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Assessing the person or the project? How disciplinary ontological and epistemological assumptions shape doctoral admissions in elite UK institutions

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Abstract
Research suggests there are notable differences in approaches to doctoral admissions and the criteria employed to select doctoral candidates. Through interviews with 65 academic staff involved in doctoral admissions at the universities of Oxford and Cambridge, this paper examines how these different approaches to admissions play out in different disciplines, driving the disciplinary divergence in conceptualisations of the PhD and, in turn, admissions practices. Findings suggest that differences are shaped by varying underpinning assumptions within disciplinary clusters about the nature and process of knowledge production and the purpose of doctoral education, what we refer to as 'ontological and epistemological assumptions' about the doctorate. These tend towards two dichotomous positions: one that views the doctorate primarily as knowledge production, an approach mainly linked with humanities and social science, and one that views the doctorate as skills formation and a licence to research, an approach mainly linked with STEM and medical science. These conceptualisations are manifested in radically different approaches to doctoral admissions across the clusters, reflected in heterogeneity in the role of the research to be undertaken, the role of the potential supervisor, and judgements about existing skills and knowledge in selection decisions. We draw on neo-institutional theory as a heuristic device for understanding how assumptions about the nature and purpose of the doctorate can be viewed as disciplinary norms that get reproduced in the processes and practices of doctoral admissions. Understanding these disciplinary differences and their drivers is a critical first stage in understanding variations and potential inequalities in doctoral admissions and ensuring that these nuances and complexity are reflected in ongoing graduate access work.

Keywords Doctoral admissions · PhD purpose · Doctoral education · Academic disciplines

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Introduction and background

In higher education (HE) systems around the world, the number of doctorates has increased enormously over the last few decades (Auriol et al., 2013; OECD, 2019; Sarrico, 2022). The drivers of growth are debated numerous times. A key part of this growth is national investment in doctorates, reflecting the fact that doctoral research is an important policy lever in driving innovation as part of knowledge-oriented industrial strategies (Enders, 2005; Thune, 2009). Further, the general massification of HE means an increasing number of people trying to obtain a positional advantage in the labour market through higher levels of credentials (Robson, 2023b).

However, this does not do justice to the complex space that doctoral research occupies. The doctorate exists in an uncomfortable dynamic, in tension between knowledge production, person production, and individual formation (see Marginson, 2023). The doctorate is both an end in its own right and part of a journey. It is simultaneously about individuals and knowledge while also being the key mechanism by which HE organisations reproduce themselves through training the next generation of researchers and academics. As such, these hybrid, liminal, and reproductive aspects of the doctorate enable us to see more clearly the power imbalances and deficiencies in our academic structures and the substantial inequalities that lie at the heart of the process of research (Derrick et al., 2024; Robson, 2023a). Yet, it is only recently that serious research attention has been paid to the role of doctoral admissions as a fundamental barrier in the research pipeline and underpinning broader inequalities in research (e.g. see Dias Lopes & Wakeling, 2022; Lindner, 2020; Smith McGloin et al., 2024; Williams, et al. 2019).

Most research on doctoral admissions has examined conceptualisations of academic merit and the evidence used to assess it. Literature from several national contexts (UK, USA, Germany, China) suggests that the application materials required as evidence when making PhD admissions decisions are similar across academic disciplines: test scores (particularly in the USA and China), transcripts, research proposals or personal statements, references, and interviews (Bloch & Mitterle, 2022; Chiu, 2019; Jung et al., 2023; Megginson, 2011). This largely reflects an emphasis on academic skills and career trajectories in admissions decisions (Jung et al., 2023) in most if not all academic disciplines under scrutiny.

However, significant variation in how this evidence is weighted and evaluated exists across disciplinary and national contexts/structures of doctoral programmes. For instance, in countries requiring graduate record examinations (GREs) (e.g. the USA), greater weight is allocated to specific test scores depending on the discipline (e.g. physics GREs in physics programs; analytical writing scores in philosophy and linguistics) (Posselt, 2014). Some disciplines also place more emphasis on particular skills (Mantai & Marrone, 2022). In countries such as the UK and Germany, where, in some disciplines, a research proposal is required as part of the PhD application, proposals are heavily valued. This is particularly the case in humanities and social sciences (HSS), where the proposal is used to provide critical evidence of research potential (Bloch & Mitterle, 2022; Chiu, 2019). Supervisors in HSS also tend to be more involved in selecting their own students, aligning with the structure of UK doctoral programs in which PhD students embark on research projects at matriculation (Chiu, 2015). In contrast, proposals are rare in science, technology, engineering and mathematics (STEM) disciplines and, when they are part of the application, are less important in selection processes than CVs and wider indications of an individual's academic potential (see Bloch & Mitterle, 2022).

Research from the USA also points to certain personal characteristics being emphasised in admissions, such as ambition, enthusiasm, motivation, proactiveness, resilience, creativity, and curiosity (see Mantai & Marrone, 2022; Posselt, 2014), alongside transferrable skills such as communication, cognitive, interpersonal, digital (Mantai & Marrone, 2022). Institutional or departmental agendas may also shape criteria and assessment processes; Chiu (2019) highlighted the "match" and "fit" issue: the extent to which an applicant matches in terms of research interests and supervision and fits in terms of "compatibility" and "suitability" to the programme and/or faculty, which includes alignment with faculty priorities and balance across research areas. The assessment of evidence and weighting of criteria further varies at the programme and individual levels, as academics may value personal characteristics that do not necessarily align with the department-level emphasis on quantifiable measures of academic performance, such as test scores (Chiu, 2019). The importance placed on criteria also shifts throughout the different stages of doctoral admissions, from initial review or sift of applications to shortlisting and final decision-making (Chiu, 2019; Posselt, 2014). At the same time, forms of the doctorate are diversifying, spurring discussions on its purpose and what the twenty-first-century doctoral researcher looks like (Kelly, 2017)—all of which raise questions about whether doctoral selection criteria and processes reflect these changes.

