Enabling NeuroDiverse Inclusive Science Careers

Centre for Employment, Work and the Professions

Institute of Life and Earth Sciences

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Executive summary

- Enabling NeuroDiverse Inclusive Science Careers (EnDISC) was funded by NERC between December 2021 and May 2022
- EnDISC was led by an interdisciplinary research team at Heriot-Watt University (Principal Investigator: Professor Kate Sang, Co-Investigators: Dr David Woolf, Professor Teresa Fernandes, Dr Clayton Magill, Postdoctoral Research Associates: Dr Lena Wånggren, Dr Cat Morgan and Project Manager: Ms Fenella Watson)
- Previous research suggests that disabled and neurodivergent early career researchers ECRs (PhD to postdoc, postdoc to the first lectureship) lack career opportunities due to inadequate means of engagement and inaccessible laboratories, office space and field work sites
- EnDISC aimed to *address this gap by using novel methods of co-design approaches to centre the lived experiences and needs of neurodivergent people at work, in this case, within the natural and environmental sciences*
- EnDISC performed a rapid evidence review, distributed and analysed a survey, conducted focus groups, and interviewed neurodivergent researchers to co-design recommendations for employers and funders to create neurodivergent inclusive research cultures
- Data showed the most significant barrier is the academic workplace culture, which lacks understanding of and support for, neurodivergent scientists
- The most concerning finding was that **37%** of ECRs surveyed indicated they had considered leaving academia and that due to this culture, **73%** had not requested any adjustments
- EnDISC recommends that institutions:
    - foster a culture of openness and inclusion, and support for neurodivergent employees
    - communicate clearly rights and responsibilities, including mandatory adjustments and job role expectations
    - allow greater flexibility for work schedules and location
    - be much more willing to provide adjustments, including private office space

Introduction

This report outlines the aims and objectives of Enabling NeuroDiverse Inclusive Science Careers (EnDISC), outlining methods, findings and the project's outputs. The report concludes by discussing co-designed recommendations to create neurodivergent, inclusive, and accessible workplace cultures.

EnDISC aimed to co-design a set of recommendations with neurodivergent early career researchers that managers, human resource staff and institutions can implement:

- to create neurodivergent inclusive research cultures,
- to develop strategies for more accessible workplaces, and
- to support inclusive careers across the natural and environmental sciences.

Background

Inequalities in STEM careers are well-known; however, disability and neurodivergence remain poorly understood and accounted for. Neurodivergence is part of the neurodiversity movement, which attempts to destigmatise and normalise the diversity of the brain. Neurodivergence includes but is not limited to autism, including Asperger's, attention deficit disorder/ attention deficit hyperactivity disorder (ADD / ADHD), dyslexia, dyspraxia, dyscalculia, dysgraphia, and Tourette's syndrome.

Each of these types of neurodivergence has different characteristics, and everyone's experience is different, but as a generality, it means neurodivergent people can experience some of the following:

- heightened sensitivity to light, touch, smell and sound
- an increased need for structure, stability, and predictability
- increased difficulty with social interaction, communication and reading people
- differences in the ability to focus on a task, and potential challenges with switching focus

These experiences underpin the barriers we discuss below and the resulting recommendations. Because there is a wide range of neurodivergence and every individual’s experience is unique, it is difficult for institutions to develop strategies for more accessible and inclusive careers across the natural and environmental sciences.

Early career researchers are a large part of the workforce whose experiences often reflect wider academic culture. Neurodivergent scientists are restricted by the lack of opportunities, including inaccessible laboratories and field work sites. This interdisciplinary project is rooted in the social model of disability, which recognises that neurodivergent researchers are disabled by neurotypical working environments, not by the condition that they may have.

