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Inertia in elite STEM widening participation: the use of contextual data in admissions

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ABSTRACT

There is a contradiction of intensive national policy efforts and the slow pace of change in widening participation in England. This paper focuses on the use of contextual data in STEM subjects, where there has been less progress in widening access and a more rigid entry pathway through A-level study. Interviews with admissions tutors suggest a narrative in which STEM curricula, and the prior knowledge and skills required to succeed within it are fixed, and that attempts to widen participation and broaden the notion of 'best students' could undermine academic standards and the student experience. The paper draws on social justice and social reproduction theoretical frameworks to explore policy enactment, identifying support for widening participation and the effects of a conservative ethos amongst academics. The tension of these approaches, alongside the autonomy of decision-makers, are key dynamics explaining the inertia of policy efforts for change.

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Access; fairness; holistic admissions; meritocracy

Introduction

The higher education sector in England is under pressure from government, sector bodies and the public to widen participation and diversify access. Widening participation became a national policy concern with New Labour in 1997, basing arguments on social justice, linking widening participation with wealth creation and a determinant of life chances (Blunkett 2000). Widening participation outreach activities have had some success in increasing applications from a more diverse student body at prestigious institutions (Barkat 2019; Mountford-Zimdars, Moore, and Graham 2016). However, with disparities in participation still evident, particularly at more selective institutions, there have been calls for more progress through greater use of the practice of 'contextualising' admissions decisions—trying to take into account the context in which an individual has been raised and educated, going beyond educational attainment. Some scholars go further, recommending making 'contextual' offers with lower grade requirements for applicants from less advantaged backgrounds (Boliver and Powell 2021).

'Contextualised' admissions practices are now commonplace in selective English higher education. Research largely drawing on national datasets and interviews with heads of

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admissions, institutional leaders within universities and other stakeholder bodies has documented varied engagement with and confidence of using contextual data (e.g. Boliver et al. 2017; Centre for Social Mobility 2018). This has prompted a need for 'ground level' research taking into account how 'decision making practices vary not only from institution to institution, but from discipline to discipline' (Jones, Hall, and Bragg 2019, 933, 934).

This study targets an area of intense policy focus—widening participation in elite higher education institutions, in STEM fields (science, technology, engineering and mathematics) where there is government interest in expanding student numbers and social pressures to diversify STEM subjects and professions. Debates and practices around contextual admissions and grade dropping may play out differently in elite STEM settings due to the strict subject-based entry requirements for STEM subjects and a more linear curriculum building on existing knowledge (Boliver and Powell 2021; Jones, Hall, and Bragg 2019; Vidal Rodeiro and Zanini 2015).

Moreover, at most elite institutions, admissions are undertaken at the department (or college) level, with disciplinary-based academics leading on admissions decisions, often in the role of 'admissions tutor'. This devolved nature means that it can be harder for national and centralised institutional policies to take effect, since they depend on individuals whose practices and decisions are shaped by multiple structural and personal factors and are farther removed from official policy objectives. This allows individual interpretations of data to determine degrees of disadvantage.

This paper therefore hones in on the role of disciplinary based admissions staff in elite STEM contexts, seeking to understand how their admissions practices, perspectives and decisions are grounded in or mediated by their elite STEM academic contexts and identities. We follow on from studies highlighting the role of individual identities, as constructed by their personal values and disciplinary allegiances (Boliver and Powell 2021; Jones, Hall, and Bragg 2019; Nahai 2013; Stevenson, Clegg, and Lefever 2010), in influencing admissions practices and decisions and in mediating the process and efficacy of policy enactment.

Intensification of the data-driven approach to widening participation

For decades, higher education policy in England has been concerned with widening participation and increasing access, aiming 'to address discrepancies in the take-up of higher education opportunities between different under-represented groups of students' (Connell-Smith and Hubble 2018, 3). However, enactment of the social justice mission promised by widening participation policies of successive governments has suffered from a lack of clear definition.

Fair access policies blend individual, institutional and area level factors, creating ambiguity around the notion of disadvantage (Boliver, Gorard, and Siddiqui 2015; Gazeley 2019), with target groups often falling along vague social class lines. A policy literature review funded by the then Higher Education Funding Council for England and Office for Fair Access (Moore, Sanders, and Higham 2013) focused on the following groups: people from lower socio-economic groups; mature students; part-time learners; learners from ethnic minority groups; vocational and work-based learners; disabled learners; and care leavers. However, this broad list indicates that the researchers were unable to institute a clear definition of widening participation criteria, nor instil sufficient understanding of the ways in which sources of disadvantage intersect. If widening participation cannot be defined, it is

even more challenging to identify data to represent vague and sometimes contradictory categories.

The *Schwarz Report* (Admissions to Higher Education Steering Group 2004) argued, on the one hand, for a fair admissions system, but on the other, explicitly did 'not want to bias admissions in favour of applicants from certain backgrounds or schools' (6). Such ambiguities have led to a culture of blame for widening participation failures. Disagreement over the definition, causes and possible remedies for underrepresentation lead to a lack of clarity about who needs to take responsibility and who needs to change, with the finger having been pointed at policymakers, universities, schools and students themselves (Stevenson, Clegg, and Lefever 2010; see also Nahai 2013; O'Sullivan et al. 2019).

