

A Longitudinal Cohort Study of Pharmacy Careers

Report 9: Longitudinal Analysis

Unpacking early career pharmacists' participation in, and commitment to, the pharmacy labour market

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September 2009

The research on which this report is based was commissioned by the Pharmacy Practice Research Trust and funded with a grant from the Royal Pharmaceutical Society of Great Britain. The research was undertaken by a research team at the University of Manchester. The views expressed in this report are those of the authors and not necessarily the commissioning body.

Published by the Pharmacy Practice Research Trust
1 Lambeth High Street, London SE1 7JN

First Published 2010

© Pharmacy Practice Research Trust 2010

Printed in Great Britain by the Pharmacy Practice Research Trust

ISBN: 978-0-9563323-2-5

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Executive Summary

Background

This report explores the extent to which participation in and commitment to the pharmacy labour market can be predicted by earlier career choices and decisions such as the decision to study pharmacy. There are two parts to our analysis: we consider first the extent to which it is possible to predict which British pharmacy students register to practise in Great Britain; we then consider relationships between current and anticipated workforce participation and early career choices, relationships between career commitment and early career choices, and whether it is possible to predict variation in early career pharmacists' experiences of working in the profession.

Methodology

Data collected from the cohort of 2006 British pharmacy graduates when they were third year students, fourth year students, preregistration trainees and when they were in their first year of practice have been linked with RPSGB (Royal Pharmaceutical Society of Great Britain) registration data. Using logistic regression techniques associations between predictor variables (including background factors) and various outcomes are explored.

Analysis focuses on measuring the influence of variables related to when and how a decision to study pharmacy was made, and on the influence of pre-work values (such as career commitment) and how these are subsequently associated with pharmacists' career pathways and work histories.

Overview of Results

Registration with RPSGB

Background factors (gender and ethnicity) and academic performance at pharmacy school were found to be significantly associated with registration with the RPSGB.

Workforce participation

Results suggest that having a preference to work in community pharmacy on entry to pharmacy school significantly predicted subsequent employment in that sector; that having lower than average levels of career commitment as a student or having considered dropping out of pharmacy school significantly predicted cohort pharmacists who intended to leave the profession within two years; and that while the predictor variables do not explain much of the total variance in cohort pharmacists' intentions to work abroad within two years these intentions were significantly associated with lower than average levels of career commitment as a student.

Career commitment

Background factors and high levels of career commitment as students were found to predict higher levels of commitment to the profession amongst practitioners. We also found that career commitment changed with career stage; on average it was highest as third year students and lowest when the cohort were in practice.

Experiences of work

With regard to whether earlier career choices and decisions explain variance amongst the cohorts' experiences of working as pharmacists, we found that white pharmacists and those who had not considered dropping out of their course were significantly more likely to derive satisfaction from their work; that background characteristics were significantly associated with perceptions of overload at work; and that those who had a pharmacist in their family were significantly more likely to have perceived that their job offered them career opportunities. Other experiences of working as a pharmacist were not well explained by the predictor variables used in our regression models.

Implications of Findings

Given that academic performance as an undergraduate is an important predictor of who subsequently enters the profession raises questions about the extent to which academically less able students should be allowed to progress within an MPharm if they are also less likely to pass the registration exam and hence also be less likely to enter the profession for which they have trained.

That career commitment amongst undergraduates is an important predictor for commitment in practice is an important finding: those involved in regulating undergraduate pharmacy education might be interested in exploring career commitment of prospective students in order to assess the extent to which they are committed to working in the profession on graduation.

The decline in commitment levels between undergraduate and early career data collection points is also noteworthy, and may reflect a process of transition from student, through preregistration training and into registered practice, that is marked by changes in work attitudes and behaviours, needs and values, in response to the socialising effects of increasing occupational experience.

1. Introduction

1.1 Background

The research reported here focuses on the early careers and pathways of the cohort of pharmacists who graduated from British pharmacy schools in 2006. Longitudinal in design, this research was commissioned by the Pharmacy Practice Research Trust (PPRT), an independent charity that supports and promotes the professional practice and development of pharmacists. The research is being undertaken by a team based in the Centre for Pharmacy Workforce Studies (CPWS) at the University of Manchester, and contributes to a wider programme of work conducted by CPWS concerning the pharmacy labour market, organisational change and development within the pharmacy profession.

Overall, this study will improve the profession's understanding of its workforce during their early careers. It complements employment data collected through the pharmacy workforce censuses and pharmacist registration data that are regularly analysed by CPWS on behalf of the Royal Pharmaceutical Society of Great Britain (RPSGB).^{1;2} What the cohort study adds to analysis of census and registration data is insight into factors related to (newly qualified or early career) pharmacy graduates' availability and motivation to practise in the profession.³

As well as adding to the pharmacy workforce evidence base the study is relevant to the education and learning agendas. As the RPSGB is due to transfer responsibility for setting and assessing education standards to a new body, the General Pharmaceutical Council (GPhC), findings from this longitudinal analysis are relevant to current debates regarding the restructuring of undergraduate pharmacy education in Great Britain (White Paper).

1.2 Aims and Objectives

1.21 Aims

Analysis presented here aims to establish the extent to which aspects of early career choices and decisions are related to subsequent participation in, and commitment to, the pharmacy labour market. We take as our starting point 'early' career choices – that is, career-related decisions made prior to entering pharmacy school. Making links between early career decisions and motivations for and commitment to working as a pharmacist, as well as establishing how and when commitment changes, is a crucial step towards accurately modelling the contributions made by early career pharmacists to the pharmacy labour market.³

There are two distinct parts to our analysis. The aim of part one is to address the following research question:

1. *Can we predict which British pharmacy students will register to practise in Great Britain?*

Part one is of particular relevance to those interested in understanding relationships between motivations for studying pharmacy, entry pathways to the degree programme and a specific [educational] outcome – entry to the profession (via registration).

Part two of the analysis focuses on those cohort pharmacists who are both registered to practise and appear on the practising section of the Register of Pharmacists in Great Britain in July 2009. Part two aims to investigate relationships between current and anticipated workforce participation and early career choices, and between career commitment and early career choices, through the following research questions:

2. *Are early career choice and decision-making factors related to participation in the pharmacy labour market?*
3. *Are early career choice and decision-making factors related to commitment to working in the profession?*
4. *How and at what points in a pharmacist's early career does commitment change?*
5. *Do career choice and decision-making factors influence experiences of working as a pharmacist?*

Part two has wider relevance. In addition to those involved in pharmacy workforce planning, analysis presented in this section is pertinent to those interested in a more sociological understanding of work and employment, since we consider the ways that experiences of work are related to 'early' expectations of that work.

1.22 Objectives

Since the purpose of this work is to inform debates about pharmacy education and the relationship of early career choices to pharmacy practice many objectives have been set. These include:

- identification of early career choice and decision-making factors affecting whether cohort members joined the Register of Pharmacists (formally known as the Register of Pharmaceutical Chemists);
- identification of early career choice and decision-making factors affecting cohort pharmacists' sector of practice;
- identification of early career choice and decision-making factors affecting cohort pharmacists' likelihood of working abroad;
- identification of early career choice and decision-making factors affecting cohort pharmacists' likelihood of leaving the profession;

- identification of early career choice and decision-making factors affecting cohort pharmacists' career commitment;
- mapping between levels of career commitment and career stage;
- identification of early career choice and decision-making factors affecting cohort pharmacists' job satisfaction; and,
- identification of early career choice and decision-making factors affecting cohort pharmacists' experiences of work.

2. Methodology

Involving a series of annual, self-administered questionnaires capturing demographic and career/employment-related information, the cohort study began data collection in 2005 when the cohort were third year MPharm students. At the outset of the study, the intention was to include the entire population of students graduating from 15 British pharmacy schools in 2006, thus providing the number of students necessary to undertake sub-group analysis, and safeguarding against having an unrepresentative sample, a possible outcome if students were drawn from only a small sample of pharmacy schools. However, after the first round of data collection one pharmacy school was excluded from the study as a result of problems engaging students based there in the study. Subsequent rounds of data collection have taken place in 2006, 2007 and 2008 with students and graduates of the remaining 14 British pharmacy schools.