Thus, doctoral admissions are highly heterogeneous. They involve a wide range of approaches and complex processes and practices shaped by national, cultural, and institutional factors. However, although there is a lack of detailed research across different disciplinary contexts, existing research suggests that one, if not the key factor in this heterogeneity, is disciplinary variation manifested in each discipline's conceptualisation of doctoral research (Posselt, 2015). This paper, therefore, aims to examine the relationship between discipline, the purpose of the PhD, and doctoral admissions. The research question guiding the paper is: *how do different understandings of the purpose of the PhD and broader disciplinary differences in doctoral education shape the doctoral admissions process and practices?* We explore how underpinning disciplinary assumptions about the purpose of the doctorate and, more broadly, about the nature of knowledge production (what we refer to as underpinning ontological and epistemological assumptions about the doctorate) shape the processes and practices of doctoral admissions. We apply neo-institutional theory as a conceptual framework and heuristic device to understand the mechanisms by which disciplinary assumptions manifest in and are reproduced through doctoral admissions. We argue that disciplines can be viewed as institutions in their own right, with their own set of embedded norms that shape the behaviour of institutional actors. Disciplinary assumptions about the nature of the doctorate can be viewed as kinds of institutional norms that are reproduced by those responsible for doctoral admissions, preserving institutional/disciplinary boundaries. This provides greater insight into differences in approaches to doctoral admissions and the powerful role that individuals play as both disciplinary gatekeepers and reproducers of institutions.

Disciplinarity and doctoral research

Despite increasing emphasis on interdisciplinary research in funding and research assessment, disciplinarity remains at the core of many PhD programmes, as discipline shapes the nature of knowledge production, supervision (Becher, 1989; Delamont et al., 2000; Parry, 2007), and research communication (Bazerman, 1988). Further, the hallmark of PhD

programmes continues to be the production of a piece of research (i.e., the thesis), which is examined by experts in the field and must meet particular institutional and disciplinary requirements (Jackson & Tinkler, 2001; Tinkler & Jackson, 2000). As such, the PhD is tied to the nature of research in the discipline, as doctoral education generally involves some level of socialisation (Delamont et al., 2000) through which the student eventually learns and then contributes to disciplinary cultures and knowledge.

Prior work has described patterns of knowledge production in terms of disciplinary clusters (Becher, 1989; Parry, 2007) with implications for doctoral research (Parry, 2007). For instance, Parry (2007) described knowledge in the humanities as "individualistic and uncertain" (p. 40), while in the social sciences, knowledge is both highly individualised and built upon methodological and theoretical approaches. Knowledge production in HSS is, therefore, a traditionally solo affair, and while this has changed significantly over the past four decades as social scientists increasingly collaborate and publish together (Henriksen, 2016), PhD research continues to be individual in most HSS doctoral programs, as a single PhD student develops and carries out a research project that forms the thesis. In turn, in these disciplines, supervision plays a key role in doctoral students' experiences (Deuchar, 2008; Pyhältö et al., 2015), as students need supervisors who have the knowledge to guide their particular projects (Parry, 2007).

In STEM, the "boundaries of knowledge are well-known" (Parry, 2007, p. 40) and therefore, the questions are more clearly defined, research is fast-paced and competitive, and doctoral research is underpinned by larger, usually funded research agendas. In disciplines in which research is lab-based, research/knowledge production is often a collective effort and for PhD students, day-to-day interactions may involve a range of lab members. Labs vary in size and may include a mixture of doctoral students and postdoctoral researchers who work under the guidance of a PI. For doctoral education, this means PhD students must fit within an existing lab and be equipped with the skills needed to contribute to the larger project (Parry, 2007). The day-to-day research life of doctoral students is thus influenced by the model of research within the chosen disciplinary area.

Neo-institutional theory (NIT) provides a valuable lens for understanding differences across academic disciplines (Alvesson & Spicer, 2019; Meyer & Rowan, 1977). A key part of NIT is the perspective that the structures and practices of organisations are largely shaped by embedded norms rather than principles of rationality or efficiency (Derrick et al., 2024; Zucker, 1977). These 'institutional norms' underpin stable social structures while also shaping behaviour and social interactions and are sustained by shared expectations of compliance and sanctioning (Bicchieri 2006). In academia, disciplines can be seen as distinct institutional fields, each governed by unique sets of rules, values, traditions, and embedded norms that influence research priorities, teaching practices, and, critically, how the world and knowledge are viewed. Disciplines establish shared rules, values, and standards that define what is considered legitimate knowledge, appropriate methodologies, and valid forms of enquiry. These institutional characteristics manifest in the formation of disciplinary boundaries, peer review processes, and professional associations that reinforce and perpetuate specific ways of thinking, making them resistant to change and fostering stability and continuity. Although subject to isomorphic pressures (DiMaggio & Powell, 1983; Robson et al., 2022) in response to external forces such as funding bodies, policy, regulation, and societal needs, they also provide stable path dependencies. This results in a mix of standardisation and differentiation across fields, contributing to the persistence of disciplinary silos while also allowing for gradual adaptation and interdisciplinary collaboration. Thus, using NIT lenses, it is possible to see how the doctorate plays a critical role in maintaining disciplinary boundaries, inducting individuals into disciplinary norms

and institutionalised membership through processes of socialisation, legitimisation, and peer review. It is also possible to see how institutionalised disciplinary differences might, therefore, underpin the variations in doctoral admissions, with the processes and practices of doctoral admissions acting both as a manifestation of embedded assumed norms and the mechanism by which they are maintained and reproduced. While each discipline has a range of distinct myths, norms and values, at the heart of doctoral admissions are set assumptions about the nature of the world and how we can and should understand it and the nature of knowledge and knowledge production—what we refer to as ontological and epistemological assumptions. These are likely to appear in the complex conceptualisations of the purpose of the doctorate, to which we now turn.

