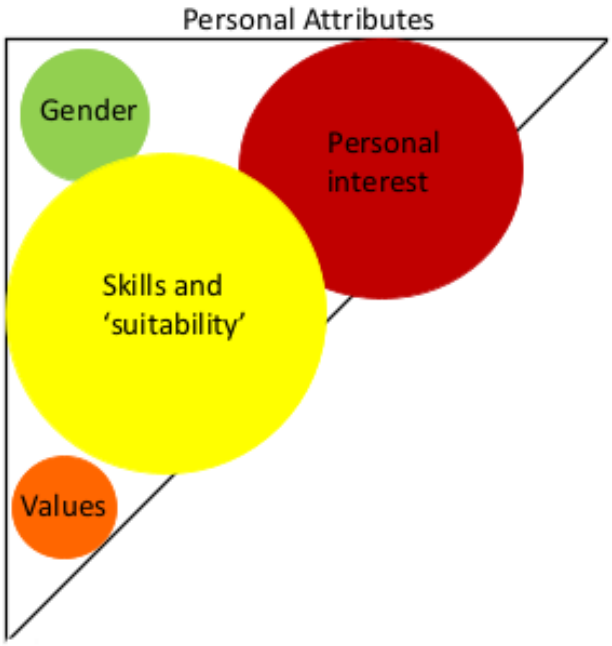
"But what do they do when they're up there [in paeds]? What can they do that's different to what I can do in A&E? … what is that difference, what skills are they getting, what extra knowledge are they doing? It's almost like a bit of a dark art I suppose"- Harry

7.4.2 Personal attributes

The previous section described how, when and where foundation doctors identified specialties that they were interested in for a career. It documented that the influence of exposure when selecting a specialty training career was significant and allowed the F2s to identify what features within specialties were preferable or not. These influences started with the personal attributes of F2s.

There were a number of personal features which influenced F2s' decisions on specialty training choices (Figure 22). Many of these related to the personal interests of individuals and their attributes such as skills or perceived suitability. These linked back to the earlier identified influences of motivation, whereby the F2s described that they selected specialties that they had interest in, which was expanded on through exposure to different specialties. In chapter 8, there is further explanation of how interest, skills and perceived suitability can be modified as part of a feedback loop.

Figure 22: Diagram of features of personal attributes that influence career decisions



7.4.2.1 Values

Some of the F2s spoke of how they were interested in a career in medicine because of the inherent desire to help others, to do something good or to benefit other people. It was described as an underlying need to be fulfilled, and that any medical career would be able to achieve this.

"I think we all get into medicine, at least in part, because you want to help people. Whether that's a driving force, like you know I think at least in part everyone wants that" – Frank

For one of the F2s the influence of her faith or religion was a supportive feature. It was a point of reflection on her situation, and she identified this as an influencing factor retrospectively. Therefore, personal factors may not be part of conscious decision-making process, but they shape the decisions implicitly.

"I think my faith is one of my biggest points… it's a spiritual kind of need…I am quite an intuitive decision maker… nothing has felt right so far"- Nina

F2 doctors identified stereotyping in specialty career choices, associating some specialties with particular genders. There was an assumption that female doctors intended to work less than full time and therefore a perception that they were suitable for certain specialties. This stereotyping was described as having negative connotations and that certain specialties were less prestigious because female doctors were more likely to choose those specialties. In particular, F2s reported that psychiatry and GP were associated with a stigma, mostly originating from their peers, which was described as off-putting to selecting careers. This stigma was associated with working pattern options and perception that these are 'easy' specialties to work in, both being seen negatively by other doctors likely stemming from medical student negative experiences.

> *"this boy, we talked about what we wanted to do after we graduated and kind of specialties we were thinking of and I said GP and this boy said 'oh well no offence but I think you would make quite a good GP'…it's this idea that oh well because you are a girl you probably just want to do GP so that you can go part-time" – Marnie*

7.4.2.2 Personal interest

Frequently the F2s stated that they were interested in a particular specialty but were not able to describe the reasons why they 'liked' it without identifying negative features of other specialties. This echoes the repertory grid process from chapter 5, where preference is rooted in comparison. All the F2s were able to identify specialties which they liked and repeatedly stated its importance in selection of a specialty career.

Some specialties were described as ones F2s 'enjoyed' without further expansion on meaning, whereas others broke down their enjoyment of specialties by matching the features of individual specialties to what they like and held their interest. For some F2s, comparing their experiences of different rotations helped to identify which specialty they enjoyed more.

"[Paediatrics on call] I find it a much less laborious thing than when you're on a general medical or surgical on call…Whereas in adults it, I find myself thinking every on call is monotonous and I don't like it as much. I know that's a bit of a rubbish reason: it's not as bad as adults" – Izzy

To be enjoyed, a specialty had to leave an impression on the F2 that it was a pleasant job, but overall, it was difficult to pinpoint why jobs were enjoyed more than others. For some, the enjoyment of a rotation was a 'gut feeling' and little explanation to why was offered. Whereas others could identify the timing of the rotation, or the conditions seen had resulted in their enjoyment.

7.4.2.3 Skills and 'suitability'

Each specialty was deemed to have higher amounts of some skills compared to other specialties, and the F2s were able to identify overall their preference for types of skills. Some F2s preferred practical 'hands on' skills, whereas others preferred specialties with higher emphasis on communication skills or patient co-ordination. The F2s reported that if they had a natural affinity for a particular skill, they would be more 'suited' to a specialty where it was heavily featured. There were aspects of personality, aptitude, reward, and support within the 'suitability' to a specialty.

The F2s believed that specialty training options were based on a suitability to that career, but overall, they found it easier to describe where they did not 'fit'. Some F2s discussed how different personalities would be more suited to different specialties. One F2 explained this using his negative feelings towards orthopaedics, although he had never worked in the specialty, as it was associated with repetitive work, but that others would see that as a positive.

"I imagine some people love it, some people would love the repetition, some would love honing their skills and being very good and very quick at things. But I couldn't think of anything worse for me personally" – Harry

Some F2s attributed their personal interest to their personality, and therefore being suitable for certain specialties.

> *"It is just something that I really enjoy so I probably it is related to my personality… like I tend to get bored quite easily … the emergency side of medicine gives me that, keeps me interested in a way… I always need a challenge"- Gemma*

On the other hand, some of the F2s identified that some specialties increase their anxiety, whether or not they had worked in the specialty, and this was sufficient for them to not consider it as a potential career. One F2 identified that she had anxieties managing adult patients, therefore would not consider managing sick children.

> *"I don't like sick adults, so I don't like sick children" - Kate*

F2s described themselves as suitable for certain specialty careers by describing their clinical skills and knowledge. Some described having the necessary skills for multiple specialties, but if they did not enjoy using those skills frequently it would be a reason to not pursue a particular specialty where they considered it a prominent feature. One of the F2s reported that she had good communication skills, however she did not find it rewarding therefore did not wish to pursue paediatrics, which is a specialty considered to rely heavily on these skills.

> *"I am normally quite good at talking with children I just don't enjoy it. So, it is something that I find boring" – Gemma*

Whereas others felt that if they do not have the skills or knowledge, then they are more likely to make mistakes. There was difficulty amongst the F2s to describe why they felt this way, with some demonstrating a fear of being wrong and resulting in negative consequences for patients. For others, it was considered as a lack of background knowledge. This could reflect a disinterest in a particular

skill or area of knowledge which resulted in a lack of motivation for some specialties and therefore was used to exclude specialties as career options.

> *"Anaesthetics, I quite like procedures, but I don't know certain things and I'm not all that bothered about machines … I don't know physics and stuff"- Nina*

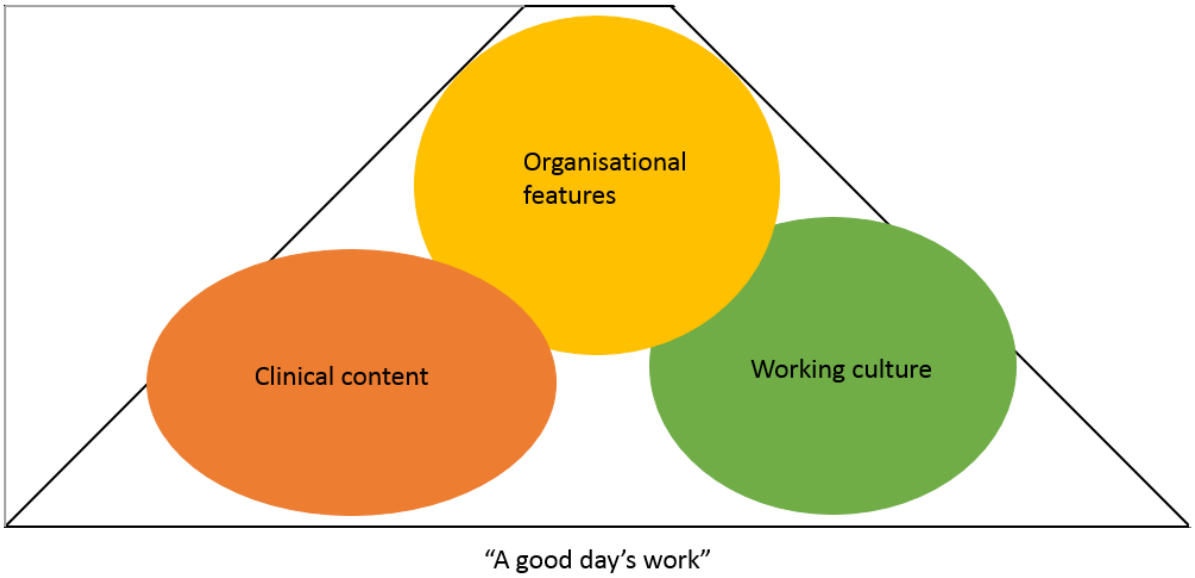
Overall, the F2s were able to identify that their skills could be improved, and if they had the support to do this, they were more likely to enjoy using those skills. Specifically, this was important for those who did not feel like they were able to be paediatricians due to their own lack of confidence.

> *"I think if you did a paediatric job and you had erm, the right support I'd probably quite enjoy it. But like going in A&E at 3 in the morning and having to see a few people, and you always have to go round when it's really busy… I guess maybe that I'm used to working with adults so maybe that's it"- Kate*

7.4.3 "A good day's work"

F2 doctors described features which would influence their choice when selecting a specialty career because they would provide them with a 'good day at work' (Figure 23). These were the qualities which made a specialty attractive as a career and are described in this next section as part of determining *what* the influencing factors were to F2s. Following exposure (how, when and where the F2s identified the influences), the clinical content, organisational features and working culture were described as the influencing factors to determine a 'good day's work'. There was also some overlap to the individual's personal attributes when the F2s considered which specialty could provide this good day at work, due to differences in personal interest, enjoyment, skills, and personality.

Figure 23: Diagram of features of a 'good day's work' that influence career decisions



7.4.3.1 Organisational features

There were various organisational features of working life that influenced the possibility of having a good day at work. Again, this echoes the impact of curriculum in medical school and clinical learning environments as described earlier in chapter 7. Differences existed in both the working environment and working patterns of different specialties.

F2s repeatedly stated that they needed to enjoy a specialty rotation to consider it for a career, and hence those that are not enjoyed are considered a deterrent. The first F1 rotation job appears to be the least enjoyed of all their working experiences for most of the F2s, regardless of specialty or environment, and was associated with feeling as if they were lost or unable to manage the clinical tasks under the pressures of a new working F1 doctor.

"So my first F1 job was … a trial of fire" – Izzy

Many of the F2s commented on a lack of adequate staff numbers. They reported feeling that this results in them staying late, after their shifts, to complete non-urgent tasks, as there was no time during the working day to do so. This in itself affects the morale of those who are working, but also

can be associated with higher rates of sick leave. This in turn then increases the number of rota gaps and it becomes a self-perpetuating cycle.

"The rotas are so short that everyone is covering so everyone is tired"- Kate

Work environment and geography

Overall, F2s had a personal preference of either ward environments, theatre work or community settings. For many it was about their personal comfort in the environment, which could relate to their familiarity of the environment and hence dependent on their previous exposure.

"I automatically feel much more comfortable in a clinic environment as opposed to in theatre"- Marnie

The F2s were concerned with the working location, and specifically its flexibility, of different career options. They reported that larger cities were likely to have multiple sites for hospital-based specialties, and those who considered general practice as a career were interested in the relationship of rural practices to secondary care settings. Some F2s spoke of paediatrics as being less flexible when compared to other training programmes, often needing to rotate through multiple geographical locations and this was dependent on size of hospitals or departments. In addition, for paediatric training, there was often only one site where subspecialisation was available per region. One F2 described their interest in sub-specialisation within paediatrics would be only possible in the North East of England if she were to stay in Newcastle, which had implications for her personal life.

"I'd like to work somewhere with a big enough hospital that they had lots of subspecialty [paediatric] medicine"- Izzy

Geography was also considered as influential as the distribution of secondary and tertiary care services varied with regions. Some F2s identified that in smaller district hospitals the working

environment, department size and patient conditions available during their training was not equal to other F2s situated in larger centres despite being allocated the same specialty rotation.

"But the ward I worked on, they were all just pneumonias, chest sepsis, and I don't think it was run very well. I didn't enjoy it"- Kate

In contrast, working environments that were perceived to be rushed or stressful were identified as negative and hence off-putting for career choice. While some F2s described A&E as a rushed environment, they related that to excitement due to the possibility of dealing with any medical condition at any time and hence they did not discount A&E careers based on this factor. Instead, F2s acknowledged that some other specialties were associated with poor staffing numbers, leading to a perception of being rushed and therefore non-preferrable for a career. The lack of staff was identified as leading to further problems. For example, F2s described a lack of teaching in these rotations resulting in poor training opportunities, which again were deterrents.

"The ward and department just was not set up to be a good training environment and supportive to juniors"- Liam

Working patterns

The working pattern of medical staff was a significant concern of the F2s. They spoke about their current working patterns, the future working patterns, their ideal working patterns, and the overall feeling about day-to-day work in the NHS. Again, these features may differ between specialties, but on an organisational level are amenable to change.

The rotas and working hours of doctors are perceived as being poor in junior roles but improve as consultants or GP partners. However, some F2s also reported observation of equally poor working patterns in senior positions.

"The thing that puts me off paediatrics is the kind of seeing the consultant's jobs and the long hours and the registrar hours and training and rotas for shifts…I love that about GP not to do nights and weekends"- Nina

The F2s also described difficult working patterns, where there were inadequate handover procedures or frequent changes from night shift to daytime shifts without adequate rest periods, which were detrimental to their enjoyment of a specialty. It was perceived that these specialties included poor rotas and were associated with a lack of staff to do the job safely.

"It has a pretty horrible on call in a tertiary hospital certainly and it can get pretty busy on call. And I think to do it, you have to enjoy the on-call part as well" – John

Some F2s attribute shift work as a positive feature, as they feel that they can leave work behind. However, in contradiction, these are traditionally antisocial working patterns and therefore influence their work-life balance. This work-life balance is seen as a bigger concern in hospital medicine, and if not achievable, they will consider leaving medicine altogether.

"A career in hospital medicine feels like you will umm be working very hard and in a way that would impact on a sort of a reasonable work life balance…the heavy burden of nights and anti-social shifts does then impact on life at home"- Liam

F2s also acknowledged the physicality of different specialties, and if they are suited to one more than another. Again, this echoes the earlier theme of suitability and 'fit' to a specialty (chapter 7.4.2.2). One specific personal factor was the age of the F2 in their consideration of the careers, whereby they believed that they were too old to undertake certain specialties associated with longer working hours. However, for others, this was a positive feature of specialties.

"Atmosphere and the fast pace, high turnover. I sort of enjoyed seeing multiple things, it's sort of high energy and I like that...being on your feet, being active"- David

7.4.3.2 Working culture

The working culture associated with different specialties stemmed from the support of senior colleagues, a feeling of pressure, the opportunities for autonomy and clinical development. Some of these features were dependent on the working environment, such as theatre, clinic, wards or accident and emergency settings as identified earlier.

The F2 doctors described having lots of contact with senior members of the team as an attractor to a specialty. This contact led to the development of their clinical understanding as well as a reciprocal appreciation of effort from the junior staff. There was an understanding from the F2s that demands on healthcare services have changed, impacting on the amount of paperwork needed but this had also resulted in a lack of autonomy among junior medical staff in some specialties. They reported that there had been significant changes to the role of trainees, and the F2s believed that previously there was a system whereby tasks were based on seniority so that registrars would have more time spent developing their skills away from mundane ward-based administration.

> *"maybe 20-30 years ago would have been different… it's [now] quite hierarchical where the consultants still make a lot of the decisions so as a registrar, you're still doing quite a lot of the ward jobs"- Kate*

F2s described the positive environment of A&E rotations as providing autonomy, interaction with senior staff and for all those interviewed who had worked in A&E departments they described them as supportive environments.

> *"The A&E department has very good supporting environment, where you have lots of contact with consultants in the department, you talk through decisions with them so really good environment for learning"- Liam*

F2s strongly valued having autonomy and they seek out the ability to have independence with their clinical decision-making. They liked to consider the options, specifically around investigations and development of their clinical skills. Being able to achieve autonomy and developing clinical skills was seen as positive features of specialty training and therefore specialties that could demonstrate this either to medical students or foundation trainees were likely to be considered for specialty careers.

"I liked the idea of GP, I had a lot of autonomy and got to make decisions and enjoyed the breadth of stuff"- Nina

In contrast, the F2s reported that a lack of responsibility made them feel less useful in the specialty and was associated with thinking poorly of that specialty as a career. Some specialties had a defined separation between foundation doctors on rotation compared to specialty trainees, each having significantly different roles. These were the specialties which were less likely to be considered for careers as the F2s reported that they were having little clinical involvement.

"You weren't doing as much… you weren't really seeing patients, so I think that really put me off, you weren't as involved as you are with other blocks" – John

The most frequently referred to positive feature of a specialty was the focus on learning or the perception of being able to develop themselves as a specialty trainee. This was associated with increased responsibility, feeling useful, feeling that they were being listened to and that seniors were interested in them. One element of the F2's autonomy came from having practical or hands-on experiences. However, for those specialties perceived to have fewer practical procedures, as long as the F2s attributed the specialty to being progressive to their skills, the F2s thought positively about the specialty as a career.

"I do like hands-on type of speciality, so I am not really into medicine…otherwise I feel like I am not growing, my experience is not growing, and I am not developing as a clinician" – Gemma

In contrast, some specialties were not perceived to develop the F2's skills. In particular, some F2s worried about the improvement of their diagnostic skills in specialties where they believed there was no consideration of use of investigations as a junior member of the team. The F2s reported that they needed to be involved in patient care and clinical decisions, otherwise they would not achieve a good day at work and thought poorly of that specialty.

"the current post that I am in is awful, so I am not enjoying anything of what I am doing at the moment... we just scan them…whatever happens, you scan them…from a junior point of view, you do get involved but then you kind of deal always with the same kind of surgical scenario... it is not really adding much to the experience I already had from general surgery" – Gemma

Inclusion and working with others

Another aspect to having a good day at work was to achieve a feeling of inclusion or belonging and was likely to result in positive feelings about a specialty. To do this, the F2s considered how they interacted with others in the department, previously identified when considering their positive and negative student experiences (chapter 7.4.1.2). Trainee experiences of working culture appeared to be defined by their introduction to a specialty team. The F2s described how welcomed they were to the specialty at the start of their rotations; and if done well, it was likely to influence their idea of the specialty enough to consider it as a career.

"for one person's surgical rotation they might go in and the surgeons are particularly nice, asks them what their name is, even something as small as that can make someone think ahh I want to be a surgeon" – Harry

Interaction with senior staff was valuable to the F2s who reported that having people to look up to, and be impressed by, was also influential in their career choices. For some this was a direct effect of role modelling, but for others it was the active inclusion and perception of value for their input in clinical decisions.

"he said 'come and do this, I have this opportunity' to [us]"- Chris

The positive culture of a department also included identifying a plan for training, teamwork, adequate staff numbers for rotas, and amount of consultant contact. The F2s expressed that they were able to appreciate the effort of a department to plan for their lack of experience within certain environments, and forward planning by seniors to improve their confidence was beneficial.

"They understand that it can be daunting for juniors um in a busy A&E department, they put a lot of thought and effort in how to make it, um, good training for 4 months" – Liam

This was echoed through the interaction with other members of the clinical team, specifically working within multidisciplinary teams, on the wards.

"Everyone is just much nicer. Whether that's the staff, the nurses, the people in A+E, even when you speak to people on the phone and say you're the paediatric X, Y or Z, they're much more understanding and more likely to speak to you for longer. So, in other specialties they might not even give you the time of day. But I don't know whether that's just because its paediatrics or it's here" – Chris

However, the F2s also cited difficult relationships with other staff members with its subsequent impact on the functioning of a ward, multiple complex patients but short rotations resulted in not feeling part of the team. This subsequently had a negative influence on their thoughts about the specialty as a career.

"Care of the elderly but that was split with rehab. So that was a bit frustrating because you get like 2months where it was something that I thought I'd really enjoy"- Kate

7.4.3.3 Clinical content

The clinical content of different specialties was evaluated by F2 doctors, and although there were individual differences describing preferential work activities, there were generalisable features of specialties that assisted in the selection of a career. Many of these features echo the influences of clinical learning environments, and some negative aspects could be counteracted by well-placed organisational features, such as increased numbers of trainees. Positive features of careers included clinical variety, whereas repetition and monotony were deemed negative. However, some reported that repetition allowed for mastery, and this may have been sought after by other trainees.

"Some people love it, some people would love the repetition, some would love honing their skills and being very good and very quick at things"- Harry

Some F2s reported that they liked complex cases for the challenges they presented, whereas others felt having breadth of knowledge and general subjects rather than subspecialties was more appealing for a career.

"I like general things. It's either going to be GP or A&E that I end up applying for"- Harry

The amount of patient contact was evaluated by the F2s with more quality contact being deemed positive and described through time spent with patients. This was influenced by the number of patients and related to the pressure the F2s felt was associated with a specialty. One F2 described how general practice allowed for longer interactions with patients and hence she felt that she would pursue a GP career.

"And I really enjoyed the like long term follow up of it … building up that therapeutic relationship through time as well...it didn't feel quite so pressurised and in a clinical way it was more relaxed" – Marnie

However, other F2s felt that general practice had a lot of repetition in patient conditions, which was associated with boredom, monotony, and a lack of stimulation. Instead, they preferred to be involved with acute illness or rare cases which was associated with higher patient numbers per day hence shorter interactions per patient, and this was more likely to be found in secondary or tertiary care.

"More opportunities to do research as there are a lot more patients… you'd expect to pick up more because you see the rarer things"- Izzy

One F2, who was on an academic foundation programme, identified his interest in the subject matter made it easy to learn about and therefore continue working towards. This echoes the findings earlier, in that interest and enjoyment are motivators to learning about a particular specialty and encourages an individual to seek out opportunities in that specialty career.

The F2 doctors described that certain specialties had specific clinical content which was not found in other specialties. In particular, F2s who were working in paediatrics at the time of interviews, identified the role in assessment of non-accidental injuries and safeguarding as part of paediatrics as being negative and was off-putting when considering paediatrics as a long-term career.

"NAI stuff you have to do it. There is no way of changing what happens to children and what parents they're left with. It's something part of this job but if I was to pick a specialty within paediatrics, it wouldn't be general paediatrics because of that." - Chris

Finally, one F2 evaluated her opinion of psychiatry to the impact she felt she could have to the patient and felt that psychiatry was associated with limited treatment options which could restrict the number of 'good days at work' she could have.

"I felt like, there were so many limits to what you could do as a psychiatrist … you can end up with patients that aren't improving, and you haven't got much more that you can offer them, and I think I would find that really frustrating" – Marnie

7.4.4 Summary

The F2 interview data described so far has demonstrated themes which have led to understanding of various specialty careers through previous exposure; the personal attributes of individuals and the relationship of these to different specialties; and the features associated with 'a good day's work'. The remaining data from the interviews however has a different orientation, whereby the F2 doctors anticipate their future. Due to this being a different aspect this will be discussed separately in chapter 8.