Each questionnaire for the study is structured around a particular stage in the cohorts' pharmacy career (see Table 1 for further information). Details on each of the different surveys analysed here are given next.

2.1 'Early Choices' – First survey (2005)

This survey had an explicit focus on choices made prior to studying pharmacy, such as how, when, and why cohort pharmacists chose to study pharmacy, early awareness of the profession, and future career commitment and intentions. Since information captured by the Early Choices survey is key to much of the longitudinal analysis presented in this report, further discussion of the variables, and description of concepts operationalised by the variables, appears in section 3.7 of this report.

Table 1 provides further details of Early Choices data used in this analysis, together with an indication of the concepts being operationalised by these data.

2.1.1 'Early Choices' – response rate

In total 1,158 Early Choices surveys were completed (66.7% of the sample). Nearly three-quarters of respondents (n=831; 71.8%) were female, and almost half (n=549; 47.4) were from minority ethnic (ME) groups. Table 1 summarises response rate and respondent profile for the surveys.

2.2 'Preregistration Choices' – Second survey (2006)

Completed when the cohort were about to finish their undergraduate education, this survey had an emphasis on preregistration training decision-making. Career commitment and intentions data were also collected.

2.2.1 'Preregistration Choices' – response rate

Completed questionnaires useable for this longitudinal analysis were received from 1,124 students, giving a response rate for the PRC questionnaire of 67.1% (1,124/1,674). The smaller denominator used to calculate the response rate to the second survey (1,674 as opposed to 1,736 used to calculate the Early Choices response rate) can be largely attributed to student attrition from the MPharm course between the two data collection points.

Characteristics of PRC respondents were generally similar to those who completed the EC survey (72.8% or n=818 female; 46.3% or n=520 from ME groups) (see Table 1).

2.3 'Your Preregistration Post' – Third survey (2007)

The third survey captured data relating to preregistration training posts, and included questions evaluating trainees' experiences of work such as their job satisfaction, quality of working life and career commitment.

2.3.1 'Your Preregistration Post' – response rate

Because of difficulties in obtaining contact addresses for cohort study participants at this stage in the research the sample size was reduced to 1,172; 701 (59.8%) of the available sample completed the 'Your Preregistration Post' survey. Once again the majority of respondents were female (76.5%, n=536) and white (60.8, n=426) (see Table 1).

2.4 'Pharmacy Practice' – Fourth survey (2008)

The fourth survey collected data relating to the cohorts' work and employment experiences one year after qualifying. It investigated respondents' current and anticipated changes to work; job satisfaction; experiences of work; desire for a pharmacy career; and career commitment.

2.4.1 'Pharmacy Practice – response rate

Pharmacy Practice surveys were sent to all previous cohort study participants who had passed the Registration exam and hence were registered with the RPSGB as (either practising or non-practising) pharmacists. A total of 558 cohort study members responded, giving a response rate of 52.4% (558/1,064). Females were in the majority amongst respondents (77.1%; n=430), and the largest ethnic group represented was white (60.2, n=336) (see Table 1).

2.5 Response rate summary

Looking across all four cohort study surveys 1,408 different participants have completed at least one survey for the study.¹ Of these, 371 (26.3% of all participants) have completed each of the four surveys, 331 have completed three surveys, 358 have completed two surveys and 348 have completed only one survey for the study.

2.6 Merged dataset

Data were merged in the statistical package SPSS v16.0. Data were linked from survey to survey using a unique numerical identifier, allowing us to explore the ways that early career choices and decisions influence subsequent participation in, and commitment to, the pharmacy labour market.

A new variable determining which cohort members had passed the Registration exam – and hence were eligible to enter pharmacy practice in GB – was generated from RPSGB registration data and added to the merged dataset. Of the 1,408 study participants on the merged database, 1,139 (80.9%) are currently registered with the RPSGB; in July 2009 sixty of these pharmacists are on the non-practising part of the Register. Part One of our analysis compares between those who are registered with those who are not.

After data cleaning and the generation of new variables the merged dataset was imported from SPSS into the statistical package STATA v9.2.

See Table 1 for details of variables in the merged dataset.

¹ A further 71 participants returned partially completed surveys for the study giving us insufficient data for analysis and hence have been excluded from the sample investigated here.

Table 1: Summary description of surveys/data sources and variables in merged dataset used in longitudinal analysis

Data survey/source	Year	Career stage	Sample	Response Rate Summary	Variables
Early Choices (EC)	2005	3 rd yr undergraduate	n=1,736	66.7 % (1,158/1,736) 71.8% female 47.4 ME	<i>Background Characteristics:</i> Gender, Ethnicity <i>Career Decidedness Variables:</i> Age Decided to Study Pharmacy, Method of Application to University, Pharmacy 1 st Choice <i>Occupational Awareness Variables:</i> Experience of Pharmacy Before MPharm, Pharmacist in the Family, Early Career Preference <i>Career Commitment Variables:</i> Desire to Study Pharmacy at Entry to University, Course Meeting Expectations, Repeat Pharmacy Examinations, Considered Dropping Out of MPharm, Career Commitment
Preregistration Choices (PRC)	2006	4 th yr undergraduate	n=1,674	67.1% (1,124/1,674) 72.8% female 46.3% ME	Career Commitment
Your Preregistration Post (YPP)	2007	Preregistration trainee	n=1,172	59.8% (701/1,172) 76.5% female 39.2% ME	Career Commitment
Pharmacy Practice (PP)	2008	1 st year of practice	n=1,064	52.4% (558/1,064) 77.1% female 39.8 ME	<i>Workforce Participation Variables:</i> Passed Registration Examination, Sector of Practice, Intended Likelihood of Working Abroad, Intended Likelihood of Leaving Profession <i>Experiences of Work Variables:</i> Job Satisfaction, Job Control, Work Overload, Career Opportunities, Growth Opportunities <i>Career Commitment Variables:</i> Career Commitment
RPSGB Register of Pharmacists	2008		n=1,408		Registration with RPSGB

2.7 Analysis

As described in section 2.2, the longitudinal analysis presented here consists of two parts. What the two parts have in common is their focus on establishing how a range of early career choices and decision-making variables are related to various outcomes. Both parts also seek to establish whether any background factors (gender, ethnicity) have implications for these outcomes, especially given that this cohort of early career pharmacists is more diverse than previous cohorts and the register overall.^{2;4}

The conceptual framework used in both parts of our analysis is outlined in Figure 1.

Logistic regression is used to explore associations between a number of predictor variables of interest (including background factors) and various outcomes. When addressing questions related to pharmacists' experiences of work or their career commitment, ordered logit regression models are reported which take into account the ordinal nature of these variables. Most of our other work involves binary logit models, with the exception of the examination of relationships between levels of career commitment and career stage, where means and percentage change in commitment are reported.

We report regression coefficients, z test values and 95% confidence intervals for each of the relevant research questions. In all cases the reference category is the omitted category against which other categories are compared and is the largest group; positive regression coefficients indicate that the outcome under investigation is *less* likely in the reference category, while a negative coefficient indicates that an outcome is *more* likely in the reference category. Results where the p-value is less than 0.05 are considered significant; where the p-value is larger than 0.05 results are not reported unless the p-value is approaching statistical significance or we consider results noteworthy. Where results are significant bold text is used in the tables to make for easier reading and interpretation of findings.

In terms of our theoretical approach, the analysis unpacks the extent to which a pharmacist's actual career pathway and work history relates to influences on their original decision to study pharmacy, with choosing to study pharmacy conceptualised as (indirectly) constituting a first step on the road to entry to the profession. We consider the influence of a range of variables measuring a number of aspects of early career choices and decisions that relate to *when* and *how* the decision to study pharmacy was made. In theoretical terms, these aspects of early choices operationalise several related concepts: career decidedness; occupational awareness; and career commitment. A full list of variables used in our analysis and the concepts they relate to appear in Table 2 below; further detail of these variables and associated concepts appears after Table 2.