There is debate of the consistency of data used in contextual admissions from higher education stakeholders including government, non-governmental and third sector bodies (Fisher and Begbie 2019; Mountford-Zimdars, Moore, and Higham 2021) and a lack of confidence in rigour and 'defensibility' of using contextual data by admissions professionals (Powell and Boliver 2019; Centre for Social Mobility 2018). Furthermore, the metrics of this data-driven approach have been subject to a strong critique, such as the adoption of POLAR (Participation of Local Areas) and Low Participation Neighbourhood data (Harrison and McCaig 2015), as well as criteria for selecting students to take part in widening participation interventions, which can actually reproduce existing inequalities (Gazeley 2019; Rainford 2017).

In line with New Public Management approaches to social policy, applied to higher education under the legitimating discourse of '*access*' and '*lifelong learning*' (Robertson 2010, 196, original emphasis), the past decade has seen a shift to a more data-driven approach to regulating universities and driving the widening participation agenda, with a greater focus being placed on the outputs and outcomes of institutions' access, retention and success initiatives (Department for Business Innovation and Skills 2011; Moore, Sanders, and Higham 2013).

The government in England has used regulatory requirements as a vehicle for delivering widening participation policy goals. The Office for Students (OfS), which replaced the Office for Fair Access in 2018, has accelerated this data-driven approach through its use of fine-grained institutional-level data to generate detailed Access and Participation Plans (APP) for individual institutions (2020). While previous research on contextualised admissions was conducted with institutional 'access agreements' in place, this research captures admissions tutors' perspectives and practices specifically in the context of the recent APPs and probes the extent to which admissions tutors are aware of and informed by these plans. APPs mark a notable point of departure from previous access agreements since they represent national commitments and institutional regulatory requirements to more specific and ambitious widening participation targets. Policymakers perceived regulatory involvement as necessary to overcome the inertia in widening participation, particularly in more prestigious or 'high dividend' institutions and courses (Moore, Sanders, and Higham 2013, 3).

Fairness in access to elite STEM higher education

Universities could be accused of performing 'competitive accountability' (Watermeyer and Tomlinson 2017), that is, of being more interested in the institutional benefits of regulatory

compliance and market position rather than a genuine accountability to addressing policy intentions. Institutional admissions practices reflect the contradictory and contested discourses of the widening participation agenda with debates and contradictions between meritocracy and fairness (Liu 2011). In practice, 'different people have different definitions of fairness, some of which may be fairer than others' (Dorling 2013, 97). Nahai (2013) goes further, arguing that fairness in admissions is impossible in light of entrenched structural inequalities in society.

High-profile research on elite admissions has often focused on the institutional level (Karabel 2005; Karen 1990; Zimdars 2007, 2010). However, this masks wide discrepancies within elite institutions (Boliver and Powell 20201; Jones, Hall, and Bragg 2019). Research on localised admissions practices helps to 'address widespread concerns about how social rewards are distributed in societies that are at once increasingly egalitarian in expectation and unequal in practice' (Nahai 2013, 695). Nahai shows how Oxford admissions tutors apply individualised 'value frameworks' and how these shape admissions outcomes (see also Stevenson, Clegg, and Lefever 2010). Similar research by Zimdars (2010) argued about the role of 'homophily' or implicit bias in favour of social similarity, as an explanation of admissions tutors' decision-making practices.

The increased admissions autonomy that tends to be associated with selective courses—even between courses in the same university (Boliver and Powell 2021)—means that these sites are arguably most at risk of the problematic outcomes of individual notions of fairness. There is a self-perpetuating belief in the fairness of meritocracy by its beneficiaries in elite higher education institutions (Warikoo 2018), although it is widely critiqued (Mijs 2016). Zimdars (2007) argues that universities have adopted meritocratic principles to select the most academically talented students without regard for their possession of social and cultural capital, although public perceptions and the outcomes of admissions practices do not support this.

Progress in widening access has been even slower when considering certain high demand STEM courses and selective institutions (Harrison 2011; Smith and White 2011) and as such it is in these selective STEM contexts that contextual admissions practices have become most pressing and expected (Boliver and Powell 2021, 63). Admissions staff in selective STEM contexts tend to view grades as both objective markers of potential and necessary markers of success to be able to cope with the high demands of the first year of the course (Boliver and Powell 2021).

The contested and contradictory discourses of widening participation mean that individuals who make admissions decisions are likely to continue to fall back on personal values to define and address the problem (Stevenson, Clegg, and Lefever 2010). Despite the critique, most highly selective institutions use contextual data in admissions decisions (Boliver et al. 2017) although this occurs primarily at the margins of decision making (Boliver and Powell 2021; Nahai 2013). The devolved nature of admissions decisions creates the opportunity for competing discourses of social justice and social reproduction to unfold.