Methods

Rapid evidence review

EnDISC began by conducting a rapid evidence review of extant literature using Google, Web of Science and Google Scholar. The collaborative process lasted for approximately six weeks, identifying thousands of items. Some items were not peer-reviewed or were reliant on neurodivergent stereotypes, including in the grey literature. Neurodivergent people's employment experiences in the sciences were sparsely discussed, focusing on neurodivergent children or adults as subjects to be studied rather than as scientific investigators. It was often deemed sufficient to get autistic people into employment rather than enabling career progression and thriving. The research team developed exclusion criteria for content that did not fit our project, such as diagnosis rather than employment. Duplicate items were removed, and evidence was narrowed to 92 items, which the research team reviewed using thematic analysis. Each researcher brought their unique positionality and conceptual knowledge to thematic analysis, developing and refining emergent themes.

Survey

The preliminary findings of the evidence review were used to design a qualitative survey, to understand the needs and experiences of neurodivergent early career researchers; specifically the barriers they faced in laboratories, office space, field work sites, and career development. The online survey ran for four weeks (between 4 – 27 March 2022), with n=125 reviewing the survey questions, some choosing not to answer. Respondents (n=87) discussed their negative experiences of being neurodivergent in the work environment, describing their adjustments to enable their productivity and what an accessible environment would look like.

Focus groups

EnDISC conducted focus groups (n = 10) with survey respondents who indicated they wanted to participate further in the project. Central to the project is ensuring that neurodivergent researchers can participate in the research in a way that most accommodates their needs. Two online synchronous focus groups were conducted in April, with 5 participants in each session. Zoom was used rather than Teams, enabling participants to amend their username and creating separation from their academic roles. An online asynchronous focus group was created via Padlet, an online bulletin board where post-it notes can be pinned, and individuals can comment on them. Using Padlet for an asynchronous discussion enabled those who wanted to participate, reducing barriers to engagement and offering more flexibility. Four main questions were asked during focus group discussions, with three additional questions to be asked if there was time.

Interviews

The research team expanded data collection to include interviews (n = 7) aiming to develop a collaborative relationship with participants; they were informal and flexible to encourage conversation, allowing questions to be asked out of sequence and follow-up with participants on specific points. Interviews were performed by different research team members using focus group questions. Interviews were recorded and transcribed, and thematic analysis was used to identify patterns in the data and develop a greater understanding of themes generated during the rapid evidence review.

Key findings

Rapid evidence review

There is a focus on supposed weaknesses associated with neurodivergence and how to overcome them rather than addressing exclusionary and disabling workplaces. Other studies frame neurodivergence as a strength, reinforcing existing stereotypes, such as cognitive advances or an ‘autism-specific perspective’.

The social model of disability has created greater awareness of neurodivergence. Stigma is reduced as awareness is raised, but more work is needed as employment is contingent on a

supportive work environment. There is a lack of specific policies and practices that cover neurodivergence, which are not covered by the wider policy on disability.

Academic work on neurodiversity in the workplace is lacking, especially in higher education (HE). Neurodivergence is underrepresented among staff in HE, which is most likely due to non-disclosure. Many neurodivergent staff do not disclose to an employer due to stigma, negative attitudes, and fear of discrimination – this specifically affects ECRs due to job uncertainty.

Survey

- **42%** of researchers thought that being neurodivergent had a negative effect on their career trajectory, and **37%** have considered leaving academia
- Researchers were reluctant to disclose their neurodivergence, expecting that they would be treated differently, viewed as less capable or seeking 'special treatment'
- **25%** of respondents had shared their neurodivergence with line managers and **23%** with colleagues, but **17%** had not shared with anyone. Some stressed their reluctance to disclose because their neurodivergence would not be understood
- The reluctance to disclose has meant that **73%** had not felt able to ask for adjustments to be put into place. However, **41%** had made their own changes in order to work effectively – some of them spending their own money to do so

Focus groups and interviews

- Many researchers thought that training should be given to all employees, not just managers and HR so that there is greater awareness and understanding of neurodivergence across the institution
- Some researchers had disclosed, but managers or supervisors did not know what to do next to support them
- There was a lot of stress and anxiety around shared office space, specifically around distractions and interruptions during intense periods of concentration. Many needed a quiet space away from others.
- Field work accommodation was typically shared with others, which caused stress and anxiety as there was no space to decompress or minimise sensory over-stimulation

Barriers

Neurodivergent researchers experience barriers in an academic culture centred around a neurotypical researcher.