Different conceptualisations of the purpose of a doctorate

Once conceived as a search for truth through knowledge production (Barnacle, 2005), the PhD was meant to prepare students for an academic career. Today, most PhD holders will find work beyond academia (Diamond et al., 2014; OECD, 2021; Vitae 2016) due in part to the global rise in doctoral enrolment and unequal growth in university-based career opportunities (OECD, 2021; Sarrico, 2022). National and supranational organisations increasingly highlight the need to prepare PhD students for multiple career trajectories, emphasising structured programmes and transferrable skills in response to employability discourses (Cuthbert & Molla, 2015) in the face of what has been referred to as the 'PhD glut' (Zumeta, 1982). At the same time, the diversification of doctoral degrees to include professional and industrial doctorates and the introduction of alternative thesis formats, such as thesis by publication, may reflect and promote wider trends towards the instrumentalisation of knowledge and publishing as a vehicle for career advancement (Frick, 2019; Skov, 2021).

Amidst these changes, many within academic and policy spheres have reflected on the purpose of the doctorate (e.g. Kelly, 2017; Park, 2005; Sharmini & Spronken-Smith, 2020). For instance, the UK Quality Assurance Agency (QAA) tried to identify the key qualities of doctoral education in its 2020 Characteristics Statement on the PhD, stating that all PhD graduates must "demonstrate an original contribution to knowledge" (QAA, 2020, p. 3), while also contending that "[academia] is just one of many options for doctoral graduates, who enter diverse jobs across all sectors, bringing their research skills to bear in their own professional context." (QAA, 2020, p. 4). This framing of the doctorate is not only consistent with narratives around skills training, employability across sectors, and impact, but also reflects a growing focus on the PhD as developing the person in policy discourse (Åkerlind and McAlpine 2017).

Given this context, research has examined the purpose (and/or perceived value(s)) of the PhD from the perspectives of supervisors (Åkerlind and McAlpine 2017; Loxley & Kearns, 2018) and doctoral students (Bryan and Guccione 2023; Mowbray & Halse, 2010). Much debate about the purpose of the PhD can be described in terms of "product versus person/process", with discussion centring on whether the primary purpose of a doctorate is to make an original contribution to knowledge or to prepare skilled knowledge workers for employment in a range of academic and industrial contexts (Åkerlind and McAlpine 2017, p. 1687). However, this is a complex debate, prone to false dichotomies: most literature suggests that both academics/supervisors and doctoral students view the PhD as having multiple interrelated purposes (e.g. Guccione & Bryan, 2022; Åkerlind and McAlpine

2017) and that personal development as a purpose of PhD education is both critical and inextricable from the overall doctoral process, which includes knowledge production, skills training, and the range of experiences that accompany the PhD (Åkerlind and McAlpine 2017).

Thus, there appears to be a complex interplay between different conceptualisations of the purpose of the doctorate, disciplinary differences, and the heterogeneous way in which doctoral admissions are enacted on the ground. Given the importance of doctoral admissions for equity in research, academic and research careers, academic reproduction, and institutionalised disciplinary stability and silos, understanding this complexity is crucial. Therefore, in this paper, we aim to examine the relationship between purpose, disciplinary differences, and the processes and practices of doctoral admissions, focusing on the research question of how different understandings of the purpose of the PhD *and broader disciplinary differences in doctoral education, shape doctoral admissions process and practices.* Taking NIT as a conceptual framework, we particularly focus on ontological and epistemological assumptions about the nature of the doctorate as embedded disciplinary norms relate to disciplinary differences in the processes and practices of doctoral admissions.

Methods

Research context: Doctoral education and admissions in the UK

The aims and questions guiding this paper are addressed through a qualitative multiple-case study approach (Stake, 1995) undertaken at the University of Oxford and the University of Cambridge as part of a larger collaboration focused on analysing the processes and practices involved in doctoral admissions. For context, the structure of UK doctoral education, specifically of doctoral admissions at Oxford and Cambridge, is described below. Oxford and Cambridge were chosen as the sites of this research because they are large research-intensive universities that play an important role in the UK higher education sector. Additionally, admissions processes at these universities are highly decentralised due to their governance structures. This may allow for additional insight into how departments handle admissions processes in relation to disciplinary and departmental factors—as well as larger institutional considerations.

The structure of doctoral education in the UK is based on the German apprenticeship model, the focus of which is the doctoral thesis. There is traditionally no coursework, as is the case in North American PhD programs. However, following a series of policy documents, including the 1986 Reyolds Report and 1991 ESRC research training guidelines, UK PhD programs became increasingly structured to reduce completion timelines and increase the quality of PhD education (UK Council for Graduate Education, 1995). Today, doctoral programmes in the UK are designed to take three to four years and include a set of research training courses during the first year. In the UK, applicants in HSS apply with their own research proposals, while those in STEMM usually join pre-existing projects or research groups. Many applicants contact supervisors prior to submitting a formal application in order to ascertain supervisor availability for their proposed projects (HSS) or to gather more information about offered projects and research groups (STEMM). Most universities also take part in government-funded doctoral training centres (DTCs), doctoral training partnerships

(DTPs), and/or centres for doctoral training (CDTs). DTPs and DTCs provide training for cohorts of doctoral students in a range of disciplinary areas, while CDTs focus on training students working in prioritised, often interdisciplinary, research areas. DTCs, DTPs, and CDTs may also have industrial partners.

The universities of Oxford and Cambridge are elite collegiate institutions, meaning that they are comprised of individual colleges (43 at Oxford, 31 at Cambridge) that operate as independent entities within each university. Both Oxford and Cambridge also have a number of academic departments that are governed by the university. At the undergraduate level, colleges are centres of both academic and social activity and handle admissions as students apply directly to individual colleges. At the postgraduate level, responsibility for admissions lies with academic departments, and colleges are allocated following an offer; colleges at the PhD level form social communities while the core academic work is based at the department. Specific criteria and admissions processes for each doctoral programme are thus designed and managed by academic departments, and there is no differentiation in requirements or process for students from different backgrounds (e.g. international vs. domestic, part vs. full-time) who are applying for the same program.