Exploring these themes, this paper addresses the research questions: How do STEM admissions tutors in elite higher education institutions understand, apply, justify, and evaluate the consequences of the use of contextual data in admissions decisions? How do their roles and disciplinary contexts shape their choices? And are such decisions impacted by the national policy discourse, targets and institutional access and participation plans?

Methodology

Theoretical framework

This study allows for in depth investigation into how institutional and disciplinary contexts interact with the personal identities and priorities of admissions tutors, as well as with admissions tutors' own understandings of institutional and national admissions policies and priorities. This offers insight into a particular manifestation of how national and institutional widening access policies play out on the ground. We draw on several theoretical framings in this research: notions of fairness in social justice and the determinism of social reproduction and how these theoretical conceptions are operationalised in admissions through the 'theory of policy enactment' (Maguire, Braun, and Ball 2015, 488).

A social justice theoretical framework

Rawls' 'justice as fairness' (2001) is dominant in Western traditions exploring procedural, social and distributive theories of justice. Boliver and Powell (2021) have recently invoked Rawls to advance fairer admissions, reminding us that his justice as fairness insists that a fair society would be one in which two people of similar capabilities and willingness to work would always have the same opportunities to obtain advantageous social positions regardless of one's background. However, this approach has been critiqued, for example Marginson's (2011) analysis of higher education participation notes Rawls' emphasis on 'advancing fairness [through] … the perfection of institutions and processes' due to flawed assumptions that formal procedural changes will result in changes in behaviour (making a similar point to that of policy enactment theory) and a lack of emphasis on the ethical 'contents of justice' (27–28).

Building on Rawls, a broader 'capabilities' approach incorporates outcomes-based notions of justice through more practical and evidence-based work by Sen (2010) and Nussbaum (2006, 2011). Going further in this tradition, a more critical stance has emancipatory intent, drawing on Freire's critical pedagogy, and taking action to make the hidden more explicit, as McArthur (2019) identifies in the work of Honneth and the Frankfurt School. Together, these different traditions form the basis of a social justice theoretical framework, which offers an interdisciplinary, holistic stance on including recognition, respect and a role in decision-making for disadvantaged social groups (Young 1990). This also reflects Fraser's (2005) multi-dimensional conceptualisation of justice, and the role of affirmative or transformative approaches. In relation to admissions work, this questions the starting point for fairness: are structures taken as given or seen to be needed to be changed?

This paper adopts the multiple historical and interdisciplinary traditions within a social justice theoretical stance. We operationalise this through interpreting our participants' holistic sense of what principles of fairness should, and do, guide their admissions beliefs and practices. Throughout our analysis and discussion, we draw predominantly from Rawls' focus on 'fairness' because participants' different understandings of this deceptively simple term provide insight into the notions of justice that are determining admissions. The capabilities approach to address fairness, which centres on 'what students are able to be and do' (Walker 2006; Wilson-Strydom 2015) aligns with many ideals of what higher education is for, and is reflected in many admissions practices and approaches. This approach also sheds

light on whether, and how, tutors reflect on the fairness of the structures and broader societal context they are operating in, and what actions they feel they can, or should take, in response. We contrast the more emancipatory aspects of social justice with those of social reproduction theory, which explores how education can perpetuate social structures of dominant groups (Gewirtz and Gribb 2003; Bourdieu and Passeron 1990). Together, this allows us to consider how notions of fairness and justice at the level of individual academics relate to those claimed or implied in policy and delivered in practice.

Policy enactment theory

Maguire, Braun, and Ball (2015) explicitly aimed 'to develop a theory of policy enactment' (488) in their study of policies being put into practice in four schools in England. However, the key insight underpinning the theory was articulated earlier, when Ball wrote that while educational policies 'create circumstances in which the range of options available [to educational institutions and actors] in deciding what to do are narrowed or changed, or particular goals or outcomes are set … [such policies] do not … tell you what to do' (Ball 1994, 19). Rather, 'putting policies into practice is a creative, sophisticated and complex process that is always also located in a particular context' (Braun, Maguire, and Ball 2010, 549). Policy enactment theory highlights the kinds of identities of those involved in this enactment, along with consideration of how their identities shape their sense of obligation and allegiance to policy and their institution, and to other potential stakeholders (Maguire, Braun, and Ball 2015; Rainford 2021) and the sense of power or autonomy (or lack thereof) to resist, reinterpret, or simply comply with policy texts and commandments (Braun, Maguire, and Ball 2010; Singh, Heimans, and Glasswell 2014).

We operationalise policy enactment theory in our attempts to understand the decisions of admissions tutors in relation to their situated identities, that is, as members and relatively autonomous gatekeepers of selective STEM courses in elite universities. The relative power and autonomy (from institutional management) that departments in such universities traditionally enjoy makes them well-suited for studying the 'creative … and complex practice' (Braun, Maguire, and Ball 2010, 549) of policy enactment.