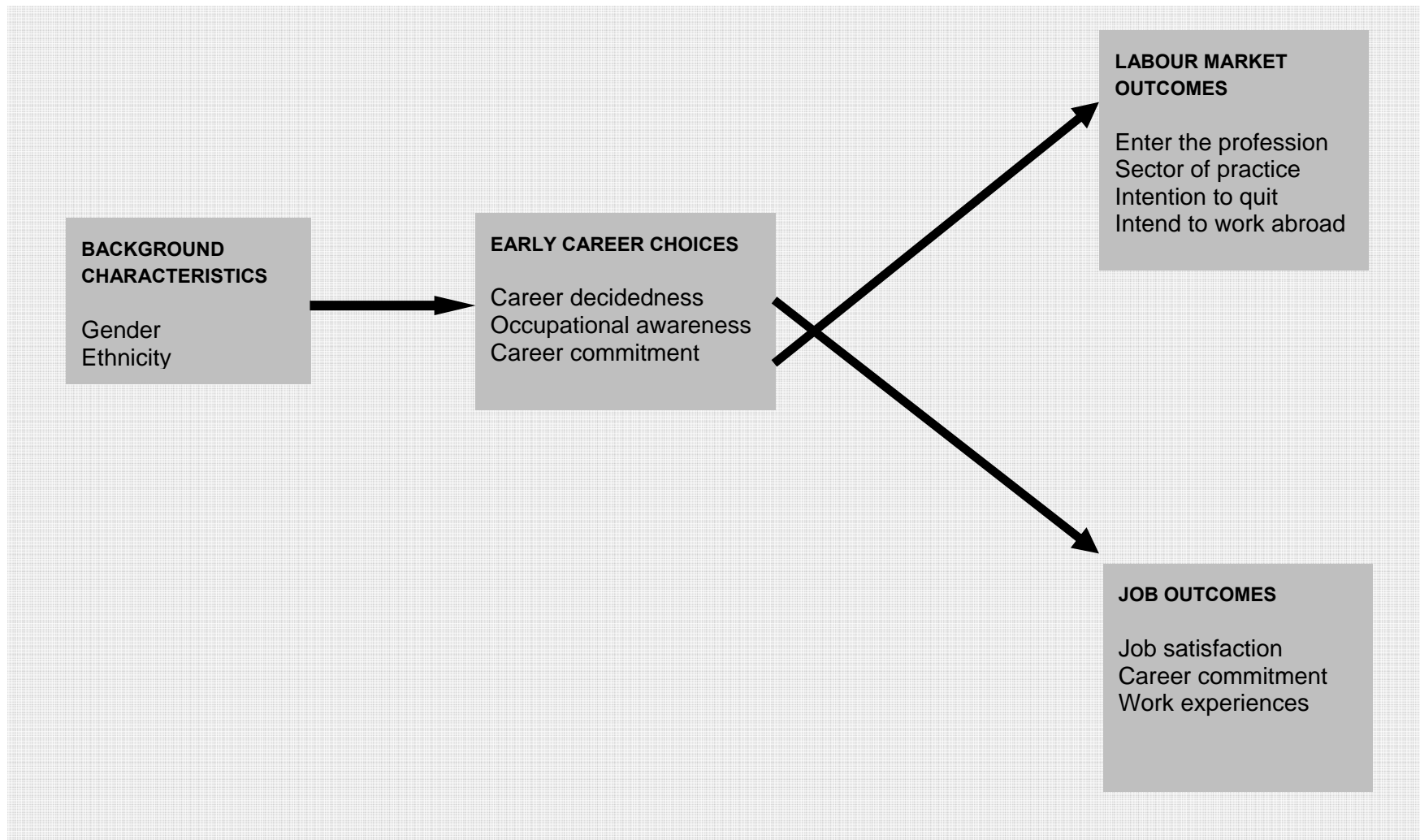
Table 2: Variables used in Part One & Part Two analysis, by % in each sample

Independent Variables	% respondents Part One*	% respondents Part Two [#]
BACKGROUND CHARACTERISTICS		
Male	29.9	27.2
Minority ethnic	49.1	46.3
CAREER DECIDEDNESS		
Chose to study pharmacy >17	36.2	34.8
Did not apply through UCAS	14.3	13.7
Pharmacy not 1 st choice	24.9	22.7
OCCUPATIONAL AWARENESS		
No work experience	38.8	37.6
Pharmacist in the family	30.3	27.4
Not intend to work in CP	50.0	49.1
CAREER COMMITMENT		
Below average career commitment	44.4	43.3
Not strong desire to study pharmacy	20.6	19.9
Repeated undergraduate exams	43.5	40.5
Considered dropping out of MPharm	19.9	19.4

* Part One analysis includes all cohort study participants

[#] Part Two analysis only includes cohort study participants registered to practise with the RPSGB in 2008

Figure 1: modelling the influence of early career choice variables on participation in, and commitment to, the pharmacy labour market



2.7.1 Career decidedness

We view career decidedness as the period of career exploration when an individual establishes their occupational preference(s). For the purpose of this report, the effect of career decidedness is examined through variables related to when a cohort pharmacist chose to study pharmacy, the method of application used to secure a place to study pharmacy at university, and whether pharmacy was a first choice of what to study at university (see Tables 1 and 2 for details). While we accept that career decidedness incorporates many states ranging from completely undecided to completely decided^{5,6} when exploring the influence of these variables in our regression analyses each variable has been simplified and recoded to create new binary variables.

In our analysis we compare between those making an 'early' choice (defined as occurring at age 17 and under, that is, prior to beginning or while studying A-levels) and those making a 'late' decision (at age 18 or over, or after A-levels) to differentiate between those demonstrating a clear level of career decidedness and those demonstrating lower levels of career decidedness. Those making an early choice are coded as 1 and those making a late choice as zero in a new binary variable in our regression analyses.

Another aspect of career decidedness is the method of application used by a cohort member when they applied to pharmacy school to study pharmacy. Here we compare between those applying through UCAS and those applying either through clearing or direct to the university, with applying through UCAS coded as 1 and all other values coded as zero. We consider those applying through UCAS demonstrate higher levels of career decidedness relative to those using alternative methods of application.

A final variable providing insight into the career deciding process is that measuring whether pharmacy was a first choice of what to study at university. We hypothesise that those pharmacists for whom pharmacy was not a first choice of subject may have different expectations of and commitment to a career in pharmacy relative to those pharmacists for whom pharmacy was a first choice of higher education degree. This difference may arise, in part, from differences in the way that the state of career decidedness is produced; given that career decidedness consists of both making a decision and sustaining a decision already made,⁷ those for whom pharmacy was not a first choice of course have failed to sustain their initial (non-pharmacy) career decision and this may have implications for any subsequent career decision-making and associated levels of career decidedness. For this reason, in our analysis, we compare between those for whom pharmacy was a first choice (coded as 1) and those for whom it was not a first choice (zero).

2.7.2 Occupational awareness

Consisting of knowledge, values, preferences, and self-concepts⁸ and influenced by a range of contextual factors (including the availability of cultural capital⁹⁻¹² - occupational awareness (OA) is an important construct for understanding how individuals make career choices. A process involving the

identification of career interests, OA can be conceptualised in terms of the ways individuals develop an awareness of an occupation or career (pharmacy) as both a profession and as a set of work practices. The process may involve experiential learning opportunities as well as awareness of an occupation gained via wider social networks transmitting aspirations and attitudes.⁹⁻¹¹

There are several important aspects of career awareness considered in our analysis. These aspects relate to how the object of awareness – working as a pharmacist – was characterised or conceptualised by cohort members prior to their entry to pharmacy school. To this end, we explore the influence of three dimensions or sources of occupational knowledge via variables related to whether a cohort pharmacist had any pharmacy work experience prior to entering pharmacy school, whether they had a pharmacist in the family (occupational inheritance), and whether a cohort pharmacist had a preference for entering one sector of pharmacy practice (community pharmacy) after registration.