Data collection

Sixteen departments (eight per university) and two DTCs/DTPs (one per university) were selected as cases. These departments were distributed across all four academic divisions at Oxford and six schools at Cambridge in order to capture disciplinary differences. A multiple-method approach was used for data collection, focusing primarily on semi-structured interviews and analysis of relevant documents. We interviewed four to eight participants per department (65 participants in total: 46 at Oxford and 19 at Cambridge). Participants were academic staff currently or recently involved in assessing doctoral applications in some capacity, e.g. shortlisting, conducting interviews, and/or sitting on admissions boards. Interviews focused on understanding explicit and implicit admissions criteria, the processes and practices underpinning doctoral admissions in different disciplines and departments at both universities and the perceived purposes of the PhD. Interviews were conducted online via Teams, recorded and transcribed, and lasted between 60 and 90 min.

Admissions documents were also collected from all participating departments. These included PhD selection criteria, assessment scoresheets, procedural documents describing admissions timelines and processes, and information on university and department websites on how to apply for a doctorate. Documents were used to provide a deeper understanding of admissions processes in each case. Specifically, documents helped to verify/clarify information collected from interviews and were sometimes used during the interviews themselves, for example, by referring to specific criteria in assessment scoresheets or inquiring about particular aspects of the application (e.g. writing samples, reference letters), which are listed on admissions websites.

This project received ethical approval from both universities and in order to protect participant identities, in the findings, we do not name specific departments or titles but rather refer to disciplinary clusters when introducing interview quotes. The disciplinary clusters are humanities, social sciences, science, technology, engineering and maths (STEM), and medical sciences. The case studies are equally distributed across these clusters.

Analysis

Data were first analysed within cases to construct an outline of each department's admissions processes and criteria and then across cases to ascertain broader patterns. The aim was to identify both admissions processes and practices, the underlying assumptions that shape them, and how. Analysis was done by two members of the research team, and the analytical process and results were iteratively discussed with the larger research team.

Interview data were analysed via NVivo 12, using a combination of pre-defined codes based on the interview questions (e.g. assessment criteria) and the phases of the admissions process (e.g. allocating applications, shortlisting, interviews, final screening), which were intended to structure the analysis, and inductive codes derived from the data. Predefined codes were applied first to the dataset, followed by the inductive codes, which largely included specific criteria used by departments (e.g. academic performance, quality of research proposal, technical skills) and other key factors that shaped admissions processes (e.g. the role of the supervisor in shaping admissions). These inductive codes were developed from multiple readings of the data and discussions with the larger research team and tested and refined throughout the coding process. Following the initial coding of interviews, larger patterns were identified, namely that departments in STEM and medical science (together STEMM) tended to place greater emphasis on skills and disciplinary expertise (which we deemed aspects focused on 'the person'), and HSS placed greater emphasis on the research proposal ('the project'), as reflected in both admissions criteria and processes. This broad disciplinary pattern forms the basis of the key findings presented below.

Limitations

It is important to acknowledge that we only captured the views of a select group of academics and may not have captured within-discipline differences in a sufficiently nuanced way. Similarly, the experiences of Oxbridge academic staff are arguably relatively unique given the elite nature of these universities, and two-thirds of the interview participants came from Oxford, reflecting an imbalance in institutional representation in our sample. However, rather than making generalisable claims about the nature of doctoral admissions, our aim with this paper is to provide a theoretically driven discussion of the relationship between ontological assumptions about the purpose of the doctorate, epistemological assumptions about the nature of knowledge production, and admissions processes and practice in the UK. The goal is to develop a deeper understanding of why different approaches to doctoral admissions exist in order to contribute to the broader critical discussion of graduate access.

Findings

The findings demonstrate clear differences in doctoral admissions processes and admissions criteria. Such differences were broadly aligned with disciplinary variations in the perceived purpose of the PhD, research practices, and the model of the PhD program. Across participating departments, the varied approaches to admissions and the underpinning assumptions about the purpose of the doctorate were most stark in relation to two disciplinary clusters in the study. No notable institutional differences were reflected in the

findings. Further, while participants had varying levels of experience in admissions and were involved at different points in the admissions process, their understanding of the criteria and process was largely the same within each department.

In HSS departments, the purpose of the PhD was viewed by the majority of participants ($n = 19$ (out of 28)) as primarily focused on knowledge production. In other words, the research project and the development of a substantive and original piece of research were viewed as the most important part of the doctoral process: "They're [applicants] not just coming here to do [the discipline], they're coming here to bring their project" (social sciences). In contrast, in STEMM, the majority of the participants ($n = 32$ (out of 37)) framed the PhD and doctoral potential solely in terms of person-focused factors such as skills, experience, and trajectory, with several ($n = 4$) explicitly noting that the aim of the PhD is to train doctoral students to become researchers in a relevant discipline. While the production of a piece of original research was still viewed as essential, this was seen not as an end in itself but as a way of evidencing the research skills and methodological expertise that students had developed. As such, the doctorate was primarily framed as a license to do research, a grounding in methodological practice, and a process of skill formation rather than, fundamentally, a knowledge-based product. This was clearly articulated by a participant who commented that "the purpose of the PhD is to learn ultimately how to ask questions [and] how to address those questions through the proper methodology". The importance of individual development was particularly emphasised by another participant below:

> ...for me it's...a very long and rigorous self-development programme that trains lots of different soft skills, resilience, motivation, but also it's critical thinking. These are really important skill sets, but also you should come out of it with a superpower. So something you can serve back to the world confidently, independently and or just like you can combine that with someone else's superpower later (STEM).

Based on our analyses of doctoral admissions processes, these different disciplinary emphases were overtly reflected in the following:

- the role of the research project in admissions assessment
- the role of the supervisor in admissions assessment
- the role of skills in admissions assessment

We discuss each of these in relation to the disciplinary clusters of HSS and STEMM.