Sampling

This study drew on the findings of several large, national studies of the use of contextual data (Boliver et al. 2017; Centre for Social Mobility 2018; Boliver and Powell 2021), identifying a specific gap in STEM settings and the devolved nature of admissions practices in the most selective institutions. To gain insight into specific current admissions practices and widening participation targets, the APPs for highly selective institutions were analysed alongside previous access agreements. This informed our focus for conducting in depth interviews with admissions tutors responsible for admissions to STEM courses at the three most selective higher education institutions in England.[1] Eight interviews were completed, with further recruitment restricted due to time demands on potential interviewees due to the Covid-19 pandemic that began to impact universities just as recruitment was underway. Due to the unique and easily identifiable positions of the interviewees we have not reported their demographic data, duration of position or specific fields, although this information was taken into account in our analysis.

The sampling approach was purposive in line with our research focus, more specifically following what has been called *theoretical sampling* (Danermark et al. 2002, 133). We chose our sample to advance theoretical understanding of the interrelations of individual academic agency and elite STEM academic contexts in the face of sharpened national and institutional policy initiatives to shape localised practices and priorities. Interviewees were uniquely placed in institutions where those making admissions decisions also have experience of teaching and providing pastoral care for those students throughout their time at university. This allowed for interviewees to reflect on their perception of admitted students' experiences in their admissions practices. The interviews therefore yielded rich and highly pertinent data despite the small sample size.

Data collection and analysis

Interviews were conducted in private offices or via video-streaming (due to the Covid-19 pandemic) and audio recorded. Participants were asked about their background and path to becoming an admissions tutor and their experience of the admissions process. Further semi-structured questions explored the role of contextual data, their personal perspective of it and how they felt students admitted on the basis of contextual data fared on the course. Interviewees were asked about their knowledge and understanding of national, institutional and departmental policies around contextual admissions. Interviews were transcribed with the assistance of artificial intelligence software, Otter.ai, resulting in nearly 53,000 words of transcribed data. Full coding of the data was conducted using the data analysis package Dedoose, one transcript at a time. All three authors read each transcript and were involved in the coding process for each interview.

Coding followed a realist paradigm, exploring how individuals make choices within complex social contexts (Pawson 2013; Sayer 2010). While there are differences and debates in realist social science, the guiding principle is to explore theories of underpinning social factors that shape participants' perceptions and decisions in relation to admissions. This implies an approach to coding which is inductive and broadly interpretivist, in the sense of being interested in how our participants understand their own role and experience in relation to national and institutional policy and educational policy contexts. The realist paradigm allowed us to explore how admissions tutors described their everyday practices and how these could be framed in relation to social justice and social reproduction theoretical frameworks. However, this approach was not fully 'grounded', since we aimed to build on earlier theorisations of academic practices and identities in relation to admissions and fairness, for example regarding the influence of one's institution, discipline and background on academics' perceptions and practices related to access and admissions.

Our coding frame was developed by starting with what our participants presented as important aspects of their work in making admissions decisions and interpreting and enacting admissions and access policies. These were organised into broad themes and divided into sub-themes which characterise our interpretation of the most relevant meanings of our participants' responses. The sub-themes therefore represent a theoretical handle on our participants' beliefs and practices related to fair access and admissions (see Table 1). The themes and sub-themes provide a framework for us to explore how tutors reflected upon and justified the choices they made, drawing out underlying theories of social justice and social reproduction being enacted.

Table 1. Coding framework.

Theme	Sub-theme	Code
Aims of admissions	'High potential' student	Subject aptitude Prior attainment Passion
	Course consideration	Engaged Cohort-building
Effective admissions	Conduct	Fairness (consistency) Efficient
	Conditions	Autonomy Support (e.g. administrative, department, colleagues)
Potentially relevant contextual information	Quality of data	Ambiguity Sources Limitations
	Official (national or institutional policy)	Care background School background Socioeconomic background Postcode Parents' education
	Unofficial (departmental or individual)	Gender Disability Nationality Ethnicity
Perceptions of widening participation students	Capable Deficit	Capable/No discernible difference Need additional support More likely to struggle May not fully participate in/contribute to university experience May be left behind if accepted

Findings

Some of the findings generated by the interviews relate to general or procedural aspects of how applications are processed, such as how applicants are banded and flagged for certain widening participation characteristics by the central university admissions team, how certain technical processes are taken as indicators of potential disadvantage (e.g. based on the applicant's postcode). These processes have been well covered in other recent, broader studies (e.g. Boliver and Powell 2021; Centre for Social Mobility 2018). Since our findings echo those reported previously, here we focus on those findings directly related to our participants' own role in admissions decisions, although we do, where relevant, refer to participants' perceptions of more central processes.

Admissions aims

Admitting 'high potential' students

When asked what they felt their main goal or marker of success was in admissions, interviewees' most common response was that the main priority was to attract and admit students who would be most likely to do well and get the most out of the course. Such students are modelled on those who previously have done well on the course. From this standpoint, the main task of the admissions process is to admit applicants who show the greatest potential—a word used by six of our participants: 'You're trying to find the students who've got the great potential to thrive and do well in our course, that's what we're looking for' (Participant 2).