Our models of workforce participation and commitment compare the effect of having no pharmacy work experience prior to entering pharmacy school with having some prior experience of pharmacy. We assume that having worked in a pharmacy provides an individual with occupational knowledge that provides them with more realistic expectations of pharmacy work than is available for individuals with no experience of pharmacy work. Those who have some work experience are consequently viewed as having greater occupational awareness and are coded as one in a new binary variable in our analysis.

We make a similar assumption about the effects of occupational inheritance, or the intergenerational continuity of occupation, on the basis that having a pharmacist in the family provides access to knowledge about pharmacists and pharmacy work that also provides socialisation towards the profession before cohort members enter pharmacy school.¹³ We include pharmacist fathers, grandparents, siblings, aunts, uncles or cousins as having a potentially socialising influence on cohort members. Hence we consider that, along with intergenerational occupational closure exerted by enduring cultural capital,¹² cohort members with a pharmacist in the family have access to socially located occupational knowledge acquired within a particular habitus or system of values and ethos transmitted by the family,^{9;14} and that habitus is a useful concept for understanding how career choices are shaped and constrained by familial and cultural influences.^{13;15} The impact of this culturally/familially-located knowledge on workforce participation and commitment is determined in our analysis; the reference category here is *not* having a pharmacist in the family (coded as 1 in the regression models).

The final aspect of OA explored in our analysis relates to ‘early’ preferences for pharmacy practice. Here we compare between those cohort members who expressed a definite preference for working in community pharmacy (CP) upon registration (the reference category) and those whose intended career path when they entered pharmacy school was not for community pharmacy. We assume that a preference to work in CP represents a higher level of OA

because most respondents who did not express a preference for working in this sector after registration either had no clear idea about pharmacy work or thought they might work in many sectors.

2.7.3 Career commitment

Career commitment is a work value defined as 'one's attitude to one's profession or vocation'.¹⁶ In this report, we are interested in whether (and how) early levels of career commitment are related to various workforce participation outcomes as well as to career commitment levels at other stages in a pharmacist's career.

We operationalise the concept directly using a variable measuring career commitment created from six statements, with those scoring above the average level of career commitment used as the reference category in our models. We also include several other variables as proxy measures of early career commitment in our models, namely: strength of desire to study pharmacy at entry to university; whether a respondent had to repeat any of their undergraduate examinations; and whether a respondent had considered dropping out of the MPharm course.

For strength of desire to study pharmacy a five-point Likert scale has been recoded as a dichotomous variable, where 1 equals a strong or very strong desire to study pharmacy and zero indicates a respondent with a moderate, weak or very weak desire to study pharmacy. The influence of having a strong desire to study pharmacy on subsequent outcomes is explored in our models.

Failing pharmacy exams is included in our analysis as another indirect measure of career commitment. Here we are interested in whether having to repeat undergraduate exams is associated with lack of commitment to the course and ultimately to subsequent pharmacy practice.

The rationale for including a variable capturing whether a respondent had considered dropping out of the MPharm is largely similar to that for including the variable related to repeating MPharm examinations. Thus we investigate if having considered dropping out of the course is associated with lack of commitment to the course and ultimately to subsequent pharmacy practice.

2.7.4 Variables used in analysis

Variables used in our regression models are shown below (see also Table 1). Bold type indicates reference categories used.

Background characteristics

- gender – male, **female**
- ethnicity – **white**, minority ethnic

Career decidedness

- made early career choice – **chose to study pharmacy ≤17**; chose to study pharmacy >17

- method of application to university – **UCAS**; not UCAS
- pharmacy 1st choice – **was 1st choice degree**; wasn't 1st choice degree

Occupational awareness

- Pharmacy work experience prior to entering university – **had work experience**; did not have work experience
- Occupational inheritance – had a pharmacist in the family; **did not have a pharmacist in the family**
- Early career preference – **work in community pharmacy**; not work in community pharmacy

Career commitment

- Career commitment – **above average level of career commitment**; career commitment lower than average
- Strength of desire to study pharmacy at entry to university – **strong desire**; not strong desire
- Repeated undergraduate examinations; had repeated exams; **had not repeated undergraduate exams**
- Considered dropping out of the MPharm course – considered dropping out; **not considered dropping out**

3. Results

3.1 Part One

3.1.1 Can we predict which British pharmacy students will register to practise in Great Britain?

Using data from the Register of Pharmacists to derive a new variable categorising passing/not passing the Registration exam our binary logit model explores factors associated with registration (Table 3).

Table 3: Predictors for whether cohort members register with RPSGB

Independent Variables	Regression Coefficients	z	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.5022	-2.66	-0.8717	-0.1326
Minority ethnic	-0.3809	-1.99	-0.7563	-0.0055
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.2282	-1.15	-0.6164	0.1600
Did not apply through UCAS	0.1633	0.62	-0.3498	0.6764
Pharmacy not 1 st choice	-0.2829	-1.28	-0.7168	0.1510
OCCUPATIONAL AWARENESS				
No work experience	0.0432	0.223	-0.3418	0.4283
Pharmacist in the family	-0.5918	-3.18	-0.9571	-0.2266
Not intend to work in CP	0.2326	1.29	-0.1214	0.5867
CAREER COMMITMENT				
Below average career commitment	-0.0396	-0.21	-0.4066	0.3275
Not strong desire to study pharmacy	-0.1305	-0.57	-0.5780	0.3170
Repeated undergraduate exams	-0.4618	-2.60	-0.8105	-0.1131
Considered dropping out of MPharm	-0.1177	-0.51	0.5664	0.3310

The results of our regression model indicate that there is a highly significant relationship between Registration to practise pharmacy in Great Britain and the set of 12 predictors ($p < 0.001$), with the model explaining 6% of the variance in the dependent variable (Registration with the RPSGB).ⁱⁱ

More specifically, Table 3 shows that male cohort members are significantly less likely than female cohort members to have registered to practise pharmacy in Great Britain ($p = 0.008$); that minority ethnic cohort members are significantly less likely than their white peers to have joined the British Register ($p = 0.047$); and that those with a pharmacist in the family are also significantly less likely than those without a pharmacist in the family to register for practise.

That having a pharmacist in the family has a negative influence on registering to practise is surprising. There must be many possible explanations for this

ⁱⁱ However, the R^2 statistic is effectively a pseudo R^2 , designed to approximate the R^2 used in ordinal regression and should be interpreted with caution.

finding. Perhaps the initial influence of cultural/familial values and contexts on career choice does not persist after students enter pharmacy school, and hence while occupational inheritance and/or habitus may encourage or guide students' decision to study pharmacy, occupational inheritance and/or habitus have less influence in determining which pharmacy students register and hence are eligible to enter the profession. Or perhaps educational experiences at pharmacy school have a negative effect on participation in the pharmacy labour market for those who have a pharmacist in the family – and also for males and those from minority ethnic groups – and this explains our findings. We know, for instance, from other research that habitus is an important concept for understanding the ways that career preferences are socially derived¹³ and that familial and cultural influences on vocational development are 'pervasive'^{15;17} and, furthermore, that the concept of social capital is especially relevant when researching how gender and ethnicity are related to career outcomes.¹¹ What is also clear from the work of others is that gender, ethnicity, and occupational inheritance are important factors in explaining why some subgroups behave and perform differently while at university.¹⁸ Certainly, our results suggest that further research considering how cultural factors shape career decisions, vocational processes, educational experiences and labour market participation would be of value.

3.2 Part Two

Part Two of our analysis focuses on those cohort members who are registered for practise with the RPSGB and addresses the remaining four research questions set out in section 1.2.1. We investigate relationships between current and anticipated workforce participation and early career choices, between career commitment and early career choices, between levels of career commitment, and between work experiences and early career choices. We begin with an examination of the extent to which early career choice and decision-making factors are related to the following workforce participation outcomes: currently working in the community pharmacy sector; some likelihood to work abroad over the next two years; some likelihood to leave the profession altogether over the next two years.

Outcome variables for our analyses are derived from data collected by the 'Pharmacy Practice' survey completed by cohort pharmacists in 2008 (see section 3.4 and Table 1 for details).