8. The future

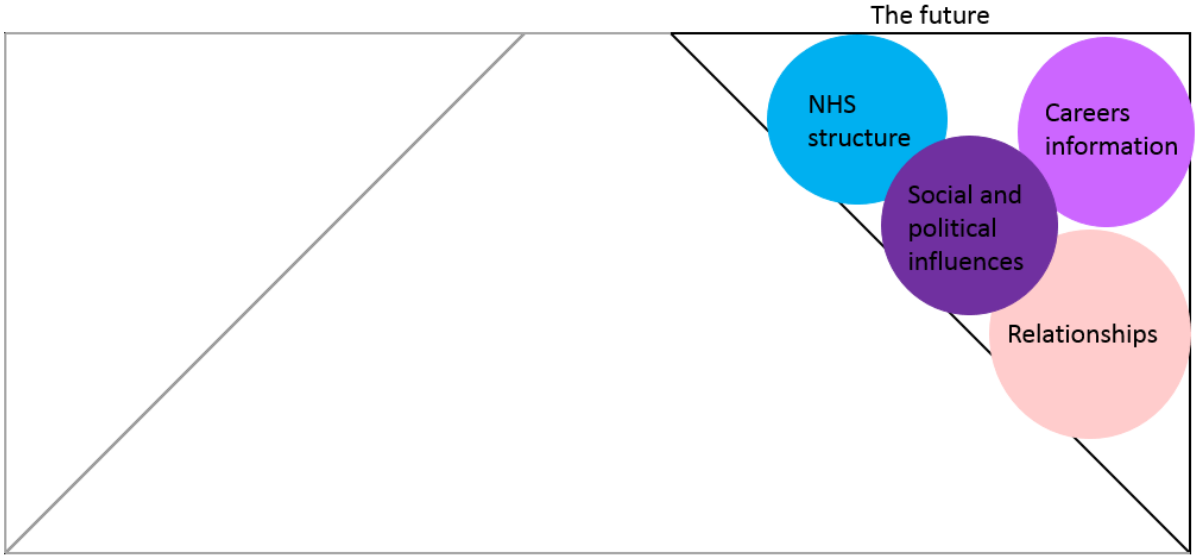
The previous chapter described how the F2s determined their preferences for specialty careers, identifying when and where this knowledge came from as well as personal attributes that the F2s helped determine which specialty to choose. In addition, chapter 7 described the features that F2s wanted to achieve as part of a 'good day at work' and how this related to specialty choice. This next chapter presents the themes which reflected the F2s perceptions of the future of their careers and can be considered as 'looking ahead'. As highlighted at the start of chapter 7, this next chapter has a change of focus and therefore interpretation was different to the previous chapter.

The foundation doctors discussed their beliefs about what might happen in the future which may influence which specialty they would want to work in. The F2s described 2 distinct time points when considering the future: the immediate next steps, which included weighing up career information and the NHS structure overall. The second time point was focused on the respondent's individual futures, specifically the ability to plan their life and where different specialties may fit in. This second feature represented the longer-term projection of the future, which also demonstrated that the respondents considered potential changes in both personal life and systems which were not yet definitive.

Figure 24 demonstrates that the theme of the future was built up of influences which included the structure of working within the NHS, careers information, relationships as well as the social and political influences on careers. Again, there was overlap of these important areas with the previous consideration of a 'good day at work' as some of the influences were seen to determine if a

good day at work could be achieved in the future. There was evidence that there were differences between micro influences, such as relationships which were often influences specific to the individual, and macro influences, those influences which affected junior doctors as a whole such as NHS structure or political change.

Figure 24: Diagram of features of the future that influence career decisions



8.1 Careers information and application

F2s considered their longer-term careers and anticipated their future as a specialty consultant or GP. A factor that influenced this was how they gained knowledge about career progression, and this complemented their previous experiences described in chapter 7. This part of the chapter documents that the next step in the F2s career was to apply to a specialty and during this process they weighed up specialty information. The F2s described that they attempted to fill gaps between their experiences (as identified through exposure) and their anticipated future in a specialty through discussions with trainees in the specialties, with friends and observation of their friends' applications, taster weeks, talks (either through university or foundation training teaching days) and use of college websites.

The F2s demonstrated a conflict between planning and uncertainty in their careers, where some F2s felt ready to apply whereas others did not. There was an element of strategic planning for

those who were intending to apply to specialty training, whereby they had collated specialty information in a way that would be most valuable to themselves. Some spoke about wanting careers information during the specialty application period, to help make final decisions. Whereas others wanted careers information on multiple options earlier in the process. These F2s acknowledged that they only sought out information for specialties of interest; otherwise, they were not well informed about alternative specialty options.

> *"My university had careers evenings... I think that the onus has to be on you yourself to do that because, they were available and I didn't go to the ones that were on you know…weren't jobs that I was considering"- Frank*

During the interviews the F2s suggested improvements could be made to careers information. They suggested more information on why they should choose a specialty and why people who are doing it may help their decision-making process.

Some F2s also observed the careers of their parents and their interactions with the medical profession. Parents were a source of advice, although unlikely to be specialty specific and instead may have been supportive. Occasionally the pressure from friends and family had a negative impact on the F2s' career decision-making efforts, resulting in them only considering careers to stop others bothering them.

> *"People were asking more and more where I'll go, what I'll do…for a while I thought I'd do GP, and everyone assumed it, they'd say 'when are you going to be a GP?' And then it became a bit much, and I started thinking about medicine, and doing medicine jobs" –Kate*

The F2s were interested in the application procedures, citing that support from the deanery was hugely important in this, although they found advice was lacking when considering alternative pathways into specialty training.

"It can be quite complicated…but there is a guy who talks about it in detail, and it was really good. There is relatively good access to the person that does it for the Northern Deanery, he is pretty good for being contactable through email or whatever if you have any questions… there is so many different little factors and different ways of getting into a specialty it can be complicated"- John

Furthermore, they wanted more information on alternative options to specialty training.

"just lack of information than that I thought I really want to do training and then have changed my mind away from it, it's just that I didn't really know what the other options would be"- Izzy

8.2 NHS structure

8.2.1 Personal future within training programmes

The F2 doctors used their previous experiences to form opinions on what specialty training would entail for themselves in the future. Some identified that foundation training rotations are not true representations of the specialty training programme and therefore found it difficult to anticipate what a specialty career would truly be like.

"I think probably F2 skews your perspective a little bit because you end up doing a different job to what you would do in [specialty] training"- Nina

Many of the F2s described that formal training programmes were associated with a number of barriers to developing oneself as a clinician. Training programmes were associated with a feeling of pressure. The F2s described that there were multiple additional requirements to progress through

training outside of clinical work. One example was an F2 who discussed how he expected his future life to be if he had pursued haematology training.

> *"That's the thing that umm put me off haematology it's not something you can switch off from, especially if you are doing the haematology training programme, so many exams and publications and training requirements you need to do to go for registrar training I don't feel like I love it enough to do it umm to make it completely live to work"- Liam*

The F2s also highlighted that there were increasing service provision demands on their already limited time. They reported that they expected this would continue, or worsen, in the future, and different specialties were likely to have different requirements. For those who attended non-UK medical schools, the burden of additional evidence was deemed to be greater.

> *"if I went into core medical training, I think I would probably have to be focusing on doing e-portfolio, getting to clinics…the extra pressure of keeping a portfolio going"- Evan*

8.2.1.1 Training programme structures

When considering different specialty training programmes, the F2s deliberated the styles and lengths of different options and how this would suit them in the future. General practice, paediatrics and obstetrics/gynaecology were those considered 'run through'. For these specialties, once accepted onto the programme there is no further application requirement until consultancy (Figure 1). Run through training schemes were generally seen as positive due to the perception that once on a scheme, there was less onus on enhancing their medical CV to be competitive and instead they could develop their own interests within the specialty.

"I like the fact that you go through a single selection process and you kind of know that at least for seven years you are into a specialty training pathway and kind of follow the route rather than apply for core training and then reapply after two years"- Gemma

Shorter training programmes were also deemed positive, in particular that of GP training was seen as beneficial due to faster progression to completion of training. However, this was accompanied by increased responsibility faster and less time to develop useful skills.

"GP training, I guess has a lot going for it … the shortness of the training is really good"- Evan

A recurrent talking point was the inflexibility of training programmes, most noticeable in run through specialties, but also the difficulties with rota commitments impacting on holidays, training and feeling as if they have a lack of control of their working lives.

"I think paediatric training is less flexible… want to be able to negotiate my terms a little bit on that. In specialty training there isn't much room for that … [having a non-training job] I guess I can take the time off that I want"- Chris

Furthermore, the F2s identified that work-life balance was not equal across specialties and predicted this would become more important as they progressed through specialty training. Some described that they were willing to change their working hours, level of patient contact or financial burden to achieve a work-life balance. Others felt it was enough to rule out a particular specialty career.

Control within training

Some F2s commented on how there was a lack of control within training programmes overall and they were fearful of possible future restrictions or changes. This included the progression through foundation training to consultancy, feeling as if they were on a 'conveyor belt', the lack of appropriate staff to guide them and the ability to develop clinical interests outside of service provision. For some,

this was an appreciation that in the future, they may wish to change specialty and to do this, they needed to identify support systems to assist with this. Due to the nature of foundation programme rotations, the focus was to obtain knowledge and skills to work in that specialty irrespective if this was needed for their future career. In addition, as discussed later, there are significant demands on resources which did not give the F2s the opportunity to develop skills or interests which were not directly related to their current rotations. This combined to lead to a sense of lack of control about their future career options.

There were fears about starting a specialty training programme and clinical requirements changing during the training scheme due to clinical pressures, which they may not be prepared for. One example was the recent change to include trainees in haematology to the medical registrar on call rota, which subsequently deterred interest in haematology as the F2 did not want to take on the role of 'medical registrar on call'. Some of the F2s described the 'medical registrar on call' role as a necessity for the smooth running of hospitals at the expense of training or well-being of the individual. The consequence of these beliefs is that the F2s seek out specialties which would not include this as a role. However, the F2s also acknowledge that a lack of people entering training to be the medical registrar on call means that more specialty training posts will need to incorporate the role into training, and hence they were hesitant to commit to specialty training.

> *"They're very busy, there is an awful lot of responsibility placed on them from quite an early point … It's a bit of a self-perpetuating thing isn't it; nobody is really applying to be a medical registrar so they drag more people in which is probably going to put people off doing these things"- Harry*

8.2.1.2 Competition

The F2 doctors were aware of varied levels of competition between different specialty programme applications. This was a constraint for some of the F2s when choosing what to apply for,

and therefore was most apparent at the point of application to specialty training. However, there was a projection that decisions made at this point could adversely affect their future careers, and hence represented a form of planning a future career.

F2s believed that some specialties required non-clinical achievements e.g. audit publications, qualifications from technical skills courses or further degrees to be successful in their application. These beneficial activities take time to achieve, therefore, some F2s considered time out of training doing trust or locum jobs to make themselves successful. However, for some this had to be weighed against spending excessive amounts of personal time focused on their career, which would demonstrate their commitment to their working life at the expense of other aspects in their life.

> *"it is not about the clinical side it is about audit, teaching, some will do research on top of everything … [I] need to develop a CV that is going to be competitive in order for myself to apply for a sub-specialty…. and that of course requires time that I need to take away from my personal and private life"- Gemma*

For some specialties there were many opportunities to take up non-training roles following completion of the foundation programme due to training scheme drop out and gaps in rota staffing. For some, this provided a better option than applying to specialty training, allowing them to focus on other aspects of their working life, without the perceived added pressures of completing specialty training conflicting with personal time.

> *"I thought it would be quite a good experience for next year…I will be a bit more prepared... partially portfolio reasons… it is quite extensive and it is very difficult; you know getting all the things together, it takes time"- John*

In contrast, F2s were also aware that some activities could be considered detrimental to an application.

"I suppose the only thing is that I wouldn't want anything to stand against me when I am applying for things which look bad. So, you have to be careful what you do in your time out, you don't want to look like you're just bumming around travelling and not gaining anything."-Nina

Other F2s considered where they work to be more important that the specialty that they chose. Trainees may have chosen specialties specifically because there was a lower competition rate and therefore were likely to get their preferred location to work in.

"so the idea that I was almost certain that I would get a place to be GP in or around Glasgow was a deciding factor for me, rather than something where I thought there's no way I would get my first choice or there's even a gamble that I'll end up with a trainee position"- Marnie

This highlighted the need to be strategic when gaining experience, which is a direct counterpoint to both medical school and Foundation training, where rotations are more opportunistic. Some strategic considerations include candidates considering if the effort of making themselves desirable for a particular career is worthwhile. It may be instead better to identify specialties where desirability is less important, and then determine if this would still fulfil their interests for a career specialty.

"I know GP is generally quite easy to get into …it's not like getting into surgery where I would have to go to conferences and do loads of audits and stuff, it's quite easy to get into."- Evan

8.2.1.3 Attrition

Following on from identifying that some specialties have less competition than others, there was an acknowledgement of attrition from some specialty training programmes. The F2s were aware of rota gaps higher up in training, and this was deemed to be detrimental. Some of the F2s

interpreted this as if they undertake that specialty, they may be more likely to drop out like others before them; but also, they will need to cover the 'slack' in service provision when colleagues leave training programmes. The F2s were aware that paediatrics has a history of trainees dropping out of the programme, attributing this to the length of the training programme.

"It used to have a high number of applicants but then you have a lot of people who drop out further up the chain"- John

However, there were also others who saw this as beneficial when thinking about longer term competition for consultancy posts. There was little awareness of the impact of part time working or maternity leave.

Finally, some F2s acknowledged that being a doctor has perceived rewards. For some, this was acceptable working hours, the vocation of medicine or financial opportunities that come with the career. However, these rewards were weighed up against the stresses associated with the career and the ability to 'switch off' after work. One F2 described her own fears that future changes would have a negative effect and lead to her leaving medicine.

"I really enjoy being a doctor… if there ever came a point where I thought I am working myself to the bone without getting any rewards… being able to spend an evening without thinking about work...I would consider not doing medicine anymore" – Marnie

8.2.1.4 Resource demands

There are increasing demands on doctors, in part due to increasing patient numbers, reducing resources (including lack of adequate staffing) and the need to take on roles that provide non-clinical care. F2s felt that this prevented them from providing adequate clinical care and witnessed seniors struggling with this conflict. Many of the respondents believed this would continue or worsen as they progressed through specialty training, expecting to need to take on additional roles

or responsibility to overcome the lack of resources. Some F2s reported concerns with pursuing adult medicine due to the need to accommodate perceived gaps in social care.

> *"Everyone is so under pressure that nobody is actually able to do their job appropriately… just filling paperwork constantly "- Gemma*

Furthermore, there was a belief that there were expectations from others to provide additional time and effort which impacted on the quality of their clinical work. Some F2s felt this was more apparent in some specialties and that they could not see it being resolved in the future.

> *"You're so bogged down in the day to day just running, putting out fires that you can't really actually give the level of patient care that you really want to. And I find that really frustrating"- Frank*

It was identified earlier, in chapter 7, that the F2s had direct experience of short staffing during their foundation training. Many F2s reported that they expected this to worsen once in training, often due to observations of attrition or inclusion of roles such as the medical registrar role which has been described earlier.

8.3 Relationships

Relationships were important to the F2 doctors, and how they perceived their future relationships would change. The F2s considered this in the context of 'what kind of life would I have' based on which specialty they pursued and how this interacted with relationships with partners, children, parents, friends, or geographical areas. F2s described that their partner was a significant influence whether by providing advice or making career decisions together. The F2s considered their partner's careers equally to their own careers.

"my girlfriend is a teacher who has just completed training … and she is ready for a break, so we have both talked about taking time to travel or to work elsewhere after this stage of our lives therefore makes sense when she is ready to take a break" – Liam

During the period of application to specialty training, many of the F2s were considering their long-term plans and 'settling down'. There was a belief that marriages take place more frequently in the F2 year or first two years of specialty training. This may be due to these junior doctors being able to make long term commitments in their personal lives as they are confident about the commitment made to their working lives or vice versa. Some F2s, therefore identified that it may be appropriate to take time out of training to obtain other experiences before this commitment takes place.

"So, I think there comes a point in your life where, you know you get married or have kids or do something later on that you don't have the opportunity to take the kind of career break that I want to"- Frank

Some of the F2s described the importance of family life, having children and how some specialties were not suited to achieving this. Hence some actively discounted certain specialties as they did not believe they would be able to achieve a family lifestyle if they pursued that career.

"Do I get to see my partner; do I get to see any kids that might come along within those six or seven years [of specialty training]? A&E is even less conducive to a family lifestyle than GP."- Harry

The F2s spoke about familiarity with certain regions or areas of the UK. Often this was the area where they went to medical school, and therefore experienced the hospitals in that area as well as university friends which provided a sense of familiarity and belonging. Alternatively, it could be a return to a childhood home or to where extended family live to achieve support or feeling as if they 'fit in'.

"I would like to stay here … because I like working here, I like Newcastle" – Izzy

Some F2s were willing to make sacrifices, whether that was moving to another location for their partner or choosing specialties that were likely to be universally required so that their partner is not limited by location for their own career.

"She works in a particular role [in large cities] … which means I need to be around larger hospitals… I'm limited to where I can apply for jobs"- Harry

8.4 Social and political influences

Social and political influences were discussed extensively by the respondents. The role of politics and the media's influences were extrinsic influences on specialty career choices, and the F2s expectations for their future careers. Many of their comments focused on what they believed would change within the NHS, working in the United Kingdom and it is likely that many of the views have been shaped by the influence of the media. It is notable to consider that interviews took place in early 2017, where there were significant changes in international politics, newspapers reported extensive crisis within NHS hospitals (BBC news, 2017a, 2017b, 2017c) and a terrorist attack in London, which could have affected the views about career decisions for the junior doctors. Therefore, this part of the chapter addresses how the F2s considered what the NHS may be like in the future.

Respondents' views of the health service in which they will be working have been shaped by the junior doctors' contract dispute with mass protests which had taken place in 2015 and 2016 when the respondents were in their final year of medical school and F1 year. In addition, the UK referendum on European membership, colloquially termed 'Brexit', in 2016 led to some of the F2s to re-evaluate their commitment to working in the United Kingdom. There are complex relationships

between the public, media, management, and politics which have affected junior doctor experiences and subsequently made them fearful of potential future changes.

Overall, there was generalised uncertainty, which in itself increased the stress associated with choosing a career, but also acted as a distraction from clinical work. Interviews identified that there were alternative options available to doctors, especially for those from outside the UK. The future impact of 'Brexit' was yet to be seen but was already playing on the minds of the F2s.

"After BREXIT, I personally didn't feel welcome because I didn't have to be here… it is not like I will not find a job in my own Country"- Gemma

8.4.1 Demoralisation of the workforce

The F2s experienced the junior doctor contract dispute as newly qualified doctors entering the profession, and it is likely that this will continue to influence their thoughts on working in the NHS for the rest of their careers. Many of the F2s described a feeling of being on the losing side, or as victims of the media.

"The junior doctors' contract dispute is kind of, you know it's made everything a bit harder hasn't it. You know there was such support for it, and we fought so hard for it, you know what we thought was right for patients and for us. And lost essentially. Well, I mean what he said was he was going to do what he wanted and force it through erm, I do think that has, yeah it has had an influence" – Frank

They reported that the contract dispute had resulted in beliefs that their foundation training was a poor experience, with subsequent consideration of alternative options. Many believed there would be better opportunities abroad or that specialty training was not something they wanted to commit to.

"The stuff about the contracts has been demoralising, and that's why lots of people are going abroad"- Izzy

Some of the F2s commented that the impact of the dispute was more apparent in certain specialties, and this demoralised attitude was off-putting when considering that specialty as a career. One F2 described paediatrics as being overall demoralised.

> *"I think people's attitudes, I think people are a kind of down and out at the moment, no one is really fired up and passionate enough about paeds that I know"- Nina*

8.4.2 Media representation

Some of the F2s reported that the media could portray doctors in either positive or negative light depending on the perspective they want the public to know. The F2s identified that the public in general are developing more negative opinions of doctors, but also that this is present within the NHS structure.

> *"The undermining of staff by higher ups whether that be your chief exec or the government, in a profession that is essentially there to help people. Demonising us, saying we're not wanting to work, but we're not getting paid enough so it's unfair… why should we be run into the ground by people, when you can do something else. We get a lot of bad press for no reason here"- Chris*

At the time of the interviews, the impact of the Charlie Gard case was yet to be felt and based on the discussions regarding the junior doctor contract, it would have likely influenced some of the F2s had the interviews been held later. Charlie was an 11-month-old boy with a rare mitochondrial disorder, where doctors and his parents did not agree on his management. This subsequently led to a vigorously reported dispute between the hospital trust and the parents, using both conventional

media and social media (Wilkinson and Savulescu, 2018). The F2s alluded to this type of representation of the NHS in the media as negative.

"When you think about the [media] stresses in the NHS at the moment it's quite hard"- John

8.4.3 Privatisation

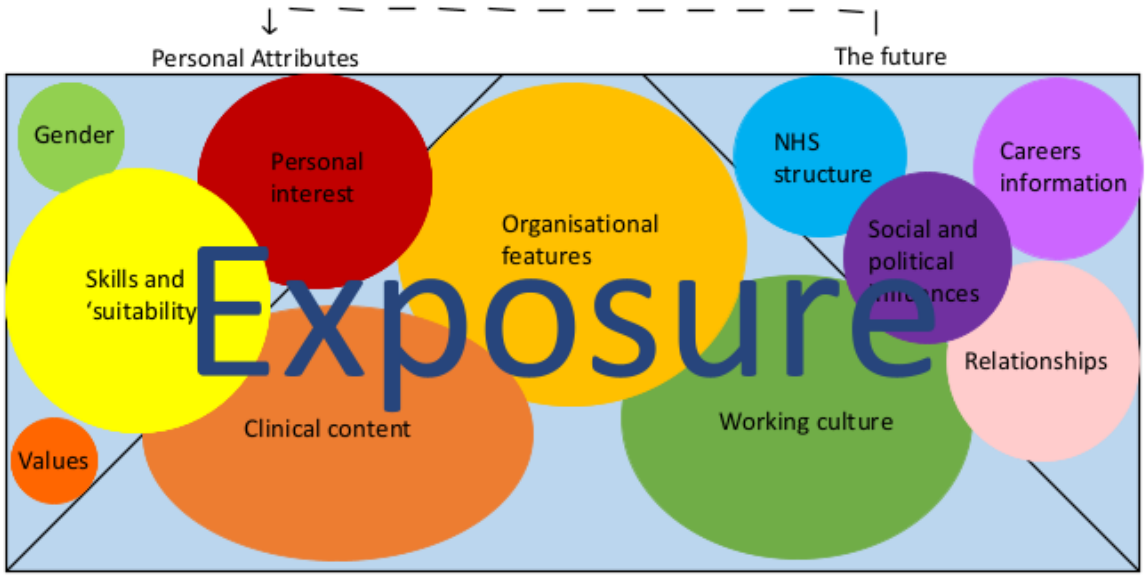
Many of the F2s described a pride in the 'free care for all' system of the NHS. A lack of fairness is associated with privatisation of the NHS and conflicts with the personal beliefs of doctors. If the NHS were to become private, there would be further consideration of alternative career paths, including leaving the workforce all together.

"If it becomes private, it would be something that I would really need to think about [leaving]"- Chris

8.5 Summary of F2 interviews

There is a complex set of influences which ultimately lead to a specialty career selection by F2 doctors (Figure 25). The qualitative interviews have demonstrated interlinking of personal attributes, desire to create a 'good day's work' and future influences in specialty selection with an underpinning of understanding coming from previous exposure to specialties.

Figure 25: Diagram of influences on career decisions of F2 doctors



The considerations of the F2's future careers relate directly with their previously defined personal attributes, with a feedback loop particularly concerning relationships and gender, as well as careers information and personal interest.