Humanities and social sciences

In the HSS, PhD application materials included official transcripts, a CV, a research proposal, writing samples, and two to three references. Most departments (6 out of 7) required a master's degree for all of their doctoral degrees. While admissions processes varied across departments, in general, application assessment involved: 1) a review of applications for completeness and, in some cases, an initial review where applications deemed weak (i.e. those below minimum academic requirements) were eliminated, 2) a thorough review of application materials, often by prospective supervisors (shortlisting), and 3) a final review of applications nominated for offer. In departments that required an interview as part of the admissions process, interviews usually took place after shortlisting and were factored into the final evaluation and offer recommendations. While all departments had their own processes for assessing applications (e.g. scorecards, spreadsheets) and explicit

criteria attached to the assessment, the criteria varied as to their specificity and phrasing. Further, implicit criteria related to personal attributes—motivation, independence, passion, creativity—were consistently identified by participants.

Role of the project

As described above, participants in HSS disciplines emphasised knowledge production as the key purpose of the PhD: "it's about being able to construct knowledge" (social sciences). While qualities of the person (skills, disciplinary background, personal motivations, etc.) were commonly identified as factors in admissions decisions, the research project was described as the medium through which the doctoral student will develop and contribute knowledge to the discipline. A feasible, PhD-appropriate research proposal was therefore crucial to admissions decisions, as most participants in HSS ($n=21$) viewed the proposal as the central part of the application. For instance: "I think it would be the proposal [that's] really at the heart [of] success…a doctorate is so intimately tied to that" (humanities). Even in departments that conducted interviews and viewed the interview as a critical factor in admissions decisions, interviews generally focused on probing the applicant's research thinking in relation to key issues raised in the research proposal, such as theory and methodology. As highlighted by a social science participant, the central question was: "Is this a good project and can we see that this candidate has ability to pursue it?

Participants described a successful, strong research proposal as one that "is going to be able to make a scholarly contribution" (humanities), has "clarity in the research questions", and "even a superficial review of the general literature in their area" (social sciences), a framework that shows "critical capabilities" (humanities), and a "particular plan and methods to investigate [the] particular research question" (social sciences). Additionally, while participants expected proposals and projects to evolve over the course of the PhD, it was important that the proposal was both original and feasible:

> We are looking at both the ambition and the feasibility of the research. So you could have a research proposal which was highly ambitious and exciting and theoretically quite potentially sophisticated [but] that was in our view, unfeasible. Similarly, you could have a research proposal that is highly feasible, but actually theoretically rather dull or unengaging or even kind of pedestrian, or has just been done before. There's nothing new there. (Humanities)

Participants also acknowledged the difficulty of ascertaining the scale and nature of a PhD contribution: "I try not to foist too much expectations on students… you need to make an original contribution, but sometimes I think that word can get so loaded in terms of how significant they think that contribution needs to be" (social sciences). As such, many emphasised ($n=15$) that assessing the project was not solely about the quality of the proposal and its potential for originality; the relationship between the project and the applicants' biographical and academic journeys was also considered: "I don't want to just to read something that could have been written by anybody clever. I want to see that this person is going to live this experience and that they're right at the heart of it" (social sciences). In other words, underpinning selection decisions in HSS was the clear assumption that the doctorate is an individual endeavour and the process of doctoral knowledge production is rooted in personal biography. Assessors wanted to see clear alignment between the project and the life stories and intrinsic motivations of the applicants, suggesting the

importance of having doctoral students who have the ability and desire/passion required to see the project through:

> This person might want to work on a particular collection of manuscripts…And if that's so, then you want them to have a sense of…I wanna come to Oxford and sit in the Bodleian Library and work with this collection of things and do this with it. And so on. So a really realistic and grounded sense of a connection between the person and the project is a good thing. (Humanities).

At the same time, participants emphasised the need for the project, and the knowledge produced through it, to be aligned with both the research agendas of the potential supervisors and the broader portfolio of research in the department and the doctoral programme. The idea of 'fit' with the research of supervisors and the department was one of the most important criteria for selection in doctoral admissions and, importantly, was cited as the key reason why applicants, even objectively excellent applicants, might be rejected. However, the alignment between potential supervisors' research, future research agendas, and applicants' proposed projects was seen as fundamentally critical. Without this individualised level of 'fit', offers of a place were very unlikely: "…there a lot of people who aren't comfortable supervising outside of that specific, very narrow area of specialty…I wouldn't want to be supervising someone looking at [x topic] because I'm just not interested in that" (social sciences).

Thus, much of the admissions processes centred on knowledge production, with the proposed research project itself being assessed for quality, feasibility, and potential contribution as well as alignment with the applicants' life stories, the research of the department and, most importantly, the research of the potential supervisors.

Role of supervisors

Given the importance of alignment between the project that applicants propose and potential supervisor research interests, the idea of supervision and supervisor capacity plays a significant role in assessment. Due to the individual nature of HSS PhD research and the variety of topics applicants propose, supervisor capacity is "a complicating factor… if somebody's applying for [a] topic and the department…does not have the supervisory capacity, [assessors] have got to think really carefully about liability, duty of care and professionalism" (Humanities). 'Capacity' can mean a number of different things. It can refer to a lack of alignment between an applicant's proposal and an individual's research agenda; or it might refer to the fact that although a member of academic staff could theoretically supervise a project, they have too many students, will be taking a sabbatical or retiring, or may not have a contract of an appropriate length to provide supervision.