3.2.1 Are early career choice and decision-making factors related to participation in the pharmacy labour market?

3.2.1.1 Working in community pharmacy

The 2008 'Pharmacy Practice' survey asked cohort pharmacists about their sector of work. Responses to this question have been recoded to create a dichotomous variable, where 1 equals working in community pharmacy (CP)

and zero equals not working in CP.ⁱⁱⁱ Table 4 presents the results of a binary logit model exploring factors associated with working in CP in 2008 and the predictor variables.

Table 4: Predictors for whether cohort pharmacists are working in CP in 2008

Independent Variables	Regression Coefficients	z	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	0.4452	1.59	-0.1045	0.9948
Minority ethnic	0.4433	1.86	-0.0242	0.9107
CAREER DECIDEDNESS				
Chose to study pharmacy >17	0.4526	1.82	-0.0345	0.9396
Did not apply through UCAS	-0.2667	-0.77	-0.9436	0.4103
Pharmacy not 1 st choice	-0.3179	-1.09	-0.8907	0.2549
OCCUPATIONAL AWARENESS				
No work experience	-0.0977	-0.40	-0.5787	0.3832
Pharmacist in the family	0.3164	1.20	-0.1992	0.8320
Not intend to work in CP	-0.9087	-4.12	-1.3415	-0.4759
CAREER COMMITMENT				
Below average career commitment	-0.0944	-0.41	-0.5456	0.3567
Not strong desire to study pharmacy	0.6481	2.02	0.0187	1.2774
Repeated undergraduate exams	-0.2481	-1.10	-0.6905	0.1944
Considered dropping out of MPharm	-0.2057	-0.74	0.7512	0.3398

The model suggests that there is a significant relationship between working in CP in 2008 and the 12 predictors ($p < 0.001$) with the model explaining 6% of variance in the outcome (working in CP).

Of particular note is the finding that those expressing a preference to not work in CP at the 'early' career choice and decision-making stage are significantly less likely to actually be working in the CP sector in 2008, suggesting that early occupational preferences have some stability. Although not significant, it is also interesting that male and ME cohort pharmacists are more likely to be working in CP, reflecting both existing occupational segregation and cohort members' longer term career preferences reported previously.¹⁹

Finally, the results show that cohort pharmacists with a low desire to study pharmacy are significantly more likely than those recording a strong desire to study pharmacy as students to be working in the community sector in 2008.

3.2.1.2 Intention to work abroad

Cohort pharmacists were asked in 2008 about the likelihood that they would make changes to their current work situation; likely changes that would impact

ⁱⁱⁱ At the time of completing the PP survey, 64.1% of cohort pharmacists were working in the community and 34.1% in the hospital sector in their main job. Only 1.8% were working in other sectors, such as industry and academia.

on the pharmacy workforce (having an intention to work abroad and having an intention to leave the profession altogether) are reported here.

Responses to the question exploring intentions to work abroad have been recoded into some likelihood (equal to 1 in a new binary variable) and no likelihood (zero) that cohort pharmacists intend to work abroad within a two-year period.

The model explains only 2% of the variance in intentions to work abroad, suggesting many other unobserved factors are affecting these plans.

The results of this model, shown in Table 5, indicate that only in relation to those who had below average career commitment as students compared with those who had above career commitment as students is the relationship between predictor and outcome variables statistically significant. However, as Table 5 suggests, those intending to work abroad are more likely to have had low levels of career decidedness when data were collected from the cohort as students – that is, they were more likely to have not applied to study pharmacy through UCAS, and pharmacy was less likely to have been a first choice of undergraduate course – and to have had low levels of occupational awareness and career commitment as students (for example, lacked a strong desire for the course, repeated exams, considered dropping out of the MPharm) than the reference categories for these variables, although relationships between these predictor variables and the outcome variable are not statistically significant.

Table 5: Predictors for whether cohort pharmacists intend to work abroad within 2 years

Independent Variables	Regression Coefficients	z	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	0.2676	1.01	-0.2520	0.7871
Minority ethnic	-0.2810	-1.26	-0.7175	0.1554
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.2625	-1.13	-0.7193	0.1943
Did not apply through UCAS	0.0944	0.28	-0.5651	0.7540
Pharmacy not 1 st choice	0.1949	-0.69	-0.3591	0.7490
OCCUPATIONAL AWARENESS				
No work experience	0.0996	0.42	-0.3612	0.5604
Pharmacist in the family	0.1550	0.63	-0.3259	0.6360
Not intend to work in CP	0.0082	0.04	-0.3962	0.4126
CAREER COMMITMENT				
Below average career commitment	0.5566	2.49	0.1187	0.9941
Not strong desire to study pharmacy	0.0951	0.32	-0.4870	0.6773
Repeated undergraduate exams	0.0229	0.11	-0.4004	0.4461
Considered dropping out of MPharm	0.0152	0.06	-0.5185	0.5490

3.2.1.3 Intention to leave the profession

As with having an intention to work abroad, responses to the question asking whether cohort pharmacists anticipated leaving the profession altogether within the next two years have been recoded into some likelihood (equal to 1 in a new binary variable) and no likelihood (zero).

The model shown in Table 6 explains 6% of the variance in the outcome variable, and indicates that there is a significant relationship between likelihood of leaving the profession within two years and the set of 12 predictors ($p=0.0025$).

Table 6: Predictors for whether cohort pharmacists intend to leave the profession within 2 years

Independent Variables	Regression Coefficients	z	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	0.4047	1.43	-0.1505	0.9599
Minority ethnic	0.1981	0.77	-0.3053	0.7015
CAREER DECIDEDNESS				
Chose to study pharmacy >17	0.0209	0.08	-0.5106	0.5524
Did not apply through UCAS	0.0527	0.13	-0.7303	0.8358
Pharmacy not 1 st choice	-0.2121	-0.64	-0.8606	0.4364
OCCUPATIONAL AWARENESS				
No work experience	-0.1635	-0.60	-0.7000	0.3730
Pharmacist in the family	0.2552	1.05	-0.8261	0.3157
Not intend to work in CP	0.0082	0.04	-0.2204	0.7308
CAREER COMMITMENT				
Below average career commitment	0.8038	3.23	0.3156	1.2919
Not strong desire to study pharmacy	0.1664	0.52	-0.4621	0.7950
Repeated undergraduate exams	-0.0521	-0.21	-0.5427	0.4384
Considered dropping out of MPharm	0.6620	2.33	0.1058	1.2181

As shown in Table 6, cohort pharmacists are significantly more likely to intend to leave the profession if they had either below average career commitment as students or if they had considered dropping out of the MPharm as students. Factors associated with an increased likelihood of intending to leave the profession include being male, being from a ME background, making a late decision to study pharmacy, not obtaining a place at pharmacy school through UCAS, having a pharmacist in the family and not having an early intention to work in CP upon registration, although relationships between these variables and intentions to leave the profession are not significant.

3.2.2 Are early career choice and decision-making factors related to commitment to working in the profession?

When modelling the relationship between the predictor variables and the career commitment of cohort pharmacists a scale of career commitment ranging from 0 (the lowest score possible career commitment score) to 6 (the highest possible career commitment score) has been used. Table 7 gives the results for this ordered logit model.

Table 7: Predictors of cohort pharmacists' career commitment

Independent Variables	Regression Coefficients	t	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.4706	-2.15	-0.9008	-0.0404
Minority ethnic	-0.6302	-3.33	-1.0023	-0.2581
CAREER DECIDEDNESS				
Chose to study pharmacy >17	0.5868	2.95	0.1963	0.9772
Did not apply through UCAS	0.3403	1.19	-0.2206	0.9013
Pharmacy not 1 st choice	-0.4620	-1.93	-0.9317	0.0076
OCCUPATIONAL AWARENESS				
No work experience	-0.1069	-0.54	-0.4969	0.2832
Pharmacist in the family	0.3129	1.51	-0.0935	0.7193
Not intend to work in CP	0.2016	-1.15	-0.5460	0.1428
CAREER COMMITMENT				
Below average career commitment	-0.9493	-5.06	-1.3180	-0.5806
Not strong desire to study pharmacy	-0.6992	-2.82	-1.1873	-0.2112
Repeated undergraduate exams	-0.0338	-0.19	-0.3932	0.3255
Considered dropping out of MPharm	-0.2172	-0.95	-0.6671	0.2328

Career commitment is highly significantly related to the 12 predictor variables ($p < 0.001$). The model explains 16% of the variance in this outcome.