This feedback is the awareness by the F2s to what they anticipate in their own future career and is based on their current (foundation programme, careers information) and previous (medical school and before university) experiences. These predicted changes in the F2's future can influence perceived suitability to specific specialties. This can lead to an active interest in those specialties or act as a motivation to obtain skills they anticipate will be useful. Many of the influences seen on trainees appears to be directly linked to their perceived plans for the future, particularly their plans to start a family and work life balance. This is discussed extensively in the literature as having significant influence on female trainees (Fysh et al, 2007; Al-Nuaimi et al, 2008; Di Mario, 2010; Lefevre et al, 2010; Goldacre et al, 2012; Dossajee et al, 2016). In contrast, many of the male F2 respondents here discussed the importance of family life and possible children in their own futures.

Some career decisions are also affected by short term changes, such as planning a wedding, which affects both genders equally. When considering the existing literature, there is confirmation of

junior doctors projecting their professional aspirations towards the future, but little is discussed on how to expand that knowledge based directly on the junior doctors themselves. Often, sweeping changes to the structure of the NHS, specialty training programme changes and available careers information comes from external forces, namely the Department for Health, GMC, and specialty colleges. One example of this is the proposed changes to core medical training, to increase it to 3 years from 2 as well as rebranding to 'internal medicine' (GMC, 2019), which none of the respondents will have been aware of at the time of interviews, which is due to come into effect in 2021 (JRCPTB, 2020). This ultimately misses out on key information, which is wanted by junior doctors, but who feel they are unable to obtain it based on existing barriers. These barriers fall into the themes discussed in chapters 7 and 8, whereby there is a belief that skills, suitability, and organisational features of NHS working determine access and opportunity to different specialty careers.

9. Discussion

This project examined different specialty training career options for junior doctors and how they select of one specialty over another. Data was collected from paediatric specialty trainee doctors (chapter 5) and foundation year 2 (F2) doctors (chapters 6, 7, and 8) within the Health Education North East and North Cumbria region. This chapter discusses the findings in the context of the published literature and provides a synthesis of new understanding around the process of career decision making. Finally, this chapter identifies strategies to improve recruitment to specialty training programmes.

9.1 Key Findings

9.1.1 RQ1: What factors influenced the career decisions of ST1/2 doctors in paediatrics?

Specialty training year 1 and year 2 (ST1 and ST2) paediatric trainees identified specialty-related and personal factors as important determinants of their decision to pursue paediatrics over other specialties. The specialty-related factors included a preference for working with children and young people, as well as the particular knowledge and skills associated with paediatrics. Personal factors included their own perceived personality and personal circumstances.

An earlier study reported that good working conditions were likely to encourage a trainee to pursue a specialty (Cleland et al, 2016) which contrasts with the findings from these repertory grid

interviews. Data from this study has shown that despite reporting that paediatrics was associated with poor working conditions, the trainees still selected the career path. Therefore, the influence of working conditions was either excluded when making the specialty choice, or that the sum total of the favourable features outweighs an unfavourable environment. However, with dwindling paediatric specialty training applications, it suggests that fewer junior doctors are likely to accept poor working environments.

9.1.2 RQ2: What are the intended career choices of foundation year 2 (F2) doctors?

Questionnaire data revealed that less than half of the F2 doctors in the Health Education North East and North Cumbria region were intending to apply for a specialty-training programme to start the next year. This is similar to published data (RCPCH, 2011; Sivey et al, 2012; Department of Health, 2017; Foundation programme, 2018; Foundation programme, 2019), showing that year by year, the number of F2s entering specialty training is reducing. For those not applying to training, the most popular alternatives were to travel in a non-working capacity, followed by gaining locum posts within the UK, and then international work.

Paediatrics was the 6th of 16 most popular specialty choice for F2 doctors, with 13% of respondents identifying they were likely to apply to the training programme. General practice and core medical training were the most popular choices, with 36% and 27% of responses respectively, although it is notable that many of those who selected these specialties also selected another specialty. Previous literature has demonstrated that these are considered to be 'hard to fill' specialties, and therefore further work to identify why this initial interest is not progressing to actual uptake of posts is needed.

Extrapolating this data, if 13% of all UK F2s were to apply to paediatrics, this would result in 975 applicants for 379 posts (Department of Health, 2017). This sounds very positive for the future of paediatrics. However, if only 30% of these doctors actually applied in the next academic year, as demonstrated by the questionnaire data, this would mean only 292 applicants for paediatrics.

Therefore, paediatrics would be more dependent on either returning out of programme or internationally trained junior doctors.

This study was conducted prior to the implementation of the UK leaving the European economic union and before the COVID-19 pandemic. These events have impacted foundation trainee career plans, resulting in improved numbers of paediatric training applications (HEE, 2020a) due to difficulties with international travel and gaining work visas. However, it remains to be seen whether the situation will revert as the pandemic recedes.

9.1.3 RQ3: What factors influence the career decisions of F2 doctors at the point of application?

F2 doctors reported multiple influences on their career decisions at the point of application to specialty training. The data can be summarised as showing that career decisions are based on two key elements: the features of influence and the 'high stakes' of the decisions.

Previous literature has confirmed that the timing of applications is an influencing factor to specialty training (Evans et al, 2002; Baruch, 2004; Moss et al, 2004) and in specialty choice (Borges and Savickas, 2002; Mwachaka and Mbugua, 2010). However, the emotional drivers of career choice have not been described to date, though the affective impact of high stakes decision making is a prominent feature among the theoretical career decision making and psychology papers (Bandura, 1971; Lent et al, 1994; Kanfer and Heggestad, 1997; Lent et al, 2000; Deci and Ryan, 2011).

9.1.3.1 Common features of influence

There was variability between which features of specialties were desirable to individual doctors. For example, perceived high competition for posts was seen as positive for some who identified this as demonstrating the desirability of the specialty, whereas for others this was off-putting as they believed it would result in less chance of gaining an acceptable post. However, while there was variability between which particular features of specialties were desirable to individual

doctors, *how* one specialty was selected over another was more consistent. All the F2s described that they wanted to work in a specialty they enjoyed for its clinical content, there were five different ways in which junior doctors described identified what would be enjoyable.

Firstly, the F2 doctors identified when and where they learned about specialties of interest, and the importance of experience. They indicated that their previous working experiences were the most influential when selecting a specialty and allowed them to make value-based decisions on whether or not the specialty was worth pursuing.

Secondly, they discussed their personal interests and skill sets as being influential when picking a specialty, believing that some skills were more suited to certain specialty careers. Some described that they had purposefully set out to improve their skills in particular areas so that they would be more competitive in that working environment, and this subsequently gave them a feeling of confidence in their choice.

Thirdly, F2s indicated the value of guidance from others. Family members were able to have both positive and negative influence on decision making. F2 doctors also sought the advice of specialty trainees within the programmes they were considering for a career.

Fourthly, junior doctors were concerned with having adequate staffing in a particular specialty and the NHS as a whole. Data collected during this project repeatedly identified under-staffing, unfilled posts, increased workload and, increasing patient numbers without corresponding increases in staff, as significant negative influences on specialty training.

Finally, although the media often portrays doctors as being driven by financial influences (Lefever, 2012; Hopkins, 2016; Pocklington, 2016), little discussion of this appeared in this study. NHS England (2019) has successfully used financial incentives in recruitment of GP trainees to less popular areas for training, which resulted in 10% increased fill rates for these areas in 2016 (NHS England, 2019). However, this data indicated that finances have a limited role in selection of a specialty career. UK training programmes have the same pay structure, therefore hypothetical financial incentives, as described by Cleland et al (2016), are unlikely to have real world relevance. Instead, financial

considerations are likely to be undertaken for those wanting either less than full time training or private work. The role of private work was documented in the questionnaire data, although interviewed F2s did not expand on this.

9.1.3.2 High stakes

The decision to apply to specialty training is a high stakes process. There was an assumption that making this choice was final for the junior doctors, and that once a specialty was selected, they were on a fixed pathway towards consultancy. Therefore, the F2s considered if they were making the right choice when selecting a specialty career. Here, the timing of applications was pivotal, and there were emotional effects seen as making the 'right' choice.

Timing: When to apply to specialty training

Some foundation doctors in this study applied to a specialty training programme on the basis that they were ready to enter specialty training. This perceived 'readiness' was most influential at the point of application, as if they did not believe they were ready, the foundation doctor would defer application (Evans et al, 2002; Moss et al, 2004). To be 'ready' the F2 had to have enough information on specialties. Hence some of the F2s felt that making an application during their first F2 rotation was problematic as they did not yet have wide enough experience. They had already identified that working experience shaped their understanding of the specialty career options better than previous experiences, but the timing of applications allowed for working experience of 4 specialties only, and this was insufficient to make a high stakes choice.

Control

The F2s described that they needed some control in their personal and working lives. Often this was stated in the context of taking time out of training, taking on a trust grade, teaching fellow or locum job. They shared a feeling that they needed to get 'off the treadmill' and have time to consider

their options at their own pace. A benefit of this choice was the potential to increase the clinical exposure to particular specialties, in addition to the control in where or how a junior doctor wished to work.

One feature of control was the geographical location of working, which is confirmed by the literature (Arnold, 2004). Some F2s discussed that certain specialties were limited in the location of posts, and they considered this a compromise in their decision-making, resulting in deferral of application to specialty training to regain control of their location. Many specialty training posts expect trainees to travel long distances or move to distant sites for rotations, which impact on families and partners. Therefore, perversely, deferring an application to specialty training can allow for more stability in the junior doctor's home life.

Therefore, it may be pertinent to consider moving the timing of applications or streamline the process of taster experiences to increase working experiences. Alternatively, modifying how specialty training posts are located may encourage F2 doctors to enter training programmes, with particular focus on traveling distance and region-wide opportunities for specialisation.

Emotional effects of choice

When considering the emotional responses associated with specialties, the most prominent of these was anticipated pressure. Pressure included the subjective stress of managing and being responsible for unwell patients, as well as perceived external deadlines (such as e-portfolio requirements, audit deadlines and submission dates for conferences). Pressure was seen to be influential when trying to decide if they wanted to enter a training programme or not, but also to make the right choice of specialty. A frequent comment was that they were not in a rush to complete training and become a consultant. Instead, the F2s were keen to take their time to master the specialties they were interested in.

Pressure was also associated with the day-to-day workloads within the NHS, with respondents identifying that they were pressurised to get jobs done with little time or resources to allow them to

achieve the best outcomes for themselves and patients. Often this included staff shortages, which were associated with increased attrition and subsequently additional shortages. This pressure therefore was regarded as a deterrent for undertaking specialty training by some of the F2s, who felt they could achieve more outside of training, and often outside the NHS system.

The second emotional theme was a feeling of compromise. The F2s acknowledged different aspects of compromise. Some F2s reported that they made sacrifices throughout their career by giving up their free time to complete exams and other activities that would give them a competitive advantage. In turn, this led to some of the respondents planning to achieve these goals prior to starting a training programme. Some felt that the compromises varied by specialty, and for a few of the F2s this was a deterrent.

The third theme was uncertainty. Many of the F2s had concerns about uncertainty in the future and reported that they needed confidence in their own skills as well as career choices. Some felt that possible future changes in their personal circumstances could influence their decisions now. Notably, F2s who described themselves as older were more likely to consider this as a greater influence to ensure their personal lives also flourished. Many F2s were unsure if they would still feel the same about a specialty after going through an 8-year training programme. Due to perceived uncertainty in the political climate, and the perceived negative impact this had, junior doctors wanted to ensure they had transferrable skills with the ability to change specialty careers in the future. They felt that their career decisions may not be permanent due to potential changes to the NHS and would consider working abroad instead.

Another key theme was a sense of value. Not only needing to feel valued within a role now, but also in the future. F2s reported that they wanted a specialty career which valued them as trainees and was demonstrated through quality training.

9.2 Paediatrics as a career choice

Chapter 9.1 has described influences on junior doctors' preferences in careers overall. This next section will discuss the influences for paediatrics.

Paediatric careers were associated with good communication skills, support from seniors and identification of role models. F2s who were interested in paediatrics often described an inherent enjoyment of the specialty, a preference for run-through training and they reported good multidisciplinary working within the specialty. Some F2s described elements of clinical work in paediatrics, such as non-accidental injury assessments, as off-putting to a paediatric career. In addition, further deterrents were a lack of flexibility within paediatric training programmes which was attributed to either location of posts, working hours, attrition, and lack of staff. One F2 identified that many current paediatric trainees are demoralised by specialty training overall due to perceived exhaustion amongst the workforce.

The interviews identified a need for female role models, particularly in paediatrics. While literature reports that there is a disproportionate number of women working within the specialty (Dossajee et al, 2016; Kawamoto et al, 2016; Kim et al, 2016), these doctors may be working less than full time, or in less visible roles compared to the male paediatricians. GMC (2017b) data reports over 50% of paediatricians are female, but around 70% of those under 40years old are female. This suggests that female paediatricians are likely to be working in junior roles and hence there is a perceived lack of senior female role models within the specialty.

Overall, F2s described that their exposure to paediatrics is inadequate. They have reported that there are minimal paediatric foundation programme placements, but medical school placements are artificial and do not allow for exposure to sub-specialty paediatrics. This has resulted in foundation doctors believing that the skills they obtained through adult medicine and surgery jobs are not transferrable to paediatrics and subsequently they rule paediatrics out as a career.

9.3 Frameworks of career choice

This work reinforces earlier findings identifying important factors which inform the choice of specialty careers (Lambert et al, 2003; Fysh et al, 2007; Spooner et al, 2017a; Bassett et al, 2018). The next step is to consider how the individual junior doctor makes their career decisions. Unfortunately, in striving for generalisable data, the literature has often excluded the importance of the individual experience in the process of medical career decision-making. The way each factor may influence individuals is different, and therefore difficult to summarise. Existing literature has attempted to address this shortfall by use of push and pull factors.

Pull factors are features of a chosen specialty which are regarded positively, and push factors are negative features of other specialties. For example, for some, shift pattern working is more attractive due to having a variety of working hours, and therefore they would seek out specialties which feature this, such as accident and emergency work. Others may find shift patterns are not appropriate to their lifestyle, and therefore actively reject specialties that include such working, despite any attraction of clinical content.

Push and pull factors have been described in the context of the migration of newly qualified junior doctors to more attractive locations (Sheikh et al, 2012; Kizito et al, 2015; Scanlan et al, 2018); and employee intentions in leaving work overall (Estryn-Behar et al, 2010; Nauta et al, 2010). However, which factors are considered push or pull for various specialties is an individual preference, and their importance changes over time, neither of which are adequately explored in the literature.

Using the mixed methods approach, the data from this study has not concluded which influences are most important overall. Instead, the data documents how the person, time and specialty interact through consideration of internal and external influences. This is expanding on existing literature. In addition, influencing factors at different stages in the personal and professional lives of the F2 doctors have different prominence. For example, some F2 doctors considered their personal lives currently as having a greater influence, through consideration of family situation or partner's work. Whereas for others, it was more important to consider their personal career goals at

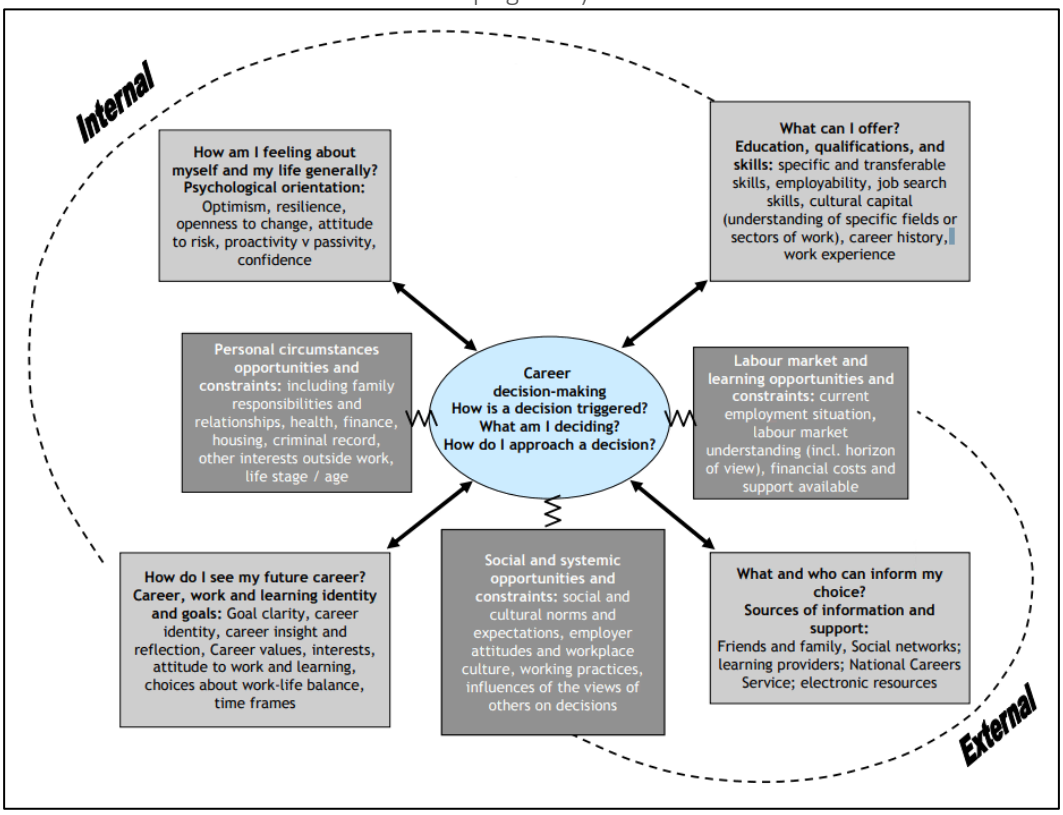
the time of application to specialty. Therefore, the next section of this chapter will discuss models of career decision making and their relevance to medical career choices.

Two frameworks have been used to structure the findings of this study to determine how career decisions are made. The first is a model designed by Gloster et al (2013), which focuses on '*what'* influences choice, and provides a framework for categorising influences as either internal or external to the individual. The second model is based on the career decision model of Lent et al (1994) which was identified in chapter 2. This model demonstrates that there are dynamic changes in the importance of relevant factors and documents *'how'* an individual moves through the process of decision making, considering different factors along the way. The use of these frameworks has allowed for creation of specific medical decision-making models which are not seen in existing literature.

9.3.1 Internal and external influences

Existing medical literature describes factors involved in career choice as seen in chapter 3. Some of this literature includes features of processes in decision-making but they do not describe them as a process. Gloster et al (2013) describe both factors and the process of career choice by describing influences as either internal or external to the person (figure 26). However, their model is not specific to medical careers. Therefore, I have expanded understanding by applying Gloster et al's (2013) model to medical careers.

Figure 26: Influences on adult career decision making (taken from Gloster et al, 2013, page 14)



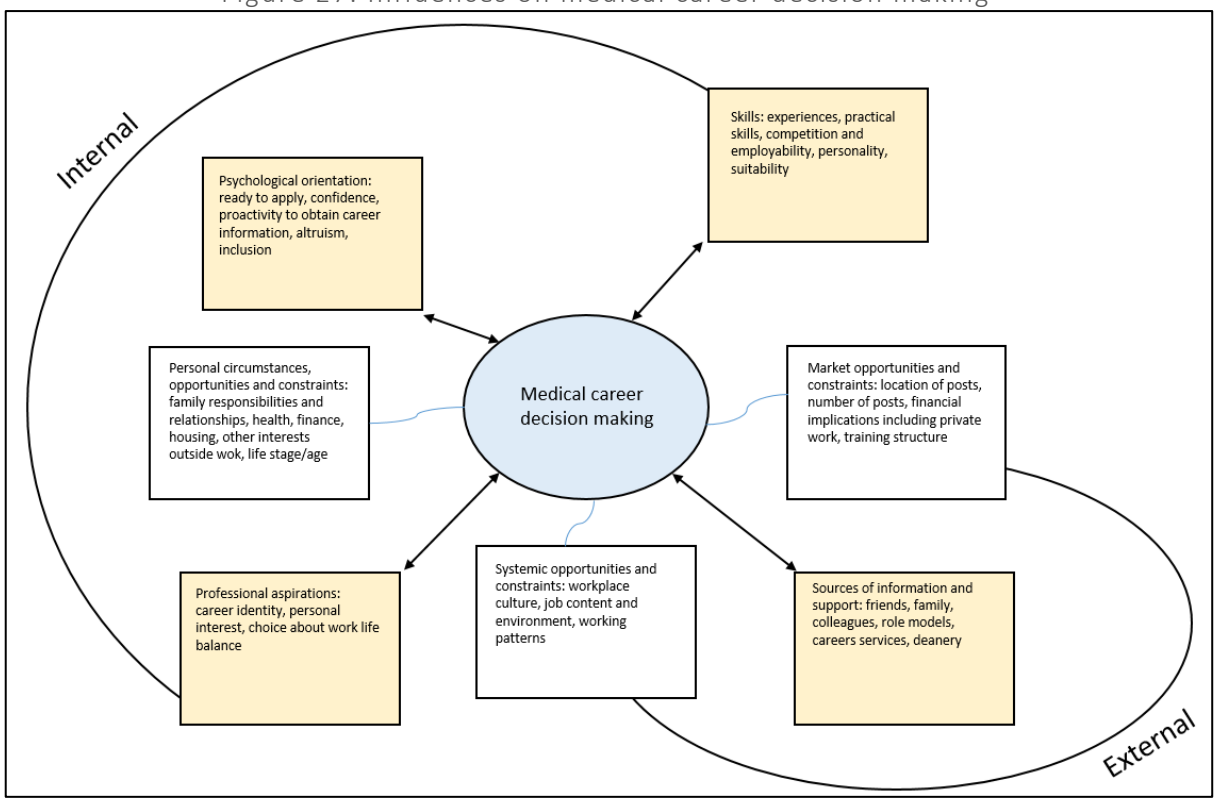
Gloster et al's (2013) model demonstrates that internal influences are the personal circumstances, the psychological orientation, career goals and personal skills, whereas external influences include sources of information or support, systematic opportunities, and labour market opportunities. This model was developed through research for the Institute for Employment Studies following interviews with adults who had required career support (Gloster et al, 2013).

Their model is also split into career issues (light grey boxes) and opportunities or barriers (dark grey boxes). They demonstrate that career issues have a two-way relationship to the individual, whereby the individual can modify the issue, or the issues can modify the individual's decision (Gloster et al, 2013). This is represented by two-way arrows. Opportunities or barriers on the other hand are often considered factual and hence amenable to system changes only, these are shown with a zigzag line (Gloster et al, 2013).

9.3.1.1 Medical model of internal and external influences

Many of the features from Gloster et al's (2013) work are relevant to medical career decisions but there are some medical career specific influences. Therefore, Figure 27 shows an updated version of Gloster et al's (2013) model based on data from this study, and the medical education literature. This is described in the next section. It is notable that the literature focuses on medical students, where the balance of the internal and external influences is slightly different to junior doctors. This study is therefore expanding on both the model and the knowledge base within medical education.

Figure 27: Influences on medical career decision making



Model modified from Gloster et al (2013)

9.3.1.2 Modified internal influences

Gloster et al (2013) describe internal influences as based in the way the individual sees themselves, their career, and their situation. Figures 26 and 27 show four areas of internal influence, with more career issues rather than opportunities or barriers (Gloster et al, 2013).

Table 14 demonstrates how Gloster et al's (2013) model has been adapted to be specific for influences in medical specialty career decisions.