Specific to the elite context of this study, another summary term was simply 'the best': 'We want to make sure that we're getting the best possible students and we're attracting the best possible students' (Participant 3). This echoes Boliver and Powell (2021, 33) findings in their study of perceptions of admissions actors in selective courses and departments. The idea that 'the best' exists and can be clearly identified is a theme that runs throughout the admissions process, where a select group of must-admit, 'you couldn't say no to' students are selected first.

Three main criteria were identified for judging an applicant's potential: existing knowledge and subject aptitude; demonstrably high attainment in relevant skills and problem-solving ability; and passion for the subject. The participants' construction of potential is highly attuned to their elite STEM context, as there is the expectation that students can cope in a highly competitive, fast-paced environment from the first day of the course, without any remedial teaching or additional support:

> The courses are really intensive. You know, I've taught at other universities and the students [here] work so much harder than they do at the other universities I've taught, and so you have to have people who are going to be willing to do that and that normally comes from an overwhelming interest in the course itself … for the love of it really. (Participant 1)

The potential of students was directed at their ability to do well on the course, without any remedial teaching or additional support. There were certain discipline-specific skills deemed necessary for students to succeed:

> For our course, absolute dynamite maths and physics skills are just needed. There's no time to for those to develop further. So if you haven't achieved, if you haven't got those skills to do really well in your A levels, you need those skills from day one on our course. Everything leads from them. Maybe for other places there's more time that when you're in more of a level playing field you can develop. I don't know. That's my feeling. (Participant 5)

Importantly, though, this construction of potential runs the risk of reproducing social inequalities, since it is often more difficult to identify the potential of people from less advantaged backgrounds compared to their more advantaged counterparts. The apparently 'objective' nature of the mathematical basis of STEM knowledge could give admissions decision makers the impression that potential would shine through regardless of one's prior experiences. However, the seeming purity and neutrality of STEM disciplines countered this for some: 'I think maths is, in some sense, a social leveller … your circumstances doesn't seem to matter too much whether you're good at solving math problems' (Participant 6).

Localised cohort building

Another aim of admissions relates to the construction of a 'balanced' cohort. This localised aspect of fairness was widely discussed by tutors, covering gender, nationality and the ratio of home and international students. Widening participation, using the regulator's definition, was not mentioned by tutors as an aspect of cohort building. One interviewee gave an example from their department, explaining that when there is no clear difference between the strength of two applicants, they would preferentially choose a female over a male applicant, rationalised by (i) the fact that females are underrepresented in their department and (ii) the perception that judgements about applicants' interview performances seem to

advantage males over females, within the context of a male-dominated staff body. There is a focus on addressing gender imbalances in male-dominated STEM fields, but this is largely ignored in the national policy discourse where the gender imbalance across all of higher education is reversed.

This cohort building practice occurs in response to localised contexts that show the autonomy of the individual decision makers. That is, they are not enactments of national or university instructions, but rather are decisions made by individuals based on their specific situations and priorities which varied widely across departments and colleges. This is distinct from other situations where participants spoke about the more general issue of how cohorts would ideally be more representative of the British population, which were framed more as issues to be addressed at sector or institution-level.

Effective admissions

All participants were supportive of contextualising admissions decisions and showed awareness of issues around underrepresentation, widening participation, and inequalities, and felt that they and their institutions could do something to address these issues. Several participants noted that most of the offers to widening participation students were contextualised in some way. However, despite huge investment in the evaluation of outreach efforts, there was a lack of analysis of outcomes of specific admissions practices. Tutors thought that data tracking the performance of widening participation students once accepted would be useful, with the lack of systematic collection of such data being a notable shortcoming (as well as being someone else's responsibility).

Fairness

An important priority in the admissions process was ensuring that the process was fair. All but one of our participants used the word 'fair' at some point in the interview. However, it is important to understand exactly what is meant by fairness as a priority in admissions. The dominant view linked fairness with equality, with every applicant being treated the same. This meaning draws on two elements: consistency and transparency in decision making. This meaning of fairness is procedural, to make sure other aims are achieved fairly and effectively rather than as an end in itself (Boliver and Powell 2021; Rawls 2001).

Some participants emphasised a further meaning to the notion of fairness as an admissions priority, one grounded in equity and social justice with three distinct elements. First, participants spoke about trying to contextualise the educational and other attainments of applicants, based on a recognition that educational experiences and opportunities are not equal. Second, participants acknowledged that some young people with the potential to enter these elite programmes may be held back from applying due to a feeling that they are not places for 'people like them'.

Finally, some participants spoke about how they tried to change aspects of their own institution's or department's admissions processes that may be perpetuating or even exacerbating social inequalities and unfairness, highlighting social justice practices. This included procedural changes such as admissions interviews being conducted by panels rather than individuals and having panel members undergo training for the role. There

were also examples of tutors exploring the 'fairness' of local admissions tests, and in some cases weighting the scores to account for differences across applicant characteristics. Some tutors aimed to make the admissions process more transparent, but such efforts were largely stymied by the complexity of institutional policies and national regulatory policies.

Autonomy

In elite, research-intensive institutions the operating units of departments and colleges have great autonomy and power in relation to the university's central management. This autonomy was important to our interview respondents in relation to their admissions roles because it empowered them to take risks and find their own ways to identify those applicants with the greatest potential. Several tutors mentioned minimal oversight from more senior management.