Higher levels of career commitment are significantly associated with background characteristics explored in our model. Hence we found that females and white cohort pharmacists are significantly more likely to be committed than males or ME cohort pharmacists. These findings replicate those reported by another recent pharmacist workforce survey.^{20;21} Commitment was also significantly positively related to above average career commitment as a student, and having a strong desire to study pharmacy as a student.

3.2.3 How and at what points in a pharmacist's early career does commitment change?

In order to answer research question four our analysis departs from reporting the results of regression models and instead seeks to establish how and when cohort members' career commitment changes. Mean career commitment scores and standard deviations calculated for the cohort at each of the data

collection points are presented in Table 8; mean scores are also compared on the basis of gender and ethnicity, with mean values for the subgroups compared using t-tests.

To establish the extent of change in commitment between the various rounds of data collection we compare between a cohort member's career commitment score as a third and as a fourth year student; between a cohort member's career commitment score as a fourth year student and as a preregistration trainee; and between a cohort member's career commitment score as a preregistration trainee and as an early career pharmacist. Comparison of commitment levels recorded at each career stage is presented in Table 9.

Table 8: Mean career commitment scores at each career stage by gender and ethnicity

	Career Commitment EC				Career Commitment PRC				Career Commitment YPP				Career Commitment PP			
	Mean	Std. Dev	t	p	Mean	Std. Dev	t	p	Mean	Std. Dev	t	p	Mean	Std. Dev	t	p
Male	3.33	1.696	-4.560	<0.001	3.18	1.408	-3.252	0.001	3.19	1.832	-2.674	0.008	2.69	1.772	-2.483	0.013
Female	3.49	1.649			3.49	1.375			3.63	1.866			3.17	1.915		
White	3.80	1.754	2.321	0.020	3.53	1.413	3.328	0.001	3.77	1.883	4.428	<0.001	3.28	1.988	3.511	<0.001
Minority Ethnic	3.57	1.577			3.26	1.352			3.14	1.777			2.72	1.689		
ALL	3.68	1.677			3.41	1.390			3.53	1.866			3.06	1.893		

Table 9: Change in career commitment scores between career stages by gender and ethnicity

	Career Commitment PRC			Career Commitment YPP			Career Commitment PP		
	< EC	> EC	same EC	< PRC	> PRC	same PRC	< YPP	> YPP	same YPP
Male	43.8	30.0	26.2	43.2*	38.4	18.5	33.7	32.6	33.7
Female	47.6	28.6	24.4	31.1	43.5	25.5	45.1	23.5	31.4
White	46.5	29.7	23.8	31.8	46.1*	22.1	44.9	24.7	30.3
Minority Ethnic	46.8	28.0	25.1	37.1	36.3	26.5	37.9	26.9	35.2
ALL	46.7	29.0	24.4	33.8	42.3	23.9	42.7	25.4	31.9

Valid %; *p<0.05

3.2.3.1 Mean career commitment by career stage

As Table 8 shows, average career commitment for the cohort is at its highest when the cohort were third year students ('Early Choices' data collected in 2005 – see Table 1 for further details) and at its lowest when in practice ('Pharmacy Practice' data collected in 2008). That career commitment changes over time, at different career stages and in different situational contexts, is not surprising. But the decline in commitment levels between undergraduate and early career data collection points raises a number of questions, including why this outcome has been observed and why cohort members remain in the profession given their declining commitment to it. It is likely that the process of transition from student, through preregistration training and into registered practice, is marked by changes in work attitudes and behaviours, needs and values, in response to the socialising effects of increasing occupational experience.²²⁻²⁵ Perhaps cohort members' career entrenchment – that is, the degree to which they are bound to, involved with, and attached to their early career choice to study pharmacy²⁶ – mediates any occupational experiences, to the extent that if cohort pharmacists experience a mismatch between the work values that initially led them to select pharmacy and the work values they are being socialised to as practitioners, they perceive the cost of leaving their chosen profession to be higher than the cost of remaining.²⁶⁻²⁸ Certainly, such an effect has been observed among nurses as they progress through their academic programme, with Myer *et al*²⁹ reporting that nursing students' commitment to their profession is based more on cost considerations [that is, the cost of withdrawing from nursing after having invested several years undertaking education and training] than on a desire to practise as a nurse.²⁹ Cohort pharmacists may also be motivated to remain in the profession on the basis that they expect the utility derived from working as pharmacists to increase in the future.²⁵

The results in Table 8 indicate that mean career commitment varies significantly according to cohort pharmacists' background characteristics. Hence we found that male cohort pharmacists have significantly lower career commitment than female cohort pharmacists at each career stage; and that ME pharmacists' career commitment, on average, is significantly lower than that reported by white pharmacists at each career stage. Background characteristics have been reported elsewhere as accounting for significant differences in the impact of occupational experiences on subgroups' work values such as career commitment.³⁰ However, gender and ethnic differences in career commitment have not been widely reported.

3.2.3.2 Change in career commitment by career stage

As cohort pharmacists were asked about their career commitment using the same scale at each of the four data collection points we have also calculated the percentage that had a score the same, higher, or lower than recorded by them one year previously. Few respondents changed score by more than ± 2 points on the scale between any of the two sequential career stages that we compared.

The results of this analysis appear in Table 9, together with subgroup analysis of percentage change in career commitment scores. Results suggest that stability in career commitment is most likely to occur between preregistration training and early practice, since 31.9% of cohort pharmacists recorded the same level of commitment at both these times; comparing between levels at other times only around a quarter of respondents were likely to have the same level of commitment.

3.2.4 Do career choice and decision-making factors influence experiences of working as a pharmacist?

Research question five is concerned with relationships between cohort pharmacists' attitudes to and experiences of work and the twelve career choice and decision-making predictors. By exploring links between cohort pharmacists' current jobs and the extent to which they are perceived as living up to expectations (measured as their job satisfaction) and variables measuring early career decidedness, occupational awareness and career commitment, we can establish whether attitudinal work outcomes such as job satisfaction are associated with early career choice.

We also look at experiences of work in answering question five, exploring how far cohort pharmacists feel in control of their jobs and the extent to which they feel overloaded in their job in relation to the early career variables. After considering cohort pharmacists' attitudes to and perceptions of their work we end by exploring their views on how their current work is preparing them for future career satisfaction. Measures included are: perceptions of how far the job provides career opportunities; and, perceptions of how far the job provides a sense of personal growth. Both are modelled as outcomes in regression analyses using the twelve early career choices, decision-making, and background characteristics variables as predictors. Our aim once again is to establish whether experiences of work such as the extent of job control, work overload, career opportunities and growth opportunities vary according to 'early' expectations of a pharmacy career.

3.2.4.1 Job satisfaction

Job satisfaction data have been recoded into satisfied (equal to 1 in a new binary variable) and not satisfied (zero). Results of the binary logit model exploring early career factors associated with job satisfaction are shown in Table 10.

The model suggests that there is a significant relationship between job satisfaction in 2008 and the 12 predictors ($p=0.010$) with the model explaining 6% of variance in the outcome. Cohort pharmacists who are significantly more likely to be satisfied are those who are white and who had not considered dropping out of the MPharm degree. While not statistically significant, results also suggest that satisfied cohort pharmacists are more likely to have had higher levels of career decidedness and occupational awareness on entry to pharmacy school, and to have been committed to both their undergraduate course and the profession.