Table 14: Career issues and opportunities or barriers of internal influences on career choices, Gloster et al (2013) model vs new medical career model

Gloster et al (2013) non-medical model	Medical career model
Career Issues	
Education, qualifications, and skills: specific and transferrable, employability, job search skills, cultural capital (understanding of specific fields or sectors of work), career history, work experience	Skills: experiences, practical skills, competition and employability, personality, suitability
Psychological orientation: optimism, resilience, openness to change, attitude to risk, proactivity v passivity, confidence	Psychological orientation: ready to apply, confidence, proactivity to obtain career information, altruism, inclusion
Career, work and learning identity and goals: goal clarity, career identity, career insight and reflection, career values, interests, attitude to work and learning, choices about work-life balance, time frames	Professional aspirations: career identity, personal interest, choice about work-life balance
Opportunities or barriers	
Personal circumstances, opportunities, and constraints: family responsibilities and relationships, health, finance, housing, criminal record, other interests outside work, life stage/age	Personal circumstances, opportunities, and constraints: family responsibilities and relationships, health, finance, housing, other interests outside work, life stage/age

*This table I have cited the career issues, opportunities and barriers of medical careers drawing on the framework of Gloster who described their findings of adult career support and career decisions

The literature documents work life balance (Lambert et al, 2003; Currie et al, 2007; Lambert et al, 2017b), career interests (O'Donnell et al, 2010; Smith et al, 2015; Lambert et al, 2017b), skills (Kanfer and Heggestad, 1997), and work experience (Lefevre et al, 2010; Firth and Wass, 2011) as significant influences supporting the data in this study. The specialty trainee interviews identified themes of skills, working patterns and personal circumstances. The questionnaire data demonstrated the importance of training flexibility, subspecialisation and the required skill of decision making. The foundation doctor interviews highlighted skills and suitability, personal interests, exposure as well as working patterns as influential.

Career Issues

The first career issue was that of education, qualification, and skills. Inherently, the general population compared to doctors have more variable education and qualifications. However, all junior doctors have medical degrees, and many have additional degrees. Therefore, this section in the medical career model is labelled 'skills'. The data in this study has highlighted the importance of experience to develop skills which in turn have led to a belief of suitability for a speciality. Alongside this, many of the F2s in this study felt that certain personalities are more suited to specific specialty careers which also connects to Kanfer and Heggestad's model of motivational fit (1997) as described in chapter 2.

The area considered as psychological orientation by Gloster et al (2013), encompassing readiness for change and new challenges, has been adapted to consider readiness to apply to specialty training as well as confidence, and proactivity to obtain specialty specific career information. In contrast to general career influences, the F2s interviewed spoke about the importance of inclusion when identifying features associated with a good day at work (chapter 7.4.3). In addition, some F2s spoke of altruistic features of medical careers, and this is also seen in the literature (Pratt et al, 2006; Price, 2008; Ossai et al, 2016; Puertas and Rivera, 2016; Osborn et al, 2017).

The final career issue as described by Gloster et al (2013) was that of career, work and learning identity and goals. Medical career issues can be streamlined to 'professional aspirations'. This describes the junior doctor's career identity, personal interests, and work-life balance. It can be considered that this area of internal influences is most interlinked with other areas, for example work life considerations are inherently linked to family responsibilities and interests outside of work.

Opportunities or barriers

Gloster et al (2013) considered personal circumstances and the opportunities or constraints on career choice as the final internal influence. For junior doctors, a criminal record will likely exclude them from continuing in the profession. Otherwise, many of these circumstances are relevant for

medical and non-medical careers alike. Some are more prominent barriers, such as many junior doctors are older than those in other occupations when deciding to have children (Gjerberg, 2003; Poole, 2017) and this is likely to impact on their career decisions more so than the general public.

9.3.1.3 Modified external influences

Gloster et al (2013) describe the external influences as the wider environment. Figures 26 and 27 shows 3 areas of external influence, with more opportunities or barriers compared to internal influences (Gloster et al, 2013). These external influences are more likely to be modifiable on a large scale or institutional basis, such as the organisation and duration of training programmes. Again, a comparison table (table 15) highlights changes based on this study data and the existing literature (Lent et al, 2000; Sinclair et al, 2006; Morra et al, 2009; Greenbank, 2011; Crump et al, 2013; Cleland et al, 2016).

Table 15: Career issues and opportunities or barriers of external influences on career choices, Gloster et al (2013) model vs new medical career model

Gloster et al (2013) non-medical model	Medical career model
Career issues	
Sources of information and support: friends and family, social networks, learning providers, national careers service, electronic resources	Sources of information and support: friends, family, colleagues, role models, careers services, deanery
Opportunities or barriers	
Labour market and learning opportunities and constraints: current employment situation, labour market, understanding (incl, horizon of view), financial costs and support available	Market opportunities and constraints: location of posts, number of posts, financial implications including private work, training structure
Social and systemic opportunities and constraints: social and cultural norms and expectations, employer attitudes and workplace culture, working practices, influences of the views of others on decisions	Systemic opportunities and constraints: workplace culture, job content and environment, working patterns

*This table I have cited the career issues, opportunities and barriers of medical careers drawing on the framework of Gloster who described their findings of adult career support and career decisions

Career issues

The career issue identified as an external influence by Gloster et al (2013) is that of sources of information and support. Many of the same features were seen in this study, with specific influences

of colleagues, role models and the deanery or LETB. One specific area of influence from family members was in facilitating work experience when at school, triggering an interest in medical careers and sometimes preference for specialties. It is unlikely the junior doctors would have obtained careers support from the national careers service as much of the advice is generic regarding medical careers, whereas the F2s were needing more specific information to weigh up different specialties.

Opportunities or barriers

The first external opportunity or barrier to medical career choices was the market opportunities and constraints. This feature was the most different to Gloster et al's (2013) model. This study has demonstrated that location of specialty training posts, number of available posts (including number of posts dependent on location), and training structure options were all significant when deciding a career specialty. Location and number of specialty posts are allocated by the Royal Colleges, based on needs identified through the Department of Health, and therefore their decisions directly impact the number of F2 doctors willing to apply to each specialty. The F2 interview data describes that some F2s are reluctant to apply to highly competitive specialties. Offering multiple training posts is likely to encourage these junior doctors to apply to these programmes, but also increases choice for all junior doctors looking to apply to specialty programmes as there is increased availability.

The second external opportunity or barrier of market opportunities as described by Gloster et al (2013) highlights the wider societal and cultural norms as well as employer attitudes. For specialty training, the employer is the NHS irrespective of which specialty is chosen. Therefore, the impact of employer attitude is less. There may be individual nuances between training programmes and NHS specialty needs instead. The data in this study has demonstrated that job content, working environment, culture and patterns are important in medical career decisions. There were clear distinctions for junior doctors considering working environment, and many of the participants in this study identified preference for either community or ward-based work.

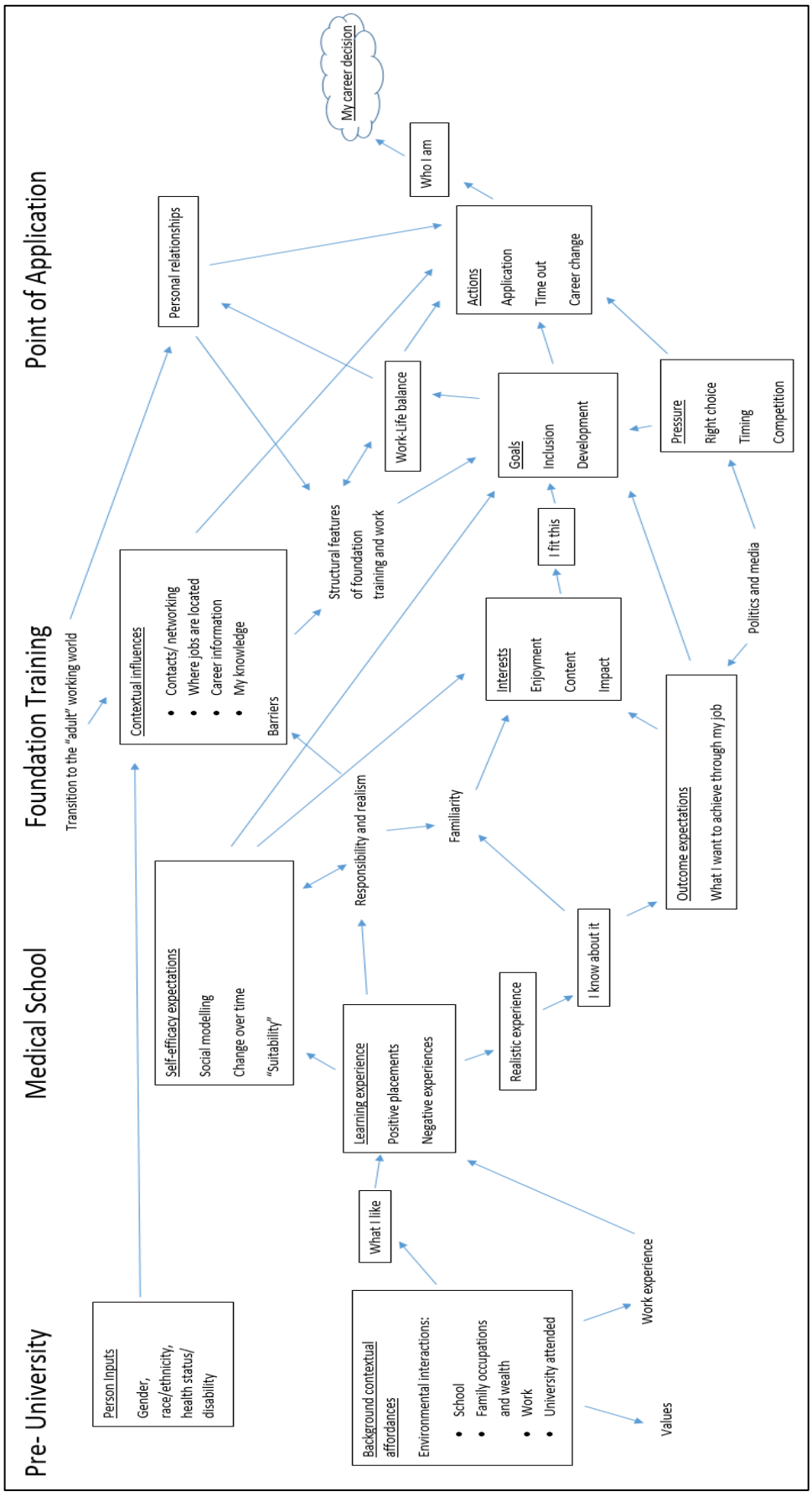
9.3.2 A model of medical career decision making

The previous section considered *what* the individual influences on specialty career choices for junior doctors were, but not *how* they interplay to lead to a decision. In this next section, the dynamic relationship of these influences over time is discussed.

This project has identified that medical career decisions develop over time, and a model of longitudinal decision making has been created to demonstrate the influences at each stage. Theoretical work on career choices identified similar timeline models in the decision-making process (Levinson,1978; Flum and Blustein, 2000). Few medical career choice papers acknowledge this progression towards a career decision, instead, they imply that influences are fixed and non-modifiable (Currie et al, 2007; Cleland et al, 2012; Subba et al, 2012; Lambert et al, 2017b).

This model is based on the work by Lent et al (1994), described in chapter 2, who documented that the dynamic process of career choice had biological, social, psychological, and environmental influences. In addition, this model identified complex reciprocal linkages between influences which were based on work by Bandura (1971). Gloster et al's (2013) work is comparable: internal features of career choice include self-efficacy, outcome expectations and creation of goals demonstrating personal agency of career development, whereas external influences include physical attributes of careers, environmental features and learning experiences (Lent et al, 1994). Pfarrwaller et al (2017) demonstrated that Lent et al's (1994) work did not account for specifics within medical career choices, and hence can be improved for application to medicine. This study confirms that influences in medical specialty career decision making are present in the years before university and are expanded on during medical school, foundation training and up to the point of application to specialty training programmes. This extends our understanding of the decision-making process, as well as providing a more detailed demonstration of the longitudinal medical specialty career choice framework (figure 28).

Figure 28: Longitudinal medical specialty career choice framework based on Lent et al (1994)



To illustrate the model, an example of a junior doctor considering their specialty career options is described here. Based on the literature, workforce data and the data collected here, the junior doctor who is likely to consider a paediatrics career is likely to be female. She may have had work experience or a previous job working in the NHS with young people which has created a sense of understanding and enthusiasm for paediatrics. During medical school, she had positive student experiences of the specialty, typically with a female paediatrician as a role model and she believed she was gaining a learning experience that reflected authentic practice in the specialty. During foundation training, although she may have considered roles in adult medicine, general practice or emergency medicine, this junior doctor enjoyed working with young people. She also identified that her communication skills, interest in holistic care and interest in procedures would fit with a role in paediatrics. However, she may have considered her age and her own personal relationships, deciding that she wanted to have children prior to specialty training and ultimately decided to take time out of training resulting in a deferred application to specialty training.

In contrast, a junior doctor who considers surgical training is more likely to be a male doctor who values career progression, practical procedures and individual clinical decision making. They may be encouraged into specialty applications based on their previous research exposure, scope for skill development and opportunity to have time out of training after the short core surgical training scheme.

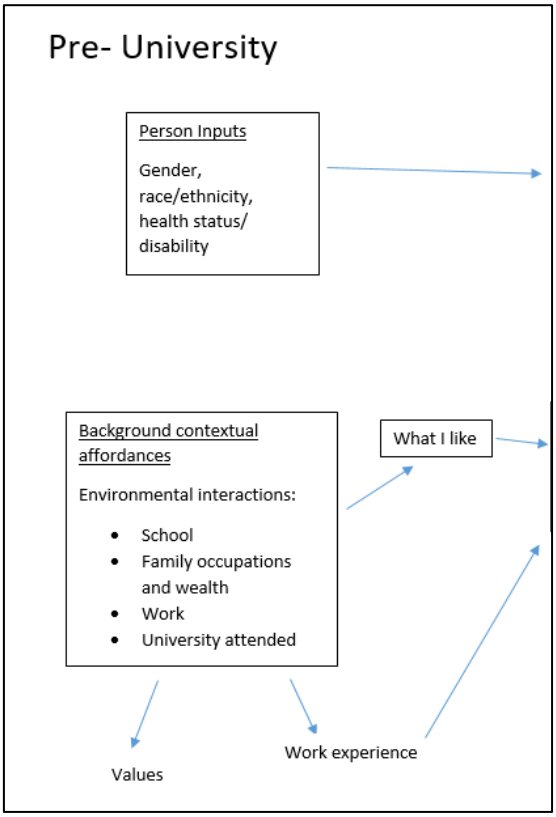
By breaking down my model in the next part of this chapter, consideration of how these interlinked influences compare and interact is discussed in context of the individual stages of the model.

9.3.2.1 Pre-University

Figure 29 demonstrates that influences on career choice progress from person inputs and background contextual affordances which are identified prior to starting medical school. This medical

model has two additional features of work experience and altruism in comparison to Lent et al's (1994) work.

Figure 29: Longitudinal medical career choice framework pre-university stage



Person inputs

Person inputs are the non-modifiable characteristics of an individual, and they remain the same as Lent et al's (1994) definition. As highlighted in chapter 2 the use of demographics to determine influence on career decision making is contentious. Data in this study confirmed the influence of gender in specialty career selection. F2 doctors reported that paediatricians were likely to be female but struggled to explain why. Gender stereotyping is seen in the literature (Muldoon and Reilly, 2003) and gender can influence clinical interests (Querido et al, 2016) however this is likely to be from socially constructed patterns. Therefore, background contextual affordances may have a bigger role in influencing career decisions.

Background contextual affordances

Background contextual affordances are the environmental events that shape a person, opportunities, or environmental barriers, that provide personal beliefs and interests. This provides a starting point of specialty interest. The affordances in medical career decision-making are more specific than those described by Lent et al (1994).

The data collected in this study has shown that school experiences, family occupation, family wealth, paid work and university selected all influence medical career choices. The literature corroborates the data with examples of influence from parents and previous academic achievement as instrumental in influencing choices associated with university (Alloway et al, 2004). In addition, knowledge of the workplace (Price, 2008), encouragement into medical school application based on school wealth (Steven et al, 2016), family wealth and career aspirations (Hall, 2004) are described in existing literature. One such example from my data is a F2 commenting that because their parent was a GP, they viewed it as an attractive career and have subsequently applied for GP training. In addition, the literature describes that the type of medical school curriculum selected, traditional or problem-based learning, may demonstrate an association for certain specialty careers (Cleland et al, 2012; Amgad et al, 2015; Nicholson et al, 2016; Tsigarides et al, 2017).

Work experience

The F2 interviews demonstrated that many work experience opportunities were based on access to family or friends within the medical professions. This is an area with little focus in Lent et al's (1994) model. This access is directly related to the background contextual affordances of the individual and their social capital. In addition, it is apparent that many fee-paying schools encourage students towards medical professions and have links with clinicians to provide work experience. In comparison, state funded institutions may rely on government or individual university schemes to help those interested in a medical career. These inequalities are reported by numerous sources

including Henderson et al (2019), as well as through polls by YouGov charity Future First (2016), upReach charity (Lough, 2019) and the Debretts foundation of etiquette (Siddiqui, 2015).

Values

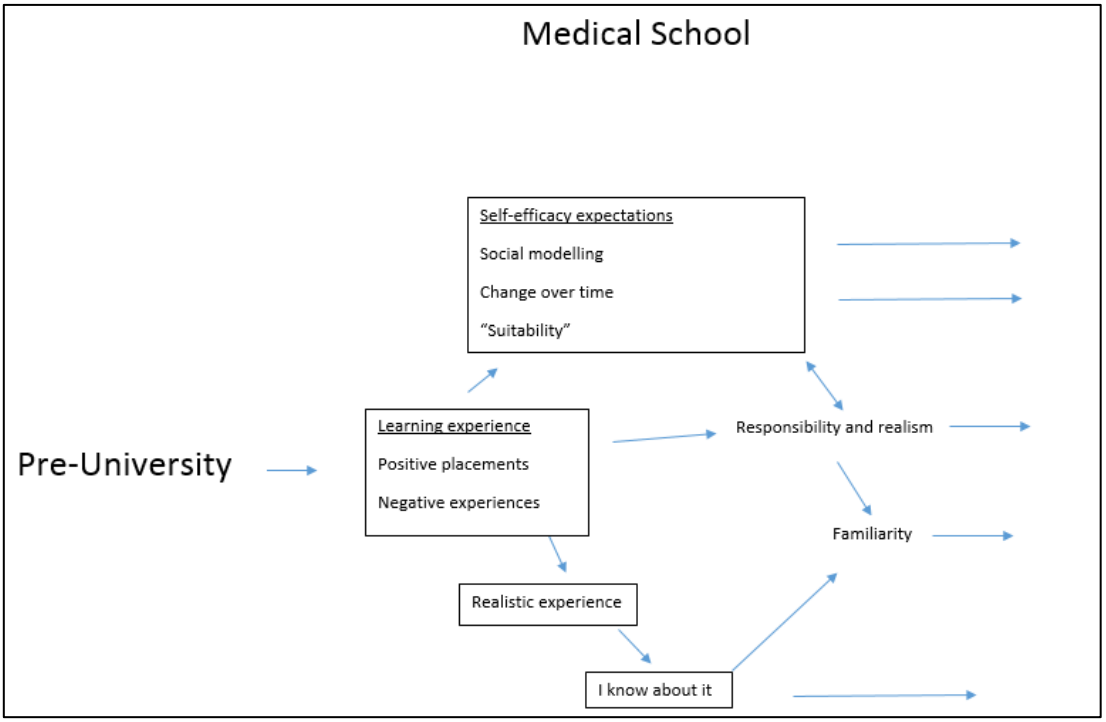
The F2s reported a need to help others as a starting point for a medical career, and some reported an influence of faith. Pre-university influences combine to provide a personal standard of altruism. Literature demonstrates both this altruistic influence on choices, as well as perception of 'noble career' as a motivator for pursuing healthcare roles (Price,2008). However, once qualified, these were no longer significant influences on nurses, and portrayal of this ideal may in fact be detrimental to job satisfaction (Price, 2008). This confirms that influences may wax and wane in importance when considering career choices. Sometimes, the attractant of prestige disappears once the university course begins (Pratt et al, 2006).

In keeping with previous literature, this pre-university phase is associated with sowing the seeds of interest in medical careers, although definitive specialty is unlikely to be fully recognised and has potential to change with additional influences.

9.3.2.2 Medical School

In this study junior doctors reported that they obtained most information about multiple specialty career options during medical school. Influences also waxed and waned during medical school, based on positive and negative experiences of different placements, to ultimately create a sense of suitability. Again, expanding on the model by Lent et al (1994) they identified a need for realistic experience, responsibility, and familiarity in comparing possible specialty careers (figure 30). The data in this study did highlight the importance of exposure, and this is most influential for smaller sub-specialties which must squeeze into densely packed medical school curriculums. It can therefore be postulated that specialty gaps may start at this point in the career decision process.

Figure 30: Longitudinal medical career choice framework medical school stage



Learning experiences

The learning experiences of medical school have significant influence in career decision making. In keeping with the literature (Kerfoot et al, 2005), the importance of student exposure to develop knowledge and understanding of different specialties was highlighted by the F2s. Positive specialty experiences led to interest in a specialty career, identification of role models and confidence with perceived specialty specific skills (Burack et al, 1997; Dornan et al, 2006; Pratt et al, 2006; Trotter and Roberts, 2006). This was highlighted extensively during the foundation doctor interviews whereby the participants spoke of how they knew about different specialty careers and that university placements had allowed them access to a variety of specialties.

In contrast, negative experiences resulted in specialties being discounted. In this study, F2s reported gender stereotyping during student placements, lack of inclusion or inability to contribute, and lack of exposure to patients as being negative experiences. Importantly, the literature describes that negative opinions formed during medical school persist and are carried forward to their foundation training (Massoni, 2011). Frequently these negative experiences are unable to be

modified by the student themselves, and may require a wider, organisational change (Burack et al, 1997; Muldoon and Reilly, 2003).

Realistic experience

In this updated model, there are 2 areas of realism to consider and are related to authenticity and are preparative. Authenticity is the understanding of what it is like to work within that environment, team, or role. Often this includes the emotional associations of work, such as being tired, stressed or satisfied with personal performance. Preparative realism is how medical students assess what the day to day lives of junior doctors are, typically what activities and clinical cases they are likely to encounter.

The first of these areas follows directly from the learning experiences. The data has shown that junior doctors needed realistic experiences regardless of whether or not medical student learning experiences are positive or negative. Literature highlights the value students place on realism (Reeves et al, 2002) and that day-to-day life working in medical careers is best achieved through early and intensive clinical exposure (Burack et al, 1997). Many of the F2s in this study felt that their medical school experiences of specialties were not realistic reflections of what working in the specialty as a career would involve. They reported that careers information sessions were artificially positive, and even during their rotations they were often presented with specialist or rare cases, which did not represent the day-to-day working of the specialty.

The second feature of realism leads to understanding of the responsibility of specialty careers. The direct observation of clinical specialties allows medical students to develop understanding of working practices, skills and patient interaction which is then used to imagine themselves in the role. The F2s frequently reported that as students they felt in the way of clinical staff or that they did not belong in the clinical environment. This then distracted the students from the reality of the specialty.

Self-efficacy expectations

Self-efficacy expectations stem from the ability of medical students to imagine themselves as competent in various career situations. The data demonstrated that this develops over time, with more junior medical students casting their 'careers net' wider, narrowing down their interests and skills as they progress through medical school. Ultimately this is where they develop ideas about being suitable for and having aptitude for one specialty career over another. Again, this is through observation of medical staff while on placements and discussion with their peers.

Often, medical schools identify the latter years of medical school for career counselling sessions. Grasreiner et al (2018) confirm that students who are undecided on specialty career choices are open to career counselling in their final year of medical school and first year of foundation training. However, the foundation doctors interviewed in this project identified that careers counselling is often lacking, describing it as un-realistic due to talks being used as 'up selling' a specialty, which the F2s did not trust to be a true representation of the career.

Familiarity

The time spent at medical school can be seen as the phase whereby students 'know about' multiple career options. This is the development of familiarity with difference specialty types, for example surgical verses medical specialties. The F2s identified the importance of role modelling, discussion of stereotypes with peers, and direct clinical experience which also included acceptance into the clinical environment as allowing them to achieve familiarity of a specialty. The F2s in this study reported developing understanding of the clinical skills required within specialties during medical school and attributed a personalised acceptability to each of these skills.