Lack of flexibility

- Many researchers wanted to work outside of traditional 9-5 working hours when they were at their most productive. Similarly, researchers found they were more effective and relaxed working at home, where they could control their environment
- Standard health & safety protocols can be restrictive and highly distracting –lab coats and life jackets made from inexpensive materials can create discomfort and anxiety

Lack of clarity

- Meetings without a clear focus or agenda can create anxiety, particularly when asked to contribute to the discussion
- Unclear expectations and unwritten rules can be confusing, such as what researchers should be doing in their role or how to get promoted

Work environment

- Too much noise and sensory over-stimulation, like intrusive music or flickering lights, can break concentration and impede the ability to hear specific speakers
- A lack of quiet or private space during fieldwork can affect mental and physical health
- With their lack of control over temperature, light and sound, open-plan offices, hot desking, and shared office space were common concerns among researchers

> *"I'm working in a three-person office which is like neurodivergent hell with several ringing telephones, open windows, people talking all the time. It's very hard to concentrate and to focus and feel in a safe space." – Marco.*

Career progression

- Some researchers were concerned that only being able to work part-time or remotely would negatively impact their career aspirations
- Routes to progression can be unclear or hard to accomplish without continuous support and guidance

Recommendations

Our recommendations aim to reduce barriers for neurodivergent researchers working in laboratories, office spaces, and field work sites.

Training

Training should be implemented across institutions for managers and HR departments to better understand neurodivergence and different workplace experiences. Institutions should aim for a positive shift in workplace culture, which would enable neurodivergent researchers to safely disclose without fear of recriminations. This training should guide supervisors, principal investigators, HR departments and line managers on how to respond to a disclosure and what kind of accommodations can be implemented. The training should stress that supporting neurodivergent researchers should be a continual conversation on how best to support the researcher to be their most effective.

Employment and Human Resources practices

Human resource policies and processes should not be ambiguous, vague, or subject to unwritten understanding. Neurodivergent researchers sought clarity on how progression worked, what evidence to collect, when they should start to think about it, and examples of completed paperwork.

There is a clear need for better support and guidance to develop career aspirations from a mentor or network. Several scientists mentioned having a neurodivergent senior manager as a role model or wishing that they had one – someone to share information and experiences of neurodivergence and enable a more open academic culture. However, this would place additional work or responsibilities on an already pressured group.

Job advertisements should only contain genuinely essential criteria for carrying out the role, removing typical “excellent written communication and presentation skills” requirements. If

the post requires field work, include a statement encouraging disclosure of special needs to enable adjustments to support the employee. Provide clear communication at all stages of recruitment about what the process is and the timelines. Consider alternative forms of selection, including tests, a written proposal with review and feedback responses, and providing questions in advance of the interview.

Rephrase the disability screening question using the legal definition of disability instead of "Do you have a disability"; many neurodivergent people do not consider themselves disabled despite meeting the legal definition under the Equality Act. Highlight that responding to this question is optional, so disclosure is not forced. Autistic people are often literal and will answer a question unless they are informed it is optional. Consider including as part of the standard new starter induction checklist a question like "Do you have a disability that you want to disclose?" or "Do you have any special needs that you need to raise?"

Hiring managers should be aware that reliance on networking to source applicants will disadvantage neurodivergent researchers who lack networking skills. They should also be careful not to make quick judgements based on smaller publication lists; some neurodivergent researchers written output takes much longer to produce.