As such, a lack of supervisory capacity was often cited as an easy catch-all reason for rejecting an application: no capacity means a lack of necessary support and, therefore, no offer, even if the application is strong. However, this very clearly points to the underpinning model of the doctorate in HSS, where the relationship between supervisor and supervisee is fundamental. Although, as described above, the doctorate was framed in terms of individualised knowledge production, this process was viewed as being rooted in a personal relationship, shaped by personal meetings – supervisions. This is why a few HSS participants, particularly in interviewing departments, emphasised that a key part of their selection decisions involved judging whether they could work well with their prospective students:

> There's no point admitting the student if they're going to be working with a supervisor who's not sympathetic to their methods. The work of writing a doctorate is a pretty solitary one still for most people, and the relationships with the supervisors are important. So we need supervisors to accept students in whom they believe and to whose methods they're sympathetic and in whose work they are genuinely interested (humanities).

Supervisors in HSS also play a role in the pre-admissions stage, as many applicants contact supervisors prior to submitting their applications and may request feedback on research ideas or send drafts of proposals for comment. The extent to which supervisors provide feedback varies tremendously, as some indicate supervision capacity and whether they are interested in the project, while others may suggest additional references or provide in-depth feedback on drafts—which could substantially influence the quality of the proposal. The nature and conceptualisation of the supervisory relationship in HSS, and an emphasis on knowledge production as the key purpose of the doctorate, can be seen as fundamentally shaping approaches to admissions and judgements about doctoral research potential in HSS departments.

Role of skills

Although the project formed the core of assessment in HSS, writing and thinking skills (e.g. critical thinking, problem-solving, analysis) were also repeatedly highlighted as essential criteria for PhD admissions. As writing is core to producing a doctorate, participants noted that successful doctoral students must possess effective writing skills. Many participants emphasised ($n = 15$) that writing skills be displayed prior to beginning the programme: "People need to be able to write; they need to be able to write before they get here because we can't really teach them to do that" (humanities). Therefore, the importance placed on writing likely underpins the expectation that most candidates will have successfully completed a master's, demonstrating an ability to produce an extended piece of academic writing. Similarly, examples of applicants' writing (the research proposal and writing samples) were identified (particularly in the humanities and non-interviewing social science departments) as underpinning selection judgements. These documents were particularly assessed for argumentation, the ability to construct and communicate an argument:

> A [good] writing sample [is one] that, after reading it, I can sort of summarize what it argued. And if you can do that, the person has successfully conveyed the core of their argument. If there's some roughness in the writing at certain moments, I'm less worried about that…My main concern is that this person can make an argument and can structure an essay (humanities).

For some participants ($n = 8$), specifically in non-interviewing departments, argument construction was the essential skill linked with writing, alluding to the importance of applicants' ability to effectively communicate their thinking. Thinking clearly and critically, navigating challenging issues, and presenting complex ideas clearly and coherently were all deemed essential skills in both the humanities and social sciences. These were largely assessed through submitted written documents, mainly the proposal, and where interviews were also used through probing questions about the proposed project.

STEMM

In STEMM, PhD application materials included official transcripts, a CV, a research statement or statement of purpose, and two to three references. While several departments offered the option of proposing one's own research project, applicants typically apply for pre-defined projects or research groups by indicating project(s) and/or prospective supervisors in their application forms. Towards the end of the admissions process, successful applicants were then allocated or matched with projects/research groups based on their preferences. Although master's degrees were usually not required, participants reported that most successful applicants completed Master's programmes. As in HSS, admissions processes varied across departments, but in general, assessment involved an initial review of applications, a shortlisting phase where application materials were assessed by either individual academics or an admissions board, an interview, and a final review of applications to make offer (and often funding) decisions. Explicit assessment criteria varied, but implicit criteria, including personal attributes similar to those identified in HSS students (e.g. motivation, passion, critical thinking), were common.

Role of the project

Because STEMM applicants usually identify several pre-existing projects or research groups to join rather than proposing their own projects, admissions focus on selecting applicants with the strongest academic records and relevant experience. Knowledge production—the research project—played a much smaller role. Rather, STEMM participants placed greater emphasis on training and skill development, framing the purpose of the PhD as a "vocational degree" in which the student is an "apprentice" (medical sciences); the goal is to become a researcher and then "get a job afterwards, whatever that might be" (medical sciences). As one participant stated,

> My legacy are the people who leave my lab and they go on to other things, so I think I'm very much person focused and sometimes at the detriment of the contribution to knowledge because when it comes to it, if I know that a student needs to graduate and needs to get a job, I will sacrifice maybe some higher impact publication at the expense of them getting a publication that they need to graduate (STEM).

As such, in STEMM the aim of admissions was to identify applicants with the experience, skillsets, and personal qualities that provided evidence of potential to thrive in the field and then become autonomous and ultimately secure employment:

> It's training...the best successes I've had are people who come in and they get trained based on skills that we have in the lab and then they take that [and] apply it to some interesting question. And by the end they should be able to do that process independently...one of the most exciting things for me is seeing them at the end and I think well, at the beginning you didn't know even what question to ask and now you're asking and you're autonomous and you're doing this all by yourself. (STEM)

Unlike in HSS, some STEMM participants ($n=5$) believed it was "completely unrealistic" to expect doctoral applicants to propose a feasible research project at this stage in their careers, consistent with the fact that none of the participating STEMM departments required a full research proposal. As one participant put it, "you have to have quite low

expectations of what [the student is] realistically going to be able to write at that stage" (STEM). Another participant emphasised:

> There's no way that a PhD student can even be at the level to understand the questions that are currently asked, because they are still working towards it; so therefore they cannot write a project [proposal]. (STEM).

Instead, doctoral projects were viewed by the participants as coming from supervisors or existing research teams ("it's really up to the supervisor to suggest a suitable topic" (STEM)) or developed collaboratively later in the doctoral process. As such, rather than bringing their own projects, PhD applicants needed to show that the project(s) or research groups in which they expressed interest were well-aligned to their academic backgrounds in terms of disciplinary knowledge (e.g. modules taken), technical skills, and other relevant research or professional experience. This was assessed via both the paper and interview portions of the application. For example, "each [interviewer gives a] score based on the quality of the [applicant's] presentation [on a prior research project] based on passion for science…understanding what is a PhD, and also how much the candidate matches to the project that was chosen" (medical sciences).