Tutors spoke of their autonomy as being essential to making holistic decisions, allowing them to consider every application rather than aiming at targets. This allowed for freedom to experiment with new ways to extend widening participation through admissions: 'We have more permission to make mistakes. Because, you know, it can go horribly wrong, but you're not going to be penalized if you're trying to do the right thing' (Participant 2).

Examples include attempts to counteract unintended biases in the admissions process by applying differential shortlisting thresholds for certain categories of students or using specific admissions interviewers for widening participation applicants. In this way, admissions tutors were able to draw upon their disciplinary backgrounds in terms of identifying the most statistically justifiable thresholds, using their own discipline-based expertise to autonomously go above and beyond policy requirements.

Autonomy was also important because it enabled admissions tutors to enact their STEM-specific disciplinary identities more generally. This was seen in the strong faith that prior attainment, such as A-level grades, were a true representation of students' knowledge. Similarly, there was an assumption that admissions tests were capturing existing knowledge, problem-solving ability and potential, even if they were devised in-house and not analysed in relation to students' subsequent experiences.

Data quality

Ambiguity of contextual data

Participants spoke about a range of contextually relevant factors that they might consider when making admissions decisions. All participants mentioned (1) education/school and (2) socioeconomic background; several but not all mentioned (3) care leaver status, (4) parents' educational background and (5) postcode/area; a few mentioned personal characteristics of (6) gender, (7) age or (8) disability.

Interestingly, '[p]rotected characteristics such as gender and ethnicity are not characteristics that are usually considered during admissions decision-making' (Centre for Social Mobility 2018, 11), yet, in at least some cases, such issues are being considered. Our interviews touched on participants' own perceptions of what potential sources of inequality and disadvantage might be of relevance when making contextual admissions, beyond those mandated by policy or APPs. This is possible by the relative autonomy that several of our participants had in their admissions decisions.

There was noted ambiguity and variation in practice. One participant described it as 'really controversial as to whether you should put gender or race into contextual admissions' (Participant 6) explaining that they have come across difference in opinion on how such categories should be treated. Another said that they were 'very concerned about the bias against women … [but] that's not something we do anything about because of the Equalities Act, we feel we can't' (Participant 4). While some participants highlighted ethnicity or race as dimensions of underrepresentation in higher education or inequality more generally, none mentioned it as a factor that they considered when making contextualised admissions.

In other cases, the inequalities were more local, i.e. tied to specific disciplines, departments or colleges (linked with cohort building). There was also evidence that different sources of inequality compete, for example where national policy may prioritise accounting for inequalities by school or socioeconomic background, but admissions staff perceive gender to be a more pertinent factor of inequality. The findings identify a complicated, multi-layered process with many opportunities for disadvantaged students to fall through the cracks.

Sources of contextual data

Despite national policy interest and institutional investment in widening participation, there was a muddled view on sources of contextual data, within and across different elite institutions, drawing on different datasets and sources. There was mention of making holistic decisions, but no set formula for triangulating data, with individual tutors developing their own ad hoc approaches.

When it came to making decisions about marginal cases and applying contextual data, participants spoke of using data to situate the student relative to their social and educational setting, including: information about the school and its overall quality; postcode data; outreach engagement; and data from UCAS forms, interviews, personal statements, or school references, but these were less systematic and used only occasionally, and often related to personal extenuating circumstances rather than widening participation. There was noted concern about using self-reported data, as there was no verification process. Several interviewees had examples of students mis-identifying widening participation characteristics (such as food at boarding school as being 'free school meals') or gaming the system through using alternative addresses.

All participants said that the first wave of offers were made to applicants who submitted the 'best' applications, but that contextual information was considered to make holistic judgements about further decisions. This is a key aspect of widening access, as one participant noted: 'Half the offers to WP students … would not have been made if they weren't contextualised in some way. So it does make a big difference to our number of WP students' (Participant 4). After sorting most students into 'admit' or 'reject' piles, admissions decisions about which applicants from the 'maybe pile' to make offers to is a key moment for the consideration of contextual factors. Participants also acknowledged that small proportions of students overall are admitted on the basis of contextual information. For example, one participant explained that they intend to make 150 offers initially, and typically they make 120 offers to top applicants, and therefore will have around 30 places remaining to make to the applicants who were neither outstanding nor excellent. Ultimately, these marginal decisions are very often 'holistic' and subjective, based on a combination of the applicant's

perceived potential, their individual circumstances, and, in some cases, considerations of cohort building and cohort balance.

Perceptions of widening participation students

Capability view

Our participants' perception about the students who enter on the basis of contextualised admissions was based mainly on personal observation or anecdotal evidence rather than systematic monitoring or analysis, but the majority stated that there was no discernible difference in their performance, e.g.:

> I think our statistical study is going to show that the people we've admitted with contextual flags do just as well on the course, pretty sure that's gonna turn out to be the case. (Participant 6)

> the WP students that we take on have done well on the course and have not struggled. I'd like to go and kind of pull out data and be able to confirm… But yeah, just anecdotally, the students who we have spoken with and engaged with seem to be doing well. (Participant 3)

Such views could suggest that selective courses could potentially take further steps to widen access without reducing standards. However, more dominant opinions weighed in on the struggle widening participation students may face.