HR departments and managers should carefully consider remote and flexible working options. For some neurodivergent researchers, relocating to a new city or country and its disruption to routine and a support network can be especially damaging. Provide extra support for neurodivergent people to transition, and recognise that relocating will be harder for certain people than others.

Managers, supervisors and PIs

Managers and Principal Investigators (PIs) should tailor their supervision to the individual through dialogue. Some neurodivergent researchers need explicit and precise instructions on workload balance, responsibilities, tasks and deadlines. For example, outlining how much ownership the researcher has over a project if they can make important decisions, and who to ask for help. Some people need help with prioritisation:

> *"We need clear guidance…like this is what you have to do, and then these are the plus/minus you can do. If you have to drop something, this is what you can drop" – Silvia.*

Many researchers would benefit from a "buddy" – a peer who can help them navigate meetings, subtext, social interactions and complicated administration.

Communication and interaction

Many participants found communications within teams to be ambiguous. Some researchers expressed the need for communication to be in writing or by email so that expectations, responsibilities, and deadlines are clearly outlined and understood by all parties, reducing stress and confusion.

Meetings should have a clear focus or agenda, allowing people to formulate responses and plan their contributions beforehand.

Funders, managers, and event organisers should be aware that attending a conference, workshop or staff "away day" can be quite draining on neurodivergent researchers. Beyond presenting to an audience, there are networking opportunities and events where interaction is the focus. Some researchers struggled with the expectation of attending meals and drinks with a large group and in a loud environment. Event organisers could create smaller groups or ensure a quiet room is available for people to decompress.

Profile pictures of faculty and students should be recognisable. Many neurodivergent people struggle to recognise faces and learn names. Old photos, photos of faces obscured by sunglasses or hats, and non-existent profile images make it difficult to navigate social spaces.

Ways of working

The most common enabler suggested by respondents was continuing or normalising the flexibility to work different hours and from home. Following a reduction in Covid-19 restrictions, some mentioned that they were asked to now be on campus. This prevalence was likely influenced by the early career status of respondents when they are much less likely to have their own private office.

Many researchers suggested that hybrid options for work in general, but specifically for conferences and meetings, would improve their access. Remote working limits the need for relocation, meaning people can remain close to personal support networks and medical experts.

Office space

Institutions should recognise that open-plan, shared offices, and hot-desking are severely disruptive to many neurodivergent people. The lack of control over their environment and access to their person is substantially more distracting than it is to neurotypical people. Some interviewees spoke of their private space as a sanctuary or a safe space. One autistic interviewee described sharing an office with one other neurotypical person who was as understanding as possible. But just him being there was a drain because she constantly had to translate neurotypical body language into something she could understand. She needed a small space where she could relax and be by herself.

Some neurodivergent people are quite happy in open plan settings. Still, colleagues, managers and departments should be trained to understand that some people cannot work in these settings and need private space to function.

Field work

Staff going on field work should be asked if they have any requirements that should be considered. Many respondents expressed frustration with the uncertainty of field work. Breaking up the day with different tasks and providing a clear and structured schedule would improve accessibility. Some neurodivergent scientists will require private sleeping arrangements. Scheduling comfort breaks and ensuring that there are facilities for everyone increases inclusivity and reduces potential health risks. While lack of facilities during field work is a challenge for many women, for neurodivergent women, it can be even more difficult.

> *"Being a woman working in marine science is difficult as well. For example, there are no facilities [on small boats]. My colleagues will just be weeing, they'll be facing away from me, but they'll be having a wee. I have to go and find somewhere to hide" – Constance.*

Laboratories

The laboratory environment can be noisy and restrictive due to the placement of machinery and the number of people in the room. Some scientists will require frequent breaks or noise-cancelling headphones.

We recommend as good practice lab inductions asking if new PhD students or staff have special needs or sensitivities that should be addressed. Researchers should be able to modify their lab coats and other equipment to minimise sensory disruption, and safety equipment designed for different body frames should be made available. Some researchers felt unable to ask for more expensive or nonstandard items and bought them with their own funds.