Role of supervisors

Because STEMM admissions focused first on identifying the strongest applicants and second on matching those applicants to projects, potential supervisors generally played a smaller role in the selection process than in HSS. While all departments in this cluster required that supervisors have the capacity, willingness, and disciplinary expertise needed to take on a student, the extent to which potential supervisors were involved in assessing their prospective students' applications varied. For instance, in one department, supervisors reviewed their prospective students' applications, and in another, supervisors could observe the interview and ask questions but were not allowed to score the interview. Other departments required potential supervisors to indicate interest in and/or rank the students who wanted to work with them, independent of the main application assessment and decision-making; supervisor preferences were considered as a final factor in confirming offers. If a supervisor did not have the capacity to take on all the students who were worthy of offers, students would be offered another project:

> We are scoring on the person...If we thought there was a lot of very strong candidates in one area, we might say…are there any other projects here that this student could do, or is there scope within this project that there might be more bandwidth there? (medical sciences).

Thus, supervisor capacity "probably won't affect whether [applicants] get an offer" (STEM), though it may affect whether they are matched with their first-choice project.

Role of skills

Participants made clear that for applicants to successfully complete a PhD in STEMM, they needed: "the necessary sort of background" (medical sciences). Due to the short timeline of a PhD in the UK, and the significant financial burden associated with supporting STEMM research, it was viewed as critical that students enter the doctoral program with a certain level of technical skill because "if you need to learn everything from scratch, it

might be very difficult to get started" (STEM). Likewise, having the right skills and disciplinary knowledge was an important factor in success:

> You can't expect someone to come in on [project x] from [a different] background, and they have to learn everything from scratch….that's where I think fit becomes very, very important. And that's where the discussions would happen if we had people that were very similar academically in terms of their scoring at university, but one of them had more of a skill set that [meant] they wouldn't drown in the project immediately. Then that's something that I think would be better for the project and for the student, right? We don't want them to fail (medical sciences).

Therefore, many participants ($n = 17$) described the academic record as the key part of the paper application, as it provided evidence of disciplinary knowledge, relevant technical skills such as the ability to "deliver in the lab" (STEM), and specific techniques—and was often emphasised in admissions scoring systems. Certain disciplines particularly valued maths skills: "That's the most important thing—can you actually cope with the mathematics?" (STEM). Several departments also included a technical question during interviews designed to verify knowledge and ability.

In addition to technical skills, as in HSS, participants emphasised the importance of the applicant's ability to think critically and analytically: "You've got to be able to absorb information, be able to assimilate it, and…use it to generate new ideas, to apply it to what you're doing" (medical sciences). Participants viewed the interview as essential because this was the space in which they could assess applicants' ability to think "on their feet". At the same time, two participants highlighted the importance of considering how the applicant could further benefit from the doctoral programme, alluding to assumption that the PhD is about developing as a researcher: "The ideal PhD would be someone that's already going to hit the ground running on some aspects, but they're going to be able to develop other skills" (medical sciences).

Summary

In both disciplinary clusters, the issue of 'fit' was important. In HSS, participants suggested that a central purpose of the PhD was knowledge production, which is reinforced by the individual model of doctoral research in HSS that requires students to work independently on a self-proposed research project with support from one or two supervisors with disciplinary and methodological expertise. The focus on the project is, in turn, reflected in the emphasis on the research proposal (and relatedly, the extent to which the applicant's profile/skillset shows potential to successfully complete the project) and the ways in which potential supervisors influence admissions decisions—i.e. fit between project and applicant, and applicant and supervisor. In contrast, in STEMM, the purpose of a PhD was framed as training/an apprenticeship towards becoming a researcher in the field, where the model of doctoral education is such that students typically work on pre-existing projects in larger labs or research groups. The goal of doctoral admissions is to determine whether the applicant's academic record (disciplinary knowledge, academic performance) and skillset are such that the applicant has the potential to successfully carry out the project, contribute to the lab, and develop further skills to become an effective researcher in the future. In STEMM, 'fit,' therefore, focuses on how the applicant's technical skills and knowledge fit with the needs of the department and of the projects or research groups on offer.

Discussion and conclusion

This study examined how academics at Oxford and Cambridge understood the purpose of the PhD and the ways in which different conceptualisations of purpose were reflected in doctoral admissions, using NIT as a heuristic device and conceptual framing to gain a deeper understanding of the importance of disciplinary differences. Our findings show that perceptions of the purpose of the PhD form two disciplinary clusters—HSS and STEMM. HSS participants described the PhD as a process of knowledge production via the doctoral research project; STEMM participants focused on the person and the doctorate as a process of skills formation and a license to do research. However, it is important to note that this dichotomy is a simplification; it may not capture within-discipline diversity, the broader embedded disciplinary norms that undoubtedly shape wider disciplinary behaviour, and the fact that conceptualisations of purpose occur on a spectrum. This spectrum of understanding reflects the fundamental challenge of defining 'doctorates', the diversity of doctoral programmes, including professional doctorates, and the range of ambitions and aspirations that students and supervisors bring to the endeavour (see, e.g. Shahram et al. 2018; Wellington, 2012). Capturing the purpose or essence of a doctorate will always be a source of debate. However, framing the disciplinary clusters in broadly dichotomous terms as project versus person is consistent with the product versus person/process debate occurring in other literature (Åkerlind and McAlpine 2017) and represents a useful heuristic device for deepening understanding of diverse practices associated with doctoral education and admissions.