Table 10: Predictors of cohort pharmacists' job satisfaction

Independent Variables	Regression Coefficients	z	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.0903	-0.28	-0.7272	0.5467
Minority ethnic	-0.8464	-3.11	-1.3796	-0.3132
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.3583	-1.27	-0.9132	0.1966
Did not apply through UCAS	-0.0841	-0.21	-0.8638	0.6956
Pharmacy not 1 st choice	-0.0577	-0.17	-0.7215	0.6062
OCCUPATIONAL AWARENESS				
No work experience	-0.0138	-0.05	-0.5902	0.5626
Pharmacist in the family	0.1415	0.47	-0.4541	0.7371
Not intend to work in CP	-0.2617	-0.99	-0.7793	0.2558
CAREER COMMITMENT				
Below average career commitment	-0.3724	-1.38	-0.9022	0.1573
Not strong desire to study pharmacy	-0.1119	-0.31	-0.8171	0.5934
Repeated undergraduate exams	-0.1981	-0.75	-0.7176	0.3214
Considered dropping out of MPharm	-0.5621	-1.82	-1.1690	0.0448

3.2.4.2 Job control

A scale outcome variable measuring the extent to which cohort pharmacists feel they have control and autonomy over their work was created from three questions included in the Pharmacy Practice survey distributed in 2008. In modelling associations between job control and the predictors a negative regression coefficient indicates that the reference category is more likely to have a high score on the job control scale (a higher score suggesting higher levels of personal control over the job). High levels of control indicate more freedom to decide how to accomplish a task or goals of a job and is associated with higher levels of intrinsic motivation for work, increases in job satisfaction, commitment, involvement, and performance.³¹

The results of the ordered logit indicate job control is not significantly predicted by the early careers variables; the model explains only 2% of variance, indicating that there are other significant, unobserved factors that are affecting cohort pharmacists' perceptions of job control.

As Table 11 shows, none of the predictor variables is statistically significantly related to cohort pharmacists' perceptions of job control. However, results suggest that cohort pharmacists who are from minority ethnic groups are less likely than white cohort pharmacists to perceive they have control of their job. Other factors associated with lower levels of perceived job control include: making a late decision to study pharmacy; not applying to pharmacy school through UCAS; not having work experience in a pharmacy before starting the MPharm; having below average career commitment as an undergraduate; and having failed examinations while an undergraduate – although none of the associations are statistically significant.

Table 11: Predictors of cohort pharmacists' job control

Independent Variables	Regression Coefficients	t	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	0.1205	0.46	-0.3941	0.6352
Minority ethnic	-0.2290	-1.02	-0.6717	0.2137
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.1277	-0.54	-0.5910	0.3356
Did not apply through UCAS	-0.0281	-0.08	-0.6890	0.6328
Pharmacy not 1 st choice	0.2082	0.74	-0.3472	0.7635
OCCUPATIONAL AWARENESS				
No work experience	-0.1306	-0.55	-0.5946	0.3333
Pharmacist in the family	0.3816	1.55	-0.1011	0.8643
Not intend to work in CP	-0.1849	-0.89	-0.5942	0.2244
CAREER COMMITMENT				
Below average career commitment	-0.2261	-1.01	-0.6650	0.2128
Not strong desire to study pharmacy	0.1574	0.53	-0.4225	0.7372
Repeated undergraduate exams	-0.0452	-0.21	-0.4733	0.3829
Considered dropping out of MPharm	0.0841	0.31	-0.4524	0.6207

3.2.4.3 Overload

A scale measuring the extent to which cohort pharmacists feel overloaded in their job was created from responses to the 2008 survey. In relation to this scale, feeling overloaded equates to having too much work to do in the time available, and a higher score indicates more overload and hence more problems with getting a job done. For this model, a negative regression coefficient indicates that the reference category is more likely to have a high score and hence to have more problems with job overload.

Regression analysis of overload indicates that it is significantly predicted by the variables in the model ($p=0.013$), with these variables explaining 6% of the variance in overload.

Table 12: Predictors of cohort pharmacists' overload

Independent Variables	Regression Coefficients	t	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.6459	-2.35	-1.1857	-0.1061
Minority ethnic	-0.6529	-2.76	-1.1184	-0.1875
CAREER DECIDEDNESS				
Chose to study pharmacy >17	0.1448	0.58	-0.3422	0.6318
Did not apply through UCAS	-0.0783	-0.22	-0.7735	0.6169
Pharmacy not 1 st choice	-0.2652	-0.89	-0.8517	0.3212
OCCUPATIONAL AWARENESS				
No work experience	0.0338	0.14	-0.4528	0.5205
Pharmacist in the family	0.1334	0.52	-0.3744	0.6412
Not intend to work in CP	0.2631	1.20	-0.1675	0.6938
CAREER COMMITMENT				
Below average career commitment	0.1028	0.44	-0.3590	0.5647
Not strong desire to study pharmacy	-0.6106	-1.97	-1.2209	-0.0003
Repeated undergraduate exams	-0.4086	-1.78	-0.8600	0.0428
Considered dropping out of MPharm	0.2685	0.93	-0.2973	0.8344

Work overload is significantly higher among female than male cohort pharmacists, and among white rather than ME cohort pharmacists – findings also reported by a recent pharmacy workforce survey using the same measure.³² Work overload is also generally higher among those with lower levels of career decidedness and, more surprisingly, higher among the committed cohort pharmacists, although associations between these variables and overload are not statistically significant.

3.2.4.4 Career opportunities

Career opportunities offered by a job are explored using a scale derived from three questions included in the 2008 survey. Higher scores on this scale indicate that cohort pharmacists perceive their job improves their career prospects relative to low scores on the scale. As with job control, a negative regression coefficient indicates that the reference category is more likely to have a high score on the career opportunities scale (a higher score suggesting cohort pharmacists perceive they have higher levels of career opportunities relative to those scoring lower levels of perceived career opportunities).

The results of our regression analysis of the relationship between the predictor variables and perceptions of the extent that the current job improves future career opportunities suggest that the predictors are significantly associated with the outcome ($p=0.002$), explaining 7% of the variance in perceptions of career opportunities.

Looking at Table 13, it can be seen that significantly fewer ME than white cohort pharmacists rate their experiences of their current job as offering future career opportunities. Only in relation to having a pharmacist in the family do

other factors significantly predict the outcome; moreover, although not statistically significant, Table 13 shows that career opportunities resulting from experiences in the present are rated better by those who had higher levels of early career commitment as measured by all the 'early' career commitment measures.

Table 13: Predictors of cohort pharmacists' perceived career opportunities

Independent Variables	Regression Coefficients	t	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.5559	-1.92	-1.1247	0.0130
Minority ethnic	-0.8904	-3.58	-1.3789	-0.4019
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.4721	-1.82	-0.9822	0.0380
Did not apply through UCAS	0.2248	0.60	-0.5095	0.9591
Pharmacy not 1 st choice	0.4344	1.39	-0.1787	1.0476
OCCUPATIONAL AWARENESS				
No work experience	0.0783	0.30	-0.4343	0.5908
Pharmacist in the family	0.7439	2.74	0.2094	1.2784
Not intend to work in CP	0.1826	0.79	-0.2696	0.6347
CAREER COMMITMENT				
Below average career commitment	-0.1725	-0.70	-0.6571	0.3120
Not strong desire to study pharmacy	-0.2696	-0.82	-0.9137	0.3744
Repeated undergraduate exams	-0.1785	-0.74	-0.6514	0.2944
Considered dropping out of MPharm	-0.22514	-0.84	-0.8408	0.3380

3.2.4.5 Growth opportunities

The final aspect of work we consider in our analysis are associations between the extent to which a current job is perceived as providing opportunities for personal and professional development and the predictor variables. Those scoring highly on the growth opportunities scale perceive their current job offers more opportunities for growth and development relative to those who have a low score on the scale. Once again, a negative regression coefficient indicates that the reference category is more likely to have a high score on the scale, hence indicating that the reference category is more likely to perceive their job provides them with growth opportunities compared with the other [non-reference] category.

Results of the ordered logit model exploring early career factors associated with perceived growth opportunities indicate that they are not significantly related; moreover, the model explains 5% of the variance in perceived growth opportunities.