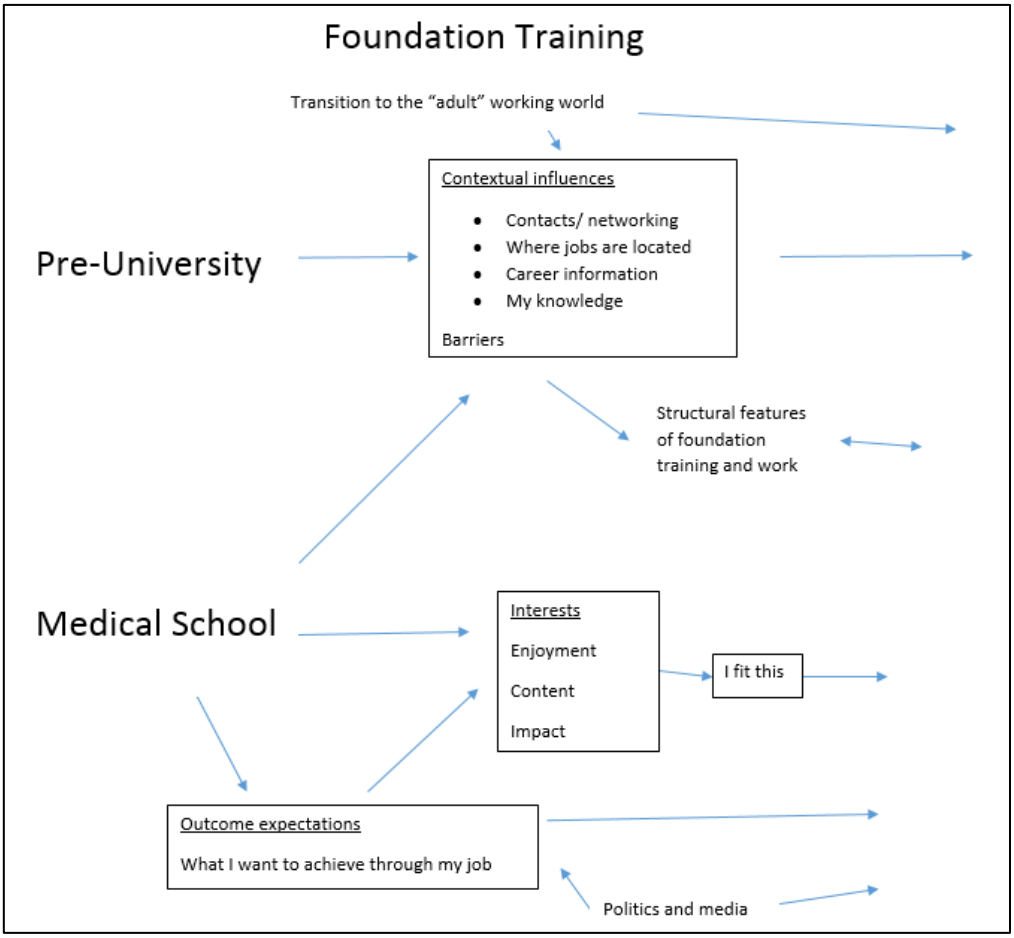
Overall, the time spent in medical school gave the junior doctors the ability to try out different roles or specialties, some of which they may have never previously considered or been aware of. This is seen in the literature, where a "language of possible selves" (p 535, Burack et al, 1997) equates to the consideration of different career choices and is a personalised imagination of

the self in different career possibilities. This information is then built upon during foundation training programmes.

9.3.2.3 Foundation training

During university, most understanding of specialties came from observation, with weighing up positive and negative features, whereas in foundation training there is a change in how the junior doctors learn about specialties in depth. During foundation training, career decision making takes place through comparing work to university; comparing specialties to each other; and what is it like to be a working junior doctor. Burack et al (1997) identified that there was a process of discovery and comparison to the self when making a career decision. The data confirms this, as during foundation training, F2s determined where they fit within medical careers. Previous influences experienced as school students and university students combined with day-to-day events such as working hours, and external influences such as the political landscape (figure 31). This gives the foundation doctors experience they feel is authentic to clinical practice; authenticity that they desire and value and creates expectations for their own role as doctors in the future.

Figure 31: Longitudinal medical career choice framework foundation training stage



Transition to 'adult' working world

When comparing work to university, and the transition to employee from student, there are some harsh realities for Foundation doctors. They need to juggle their clinical responsibilities, their own learning and development, the expectations of seniors and ultimately the accountability for their decisions. University experiences have largely been provided for their benefit, whereas with the focus on service delivery in Foundation Programme many foundation doctors identify they are at the 'bottom of the pecking order' (Brennan et al, 2010).

In addition, the data from this study identified a conflict between seeking out specialty career information and their role in service provision. Foundation doctors need both the time and access to clinical specialties to formulate their career path. However, with pressures on the NHS as a service, they frequently struggle to achieve this, with the data demonstrating organisational priorities of administrative work and difficulty in accessing specialties impedes their learning.

Contextual influences

Contextual influences such as location of jobs, clinical knowledge, and careers information play a big role in specialty comparisons. The experience gained from who F2s work with shapes how they view individual specialties through role modelling and the team atmosphere. Both the people encountered, and the clinical role may lead to additional opportunities such as research or audit. F2s can marry this information up with careers advice, although as demonstrated in the F2 interviews, the latter may not be adequate or well timed. Ultimately this information experienced allows the foundation doctors to consider their options, create goals and subsequent actions. The goals are discussed further in chapter 9.3.2.4 and focus on the achievable features of work.

Structural features of foundation training and work

Structural features impact lifestyle choices for junior doctors. This includes rotas experienced or training programme structure, and this can significantly outweigh the enjoyment of some specialties for some foundation doctors as they would be limited in their non-work activities. For many junior doctors, foundation training is their first paid employment, with effects on their personal relationships and lifestyle. Foundation training is the time when junior doctors are becoming settled in their personal lives, and therefore an understanding of work-life balance is developing into ideas for the future to what they want to achieve outside of work. Structural features are assessed individually and then a decision made to what is more important, lifestyle features or intrinsic interest (Petchey et al, 1997).

Outcome expectations

As discussed in chapter 2 Lent et al (1994) describe the outcome expectations as rewards associated with a career. The data collected demonstrates that many of these outcome expectations for medical careers could be perceived as perfectionism or idealistic beliefs about one specialty over

another. Participants spoke of being able to achieve work life balance with controllable working hours, being able to pursue topics of interest irrespective of departmental need or the emotional impact of the specialty. The F2s described how they want a career to make them feel, focusing on a sense of fulfilment. Confirming this, Smith et al (2015) conclude that the role of personal fulfilment increases in importance each year following graduation. Through comparing their working experiences to their medical student experiences, the F2s were able to describe not only the positive and negative features of different specialties, but also the impact specialties had on them, again echoed by Brennan et al (2010). This creates a constraint whereby working experience of a specialty is needed to consider it as a career.

Politics and media

Overall societal structures influence perceptions and expectations of young people, their careers, and their long-term futures. In some cases, these are specific events, such as the corona virus pandemic of 2020, alternatively, more subtle influences impact on people's experience of the world. The roles of the 2016 junior doctor contract dispute and 'Brexit' were significant in shaping respondents' views during the F2 interviews.

The public portrayal of junior doctors has been seen to negatively impact foundation doctors' enthusiasm for working within the NHS (Spooner et al, 2017a) following the junior doctor contract dispute. Many participants stated this had highlighted other features of work as being important when selecting a specialty. This included identifying specialties with transferrable skills, flexibility, and social working hours rather than subspecialisation, prestigious working locations or clinical interest. For some, the media portrayal of 'Brexit' has resulted in them feeling unwelcome living in the UK despite working for the NHS and hence were considering leaving the UK permanently.

Interests

During foundation training, junior doctors evaluate their familiarity and presumptions of what they can achieve across different specialties. This allows the junior doctors to create a list of features of specialties that they deem important (Antoniou et al, 2003). Often, enthusiasm for a specialty is stated to be the most important feature during selection of a specialty (Smith et al, 2015). To obtain this enthusiasm, the junior doctors may compare the clinical content of each specialty, but ultimately it is how they *feel* about each one that has the strongest influence. This is often an emotional response, rather than a cognitive or analytical deduction of factors, which echoes Kahneman's (2011) two system decision making process. This feeling in part results from the impact the specialty had on them, but also what they expect to be able to obtain from the specialty.

During the interviews F2s noticed different factors that they could influence, and some which they could not, that would ultimately identify what they wanted to do. This echoes the Gloster et al (2013) model, whereby there are both career issues as well as opportunities and barriers which influence career choices.

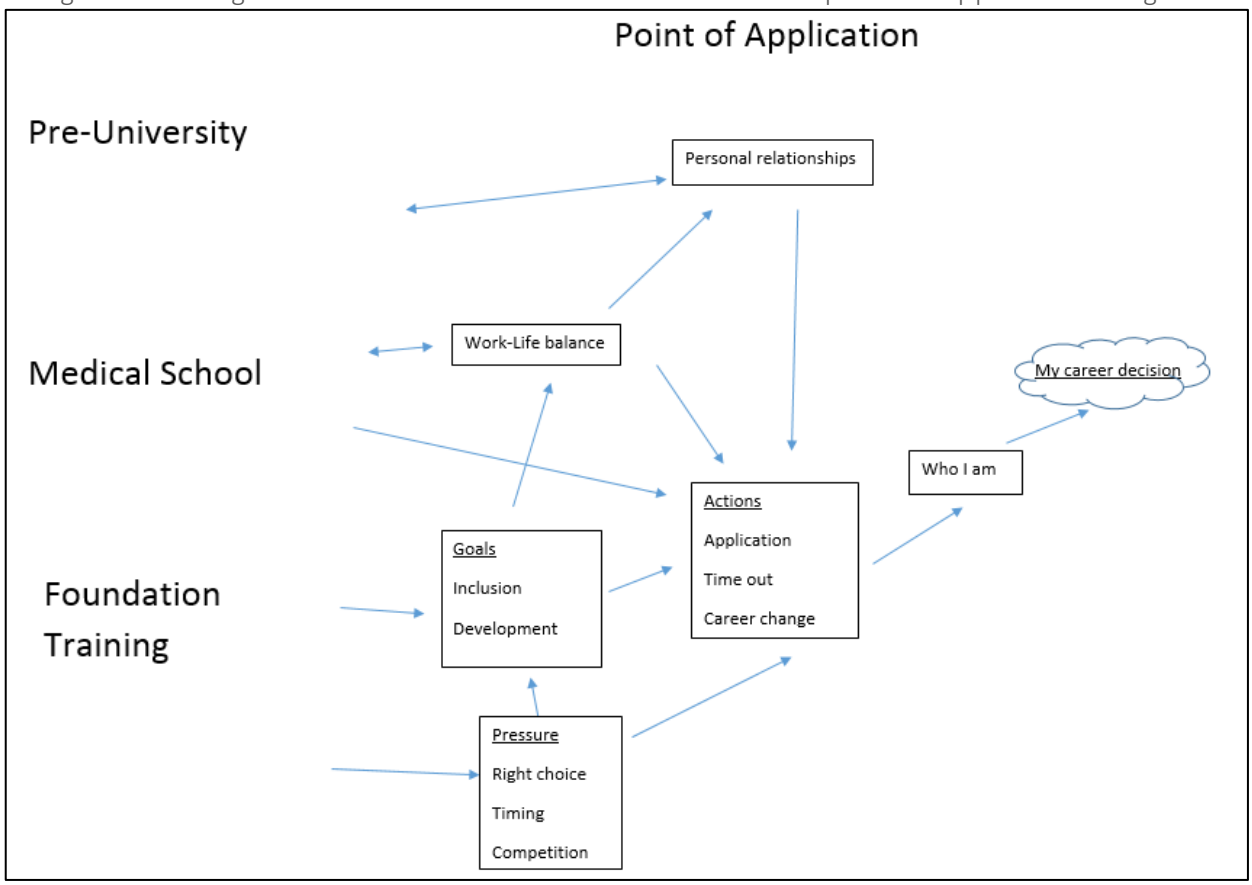
At this point of the model, decisions form part of the 'head versus heart' debate. For some junior doctors, there were few conflicting features and progression to the next stage of application was easy. However, for others, they did not have enough information to make a choice. They attempted to determine if they 'fitted' a particular specialty or not, but with limited information and hence needed to weigh up further options at the point of decision making, the application deadline. This is discussed in the next section.

9.3.2.4 Point of application

As junior doctors near the point of application to specialty training, they seem to evaluate their current work life balance, the perceived work life balance of career options and its correspondence to their personal relationships. It is at this point whereby a Foundation Year 2 doctor

decides if they are going to apply to specialty training or not, and the various reasons for either option become more apparent (figure 32).

Figure 32: Longitudinal medical career choice framework point of application stage



Personal relationships

The F2s reported the importance of stability within their working lives to progress their personal relationships or family situation. For some, the influence of their partner's work, such as location or working hours, can detrimentally impact on their own opportunities for specialty career choice. All the study participants stated that they sought support from family members, partners, and friends, often also within the medical workforce, when making specialty career decisions.

Work-life balance

The junior doctors in this study repeatedly referenced the importance of a 'work-life balance' numerous times, something which is heavily featured in the literature (Bindal et al, 2010; DeZee et al, 2013; Gloster et al, 2013; Osbourn et al, 2017). Within the literature review of chapter 3, work-life balance was framed in context of home life vs working life, with influences of gender, geography, and finances. This study data has confirmed these features, but also that their relevance peaks at various stages of the career decision process.

Pressure of decision

Frequently the pressure experienced by F2s is that of making the right choice of specialty, the right choice of location, the timing of the application in relation to foundation training and the uncertainty that they have the right attributes to obtain their chosen specialty post. Many of the F2s interviewed spoke of the sacrifices and additional requirements needed to be appointable to certain specialties, and that this was too much for them to consider those specialties for a career. This feature of the decision process most heavily affects the F2's actions at the point of application.

Goals

Foundation doctors have personal goals affecting their decisions. Based on Lent et al's (1994) work, this area is implicit for all careers and are the self-motivating factors that guide actions. This is different to the outcome expectations, as goals are the realistic aspirations of careers whereas outcome expectations were idealistic emotive features of careers. The goals for the junior doctors are to ensure that they continue to develop as practitioners and the need for inclusion as part of a team. There is a need to feel valued within a specialty, something currently lacking among paediatric trainees (Shabde, 2006; MDDUS, 2013; HHE East of England, 2016; Somauroo, 2016; Redman and Payne, 2019). Opportunities for professional development are also important, some value the ability to subspecialise clinically and hone their skills to one particular area; others aim to achieve a level of

competency across multiple areas clinically; some wish to extend their practice beyond clinical work and take on leadership or management roles.

Actions

The point of application identifies that foundation doctor application intentions are split. One half of foundation doctors appear able to make a specialty career decision, whereas the other half do not. Both groups have had the same opportunity to weigh up previous experiences, compare it to their current personal situation and future projections for careers and personal lives.

Those who determine that they are able to apply to specialty training state that they feel they know enough about their intended specialty. Often these F2 doctors have clearly defined career goals and ultimately believe it is the right time to apply to training.

In contrast, those who do not feel ready to apply to specialty training state they do not have enough information to make a career decision, and instead state they are under pressure to make the 'right choice'. In particular, the questionnaire data demonstrates that few F2s feel they are informed enough to make a long-term career decision, and hence consider time out of a training programme.

Some F2s have not yet found a specialty which they believe they fit with. These are the F2s who are likely to defer application to specialty programmes to instead take up locum or trust grade posts with the aim of experiencing specialties in greater depth to determine if they do indeed 'fit'.

Other F2s feel like they are stuck on a 'treadmill' of training and want time away from the constraints of training programmes, either to travel, work abroad or consider alternative careers. When reviewing the demographics of F2s, most are aged 25-27 years, single and have no dependents. They are in a position which allows ostensible career freedom due to the lack of dependants yet financial security, which is different to other professional groups. Both sets of F2s not intending on applying to specialty training often state that the pressure of choice is detrimental to their career progression.

The F2s at the point of application have considered their options and determined what they see themselves as: what type of clinician they are and what they want their career to be like. Some need to take time out off training to achieve this. Therefore, it is at this point where gaps in specialty applications are felt, and regarding paediatrics this is likely to be detrimental as the F2s acknowledged there is significant concerns about attrition from the programme already.

9.4 Future strategies to improve recruitment

The data has improved understanding on specialty recruitment issues: application to medical school, specialty selection and application, as well as retainment of medical staff. This next section discusses how improvements could be made.

9.4.1 Medical school recruitment

Applications to medical schools are on the decline as seen with offers of clearing places (Aggarwal, 2016; SGUL, 2017). How medical careers are perceived by the public, media, schools, family, and friends shape initial thoughts about getting into medical school. Medical careers need to be appealing to school students regardless of background to ensure a breadth of personalities, skill sets and personal interests to fulfil service needs of all specialties.

One option may be to lower the requirements to obtain a place at medical school to increase applications. Currently, those selected are those who have the highest academic grades, work experience, commitment to the career and attributes that are considered in keeping with the image of a 'doctor'. Alternatively, increasing the number of medical school places could reduce the requirements for each applicant, as there will be more slots to fill, the 'second best' applicants will have a better chance of gaining a place. Other options focus on widening participation schemes (Garlick and Brown, 2008; Griffin and Hu, 2014); or reducing (or removing) tuition fees for medical students, particularly those who are postgraduate applicants.

9.4.2 Specialty selection and application

F2s have reported difficulties in deciding when to enter specialty training, and for some, which specialty to pursue. Structural changes to the progression of medical careers may be able to alleviate some of these difficulties.

9.4.2.1 Structural changes to medical careers

The data confirms few F2s intend to go straight into training, feeling unable to make a specialty choice at that point. In an ideal world, junior doctors want to consider all their options and have working experience of all specialties they consider. One consideration could be enforcement of taster experiences. Currently, taster experiences require extensive planning by the foundation doctor, and study participants reported barriers in their own rotas to this. If slots of sufficient length were built into F1 rotas, there would be no unplanned absences of junior doctors and this could broaden the working experience to six different specialties before specialty applications are required.

Considering that there are fewer F2 doctors applying to specialty training year on year (Aggarwal, 2016; RCPCH, 2017), it may be pertinent to consider that all junior doctors would prefer to take a year out of structured training following the foundation programme. If it becomes expected that F2 doctors do not apply to specialty training, the perspective that there is a lack of applications to specialty programmes changes and rather than being considered as a recurrent anomaly, instead it becomes actively managed or integrated into normality. Therefore, it may be worth considering a planned foundation programme year 3, whereby the junior doctors select one or two specialties of their interest to work in following their F2 year. This may reduce the number of F2s who consider locum work or trust posts following foundation training.

9.4.2.2 Specialty selection and attraction

Overall, the data has shown that junior doctors prefer short training programmes, run through programmes, and those with flexibility. Addressing some of these elements could be used by struggling specialties to entice applications. Alternatively, more 'generic' training programmes could be created. This could be similar to the broad-based training programme of 2013-2015, which allowed experience of four specialty programmes before entry to a chosen specialty in the ST2 year (Rowell and Hayden, 2012; Sherlaw, 2015). A possibility would be to offer one year of either 6 month or 4-month rotations that are counted as part of training in groups of related specialties, for example paediatrics, general practice or accident and emergency medicine. In similar fashion, core medical training was replaced by 'internal medicine' after the shape of training review in 2019 with the aim of increasing skills and reducing rota gaps in adult medicine (HEE, 2020c).

General practice and psychiatry have had an increase in positive marketing towards medical students, focusing on the attractive potential lifestyle or work life balance of these specialties (Shrestha and Joyce, 2011; RCPG, 2020; RCPSYCH, 2020). If paediatrics were to market their specialty, the focus should centre on support and inclusion, as those interested in paediatrics reported it helped attract them towards the specialty. Some hospital trusts encourage mentor schemes for specialty trainees, whereby more senior trainees support the newer specialty trainees. This could be extended to include foundation doctors, using a volunteer scheme, to provide additional support for those foundation doctors who feel that they do not know enough about a particular specialty.

Conversely, issues around working environments in paediatrics needs to be addressed. The ST1/2 data demonstrated known issues with paediatric working environments, and with declining applications to the speciality it is likely that the number of junior doctors willing to tolerate this flaw is also on the decline. To encourage those who are undecided about paediatrics as a career, development of positive working environments should be encouraged on both a local and national scale. Some system changes, such as offering flexible working patterns, may reduce barriers to

decision making, but will be restricted by workforce numbers, amount of frontline care needed as well as multidisciplinary team commitments.

9.4.3 Retainment of trainees

Newspapers report a massive 'brain drain', whereby large numbers of junior doctors are leaving the NHS (Aggarwal, 2016). Push and pull factors are considered as influential in movement of trainees (Estryn-Behar et al, 2010; Scanlan et al, 2018) and need to be addressed when considering attrition.

From this study, potential improvements include ensuring that training meets trainees' expectations. The bottom line for this is that junior doctors feel that there are not enough doctors to do the job and train well as well as have a personal life. This personal life was referred to extensively by the F2 doctors, often referencing the need to be in a specific location due to family members or partners. Currently specialty training posts are only tied to a region, and for the North East and North Cumbria region in particular, this can result in individual rotations being many miles apart. This is not conducive to a work life balance, with junior doctors either needing to be prepared to move frequently or accommodate extensive commutes impacting on personal time. One way to address this, would be to have rotations within training to only include sites within a short driving distance of each other grouped together. This could also potentially reduce some concerns about driving incidents following on call shifts (Barger et al, 2005).

9.5 Strengths and weaknesses

As identified in chapter 4, there were various strengths and weaknesses of this study.

9.5.1 Strengths of the project

Strengths of this project include the use of mixed methods, careful piloting processes and detailed literature review to ensure rigor, credibility, and validity.

This project looked specifically into the choice of paediatrics as a career; no previously published UK paper investigated how or why junior doctors select paediatrics as a career and therefore this project has added significantly more understanding to this process.

9.5.1.1 Literature review

The systematic literature review demonstrated that choice of specialty career is not limited to a section of the medical workforce, has relevance internationally, and has been an area of interest over time. It confirms that medical career choices have changed since MMC.

The reliance on surveys of medical students in the literature resulted in a lack of knowledge of influence at the point of application. Therefore, this project has been able to expand knowledge on junior doctor specialty career choices, as well as the process of medical career decision making.

One reason why literature focused on medical students may be that access to students is much easier for those undertaking qualitative research, who frequently are based in university settings, whereas junior doctors are likely to be spread over a significant geographical region, resulting in reliance on support from non-clinical staff.

9.5.1.2 Methods

Mixed method designs which include both qualitative and quantitative data demonstrate validity and rigor through correlation of results, and hence an overall depth of understanding is achieved. At each data collection stage, piloting was conducted to confirm reliability of methods. By using each data set to inform the next stage of investigation, triangulation was achieved.

Construct validity was observed in the use of the repertory grid, which allowed a broader understanding of positive and negative influences in any specialty choice. The technique of repertory

grid was able to identify constructs which were easily defined, understandable and transferable. This allowed for creation of a validated tool for investigation and hence confirms methodological rigor.

Statistical data of the questionnaire is directly comparable to existing literature and expands on existing knowledge as few published papers have considered all specialty choices available, and no UK based papers focus on the selection of paediatrics as a career choice.

Content validity was addressed by participation of junior doctors representing the range of responses in both interviews and the questionnaire. This study included 41% of regional F2s who represented those applying and not applying to specialty training, as well as those interested, uninterested and undecided about paediatrics. Furthermore, demographic data of the questionnaire was comparable to previous studies (Smith et al, 2014; GMC, 2017b; Ryan et al, 2018; Woodward et al, 2018).

9.5.1.3 Personal perspective

As a junior doctor I had insight into the responses of participants, including a shared understanding of the application process for specialty training, as well as the deferral of this decision. At the time of data collection, I was a teaching fellow clinically working in paediatrics. This was valuable to identify and maximise recruitment of participants- by being flexible with data collection times and settings - in addition to understanding of clinical terms and activities. My own experience of specialty training selection allowed me to delve past superficial responses during the F2 interviews and get to the heart of participants' decision-making.