Drawing on NIT as an initial framing, our analysis shows how these two broad conceptualisations of the purpose of the PhD were rooted in what we refer to as ontological and epistemological assumptions within disciplines. These are key institutionalised disciplinary assumptions about the world and the nature of knowledge and knowledge production, which underpin understandings of the purpose of the doctorate. Such assumptions about the purpose of the doctorate are rarely discussed and are usually taken for granted by those involved in doctoral admissions. This 'taken for grantedness' is a key feature of institutional norms within NIT (e.g. Meyer & Rowan, 1977). These assumptions were subsequently reflected in significantly divergent approaches to doctoral admissions manifested in three key areas: 1) the role of the PhD project in admissions decisions, 2) the role of the potential supervisor in the admissions process and in decisions, 3) the role of skills in admissions decisions.

The nature of knowledge is often viewed as contested and constructed in HSS (Becher, 1989; Parry, 2007), in part reflecting a tendency towards more interpretivist or social realist ontological and epistemological positions. While the importance of collaboration is increasingly emphasised in HSS, such philosophical underpinnings allow more space for individual researchers to make significant contributions to knowledge, a position which is reflected in the emphasis on knowledge production in the doctorate, the importance of the research proposal in admissions and the way the project was viewed as entangled with the individual applicant's biography and their potential for research (Bloch & Mitterle, 2022; Chiu, 2019). HSS participants' assertions that the supervisor is and should be central to admissions due to the individual nature of doctoral research are also reflective of the broader epistemic practices in these disciplines (Parry, 2007).

In contrast, the ontological and epistemological norms of STEMM disciplines tend to locate knowledge production within bounded contexts and conceptualise research as a process of extending those boundaries (Becher, 1989; Parry, 2007). Rather than a process of

construction, knowledge-based metaphors often centre on processes of discovery, building on previous work, or accumulation of facts. Research tends to be viewed as a collective effort, done primarily in a lab or research group, with doctoral work contributing to broader collective projects as part of a holistic process of discovery or accumulation. Thus, as reflected in our results, doctoral admissions in STEMM are less concerned with applicant proposals (if they are included at all) and, instead, focus on identifying applicants with the right combination of technical skills, knowledge, and disciplinary background to contribute to the group's or lab's research agenda. As such, this focus on the 'person' over the applicant's individual research agenda and the reduced importance of specific supervisors within the admissions process can be traced back to core ontological and epistemological assumptions about the nature of the world, the ways in which knowledge is extended, and the purpose of the PhD.

Prior work has emphasised differences in the weighting of evidence by area of study in doctoral admissions (e.g. Bloch & Mitterle, 2022; Chiu, 2019; Mantai & Marrone, 2022; Posselt, 2014). However, our findings extend this by providing an important conceptual link between institutionalised disciplinary norms manifested in underpinning ontological and epistemological assumptions about the nature of the world, knowledge production, the purpose of the doctorate, and the radically different approaches to doctoral admissions across disciplinary groupings. In our view, this is an essential foundation for further work on improving access to doctoral education by improving doctoral admissions.

As highlighted by an increasing number of scholars and commentators (e.g. see Mateos-Gonźalez & Wakeling 2022), graduate access and doctoral admissions is a grossly under-researched and under-discussed area, yet it is fundamental to the process of knowledge production and social reproduction in academia. However, as attention is beginning to be focused on doctoral access (Burford et al., 2024; Dias Lopes & Wakeling, 2022; Lindner, 2020; Smith McGloin et al., 2024; Williams et al., 2019), it may be all too easy to view doctoral admissions processes and practices in homogenised terms, and consequently locate improvements in doctoral admissions in generic, cross-disciplinary interventions and initiatives. This paper not only emphasises the fundamental heterogeneity of doctoral admissions but also shows why a diverse range of approaches to admissions is not only appropriate but necessary given the variations in underpinning philosophies and understandings of the purpose of the doctorate across disciplinary clusters. Using NIT, it also emphasises that since variations in admissions processes and practices are fundamentally tied to disciplinary structures, boundaries and identities, surface-level interventions to change practice will almost inevitably meet resistance given the inherent stability and reproductive power of institutional disciplinary norms. Only when these complexities, nuances, and disciplinary structures are understood and appreciated can appropriate access interventions targeting admissions processes and practices be introduced in an effective manner that engages with the core assumptions that underpin them.

The findings have several practical and research implications. First, academic institutions and departments may reflect on how disciplinary, institutional, and individual assumptions about the purpose of a doctorate are manifested in admissions criteria and processes and whether the criteria and processes capture what is intended. Targeted discussions on the assumptions underpinning admissions decisions and the evidence used to assess doctoral potential in relation to access and widening participation are also important in considering the future of doctoral education and its wider implications for diversity and inclusion within the academic and research-related sectors.

Future research might examine disciplinary variation in doctoral admissions in contexts with other models of the doctorate (e.g. North America) to ascertain whether similar

disciplinary clusters emerge based on ontological and epistemological perspectives. Other research may focus on the ways in which supervisor fit is perceived and established by potential supervisors in HSS in the UK (and other systems requiring research proposals upon application) towards understanding the relationship between knowledge production and how supervisors decide which students to support before and during the formal application process. As the findings of our study also contribute to ongoing discussions about the purpose of the PhD in the context of the scarcity of academic positions and non-academic career trajectories, further research could examine how or whether doctoral admissions criteria have evolved alongside changing doctoral research careers, particularly in STEMM fields, which see larger proportions of doctoral researchers purposefully seeking work outside the academy. Similarly, reviewing and comparing doctoral purpose, programme structure, and admissions criteria processes for other forms of the doctorate (e.g. professional or practice-based) may provide further insight into the meaning of the doctorate, its societal contributions, and the students who pursue these degrees.

We hope that providing more detailed insight into the fundamental heterogeneity of doctoral research and doctoral admissions can provide an opportunity for further critical discussion and reflection on the purpose of the doctorate. This is an essential foundation for developing more innovative approaches to doctoral education that will lead to a greater and more diverse range of pathways into and through doctoral education. Access, diversification of pathways, and educational transformation all need to be part of the same conversation. Through our analysis of divergent doctoral admissions processes and practices across disciplinary clusters, we have aimed to provide an important foundation for this ongoing work.

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