Deficit view

The majority opinion was that any further attempts to widen access should not include making lower grade offers to students with contextual considerations and tutors felt that there was a risk that lower grade offers could result in admitting students who would present too much of a challenge for the course to be able to meet, and that it would therefore be unfair to those students:

> I'm trying to be really polite to our tutors, but they're not A-Level specialists and it's not clear if they could go one step down and help people catch up… That's kind of a different skill. (Participant 6)

This opinion was held even where the available evidence currently suggests that students admitted on the basis of contextualised admissions do not struggle, and where participants recognise that lower grade attainment by an applicant from a disadvantaged background can indicate the same level of potential as a student with higher attainment and more advantages.

> So what failure looks like is you admit somebody who turns out to be totally dud and then they make your life a misery for the next years while they fail everything and just make your life hell. Or you get somebody, and again, this can happen, right, you admit somebody who's from quite a, again, maybe an underprivileged background or whatever, and they fail, they just fail the first year and pull out and that's it. And that's not a good outcome. … I want an easy life when they arrive, you know, and I want them to leave with really good results and to go and make successes in their lives. (Participant 2)

On the one hand, Participant 2's response reflects a genuine desire to see students who enrol on the course go on to do well and make the most of the opportunity, rather than get through admissions only to find that they struggle with the course. However, it also reflects

what has been referred to as a 'deficit model' (Boliver and Powell 2021, 112) of student attainment, in which admissions decision makers continue to see differences in prior grades as essentially explained by different capabilities, so that lower school grades reflect a genuine deficit in the student rather than differences in social and educational opportunities, experiences and support. Participant 2's view seems to be reflected in the aggregate view of our participants; although all acknowledged that social and educational disadvantages can affect grades, all but one were against making lower grade offers due to concerns about applicants' capabilities. Our participants did not see the success of existing or past widening participation students as a sign that yet more could, or should, be done to widen access, but rather enacted this deficit model to rationalise their view that lower grade offers would lead to an increase in students who struggle and have high support and resource needs.

Discussion

Although there is a clear policy aim to widen participation, the lack of definition and specification of exactly what this means in practice has diffused the policy drive and impetus to change. This helps to explain the slow rate of change in elite STEM admissions, where, as the findings demonstrate, admissions tutors acknowledged the challenge of widening participation in STEM without it being prioritised in the admissions process.

Inertia

The contrast between bold national and institutional policies and the reality of admissions decision-making practices highlights the challenges of policy enactment (Ball, Maguire, and Braun 2012). The disconnect between the intentions to support widening participation and existing structures, processes and practices leads to the stagnancy that has characterised the widening access to elite STEM higher education in England. This echoes the limitations of Rawls' distributive justice and the need to account for inequalities in social structures and institutional contexts (Young 1990). The 'deficit' view pathologises widening participation students (Leibowitz 2009), oppressing them based on vague and ambiguous data.

Those working in admissions have not had reason to act upon devolved and entrenched admissions practices at selective universities, and recent national targets and the threat of institutional sanctions have yet to embed at the local level. Significant changes in admissions practices were anticipated to bring about wider changes in student support and the structure and intensity of the curriculum. This allows for a reproduction of a system which advantages those matching the characteristics of students who have previously succeeded on the courses.

> There's a lot of ad hoc recontextualization. People … are making decisions based on contextual data in ways that are quite hard to be consistent about … I think I'm more radical than a lot of my colleagues and I think could be doing more … I think we can make more offers to people from socioeconomic backgrounds that are holding them back historically, who would then go on to do really well. (Participant 6)

The admissions tutors acknowledged the potential within their roles to enact change. However, they also admitted the huge challenge of widening participation in STEM and

made it clear that this was not a priority, with contextual data mostly being used at the margins of the decision-making process.

Conservative ethos

Autonomous admissions tutors do not necessarily direct their agency towards enactment of widening access policies even when their institutions encourage or mandate them to do so. For example, Boliver and Powell (2021, 2) revealed a perception amongst university heads of admissions that academic staff represent a notable source of resistance to widening access. This research explored how a view of the whole student lifecycle—from admissions through students' experiences and graduation—may influence tutors' admissions practices. However, although tutors referenced how students admitted on the basis of contextual data went on to fare, this was largely anecdotal.

Given the investment in widening participation efforts within admissions and across institutions, this was a surprising finding. A partial explanation could be that previous national admissions policies focused largely on access, and only recently have targets on progression and completion emerged with the new APPs, which have yet to be enacted on the ground. A more (potentially) positive take is that once students were admitted, staff treated them as 'regular' students and did not continue to categorise them as coming from disadvantaged backgrounds. However, this would also mean that some students may fail to receive relevant support and guidance given their backgrounds.