As this projected progressed I had become a paediatric trainee, progressing through the junior roles and across various subspecialties within the region. Experiencing first-hand the difficulties with trainee retainment and safe staffing increased my engagement with the findings of this project. In contrast, it also increased my frustrations with the data which demonstrated dissatisfaction with training programmes as a whole, and lack of appreciation of the variety of clinical work found in paediatrics by some of the respondents.

I had previous experience in medical education research which provided a basis on how to construct and conduct this study. This thesis has allowed me to increase my qualitative researcher skills by providing me with a need to conduct both structured and semi-structured interviews, creation of a questionnaire based on data, deeper appreciation of theoretical literature outside of medical research and an appreciation of additional statistical methods. By conducting this rigorous medical education project, it has not only enhanced my own critical thinking skills, given me opportunities to present and be critiqued on my research, but also given me an appreciation of my own role now as a paediatric registrar in supporting junior colleagues in career choice.

9.5.2 Limitations of the project

In contrast, the limitations of this project relate to participant numbers, issues around responses in the questionnaire, as well as timing and researcher influence. At various stages of this thesis, it has been highlighted that the geographical diversity of the region potentially has limitations on the data collected. There is a risk that some viewpoints have not been accounted for due to this. One feature of concern may be the unintentional biases seen in recruitment, some of which may be experienced when describing inclusion in considering working culture.

9.5.2.1 Participant numbers

The ST1/2 interviews had a small number of participants, however, these 5 created over 160 constructs resulting in 10 themes. This is considerably more than previous studies which on average generate less than 25 constructs per interview (Bannister, 1968; Fransella et al, 2004; Curtis et al, 2008). By the third interview, no new construct theme was described demonstrating 'saturation' of data and hence the impact of a small number of participants is minimal.

9.5.2.2 Questionnaire responses

Instructions were provided but without attending all the sessions where the questionnaire was distributed, there was potential for individuals to interpret items differently and the scale of responses differently. Hence there was a potential threat to content validity which was mitigated by use of piloting that deemed the questionnaire included appropriate instructions and therefore, conclusions remain trustworthy.

9.5.2.3 Timing of F2 interviews

The F2 interviews were conducted after the point of application and hence the F2s may not have recognised their feelings towards specialties or influencing factors in the same way as they had additional working experience. This could adversely affect credibility, however pragmatically this was the best opportunity to conduct those interviews as the questionnaire was undertaken at the time of specialty application, and this needed analysis before interviews could be performed.

9.5.2.4 Researcher influences

Interpretation of any interview transcript is shaped by the researcher's experience and knowledge. In this case, analysis has been undertaken by a junior doctor working in the same specialty and geographical area as participants. As identified in chapter 9.5.1.3, many of these features are strengths of this project. However, there was potential for my own experiences to impact on the data. By taking an approach that used a of repertory grid technique, anonymised questionnaire, and semi -structured interviews based on the participants' response to the questionnaire, the effect of this bias is reduced. The impact of this reflexivity has been identified earlier and justification of the process has been described in the methodology chapter. A particular mitigating factor was the process by which I encouraged F2s to expand on their responses in the F2 interview stage to ensure rigor. This was achieved by tailoring questions to the individual's questionnaire response, and then moving on to questions about paediatrics irrespective of their

intention to apply to the specialty or not. My interpretation may have been shaped by my experience, and some bias cannot be excluded. However, the review, and critique, of my interpretation and explanation by supervisors in comparison to existing literature through the process of triangulation has mitigated this.

Finally, as a female, mixed-race junior doctor with clinical interest in paediatrics, I had not anticipated the risk of gender and race being excluded from the data, and hence I did not seek out responses in relation to these factors. It is an omission likely based on regional bias that participants did not volunteer information regarding race or ethnicity. Therefore, the influence of these factors is unintentionally overlooked, and the data could be enhanced upon by conducting this study again in a region with increased diversity.

9.6 Further potential research

This project has looked at influences on career choices made by F2s and expands on previously published work, but alternative approaches could be considered. Previous work has focused on medical students, with some data on the career intentions of students with longitudinal follow up.

9.6.1 Paediatric longitudinal studies

There are numerous options for longitudinal studies, whereby identification of influences earlier in the specialty selection process can be reviewed at various time points to determine persistence and importance. A recent paper on early experiences of general practice may demonstrate possibilities for paediatrics (Agravat et al, 2021). A study on the influences seen in school age students and their opinions of paediatric careers could be conducted allowing for longitudinal follow up work in medical school, foundation training or specialty training.

Examples of possible longitudinal studies includes follow up of the F2s from this study to determine if the same influences are relevant once in specialty training. Alternatively, interviews with paediatric senior registrars and consultants, to identify changes from their training to current training programmes, and what they think could be done to help with retainment of specialty trainees, could be undertaken.

Instead, follow up work could be with those F2s who were deferring specialty training. This could determine if deferral allowed them to achieve what they expected, if it impacted their plans for specialty training and, for those who planned to move abroad, if they returned to the UK with additional skills or knowledge that is beneficial to their chosen specialty career.

Other options include research with new, year 1 specialty trainees to determine their path of application to the training post, identifying whether they are entering training following foundation programme completion or if they took an unconventional route. If these trainees had not entered specialty directly following F2, it would be valuable to discuss what the influences were for their return to a training programme.

9.6.2 Other specialties of interest

Considering options for other specialties, research could be carried out in the same way as this project but with a focus on other specialties thought to be in need, or other regions of the UK. There was an active decision in the statistical methods used in this study to identify the choice of paediatrics or not, however if other specialties were of primary interest, the binary logistic regression could be done for those specialties individually. This could be useful to triangulate the process, but the results were not relevant to the purpose of this thesis and hence have not been performed. This further research may identify if influences on paediatrics are different to other specialties; if other regions of the UK have different pressures compared to the North East and North Cumbria; and potentially target improvement options in recruitment and retainment for other specialties or regions more specifically.

10. Conclusions

This project has identified influences in specialty career selection, the process of selection and approaches to improving recruitment and retention of trainees with emphasis on paediatrics.

Specialty careers are chosen through several internal and external influences. Overall, these influences work together to identify a specialty which is enjoyed, suitable, and allows junior doctors to achieve their career goals.

10.1 Paediatrics

Paediatrics is an attractive specialty career to those who value practical procedures, communication skills, individual clinical decision making, ward-based work, multidisciplinary teamwork, as well as a mixture of acute and chronic patient care. Junior doctors report that paediatrics features a high-pressure environment, related to care co-ordination roles such as resus management or safeguarding assessments. The shortcomings of paediatrics include perceived high competition, attrition, and workloads (Goodyear, 2009; Bindal et al, 2010; Goldacre, 2012; Shortland et al, 2015). It is also associated with difficult working patterns, inflexibility within training and geographical restrictions. Foundation doctors who identified themselves as interested in subspecialisation are less likely to consider paediatrics as a career, which is surprising due to the extensive number of sub-specialties within paediatrics.

10.2 Process of career choice

For all junior doctors, there is a progression of influencing factors over time. Some of these influences are more prominent at certain times in the process of career choice. Influences are seen prior to starting medical school, whereby various opportunities create an initial interest in medical careers. This is developed through university and foundation training up until the specialty application deadline. At this point some F2 doctors are able to apply to a specialty training programme and some are not, due to concerns about lack of specialty awareness, and the high stakes nature of their choice.

10.3 Recruitment and retention

This project has also identified approaches to improve recruitment and retention of specialty trainees. The data and existing literature demonstrate that a systematic approach may be most beneficial. Previous system changes, such as the Modernising Medical Careers initiative, aimed to result in highly motivated practitioners working in their preferred specialty areas. Evidence from this study and existing literature suggests this has not been achieved (Moss et al, 2004; GMC, 2018). The full impact of the Shape of Training review is yet to be seen, although many of those suggestions do not address the career concerns of junior doctors raised in this study. Instead, an overall acceptance that trainees need time out of structured training or have the option to select training experiences more easily would enhance how junior doctors explore career options. This would result in more motivated junior doctors, who feel valued and are enthusiastic for their chosen specialty career.

11. Word count: 55,304/ 60,000

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13. Appendices

Appendix A = Pilot repertory grid interviews

Table 1: HEE specialties and their involvement in this pilot study

Training programme	Used in pilot study?
ACCS Emergency medicine	Yes as ACCS
Anaesthetics (including ACCS)	Yes as ACCS
Broad Based Training	No
Cardiothoracic Surgery	Yes as Surgery
Clinical Radiology	Yes as Radiology
Community Sexual and Reproductive Health	Yes as Community Sexual Health
Core Medical Training (including ACCS)	Yes as General Medicine
Core Psychiatry Training	Yes as Psychiatry
Core Surgical Training	Yes as Surgery
General Practice	Yes as GP
Histopathology	Yes as Lab Based
Neurosurgery	Yes as Neurosurgery
Obstetrics and Gynaecology	Yes as Obs&Gynae
Ophthalmology	Yes as Ophthalmology
Oral and Maxillofacial Surgery	Yes as Maxfax
Paediatrics	Yes as Paediatrics
Public Health	Yes as Public Health

Table 2: Example using fruit as a triad to generate constructs as part of Repertory grid

1. Similar		Different	2. Similar		Different	3. Similar		Different
Orange		Banana	Banana		Apple	Apple		Orange
Apple			Orange			Banana		

Comparison	Similar to each other	Different from
1.	Grow in Europe	Grow in tropics
1.	Round	Not round
2.	Peel skin	Eat skin
2.	Exotic	Local
3.	Sweet	Tangy

Table 3: TF1 constructs

Surgical	vs	Little surgery
End specialty	vs	Springboard to specialty
“Big personalities”	vs	Variety of people within job
Small specialty	vs	Big specialty
Standard route of entry	vs	Dentistry and medicine needed
High on call work	vs	Little on call as a consultant
Medical theory	vs	Procedure based
Female patients	vs	Mix of patients
Not run-through	vs	Run through training
Lone working	vs	Team working
Less competitive	vs	Competitive
Varied people within specialty	vs	Specific type of person (e.g. “bolshie”)
Hospital based	vs	Community based
Full time	vs	Part time trainees
Communication skills	vs	Little emphasis on comm skills
Gaps in rotas	vs	Easy to fill posts
Only child patients	vs	Mixed patients
Acute presentations	vs	Chronic presentations
Pre-hospital medicine	vs	Less involved at acute stage
Core rotations then reapply	vs	Run through specialty
Able to subspecialise	vs	No subspecialisation
Minimal patient contact	vs	Patient contact
Primary science	vs	Clinical
Microscope based	vs	Macro skills
Women’s health	vs	Not gender specific
Medical	vs	Surgical
Female staff	vs	Male staff
Public health	vs	Not focused on preventatives
Medical degree	vs	Non-medical degree
Admin heavy	vs	Clinical
Non-clinical team	vs	Clinical teams e.g. Nurses
Work with dentists	vs	Little contact with dentists
9-5 job	vs	Out of Hours/On call work
Single organ specialty	vs	More varied
Expanding patient population	vs	Static patient population

Table 4: TF2 constructs

Prevention of disease	vs	Treatment and management of disease
MDT interest	vs	Facts and theory
Individual	vs	Social
Communication skill to patients	vs	Interprofessional comms skills
Patient contact	vs	Broader picture
Community based	vs	Hospital based
Overlap of presentations	vs	Single system
Sensitive issues	vs	Less sensitive/private issues

Medicine	vs	Surgical tasks
Broad range of conditions	vs	Similar presentations
Procedures planned	vs	Acute procedures
High responsibility	vs	Lower responsibility
Litigation	vs	Less litigation
Patient contact	vs	Interpretation of results
Emergency patients	vs	Non-emergency based
Shift pattern work	vs	On call at home
Those who thrive on “busy-ness”	vs	Don’t like high pressure environment
Factual or black/white	vs	Influences and broader scope
Enjoys procedures	vs	Don’t like practical tasks
Interest in research	vs	Less interest in research
Adult patients	vs	Child patients
Broad range of problems	vs	Specialised
Those who like patients and communication skills	vs	Enjoy procedures or the underlying condition
Medical training	vs	Mixed training
Time with patient	vs	Short attention span
Medical treatment	vs	Surgical treatment
Emergency patients	vs	Not acute patients
Like a work-life balance	vs	Lots of out of hours rotas
Emergency plan	vs	Time to think
Short attention span	vs	Want to spend time
Interested in background of patient	vs	Concerned with acute presentation
Part time working	vs	Difficult to be part time
1st presentation of patient	vs	Referred patients
Similar mix of patients	vs	One type of patient
Little patience	vs	Patient
Single system based	vs	Multisystem

Appendix B = Repertory grids

Interview 1

26yr female, ST1 paediatrics in HENE. Currently working in cardiology in specialist centre. Triads compared:

1. ACCS, surgery and radiology
2. Paediatrics, medicine, ACCS
3. Paediatrics, medicine, surgery
4. GP, paediatrics, surgery
5. Medicine, surgery, GP

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	Triad number	Theme
See patients	1	1	1	1	1	5	Pictures	1	Skills involved
Unwell patients	2	2	4	3	2	5	Any patient	1	Patient type
Like pressure	2	1	4	2	1	4	Like to take time	1	Working environment
Like practical	3	1	4	3	2	3	Don't like practical	1	Skills involved
On call	3	3	2	3	5	1	Shift work	1	Working pattern
Generally medicine	1	5	3	2	3	3	Non-medical	2	Knowledge base
Broad	1	3	1	1	3	5	Specific	2	Knowledge base
Like mix of things	1	5	1	1	3	5	Want specific role	2	Skills involved
Own specialty	1	3	1	3	5	1	Pathway to other specialties	2	Knowledge base
Adults	1	3	3	5	2	3	Kids	2	Patient type
Similar conditions	1	5	1	5	1	1	Specific illnesses	2	Knowledge base
medicine	1	5	3	2	1	3	Surgery	3	Working environment
Think about problem	1	5	1	1	3	2	Practical "DIY" fixing	3	Skills involved
Spend time with patient	2	5	1	1	3	5	Little time with patient	3	Patient interaction

Ward based	1	5	1	1	3	3	Theatre based	3	Working environment
Long term patients	1	5	1	1	5	5	Short stay patients	3	Patient type
Consider whole patient	3	5	1	1	5	5	Consider 1 problem	3	Patient interaction
Consider patient and family	5	5	1	1	5	5	Just patient	3	Patient interaction
Consider acute problem	3	1	5	5	1	1	Consider long term issues	3	Patient interaction
Less fun	1	1	1	5	1	1	Fun	3	Working environment
Know patient less	1	1	5	5	1	1	Get to know patient	4	Patient interaction
Context of problem	3	5	1	1	5	5	Fix problem	4	Skills involved
Want to build relationship with patient	1	5	1	1	5	5	Want to do something practical	4	Skills involved
Think about life outside of work	2	5	1	3	5	3	Training more important	4	Personal circumstances
Consider own family	1	5	1	3	5	1	Training higher in priorities	4	Personal circumstances
Easier to be part time	1	5	1	1	5	1	Hard to be part time	4	Working pattern
Only see one type of problem	5	1	5	5	5	1	Range of problems	4	Skills involved
Hospital based	1	1	5	3	1	1	Community based	4	Working environment
Long training	1	1	5	1	5	5	Short training	4	Training
specialist	5	1	5	1	1	1	Generalist	4	Knowledge base
Sick patients	1	1	5	2	1	3	Well patients	5	Patient type
treatment	1	1	5	3	1	1	Looking after general health and prevention	5	Skills involved

Interview 2

27y female, ST2 paediatrics in HENE. Currently working in Neonates at a children's hospital. Triads compared:

1. Medicine, radiology, surgery
2. GP, radiology, ACCS
3. ACCS, radiology, medicine
4. Medicine, ACCS, GP
5. Paediatrics, ACCS, radiology
6. ACCS, GP, surgery
7. Medicine, GP, paediatrics

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	Triad number	Theme
Look at whole picture and background	2	4	1	1	4	5	Doing set thing	1	Skills involved
Wide range of knowledge	1	4	1	1	1	5	Directed	1	Knowledge base
Patient is focus	2	5	1	1	1	5	1 part of patient is focus	1	Patient interaction
Less people skills	5	2	5	5	3	2	Good communicator	1	Skills involved
Separate from other department	5	2	3	5	2	1	MDT approach	1	Working environment
Involve people	1	1	1	1	1	5	Involve computers	1	Patient type
Physically in hospital	1	1	3	1	1	5	Can work anywhere	1	Working environment
Learn to bargain	1	1	1	1	1	4	Can refuse to help	1	Skills involved
Wider family interaction	2	3	1	1	2	5	No family etc to manage	1	Patient type
Less intense	3	4	2	3	4	1	High intensity job	2	Working environment
In hospital	1	1	5	2	1	1	Community	2	Working environment

Look at what's in front of you	4	2	5	4	2	1	Whole picture	2	Patient interaction
What's happening right then	4	2	5	5	3	2	History and background	2	Patient interaction
Deal with patients	1	1	1	1	1	5	Pictures	2	Patient type
Able to break bad news	1	4	1	1	1	5	Less communicatio n skills	2	Skills involved
Acute	2	2	2	2	1	5	Organized	3	Working environment
Putting your decisions on the line	1	1	1	1	1	5	Impression of situation	3	Knowledge base
Individual based	3	2	4	5	3	1	Family based	4	Patient interaction
Work with colleagues	1	1	5	1	1	1	Individual decisions	4	Working environment
Safe environmen t	2	2	4	2	4	1	Short time to decide	4	Working environment
monitoring	2	2	4	1	3	4	Can't follow up	4	Working environment
All specialties	2	3	1	1	1	5	One specialty	4	Knowledge base
Have to call others for specialist advice	4	5	1	5	3	5	Can be top level of specialty	4	Knowledge base
diagnostic	1	1	1	1	4	2	Supporting patient	4	Patient interaction
Manage patient and family	2	4	1	1	4	5	Treat one patient	5	Patient type
Like awake patients	1	1	1	1	4	1	Like sedated patients	5	Patient type
All medical knowledge	2	4	1	4	1	4	Can forget things and still be good at job	6	Knowledge base
Often never see patient again	3	2	5	4	2	2	See patients again	6	Patient interaction
Can be interlinked	1	4	1	5	2	3	Separate specialty	6	Working environment
Career orientated	3	1	5	4	1	3	Fit around family	6	Personal circumstanc e

Can go in different directions	5	1	5	4	3	1	Always general	6	Knowledge base
Able to change specialty	1	1	4	1	1	3	Hard to change specialty	6	Personal circumstance
Learn on the job	1	1	1	1	1	4	Studious	7	Skills involved
Can fit you	5	4	5	5	4	1	You have to fit to patient	7	Working environment
Office type job	5	5	1	5	5	1	Wider distance to cover	7	Working environment
Lifesaving and resus	1	2	4	1	1	5	Less likely to do resus	7	Skills involved
Lots of paperwork	4	4	2	4	4	4	More clinical	7	Skills involved

Interview 3

27yr female, ST2 paediatrics in HENE. Currently working in general paediatrics in a DGH. Triads compared:

1. Paediatrics, GP, surgery
2. Radiology, ACCS, medicine
3. Medicine, paediatrics, GP
4. GP, paeds, ACCS
5. Paediatrics, surgery, ACCS
6. Paeds, medicine, radiology

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	Triad number	Theme
Work life balance better	4	5	1	3	4	2	Antisocial hours	1	Working pattern
Part time work	4	5	1	1	4	2	Full time or hard to be PT	1	Working pattern
Nicer people	3	5	2	1	3	4	Hostile	1	Personality
High academic expectations	3	2	4	4	4	1	Focus on job	1	Competitive

More women	3	5	1	1	3	4	More men	1	Working environment
Adult patients	1	3	3	5	2	2	Kids	1	Patient type
Hospital	1	1	5	2	1	2	Community	1	Working environment
Long training scheme	2	2	5	1	3	3	Shorter training	1	Training
Practical skills	2	1	5	1	1	5	Less practical	1	Skills involved
Out of hours work	2	2	4	2	2	4	9-5 work	1	Working pattern
Clinically based	2	1	3	2	1	5	Office based	2	Working environment
Out of hours work	1	3	2	1	1	5	On call from home	2	Personal circumstance
Intensive	3	2	5	2	1	5	Less intense	2	Working environment
Generalist	1	2	1	2	2	2	Specific	2	Knowledge base
Lots of on call	2	2	5	2	2	5	Less on call	3	Working pattern
Lots of exams	2	2	3	1	2	3	Less exams	3	Personal circumstance
Clinical freedom	4	4	2	4	5	4	Given a service	3	Working environment
Only see adults	1	3	3	5	2	3	Can see adult or child	3	Patient type
Wide knowledge	1	2	1	2	2	2	Narrower knowledge base	3	Knowledge base
Relaxed people	3	5	2	2	4	4	Intense people	4	Personality
Full training scheme	5	5	1	1	5	3	Common stem training	4	Training scheme
Acutely unwell patient	3	3	5	2	1	5	Not acute patients	4	Patient type
Practical based skills	3	1	5	2	2	4	Communication skills	4	Skills involved
Resus and intensive care	3	2	5	2	1	5	No resus	4	Skills involved
Not run through	1	1	5	5	1	3	Run through training	5	Training scheme
Narrow curriculum	5	3	5	4	3	3	Wide curriculum	5	Knowledge base

Flexible training	3	4	1	1	4	3	Rigid training	5	Training
Intensive care placements	3	3	5	1	1	5	No intensive care	5	Working environment
Procedures	1	5	3	1	1	3	Surgery	5	Skills involved
Consultants n site out of hours	5	4	5	2	2	5	Off-site consultants OOH	5	Working environment
Acute	2	2	4	2	2	5	Office based	6	Working environment
More out of hours	2	2	4	2	2	5	Less out of hour rota	6	Working pattern
Few vacancies	4	1	3	3	2	4	More vacancies	6	Competitive
Share patients with other specialties	4	3	1	4	2	1	Own patients	6	Patient type

Interview 4

27yr married male, ST2 paediatrics in HENE. Currently working in specialty paediatrics in GNCH. Triads compared:

1. ACCS, GP, paeds
2. Surgery, paediatrics, ACCS
3. Medicine, GP, radiology
4. Radiology, ACCS, surgery
5. Surgery, paeds, GP

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	Triad number	Theme
Treat adults	1	3	4	5	3	3	Exclusively treat children	1	Patient type
Holistic view of patients	3	4	1	1	3	5	Acute presentation	1	Patient interaction
Chronic illnesses	3	4	2	2	5	3	Acute illnesses	1	Patient type

Secondary care	1	1	5	2	1	2	Primary care	1	Working environment
Short training scheme	1	1	2	5	2	3	Long training scheme	1	Training
Sicker patients	2	2	5	3	1	3	Minor illnesses	1	Patient type
Task focused	4	1	5	5	2	1	Deeper interest	2	Skills involved
Lots of practical skills	2	1	5	2	1	4	Less practical skills	2	Skills involved
Less nice doctors	3	2	5	5	3	2	Nice doctors	2	Personality
Medical specialty	1	5	1	1	1	3	Surgical specialty	2	Working environment
Treat patients	1	1	1	1	1	5	Don't treat patients	3	Patient interaction
History and examination assessment	1	1	1	1	1	5	Not clinical assessment	3	Patient interaction
Less detailed knowledge of anatomy	2	5	2	2	3	4	In depth anatomical knowledge	3	Knowledge base
Difficult to attract trainees	1	4	2	3	4	5	Easier to attract trainees	3	Training
Poorly filled posts	1	4	1	2	3	5	Well filled posts	3	Competitive
Office based work	5	3	1	4	5	1	Ward based work	3	Working environment
Interested in sick patient treatment	2	2	5	3	1	5	Don't like to assess/treat sick patients	4	Patient interaction
Can subspecialise	1	1	5	2	4	2	Stay generalist	5	Knowledge base
Out of hours work	1	1	5	1	1	3	No out of hours work	5	Working pattern
Less flexible training	2	2	5	2	2	3	Flexible training	5	Training scheme
Safeguarding element	3	5	2	1	3	5	No primary role with safeguarding	5	Skills involved
Complex patients with range of problems	1	5	1	1	3	5	Specific role	5	Patient interaction
Coordinating role	1	5	1	1	2	5	Service provision	5	Skills involved

Longevity of patient relationship	3	4	1	2	5	5	Short relationship with patients	5	Patient interaction
Interest in challenging communication	2	5	1	1	4	5	Less interest in communication	5	Skills involved
More women	3	5	1	1	3	3	Less women	5	Working environment
Family friendly to work in	3	5	1	1	3	1	Hard to have family life	5	Personal circumstance

Generated 27 constructs. Most ratings were extremes (1 or 5). 3 construct pairs without preference of either side.