While not statistically significant, growth opportunities are rated as being better by females and white cohort pharmacists, by those who made an early decision to study pharmacy, by those who applied through UCAS, and by those who had higher levels of career commitment as students (as measured by three of the four career commitment variables in the model). Opportunities

for personal and professional development in the current job are rated significantly higher amongst those with a pharmacist in the family (see Table 14 for details).

Table 14: Predictors of cohort pharmacists' perceived growth opportunities

Independent Variables	Regression Coefficients	t	95% Confidence Interval	
BACKGROUND CHARACTERISTICS				
Male	-0.4868	-1.81	-1.0141	0.0406
Minority ethnic	-0.4322	-1.87	-0.8863	0.0219
CAREER DECIDEDNESS				
Chose to study pharmacy >17	-0.4111	-1.70	-0.8860	0.0637
Did not apply through UCAS	-0.1088	-0.31	-0.7881	0.5705
Pharmacy not 1 st choice	0.2312	0.80	-0.3392	0.8017
OCCUPATIONAL AWARENESS				
No work experience	0.1465	0.61	-0.3287	0.6217
Pharmacist in the family	0.5673	2.25	0.0712	1.0634
Not intend to work in CP	0.3614	1.69	-0.0588	0.7815
CAREER COMMITMENT				
Below average career commitment	-0.0020	-0.01	-0.4520	0.4482
Not strong desire to study pharmacy	-0.4770	-1.58	-1.0717	0.1178
Repeated undergraduate exams	0.1831	0.82	-0.2555	0.6218
Considered dropping out of MPharm	-0.2622	-0.94	-0.8110	0.2866

4. Discussion

4.1 Summary of findings

4.1.1 Registration with RPSGB

Previous analysis of student attrition has estimated that an average of 9.5% of pharmacy students who enter pharmacy school do not pass the RPSGB registration exam.³³ As with this analysis of student attrition, the results of our regression analysis suggest that background factors (being female, not being from a ME group) are significantly associated with registration with RPSGB. What our longitudinal analysis adds to a numerical exploration of entry and exits from the MPharm is an investigation of 'early' career factors associated with registration to practise. Just what exactly motivates students to enter practice is, of course, beyond the scope of our model, but it is likely that there is some relationship with academic performance, given the significance of failing undergraduate exams in the model. The results of our model also suggest that occupational awareness variables are not good predictors for determining who registers to practise: the significant but inverse relationship between having a pharmacist in the family and registration to practise is hard to explain. It would be interesting to find out more about the extent of occupational awareness and occupational inheritance influence on qualification to practise as a pharmacist, and how these factors may be mediated by others when it comes to understanding associations between early career decision-making and career outcomes.

Other factors associated with registration include choosing to study pharmacy aged 17 or under, pharmacy being a first choice of degree, and having higher levels of career commitment as a student. These relationships are in line with our assumptions that career decidedness and career commitment as students are relevant for predicting who goes on to register for pharmacy practice in Great Britain.

4.1.2 Working in community pharmacy

Results show that an early career preference for working in community pharmacy significantly predicts subsequent practice in that sector. This is an important finding; moreover, given evidence that those more likely to have a pharmacist in the family and those who have early pharmacy work experience are also more likely to work in CP suggests that occupational awareness variables are important for predicting early career pharmacists' participation in the pharmacy labour market. Explanation of these findings is beyond the scope of the analysis presented here, but would perhaps draw on the ways that early career socialisation is effected through occupational awareness.

4.1.3 Intention to work abroad

The predictor variables examined do not explain much of the total variance in cohort pharmacists' intentions to work abroad, suggesting that some predictors for intentions to work abroad are covered in our model, while some important others are likely to be still missing.

However, what we can say about intentions to work abroad based on the results of our model is that those with lower levels of career commitment as students – as measured by all four variables included in our analyses – are more likely to intend to work abroad within the next two years. Males and cohort pharmacists of white ethnicity are also more likely to have an intention to work abroad based on the results of our model.

4.1.4 Intention to leave profession

Male cohort pharmacists are more likely to be considering leaving the profession, a finding also reported elsewhere.¹ Furthermore, those with lower levels of career commitment are significantly more likely to be considering leaving the profession. This is important because others have found that career commitment is a critical factor in explaining what keeps pharmacists where they are (in their current working arrangements and in the profession).³⁴

4.1.5 Career commitment

The predictor variables used in our models are most likely to explain variation in this outcome. Female cohort pharmacists and those of white ethnicity are significantly more likely to be committed, as are those who had a strong desire to study pharmacy and those with higher levels of career commitment as students. Findings suggest that these subgroups are more entrenched in

the profession and their chosen career, and that these subgroups experience a better fit between the values of the profession and their own individual values.^{27;35}

Career commitment changes with career stage and background characteristics, indicating that it is a dynamic work value that is associated with situational and contextual variables.

4.1.6 Job satisfaction

Cohort pharmacists with higher levels of career decidedness, occupational awareness on entry to pharmacy school, and career commitment are more likely to be satisfied with their work; white cohort pharmacists and those who had not considered dropping out of the MPharm degree are significantly more likely to be satisfied. The association between commitment and job satisfaction among pharmacists has been reported previously.²¹

4.1.7 Job control

The model does not explain much variation in job control; while most of the reference categories are associated with the outcome, none of the associations are statistically significant.

4.1.8 Overload

Perceptions of work overload are more successfully predicted by the variables included in our models. In common with findings reported by a recent pharmacist workforce study,³² female cohort pharmacists are more likely to report overload than males, while those from ME groups are less likely than white cohort pharmacists to report overload.

4.1.9 Career opportunities

In relation to future prospects, ME cohort pharmacists are significantly less likely than white cohort pharmacists to rate their future career opportunities highly. Career opportunities are more likely to be rated highly by those with higher levels of early career commitment.

4.1.10 Growth opportunities

Females and white cohort pharmacists, those making an early decision to study pharmacy, those applying through UCAS, and those with higher levels of career commitment as students are more likely to rate their current work as providing them with opportunities for growth; growth opportunities are rated significantly higher by those with a pharmacist in the family.

4.2 Unpacking early career pharmacists' participation in, and commitment to, the pharmacy labour market

Given analysis presented in this report has sought to establish the extent to which aspects of early career choices and decisions are related to subsequent participation in, and commitment to, the pharmacy labour market, how successful have we been in addressing the research questions posed? Overall, results suggest that the predictor variables are most likely to explain variation in cohort pharmacists' career commitment and perceptions of the extent to which their current job improves their career prospects. Since the four cohort study surveys have an explicit focus on careers decisions and motivations for and commitment to working as a pharmacist, these findings are not altogether surprising; moreover, findings represent an important step towards accurately modelling the contributions made by early career pharmacists to the pharmacy labour market.

However, one of the difficulties we faced in undertaking this longitudinal analysis was in relation to the limited data available on all cohort pharmacists. In part this was due to attrition from the study and non-response, but also arose because a sizeable minority of respondents to the student surveys did not pass the Registration exam and hence were ineligible for inclusion in Part Two of our analysis. For future work aimed at modelling early career pharmacists' labour market participation further investigation of factors influencing who graduates from pharmacy school (and the duration of their undergraduate education) might also help explain who registers to practise.

4.3 Limitations of the research

In the main, the regression models applied in our analysis explain only a limited amount of variation in the outcome variables, suggesting that other factors not identified in our work affect these outcomes. Furthermore, the models do not take into account differences between the genders on the basis of ethnicity. As many outcomes varied by both gender and ethnicity more complex models might benefit from exploring the interplay between these characteristics more fully.

4.4 Recommendations for future research

As the environment in which cohort pharmacists practise is significantly different from earlier cohorts of pharmacists, continued future funding of the cohort study is important for informed workforce planning. Understanding what influences early career pharmacists' contribution to the pharmacy labour market requires regular data collection beyond that collected by the pharmacy workforce census, and given the substantial investment by the PPRT in the cohort study to date future data collection episodes would allow for tracking of labour market changes to be investigated and for the PPRT to recoup further returns on its investment in the study.

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