> *"Safety equipment has a benefit, and it also has a cost. Wearing this super-uncomfortable lab coat is distracting. That's detrimental to my work" – Alison.*

Funders

Funders should ensure their application process is as simple as possible with specific information on each section, including how detailed or broad the response should be. Forms should use straightforward language, and we suggest funders employ neurodivergent reviewers to provide feedback on the ease of applications. Forms should also be in an adjustable format – e.g., can be changed to white text on black background, tables resized, and font changed. Funders should accept these adjusted forms without requiring applicants to reformat them.

Funders should clearly outline restrictions for applying to funding and should be much more willing to approve no-cost extensions when a Research Associate is employed who needs to work part-time. Funders should also be more open to fixed-term contract researchers applying for funding as PIs. Being able to apply for funding and remain at their current institution enables neurodivergent researchers to develop their career and creates more stability.

Unions

Trade unions should be performing their own research or seeking out academic partnerships to create a better understanding of neurodivergent employees' experiences. Union representatives should understand the legal contexts for collective and individual bargaining. Specifically, neurodivergent researchers' circumstances would be considered during a redundancy process. Union representatives should be alert and aware of the possibility that an employee's neurodivergence is a factor in a disciplinary or grievance process – especially keeping in mind that not everyone has a formal diagnosis.

Outputs

The project findings and co-designed recommendations are presented in three short videos with British Sign Language and captions. **Video 1 – What is neurodivergence?** presents information about the social model of disability and gives an overview of experiences under the umbrella term 'neurodivergent'. **Video 2 – Barriers** outlines the specific challenges researchers experience in the workplace. **Video 3 – Recommendations** detail a set of recommendations for employers that will help to create an accessible and inclusive research culture. EnDISC videos will be shared via the Edinburgh Business School YouTube channel (Heriot-Watt University) and promoted via the DISC Twitter account.

At an institution-wide presentation on 23rd May, we outlined the rationale for the project and shared both our findings and recommendations. Representatives from the Human Resources department and researchers at various career stages were in attendance. A Q&A session created a welcome discussion about how to implement specific recommendations, and the need for change to be reflected widely in academia.

We will disseminate project findings in a half-day workshop, *Enabling disability and neurodivergent inclusion in science careers*, on 23rd June for researchers and practitioners. The workshop is designed to create a dialogue between experts and the attendees to set out priorities for future research and develop inclusive strategies for neurodivergent early career researchers. We have invited multi-disciplinary speakers to give short presentations about their current projects on disability inclusion, which will be followed by a panel discussion and Q&A session. We hope this will create connections resulting in collaborations

with researchers interested in the inclusion and employment of neurodivergent researchers in science careers.

A conference presentation about the project at Challenger 150: The Challenger Society Conference, in September 2022.

A blog post on *Equate Scotland* about improving the recruitment, retention, and progression of neurodivergent ECRs, which will reach employers and policymakers.

A journal paper based on the rapid evidence review will outline theoretical positions in the extant literature, which will be submitted to an interdisciplinary journal, such as Equality, Diversity and Inclusion.

Conclusions

This reports the findings from the EnDISC project, which explored the needs and experiences of neurodivergent early career researchers. The data provides a reason to be concerned about the substantial barriers faced in laboratories, field, office spaces, and career development. The most significant barrier is the academic workplace culture, including interactions with colleagues and managers, which lacks understanding and individualised support for neurodivergent individuals.

The findings highlight the need for changes to ensure that careers in science are equal, diverse, and inclusive. The academy must create a work environment where early career researchers can disclose without the concern that this will limit their career progression. Change needs to be made at an institutional and national level, as the challenges experienced by neurodivergent researchers reflect systemic issues. It is essential to create a general understanding of neurodivergence and how it is experienced in the workplace and implement project recommendations to improve early career researchers' employment, progression, and retention.

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