As one participant in our study said, one of their markers of a successful admissions process is if the admitted students give them 'an easy life'. It may be this that is partly responsible for the majority view amongst our participants that making lower offers to widening participation students is not appropriate. This was despite the fact that most of our participants acknowledged that widening participation students went on to do at least as well as their non-widening participation counterparts, which suggests that they had not yet reached the point where increased widening participation admissions were negatively affecting the course or department.

The importance of maintaining the status quo was seen through the pervasive notion throughout interviews of finding students who would be the 'best fit' for the existent curriculum versus broadening the notion of 'best students' and adapting the curriculum. 'The courses really are demanding and if you were to lower the entry level, you would actually be putting disadvantaged people at even more of a disadvantage' (Participant 1).

Despite rhetoric about risk-taking, a conservative ethos pervades the discourse of our interviewees, even those committed to a widening participation agenda. Many tutors felt it was much better to prevent a disadvantaged student from not succeeding on a course than giving them an opportunity to succeed. 'Almost the worst thing that you could do for a widening participation student, is give them a position on degree that you don't think they could pass' (Participant 8). Social reproduction theories dominate, challenging meritocratic assumptions and egalitarian aspirations (Collins 2009).

This concern seemed to be largely based on assumption rather than evidence of contextualising admissions practices leading to offers to students who then failed. In fact, the opposite view was mentioned:

> There's no point just bringing in a whole load of students who are potentially going to struggle, which is why the system has worked so far because we haven't seen widening participation candidates struggle, so far, but if it becomes an open blanket, everybody has to get, you know, [the] minimum [offer], then do you end up bringing students who are just not prepared for this environment? You know, if you say, right, we don't even have to interview they just get an offer. Again, this is why some caution is needed over the process and what is acceptable, what is achievable. (Participant 3)

Even the success of widening participation students was seen as evidence that a conservative approach was needed to changing admissions practices. So somewhat ironically, rather than supporting a social justice agenda, this reinforces models of social reproduction. Consistent tracking and evaluation of students admitted on the basis of contextual data across the whole student lifecycle could support moving from anecdotal perspectives of students' experiences to more evidence-informed decision-making in widening participation into, through and out of higher education.

Conclusion

Although generalisability is limited by the sample size, consistent themes emerged that point to a 'generality' (Sayer 2010, 239), that is, analysis of the interviews shows the similarity of the mechanisms, processes and outcomes associated with the structured agency of admissions tutors in different elite STEM courses, colleges and departments. Consequently, while we cannot make claims or predictions about what proportion of STEM tutors share the views and practices of our respondents, we do reveal tensions that are likely to be more general—between national and institutional policies and the identities generated by contexts of elite STEM fields.

Contextualised admissions processes make understandings of fairness explicit, but with fairness being a contested term, such processes are contentious (Thiele et al. 2016) and associated with concerns about positive discrimination and social engineering (Henry 2013). And while the practice of contextual admissions has become normalised and more widespread, the data used for contextual admissions is contested, often based on unvalidated self-reporting, and lacks transparency across (and within) institutions (Boliver and Powell 2021; Gorard et al. 2019).

This study took place at a moment of interest in widening participation and relevance to the sector's ongoing investigation of what it would take to achieve genuine equity (Boliver and Powell 2021; Marginson 2011). The onset of APPs by the OfS specified and committed universities to ambitious access goals to a greater degree than ever before. It might therefore be expected that this enhanced institutional commitment would translate into localised admissions practices. However, rather than finding a significant departure from what had been revealed in pre-APP and pre-OfS studies, our study reaffirms and further highlights the contestation and contradictions of widening participation policy and practice. The lack of definition of widening participation means different levels of policy and practice address different factors of disadvantage. This diffuses the impact of public and policy pressure, as well as internal desire for change. Huge efforts are spent on increasing precision of the analysis of metrics, embodying the spirit of STEM disciplines, but the lack of confidence in the data and the positioning of widening participation at the margins of admissions

decision-making further holds back progress. Widening participation, like social justice, simply becomes another mantra (Brennan and Naidoo 2008).

The lack of joined-up analysis at different levels supresses the availability of evidence of impact, while the lack of change in progress in widening participation in elite STEM admissions hinders outcome analysis as numbers, even in aggregate, are very small. The subsequent lacking evidence of success allows a conservative ethos to dominate, resulting in inertia of widening participation efforts. The determinism of social reproduction will continue until greater attention is paid to individual agency and identity (Fitz, Davies, and Evans 2005). The lens of policy enactment shows how the ambiguity in defining widening participation and lack of consistency in data used acts as a barrier to a Rawlsian 'fair' approach to admissions. Greater engagement between policy makers and the sector in defining and providing consistent datasets could help accelerate widening participation in elite STEM admissions. The global Covid-19 pandemic has significantly disrupted education, including the systems of school exams and grades that universities in England rely on for making offers. Responses to these challenges may provide the necessary force.

Note

1. Although we do not condone the use of league tables, the selection was based on average entry tariff (https://www.thetimes.co.uk/article/good-university-guide-in-full-tp6dzs7wn).

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The authors report there are no competing interests to declare.

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