Training programmes that fit this person's preference (green): gen med (12), surg (9), GP (16), paeds (17), ACCS (8), radiology (10).

Interview 5

28yr female in long term relationship, ST1 paediatrics in HENE. Currently working in specialty paediatrics in GNCH. Triads compared:

1. GP, paediatrics, surgery
2. GP, ACCS, radiology
3. Medicine, GP, ACCS

construct	Gen Med	Surg	GP	Paeds	ACCS	Radio	construct	Triad no	Theme
Medical	3	5	2	4	4	3	Skills based	1	Skills
High interaction with women and kids	3	4	2	1	4	3	More men	1	Patient type
Less practical	3	5	1	4	4	4	Practical skills	1	Skills
Flexible training	3	4	1	3	4	3	Inflexible	1	Training
Less competitive	3	5	1	2	3	3	Less training posts	1	Competitiveness

Excellent comms skills	3	3	1	1	2	3	Unapproachable	1	Skills
Interpersonal skills	2	4	1	1	2	4	Less interpersonal skills	1	Skills
Range of patient ages	1	1	1	5	2	2	0-18yrs only	1	Patient type
Long training	3	1	5	1	4	3	Shorter training	1	Training
Demanding rota	1	1	4	1	1	3	Less antisocial hours	1	Work patter
Leave at end of shift	5	5	2	5	5	5	On call at hospital	1	Work patter
Hospital based	1	1	5	2	1	1	Community based	1	Working enviro
Large team based	2	1	5	2	2	4	Independent practitioner	1	Working enviro
Better work life balance	4	4	2	4	4	3	Poor w-l balance	1	Personal circs
Attractive to female trainees	3	4	2	3	3	3	More male trainees	1	Personal circs
Can develop other interests	3	4	2	4	3	2	Difficult to develop other interests	1	Knowledge base
Easier to have career breaks	3	4	2	4	4	3	Difficult to have career break	1	Personal circs
People orientated	1	3	1	1	2	4	Interpreting images	2	Skills
Lots of patient interaction	2	4	1	1	2	4	Little patient interaction	2	Patient interaction
Medical	2	4	2	3	3	4	scientific	2	Skills
More practical skills	3	1	5	3	3	2	Personal/communication skills	2	Skills
Run through training	5	5	1	1	5	1	Precursor training programme	2	Training
Can develop special interest	4	4	2	4	3	4	More structured	2	Knowledge base
Range of patients	5	4	1	3	5	3	No children	2	Patient type
If change mind, need to leave programme and can't return	4	2	2	2	4	2	Can try similar specialties within training before deciding final career	2	Training

General med specialty	2	4	1	3	3	3	Acute specialty	3	Skills
Less skills based	3	4	1	3	3	3	Practical skills	3	Skills
Do what options are in that specialty	2	3	5	3	2	3	Need to consider final subspecialty early	3	Training
3yr training scheme	5	5	1	5	1	4	2yr then more as not complete training scheme	3	Training
Run through	5	1	1	1	5	1	Rotate through specialties	3	Training
Acute management	3	2	5	3	2	3	Chronic management	3	Patient interaction
Manage within own area	4	2	4	3	2	2	Refer to specialty (gatekeeper)	3	Skills

Generated 32 constructs. Most ratings were moderates (i.e., 2, 3 or 4). 12 construct pairs without preference of either side.

Training programmes that fit this person's preference (green): gen med (15), surg (4), GP (13), paeds (16), ACCS (16), radiology (10).

Features of paediatric careers

Table 1: Each interview's list of preferred constructs that they feel are part of a paediatrics career

Interview 1	Interview 2	Interview 3	Interview 4	Interview 5
See patients	Look at whole picture and background	Part time work	Exclusively treat children	High interaction with women and kids
Mixture of On call and Shift work	Wide range of knowledge	Nicer people	Holistic view of patients	Practical skills
Generally medicine	Patient is the focus	Focus on job	Chronic illnesses	Excellent communication skills
Broad	Good communicator	Kids	Secondary care	Interpersonal skills

Like a mix of things	MDT approach	Clinically based	Deeper interest	0-18yr only
Kids	Involve people	Can see adult or child	Nice doctors	Hospital based
Specific illnesses	Physically in hospital	Wide knowledge	Medical specialty	Large team based
Medicine	Learn to bargain	Relaxed people	Treat patients	Mixture of Attractive to female trainees and More male trainees
Think about the problem	Wider family interaction	Full training scheme	History and examination assessment	People orientated
Spend time with patient	Mixture of Less intense and High intensity job	Run through training	Less detailed knowledge of anatomy	Lots of patient interaction
Ward based	In hospital	Wide curriculum	Ward based work	Mixture of Medical and Scientific
Consider whole patient	Whole picture	Flexible training	Mixture of Interested in sick patient treatment and Don't like to assess/treat sick patients	Mixture of more practical skills and Personal/ communication skills
Consider patient and family	Deal with patients	Intensive care placements	Can subspecialise	Mixture of General med specialty and Acute specialty
Fun	Able to break bad news	Procedures	Complex patients with range of problems	Mixture of Less skills based and Practical skills
Get to know patient	Acute	Acute	Longevity of patient relationship	Mixture of Acute management and Chronic management
Context of problem	Putting your decisions on the line	Mixture of Few vacancies and More vacancies	Interest in challenging communication	Mixture of Manage within own area and Refer to specialty (gatekeeper)
Want to build a relationship with patient	Family based	Own patients	Family friendly to work in	
Mixture of think about life outside of work and Training more important	Work with colleagues			

Mixture of Consider own family and Training higher in priorities	Safe environment			
Range of problems	Monitoring			
Long training	All specialties			
Specialist	Diagnostic			
Sick patients	Manage patient and family			
	Like awake patients			
	Can forget things and still be good at job			
	See patients again			
	Able to change specialty			
	Learn on the job			
	You have to fit to patient			
	Wider distance to cover			
	Lifesaving and resus			
	More clinical			

Table 2: Positive constructs which are not found in a paediatrics career

Interview 1	Interview 2	Interview 3	Interview 4	Interview 5
Unwell patients	Mixture of What's happening right then and History and background	Work life balance better	Mixture of Short training scheme and Long training scheme	Mixture of Medical and Skills based
Mixture of Like pressure and Like to take time	Have to call others for specialist advice	Mixture of More women and More men	Sicker patients	Flexible training
Like practical	Can be interlinked	Mixture of Hospital and Community	Less practical skills	Mixture of Less competitive and Less training posts

Own specialty	Mixture of Career orientated and Fit around family	Mixture of Long training scheme and Shorter training	Easier to attract trainees	Mixture of Long training and Shorter training
Mixture of Long term patients and Short stay patients	Can go in different directions	Mixture of Practical and Less practical	Well filled posts	Less antisocial hours
Mixture of Consider acute problem and Consider long term issues		Mixture of Out of hours work and 9-5work	No out of hours work	Leave at end of shift
Mixture of Easier to be part time and Hard to be part time		Mixture of Out of hours work and On call from home	Flexible training	Better work life balance
Hospital based		Mixture of Intensive and Less intense	No primary role with safeguarding	Can develop other interests
Treatment		Mixture of Generalist and Specific	Service provision	Easier to have career breaks
		Less on call	Mixture of More women and Less women	Precursor training programme
		Less exams		Can develop special interest
		Mixture of Clinical freedom and Given a service		Range of patients
		Mixture of Acutely unwell patient and Not acute patients		Can try similar specialties within training before deciding final career
		Mixture of Practical skills based and Communication skills		Do what options are in that specialty
		Mixture of Resus and intensive care and No resus		Mixture of 3yr training scheme and 2yr then more as not complete training scheme
		Mixture of Consultants on site out of hours		Mixture of Run through and

		and Off site consultants OOH		Rotate through specialties
		Less out of hours rota		

Appendix C = Pilot questionnaire/drafts

Initially the pilot questionnaire had three subsections: background information about the participant's intentions regarding specialties; questions about different aspects of specialties; and finally, information to contact the participant in the future for an interview. However, it was revised and reconsidered to develop a final pilot questionnaire draft which was used in a pilot between July and August 2016.

Through development of the pilot by discussion with supervisors, it was decided that some basic demographic data was also required. This included the gender of the participant, their age, family status, and where they went to medical school. As this data is being recorded, the questionnaires themselves were anonymised with an ID number. This section was situated at the beginning of the pilot questionnaire and then followed by the section about intentions.

The intentions of participants regarding specialties was originally drafted to be two separate questions where the Health Education England (HEE) list of possible specialty choices were listed for identification by the participant of which they would apply to and those they would not apply to. Through discussion and development, this section was modified to be one question where all the HEE specialty choices can be rated. This change allows for data to be recorded as a scale and use chi squared analysis.

The questions in the questionnaire were originally derived directly from the ST repertory grid interviews. From analysis of the repertory grids, themes were identified between the constructs generated. The constructs identified as the same theme were grouped together and from there were assessed in comparison to others in the same theme. Those constructs which used the same language as another in the same group were identified as key aspects and were used in the questionnaire directly. Those with similar meaning were grouped and combined to make a statement which attempted to address the overall subject of the constructs. These were reviewed with my supervisors to ensure my interpretation still applied to all the constructs in the group.

The repertory grid themes had various amounts of constructs within each theme. For example, the theme of “working environment” had 30 construct pairs, whereas “competitiveness” had 4 construct pairs. The themes with the most constructs within them were identified to be themes in which there were more aspects that could influence career choice and therefore more of those aspects would be included as questions.

By discussion with supervisors, the wording of each aspect was reviewed and considered. However, the layout of the questions based on themes had the potential to impact on how a participant would answer the questions. Therefore, it was decided to alphabetise the aspects instead. Furthermore, to maintain consistency the aspects were listed, and a rating scale applied. This will allow for factor analysis of the results. The intention of this is to improve reliability and obtain as much information from the data as possible.

Two participants were not applying to specialty training. The first was intending to do a stand-alone SHO job or teaching fellow role with the intention of gaining more “acute experience before CMT”. The second was less clear with their plans, intending to spend some time in research; locum SHO postings as well as time spent travelling. They stated that this was because they were “unclear about specialty choice so time to choose” would develop in this time.

Most of the specialties were listed as “definitely not applying to” for each of the participants. with a total of 62 ticks out of possible 85. In contrast, the total number of ticks in the “definitely applying to” boxes were 5 out of a possible 85. Table 11 below demonstrates how these ticks relate to the different specialty options. It is apparent that those specialties considered to be surgical, or previously identified as ‘specialist’ in the repertory grid pilot study, were the least popular choices.

Table 11: Pilot questionnaire participants career choices

	Definitely not applying to	Unlikely to apply to	Undecided about application	Likely to apply to	Definitely applying to
Core medical training	1			1	3
Core surgical training	4	1			
Obstetrics and gynaecology	4	1			
General practice	2	1	2		
Paediatrics	2		2		1
ACCS Emergency medicine	3		1	1	
Anaesthetics	3		1	1	
Clinical radiology	3		2		
Neurosurgery	5				
Oral and maxillofacial surgery	5				
Broad based training	2*	1	1		
Core psychiatry training	4	1			
Community sexual and reproductive health	5				
Histopathology	4				1
Ophthalmology	5				
Cardiothoracic surgery	5				

Specialties which are perceived to possess the aspects of: ability to change specialty, ability to try similar specialties before choosing the final career, involved a broad subject area, career breaks, allowed for family life, opportunity to follow up patients, allowed individual clinical decision making, interpretation of data, included nice staff, and those which involved patient and wider family care were identified as specialties they would be more likely to apply to.

There were no aspects which unanimously deterred the participants when considering specialty applications. Two participants identified that gender of patient would have a negative effect

considering a specialty application, the participants stated that this was due to not wanting to specialise in gynaecology specifically. Two participants identified that gender of staff would have a negative effect when considering specialty applications, they stated this was due to not wanting to feel like 'the only girl' in a specialty or that there may be 'restrictions' based on gender.

Table 2: Section 3 of pilot questionnaire

Aspects	Strong positive	Slight positive	Neutral	Slight negative	Strong negative
'Out of hours' work		1	1	3	
Ability to change specialty		5			
Ability to try similar specialties before choosing final career	2	3			
Academic expectations of post	1	3	1		
Acute assessment	2	2	1		
Acutely unwell patients	2	2	1		
Age of patient	1	3	1		
Anatomical knowledge		2	2	1	
Antisocial hours			2	2	1
Broad subject area	2	3			
Career breaks	1	4			
Career progression	1	3	1		
Chronic illness care		1	2	1	1
Community based		2	1	1	1
Complex patients		2	2	1	
Consultants on site at all times			4	1	
Degree of patient interaction	2	2	1		
Doing something practical	2		2	1	
Emphasis on communication skills	3		2		
Family life	2	3			
Flexibility of training	1	3	1		
Focus on one area of illness		1	1	3	
Follow up patients	1	4			
Gender of patient			3		2
Gender of staff			3		2
Having a single specific role			2	3	
High pressure job		1	1	3	
Hospital based	1	2	1	1	
How attractive the scheme is to others			4		1
Individual clinical decision making	2	3			

Intense staff		1	2	2	
Intensive care environment		1	2	2	
Interaction with patient and wider family	3	1	1		
Interpretation of data	3	2			
Involved in co-ordination of other specialties or teams	2	2	1		
Length of training			3	1	1
Lots of procedures		2	2	1	
Manage long term health	1	3	1		
Manage sick patients	2	1	2		
Many opportunities for 'resus'		2	1	2	
Minor illnesses		3		1	1
Nice staff	3	2			
Number of exams			3	1	1
Number of vacancies within post		3	1		1
On call work			3	2	
Part time opportunity		4	1		
Patient and wider family care	1	4			
Plan a final subspecialty from beginning	1	1	2	1	
Relaxed staff	2	2	1		
Run through training		4		1	
Scientific	2	1	2		
Shift work			2	2	1
Short relationship with patients			3	2	
Specialist subject area	1	2	1	1	
Sub-specialization	1	2	2		
Total number of training posts available		2	2	1	
Use ALL of your medical knowledge	1	1	2	1	
Ward based		3	1		1
Working anywhere	1	3	1		
Working within a team	3	2			
Work-life balance	2	3			

Appendix D = Final questionnaire

ID number

Foundation Doctor Career Choices Questionnaire

Thank you for agreeing to complete this questionnaire. I am currently studying for an MPhil in medical education and undertaking research into how junior doctors make career choices regarding specialties. The questions asked here have been developed based on interviews carried out earlier in the year with ST doctors. This project has ethical approval from Newcastle University and is supported by Jon Scott, Foundation School director for Health Education North East.

Please complete the following anonymous demographic details about yourself:

1. Gender: Male Female Prefer not to say
2. Age: ≤24y 25-27y 28-30y ≥30y
3. Family status: Single Married Long-term partner
4. Do you have children living with you: Yes No
5. Where did you go to medical school: UK Non-UK
6. Are you applying to a specialty training post this year?
   Yes No
   If no- what are you intending to do instead, and why?

7. When thinking about specialty training now, or in the future, which specialties have you considered? Please indicate for each specialty, how likely it is you would apply to that training scheme.

	Definitely not applying to	Unlikely to apply to	Undecided about application	Likely to apply to	Definitely applying to
Core medical training					
Core surgical training					
Obstetrics and gynecology					
General practice					
Paediatrics					
ACCS Emergency medicine					
Anesthetics					
Clinical radiology					
Neurosurgery					
Oral and maxillofacial surgery					
Core psychiatry training					
Public health					
Community sexual and reproductive health					
Histopathology					
Ophthalmology					
Cardiothoracic surgery					

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8. The following sections relate to aspects of different specialty jobs. Please indicate if these aspects have a positive effect (ie you are more likely to apply to a specialty that features this), a negative effect (ie you are less likely to apply to a specialty that features this), are neutral (either has no impact on your choice of specialty or this feature was not something you previously considered) when thinking about specialty training now, or in the future.

	Strong positive effect	Slight positive effect	Neutral	Slight negative effect	Strong negative effect
'Out of hours' work					
Ability to change specialty					
Ability to try similar specialties before choosing final career					
Academic expectations of post					
Acute assessment					
Acutely unwell patients					
Age of patient					
Anatomical knowledge					
Antisocial hours					
Broad subject area					
Career breaks					
Career progression					
Chronic illness care					
Community based					
Complex patients					
Consultants on site at all times					
Degree of patient interaction					
Doing something practical					
Emphasis on communication skills					
Family life					

	Strong positive effect	Slight positive effect	Neutral	Slight negative effect	Strong negative effect
Flexibility of training					
Focus on one area of illness					
Follow up patients					
Gender of patient					
Gender of staff					
Having a single specific role					
High pressure job					
Hospital based					
How attractive the scheme is to others					
Individual clinical decision making					
Intense staff					
Intensive care environment					

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Foundation Doctor Career Choices Questionnaire

	Strong positive effect	Slight positive effect	Neutral	Slight negative effect	Strong negative effect
Interaction with patient and wider family					
Interpretation of data					
Involved in co-ordination of other specialties or teams					
Length of training					
Lots of procedures					
Manage long term health					
Manage sick patients					
Many opportunities for 'resus'					

	Strong positive effect	Slight positive effect	Neutral	Slight negative effect	Strong negative effect
Minor illnesses					
Multiple exams					
Multiple vacancies within post					
Nice staff					
On call work (carry emergency bleep)					
Part time opportunity					
Patient and wider family care					
Planning your final subspecialty at this point of application					
Relaxed staff					
Run through training					
Scientific					
Shift work					
Short relationship with patients					
Specialist subject area					
Sub-specialisation					
Total number of training posts available					
Use ALL of your medical knowledge					
Ward based					
Working anywhere (geographically)					
Working anywhere (workplace environment)					
Working within a team					
Work-life balance					

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Foundation Doctor Career Choices Questionnaire

9. Is there anything else that has influenced your career choice which have not been covered here?

   .....
   .....
   .....

Thank you for completing this questionnaire. The information gathered here will help us to understand how Foundation Doctors choose their careers. Following on from this I would like to invite you to participate in a short one-to-one interview between January and March 2017 to uncover more about how career choices are made. This interview will last about 30mins and would be arranged via email.

Would you be happy to participate in a follow up interview?

- Yes- please include the best email address to contact you below

  .....
- No

Researcher contact details:

- Dr Sarah Scales, Senior Teaching and Research Fellow, RVI, Newcastle upon Tyne Sarah.scales@nuth.nhs.uk
- Dr Gillian Vance and Dr Bryan Burford, Research supervisors, Ridley Building 1, Newcastle University

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Appendix E = Questionnaire data

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	171	97.7
	Missing Cases	4	2.3
	Total	175	100.0
Unselected Cases		0	.0
Total		175	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
.00	0
1.00	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			unsurenegative		Percentage
	Observed		.00	1.00	Correct
Step 0	unsurenegative	.00	148	0	100.0
		1.00	23	0	.0
	Overall Percentage				86.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.862	.224	68.996	1	.000	.155

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Out of hours work	.067	1	.795
		Ability to change specialty	1.312	1	.252
		Ability to try similar specialties before choosing final career	1.417	1	.234
		Academic expectations of post	.254	1	.614
		Acute assessment	.033	1	.856
		Acutely unwell patients	.332	1	.564
		Age of patient	8.140	1	.004
		Anatomical knowledge	.846	1	.358
		Antisocial hours	.380	1	.538
		Broad subject area	.381	1	.537
		Career breaks	.744	1	.388
		Career progression	.793	1	.373
		Chronic illness care	.126	1	.722
		Community based	.009	1	.923
		Complex patients	.017	1	.898
		Consultants on site at all times	.260	1	.610
		Degree of patient interaction	3.391	1	.066
		Doing something practical	.124	1	.725
		Emphasis on communication skills	.455	1	.500
		Family life	.083	1	.773
		Flexibility of training	7.054	1	.008
		Focus on one area of illness	.004	1	.951
		Follow up patients	.345	1	.557
		Gender of patient	2.010	1	.156
		Gender of staff	2.178	1	.140
		Having a single specific role	1.451	1	.228
		High pressure job	.044	1	.833
		Hospital based	1.123	1	.289
		How attractive the scheme is to others	.055	1	.814
		Individual clinical decision making	1.179	1	.278

	Intense staff	.487	1	.485
	Intensive care environment	.332	1	.564
	Interaction with patient and wider family	4.199	1	.040
	Interpretation of data	.294	1	.588
	Involved in co-ordination of other specialties or teams	.531	1	.466
	Length of training	.772	1	.380
	Lots of procedures	.270	1	.603
	Manage long term health	.000	1	.994
	Manage sick patients	.039	1	.844
	Many opportunities for 'resus'	.088	1	.767
	Minor illnesses	6.083	1	.014
	Multiple exams	.014	1	.905
	Multiple vacancies within post	.009	1	.926
	Nice staff	3.403	1	.065
	On call work (carry emergency bleep)	.003	1	.959
	Part time opportunity	3.530	1	.060
	Patient and wider family care	.761	1	.383
	Planning your final subspecialty at this point of application	1.035	1	.309
	Relaxed staff	.263	1	.608
	Run through training	1.037	1	.308
	Scientific	.463	1	.496
	Shift work	.832	1	.362
	Short relationship with patients	.073	1	.787
	Specialist subject area	.466	1	.495
	Sub-specialisation	3.849	1	.050
	Total number of training posts available	1.473	1	.225
	Use ALL of your medical knowledge	.036	1	.849
	Ward based	6.278	1	.012
	Working anywhere (geographically)	1.080	1	.299
	Working anywhere (workplace environment)	.239	1	.625
	Working within a team	4.376	1	.036
	Work-life balance	1.008	1	.315
Overall Statistics		67.081	62	.307

Block 1: Method = Forward Stepwise (Likelihood Ratio)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.628	1	.006
	Block	7.628	1	.006
	Model	7.628	1	.006
Step 2	Step	7.377	1	.007
	Block	15.005	2	.001
	Model	15.005	2	.001
Step 3	Step	6.575	1	.010
	Block	21.580	3	.000
	Model	21.580	3	.000
Step 4	Step	7.083	1	.008
	Block	28.663	4	.000
	Model	28.663	4	.000
Step 5	Step	4.226	1	.040
	Block	32.890	5	.000
	Model	32.890	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	127.413[a]	.044	.080
2	120.037[b]	.084	.154
3	113.461[b]	.119	.217
4	106.378[b]	.154	.283
5	102.152[b]	.175	.320

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

b. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			unsurenegative		Percentage
	Observed		.00	1.00	Correct
Step 1	unsurenegative	.00	148	0	100.0
		1.00	23	0	.0
	Overall Percentage				86.5
Step 2	unsurenegative	.00	148	0	100.0
		1.00	23	0	.0
	Overall Percentage				86.5
Step 3	unsurenegative	.00	146	2	98.6
		1.00	21	2	8.7
	Overall Percentage				86.5
Step 4	unsurenegative	.00	144	4	97.3
		1.00	18	5	21.7
	Overall Percentage				87.1
Step 5	unsurenegative	.00	145	3	98.0
		1.00	17	6	26.1
	Overall Percentage				88.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age of patient	-.781	.282	7.672	1	.006	.458
	Constant	.102	.703	.021	1	.885	1.107
Step 2[b]	Age of patient	-.787	.296	7.045	1	.008	.455
	Flexibility of training	-1.037	.418	6.145	1	.013	.354
	Constant	1.707	.971	3.091	1	.079	5.511
Step 3[c]	Age of patient	-.661	.309	4.574	1	.032	.516
	Flexibility of training	-1.243	.447	7.744	1	.005	.289
	Ward based	-.602	.247	5.939	1	.015	.548
	Constant	3.485	1.252	7.750	1	.005	32.624
Step 4[d]	Age of patient	-.725	.329	4.864	1	.027	.484
	Flexibility of training	-1.471	.496	8.796	1	.003	.230
	Sub-specialisation	.693	.268	6.692	1	.010	1.999
	Ward based	-.693	.265	6.818	1	.009	.500
	Constant	2.427	1.359	3.188	1	.074	11.326
Step 5[e]	Age of patient	-.833	.349	5.712	1	.017	.435
	Flexibility of training	-1.660	.518	10.256	1	.001	.190
	Individual clinical decision making	.697	.341	4.179	1	.041	2.009

	Sub-specialisation	.770	.291	6.991	1	.008	2.159
	Ward based	-.773	.281	7.543	1	.006	.462
	Constant	1.514	1.451	1.090	1	.297	4.547

a. Variable(s) entered on step 1: Age of patient.

b. Variable(s) entered on step 2: Flexibility of training.

c. Variable(s) entered on step 3: Ward based.

d. Variable(s) entered on step 4: Sub-specialisation.

e. Variable(s) entered on step 5: Individual clinical decision making.

Model if Term Removed

Variable		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 1	Age of patient	-67.521	7.628	1	.006
Step 2	Age of patient	-63.572	7.106	1	.008
	Flexibility of training	-63.707	7.377	1	.007
Step 3	Age of patient	-59.011	4.560	1	.033
	Flexibility of training	-61.550	9.640	1	.002
	Ward based	-60.018	6.575	1	.010
Step 4	Age of patient	-55.642	4.906	1	.027
	Flexibility of training	-58.943	11.508	1	.001
	Sub-specialisation	-56.731	7.083	1	.008
	Ward based	-57.074	7.769	1	.005
Step 5	Age of patient	-54.015	5.879	1	.015
	Flexibility of training	-57.931	13.710	1	.000
	Individual clinical decision making	-53.189	4.226	1	.040
	Sub-specialisation	-54.859	7.566	1	.006
	Ward based	-55.466	8.779	1	.003

Variables not in the Equation

			Score	df	Sig.
Step 1	Variables	Out of hours work	.031	1	.861
		Ability to change specialty	1.124	1	.289
		Ability to try similar specialties before choosing final career	1.785	1	.182
		Academic expectations of post	.257	1	.612

Acute assessment	.947	1	.330
Acutely unwell patients	.029	1	.865
Anatomical knowledge	.284	1	.594
Antisocial hours	.357	1	.550
Broad subject area	.002	1	.965
Career breaks	1.135	1	.287
Career progression	.329	1	.566
Chronic illness care	.004	1	.947
Community based	.006	1	.939
Complex patients	.699	1	.403
Consultants on site at all times	.313	1	.576
Degree of patient interaction	1.890	1	.169
Doing something practical	.069	1	.793
Emphasis on communication skills	.028	1	.867
Family life	.028	1	.866
Flexibility of training	6.655	1	.010
Focus on one area of illness	.014	1	.904
Follow up patients	.006	1	.938
Gender of patient	1.390	1	.238
Gender of staff	1.610	1	.205
Having a single specific role	1.871	1	.171
High pressure job	.532	1	.466
Hospital based	.251	1	.616
How attractive the scheme is to others	.363	1	.547
Individual clinical decision making	1.839	1	.175
Intense staff	.103	1	.748
Intensive care environment	.242	1	.623
Interaction with patient and wider family	2.531	1	.112
Interpretation of data	.992	1	.319
Involved in co-ordination of other specialties or teams	.068	1	.794
Length of training	.367	1	.545
Lots of procedures	.299	1	.585
Manage long term health	.217	1	.641
Manage sick patients	.577	1	.448
Many opportunities for ‘resus’	.021	1	.886
Minor illnesses	4.269	1	.039

		Multiple exams	.001	1	.982
		Multiple vacancies within post	.063	1	.802
		Nice staff	2.028	1	.154
		On call work (carry emergency bleep)	.447	1	.504
		Part time opportunity	4.580	1	.032
		Patient and wider family care	.385	1	.535
		Planning your final subspecialty at this point of application	2.261	1	.133
		Relaxed staff	.431	1	.512
		Run through training	.468	1	.494
		Scientific	.069	1	.793
		Shift work	.042	1	.838
		Short relationship with patients	.016	1	.899
		Specialist subject area	.813	1	.367
		Sub-specialisation	4.652	1	.031
		Total number of training posts available	1.798	1	.180
		Use ALL of your medical knowledge	.648	1	.421
		Ward based	4.158	1	.041
		Working anywhere (geographically)	2.424	1	.120
		Working anywhere (workplace environment)	1.603	1	.205
		Working within a team	1.794	1	.180
		Work-life balance	.699	1	.403
	Overall Statistics		61.073	61	.473
Step 2	Variables	Out of hours work	.175	1	.675
		Ability to change specialty	.400	1	.527
		Ability to try similar specialties before choosing final career	.534	1	.465
		Academic expectations of post	.242	1	.623
		Acute assessment	1.368	1	.242
		Acutely unwell patients	.197	1	.657
		Anatomical knowledge	.377	1	.539
		Antisocial hours	.733	1	.392
		Broad subject area	.093	1	.761
		Career breaks	4.148	1	.042
		Career progression	.039	1	.843
		Chronic illness care	.032	1	.859

	Community based	.155	1	.694
	Complex patients	2.293	1	.130
	Consultants on site at all times	.010	1	.920
	Degree of patient interaction	1.051	1	.305
	Doing something practical	.534	1	.465
	Emphasis on communication skills	.037	1	.847
	Family life	1.049	1	.306
	Focus on one area of illness	.314	1	.575
	Follow up patients	.007	1	.931
	Gender of patient	1.271	1	.260
	Gender of staff	1.968	1	.161
	Having a single specific role	1.760	1	.185
	High pressure job	.310	1	.578
	Hospital based	.249	1	.618
	How attractive the scheme is to others	.884	1	.347
	Individual clinical decision making	3.427	1	.064
	Intense staff	.134	1	.714
	Intensive care environment	.021	1	.884
	Interaction with patient and wider family	1.909	1	.167
	Interpretation of data	2.710	1	.100
	Involved in co-ordination of other specialties or teams	.171	1	.680
	Length of training	.031	1	.861
	Lots of procedures	.493	1	.482
	Manage long term health	.309	1	.578
	Manage sick patients	1.450	1	.229
	Many opportunities for ‘resus’	.096	1	.757
	Minor illnesses	3.131	1	.077
	Multiple exams	.016	1	.899
	Multiple vacancies within post	.454	1	.500
	Nice staff	.120	1	.729
	On call work (carry emergency bleep)	.375	1	.540
	Part time opportunity	1.114	1	.291
	Patient and wider family care	.046	1	.829
	Planning your final subspecialty at this point of application	2.320	1	.128

		Relaxed staff	1.959	1	.162
		Run through training	.024	1	.877
		Scientific	.268	1	.605
		Shift work	.006	1	.940
		Short relationship with patients	.076	1	.783
		Specialist subject area	1.544	1	.214
		Sub-specialisation	6.046	1	.014
		Total number of training posts available	2.768	1	.096
		Use ALL of your medical knowledge	2.417	1	.120
		Ward based	6.317	1	.012
		Working anywhere (geographically)	4.012	1	.045
		Working anywhere (workplace environment)	3.505	1	.061
		Working within a team	.103	1	.749
		Work-life balance	.253	1	.615
	Overall Statistics		52.404	60	.746
Step 3	Variables	Out of hours work	.094	1	.760
		Ability to change specialty	.262	1	.609
		Ability to try similar specialties before choosing final career	.439	1	.508
		Academic expectations of post	.137	1	.711
		Acute assessment	2.171	1	.141
		Acutely unwell patients	.888	1	.346
		Anatomical knowledge	.790	1	.374
		Antisocial hours	.504	1	.478
		Broad subject area	.117	1	.732
		Career breaks	3.813	1	.051
		Career progression	.410	1	.522
		Chronic illness care	1.067	1	.302
		Community based	.139	1	.709
		Complex patients	2.226	1	.136
		Consultants on site at all times	.025	1	.874
		Degree of patient interaction	.296	1	.586
		Doing something practical	.178	1	.673
		Emphasis on communication skills	.157	1	.692
		Family life	1.051	1	.305
		Focus on one area of illness	1.023	1	.312

	Follow up patients	.175	1	.676
	Gender of patient	1.800	1	.180
	Gender of staff	2.700	1	.100
	Having a single specific role	2.221	1	.136
	High pressure job	.327	1	.567
	Hospital based	.129	1	.719
	How attractive the scheme is to others	2.421	1	.120
	Individual clinical decision making	3.851	1	.050
	Intense staff	.006	1	.938
	Intensive care environment	.004	1	.953
	Interaction with patient and wider family	.614	1	.433
	Interpretation of data	2.897	1	.089
	Involved in co-ordination of other specialties or teams	.061	1	.806
	Length of training	.313	1	.576
	Lots of procedures	.321	1	.571
	Manage long term health	1.081	1	.298
	Manage sick patients	3.291	1	.070
	Many opportunities for ‘resus’	.757	1	.384
	Minor illnesses	2.662	1	.103
	Multiple exams	.050	1	.823
	Multiple vacancies within post	.385	1	.535
	Nice staff	.117	1	.733
	On call work (carry emergency bleep)	.992	1	.319
	Part time opportunity	1.310	1	.252
	Patient and wider family care	.000	1	.983
	Planning your final subspecialty at this point of application	2.390	1	.122
	Relaxed staff	1.748	1	.186
	Run through training	.215	1	.643
	Scientific	1.065	1	.302
	Shift work	.045	1	.833
	Short relationship with patients	.032	1	.859
	Specialist subject area	2.636	1	.104
	Sub-specialisation	7.276	1	.007
	Total number of training posts available	2.801	1	.094

		Use ALL of your medical knowledge	2.004	1	.157
		Working anywhere (geographically)	1.770	1	.183
		Working anywhere (workplace environment)	3.099	1	.078
		Working within a team	.000	1	.992
		Work-life balance	.150	1	.699
	Overall Statistics		49.633	59	.802
Step 4	Variables	Out of hours work	.084	1	.772
		Ability to change specialty	.082	1	.775
		Ability to try similar specialties before choosing final career	.290	1	.590
		Academic expectations of post	.334	1	.563
		Acute assessment	2.560	1	.110
		Acutely unwell patients	.641	1	.423
		Anatomical knowledge	.035	1	.853
		Antisocial hours	.118	1	.732
		Broad subject area	.950	1	.330
		Career breaks	2.481	1	.115
		Career progression	.168	1	.682
		Chronic illness care	2.246	1	.134
		Community based	1.334	1	.248
		Complex patients	1.326	1	.249
		Consultants on site at all times	.014	1	.907
		Degree of patient interaction	.016	1	.898
		Doing something practical	.039	1	.843
		Emphasis on communication skills	.668	1	.414
		Family life	1.607	1	.205
		Focus on one area of illness	.001	1	.974
		Follow up patients	.522	1	.470
		Gender of patient	1.832	1	.176
		Gender of staff	3.398	1	.065
		Having a single specific role	.830	1	.362
		High pressure job	.044	1	.835
		Hospital based	.481	1	.488
		How attractive the scheme is to others	1.096	1	.295
		Individual clinical decision making	4.343	1	.037

		Intense staff	.199	1	.655
		Intensive care environment	.360	1	.549
		Interaction with patient and wider family	.051	1	.822
		Interpretation of data	1.449	1	.229
		Involved in co-ordination of other specialties or teams	.277	1	.599
		Length of training	.087	1	.768
		Lots of procedures	.010	1	.921
		Manage long term health	1.654	1	.198
		Manage sick patients	2.273	1	.132
		Many opportunities for 'resus'	.281	1	.596
		Minor illnesses	1.419	1	.234
		Multiple exams	.000	1	.997
		Multiple vacancies within post	.391	1	.532
		Nice staff	.005	1	.946
		On call work (carry emergency bleep)	.403	1	.526
		Part time opportunity	.421	1	.516
		Patient and wider family care	.746	1	.388
		Planning your final subspecialty at this point of application	.481	1	.488
		Relaxed staff	2.227	1	.136
		Run through training	.282	1	.595
		Scientific	.171	1	.679
		Shift work	.025	1	.874
		Short relationship with patients	.417	1	.518
		Specialist subject area	.539	1	.463
		Total number of training posts available	1.509	1	.219
		Use ALL of your medical knowledge	2.966	1	.085
		Working anywhere (geographically)	1.405	1	.236
		Working anywhere (workplace environment)	2.021	1	.155
		Working within a team	.091	1	.763
		Work-life balance	.326	1	.568
	Overall Statistics		46.262	58	.867
Step 5	Variables	Out of hours work	.104	1	.747
		Ability to change specialty	.025	1	.875

	Ability to try similar specialties before choosing final career	.212	1	.645
	Academic expectations of post	1.371	1	.242
	Acute assessment	1.357	1	.244
	Acutely unwell patients	.344	1	.557
	Anatomical knowledge	.016	1	.900
	Antisocial hours	.125	1	.723
	Broad subject area	.085	1	.770
	Career breaks	1.445	1	.229
	Career progression	.002	1	.964
	Chronic illness care	.852	1	.356
	Community based	1.169	1	.280
	Complex patients	.387	1	.534
	Consultants on site at all times	.030	1	.863
	Degree of patient interaction	.057	1	.812
	Doing something practical	.000	1	.985
	Emphasis on communication skills	.339	1	.560
	Family life	2.378	1	.123
	Focus on one area of illness	.006	1	.936
	Follow up patients	.191	1	.662
	Gender of patient	1.212	1	.271
	Gender of staff	2.225	1	.136
	Having a single specific role	.505	1	.477
	High pressure job	.201	1	.654
	Hospital based	.735	1	.391
	How attractive the scheme is to others	.281	1	.596
	Intense staff	1.511	1	.219
	Intensive care environment	1.059	1	.303
	Interaction with patient and wider family	.245	1	.621
	Interpretation of data	.512	1	.474
	Involved in co-ordination of other specialties or teams	.055	1	.814
	Length of training	.149	1	.700
	Lots of procedures	.030	1	.862
	Manage long term health	.808	1	.369
	Manage sick patients	2.118	1	.146
	Many opportunities for ‘resus’	.021	1	.884
	Minor illnesses	1.913	1	.167

	Multiple exams	.118	1	.731
	Multiple vacancies within post	.296	1	.586
	Nice staff	.023	1	.878
	On call work (carry emergency bleep)	.102	1	.749
	Part time opportunity	.199	1	.656
	Patient and wider family care	.394	1	.530
	Planning your final subspecialty at this point of application	.066	1	.798
	Relaxed staff	3.031	1	.082
	Run through training	.922	1	.337
	Scientific	.020	1	.887
	Shift work	.116	1	.733
	Short relationship with patients	.543	1	.461
	Specialist subject area	1.014	1	.314
	Total number of training posts available	1.310	1	.252
	Use ALL of your medical knowledge	1.512	1	.219
	Working anywhere (geographically)	.298	1	.585
	Working anywhere (workplace environment)	.832	1	.362
	Working within a team	.004	1	.948
	Work-life balance	.118	1	.731
Overall Statistics		44.041	57	.896

Multi-collinearity

To overcome this, two methods were employed. Variance inflation factors (VIF) assess the level of multi-collinearity, where high values are associated with multi-collinearity. Cut-off values are open to interpretation, some literature states 10 is appropriate (Kennedy, 1992; Hair et al, 1995), others state 5 (Rogerson, 2001), or 4 is preferable (Pan and Jackson, 2008). In SPSS statistics, the stepwise procedure was:

- Analyse; regression; linear
- Dependent = unsurenegative

- Independents= all questionnaire items (variables)
- Statistics; collinearity diagnostics

Following this, a co-efficient table was produced with a VIF result for each questionnaire item.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.426	.452		.943	.348		
Out of hours work	-.030	.045	-.086	-.668	.506	.340	2.944
Ability to change specialty	-.040	.052	-.084	-.778	.438	.479	2.087
Ability to try similar specialties before choosing final career	-.038	.047	-.087	-.804	.423	.479	2.088
Academic expectations of post	-.013	.042	-.038	-.318	.751	.400	2.499
Acute assessment	.071	.077	.179	.920	.359	.149	6.698
Acutely unwell patients	-.003	.076	-.009	-.041	.967	.115	8.731
Age of patient	-.116	.051	-.257	-2.267	.025	.437	2.286
Anatomical knowledge	-.018	.041	-.055	-.435	.664	.349	2.863
Antisocial hours	.014	.043	.040	.331	.741	.378	2.646
Broad subject area	-.010	.043	-.028	-.238	.813	.413	2.424
Career breaks	.030	.046	.073	.640	.523	.430	2.327
Career progression	.004	.050	.010	.086	.932	.456	2.191
Chronic illness care	.024	.052	.072	.463	.644	.231	4.333
Community based	.030	.052	.104	.585	.560	.179	5.582
Complex patients	.002	.046	.006	.052	.959	.392	2.550
Consultants on site at all times	-.043	.041	-.108	-1.054	.294	.540	1.852
Degree of patient interaction	-.013	.052	-.033	-.247	.805	.322	3.103
Doing something practical	.027	.061	.067	.453	.652	.259	3.861
Emphasis on communication skills	.031	.048	.078	.634	.527	.368	2.716
Family life	.023	.051	.062	.455	.650	.308	3.248
Flexibility of training	-.092	.062	-.189	-1.490	.139	.350	2.858
Focus on one area of illness	.012	.054	.032	.225	.823	.270	3.710

Follow up patients	-.010	.057	-.028	-.180	.858	.239	4.190
Gender of patient	-.014	.126	-.016	-.114	.910	.271	3.687
Gender of staff	.085	.130	.094	.659	.511	.279	3.583
Having a single specific role	.039	.047	.096	.825	.411	.419	2.386
High pressure job	-.012	.045	-.041	-.269	.789	.244	4.092
Hospital based	.017	.051	.051	.333	.740	.241	4.148
How attractive the scheme is to others	.032	.047	.075	.669	.505	.452	2.213
Individual clinical decision making	.047	.055	.100	.859	.392	.416	2.402
Intense staff	-.009	.046	-.024	-.185	.854	.328	3.050
Intensive care environment	-.087	.044	-.279	-1.953	.053	.275	3.636
Interaction with patient and wider family	-.081	.057	-.233	-1.423	.158	.209	4.782
Interpretation of data	.012	.046	.032	.272	.786	.408	2.453
Involved in co-ordination of other specialties or teams	-.020	.049	-.045	-.411	.682	.466	2.145
Length of training	-.018	.039	-.049	-.461	.646	.492	2.031
Lots of procedures	-.006	.051	-.017	-.112	.911	.244	4.099
Manage long term health	.027	.054	.078	.509	.612	.239	4.180
Manage sick patients	.074	.063	.167	1.162	.248	.272	3.670
Many opportunities for ‘resus’	-.012	.048	-.039	-.257	.798	.244	4.094
Minor illnesses	-.084	.045	-.240	-1.885	.062	.348	2.877
Multiple exams	-.010	.043	-.026	-.239	.812	.492	2.034
Multiple vacancies within post	.015	.041	.040	.360	.720	.448	2.232
Nice staff	-.092	.064	-.205	-1.434	.155	.277	3.616
On call work (carry emergency bleep)	.007	.046	.020	.144	.886	.303	3.304
Part time opportunity	-.045	.047	-.115	-.964	.337	.399	2.509
Patient and wider family care	.033	.056	.092	.590	.557	.231	4.323
Planning your final subspecialty at this point of application	.034	.036	.105	.929	.355	.442	2.265
Relaxed staff	.098	.057	.224	1.725	.087	.335	2.985

Run through training	-.071	.046	-.184	-1.558	.122	.404	2.478
Scientific	-.004	.040	-.011	-.103	.918	.458	2.182
Shift work	.008	.044	.021	.175	.862	.380	2.631
Short relationship with patients	-.010	.047	-.028	-.206	.837	.296	3.375
Specialist subject area	-.039	.063	-.103	-.621	.536	.204	4.911
Sub-specialisation	.072	.055	.195	1.314	.192	.255	3.922
Total number of training posts available	.060	.048	.144	1.253	.213	.425	2.351
Use ALL of your medical knowledge	.026	.048	.067	.552	.582	.381	2.626
Ward based	-.060	.037	-.185	-1.609	.111	.427	2.341
Working anywhere (geographically)	.013	.035	.047	.372	.711	.356	2.812
Working anywhere (workplace environment)	.028	.048	.071	.581	.563	.380	2.635
Working within a team	.016	.061	.034	.268	.789	.346	2.887
Work-life balance	-.019	.064	-.042	-.302	.763	.294	3.398

a. Dependent Variable: unsurenegative

A cut off value of 5 was selected (Rogerson, 2001). Three questionnaire items had a VIF of over 5: 'acute assessment', 'acutely unwell patients' and 'community based'. Binary logistic regression was carried out in the same way as earlier except for removal of variables with a VIF >5to assess impact on the final model. There was no change to the individual item predictors, demonstrating that the model had acceptable fit and satisfactory outcome.

Appendix F = Interview schedules

Background information needed from questionnaire:

- Applying to specialty or not
- Specialty choices

Two interview schedules based on if they're applying or not for the coming academic year. Each interviewee will be asked the below questions based on their responses in the questionnaire to specialties e.g. Those selecting paediatrics will be asked question 4 whereas if not or undecided about paediatrics would be asked question 5 if using the applying to specialty schedule. In addition, 'X' denotes choices documented in the questionnaire response and may be one or more options.

Applying to specialty

1. How did you decide you were interested in X specialty as a career?
    a. Why did you choose X, what is it about this specialty
    b. Who or what influenced you when considering your career e.g. family/friends, colleagues/consultants, university, the media
    c. When did you decide this
2. Has this always been your preferred intention?
    a. If no: what from, and why/ what changed for you
    b. If yes: how are you so sure about this specialty e.g. have you had working experience/ what have you learned about it and how?
3. What exposure to paediatrics have you had?
    a. How much do you know about paediatrics
    b. What have you heard from others about paediatrics
4. *if applying to paediatrics* considering paediatrics as a career, what does it offer you that other specialties don't?
    a. How did you find this out
    b. Do you think there is anything that could increase your interest in paeds?
    c. Are there downsides to a paeds career?
        i. If yes why are you happy to accept them?
        ii. How do you know about them?
    d. Could you describe a paediatrician?
5. *if not or undecided about applying to paediatrics* Have you considered paediatrics?
    a. What do you think about paediatrics as a career?
        i. Can you describe a paediatrician?
    b. Why paeds is not for you / what don't you like about paeds?
    c. What would have to change in paediatric careers for you to consider it?
    d. *if undecided* do you think there is anything that could increase your interest in paeds?
    e. *if undecided* are there downsides to a paediatric career that are stopping you from applying?
        i. How do you know about these?

Not applying to a specialty

1. Why do you think not applying to a specialty now would be beneficial for you?/ what made you not want to apply to a specialty post?
    a. What do you hope to achieve/ what can't you achieve if you went into a specialty post straight after F2?
    b. What made you feel that not applying to any specialty would be good for you? E.g. family/friends/media/political influences
2. *based on specialty choices in future* How did you decide that X, X or X were careers you may be interested in the future?
    a. How did you develop these ideas, what influenced you?
    b. What does that specialty (specialties) offer you?
    c. Are there any aspects that prevent you from wanting to apply to X, X or X specialty?
        i. If yes, which are most important or have greater impact on your choice to apply/not apply
3. What do you think about paediatrics as a specialty?
    a. Could you describe a paediatrician?
        i. Skills, attributes, personality, stereotype
    b. What exposure to paediatrics have you had?
        i. How much do you know about paeds
        ii. What have you heard from others about paeds?
    c. Is there anything that would make you change your mind, and apply to a paediatrics post now?