UNIVERSITY OF HULL

DAIM

Ivory Towers are too Loud, Smelly, and Neurotypical

Dr Kenneth Y. Wertheim (they/them)

Also known as 11250205

03/12/2025

Trigger warning

- Sensitive topics such as disability, bullying, suicide, filicide, racism, sexism, and homophobia.
- These topics may be distressing to some people.
- You are free to leave any time.
- If you do leave, feel free to come back any time.

Neurodevelopmental conditions

- Conditions that affect the development of brain function, leading to what some consider impairments (East and North Hertfordshire Teaching NHS Trust, 2025).

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- ADHD (attention deficit hyperactivity disorder) affects attention, energy, and impulse control (NHS, 2025).
- Dyslexia causes problems with reading, writing, and spelling (NHS, 2022b).
- Dyspraxia (developmental co-ordination disorder) affects movement and coordination (NHS, 2020).

About me

- My expertise is in mathematical modelling, scientific computing, and artificial intelligence.
- I model biological and social systems, such as neuroblastoma and unequal societies.
- Lecturer in data science, artificial intelligence, and modelling.
- Equality, diversity, and inclusion champion.
- Not a psychologist or medical doctor.

About me

- Here as a social justice advocate, not an academic.
- Diagnosed with autism in 2022, when I was a postdoc in Sheffield.
- Diagnosed with dyslexia earlier this year.
- Assessed for dyspraxia last month. Likely, but report pending.
- I apologise if I communicate something wrong or offensive.

Methodology

- Literature.
- Lived experiences*.
- Observations*.
- Simple conceptual and mathematical models constructed by me to summarise what I have read.
- Back-of-the-envelope calculations.

POINT OF VIEW

An annotated introductory reading list for neurodiversity

Abstract Since its inception, the concept of neurodiversity has been defined in a number of different ways, which can cause confusion among those hoping to educate themselves about the topic. Learning about neurodiversity can also be challenging because there is a lack of well-curated, appropriately contextualized information on the topic. To address such barriers, we present an annotated reading list that was developed collaboratively by a neurodiverse group of researchers. The nine themes covered in the reading list are: the history of neurodiversity; ways of thinking about neurodiversity; the importance of lived experience; a neurodiversity paradigm for autism science; beyond deficit views of ADHD; expanding the scope of neurodiversity; anti-ableism; the need for robust theory and methods; and integration with open and participatory work. We hope this resource can support readers in understanding some of the key ideas and topics within neurodiversity, and that it can further orient researchers towards more rigorous, destigmatizing, accessible, and inclusive scientific practices.

MIRELA ZANEVA*, TAO COLL-MARTÍN†, YSEULT HÉJJA-BRICHARD†, TAMARA KALANDADZE†, ANDREA KIS†, ALICJA KOPERSKA†, MARIE ADRIENNE ROBLES MANALILI†, ADRIEN MATHY†, CHRISTOPHER J GRAHAM‡, ANNA HOLLIS‡, ROBERT M ROSS‡, SIU KIT YEUNG‡, VERONICA ALLEN§, FLAVIO AZEVEDO§, EMILY FRIEDEL§, STEPHANIE FULLER§, VAITSA GIANNOULI§, BILJANA GJONESKA§, HELENA HARTMANN§, MAX KORBMACHER§, MAHMOUD M ELSHERIF#, ALYSSA HILLARY ZISK#

(Zaneva *et al.*, 2024)

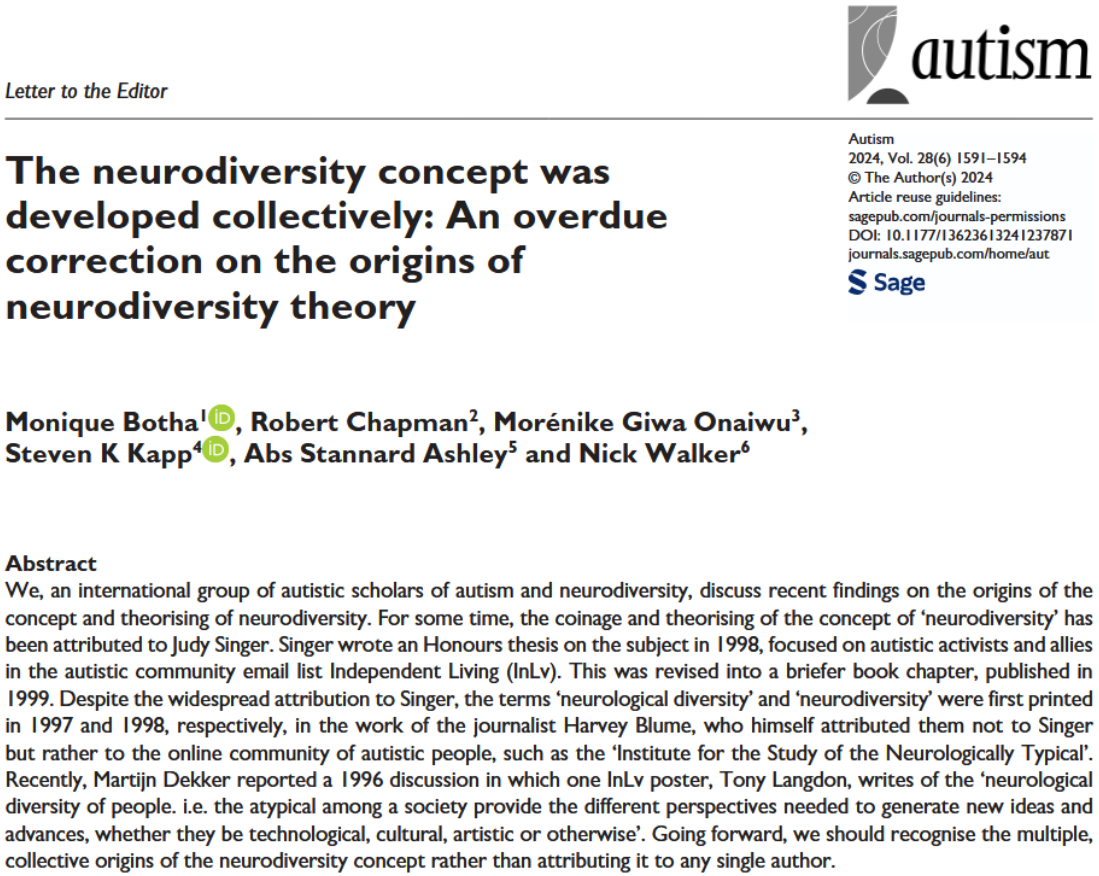
*Disclaimer: In this seminar, all the examples based on my lived experiences and observations are composite stories with fictional elements, even when I refer to myself.

Methodology

Focus on autism because most of the literature or at least the parts I have read is about autism.

Origins of the neurodiversity concept

Origins of neurodiversity



Letter to the Editor

autism

Autism
2024, Vol. 28(6) 1591–1594

DOI: 10.1177/13623613241237871
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The neurodiversity concept was developed collectively: An overdue correction on the origins of neurodiversity theory

Monique Botha[1], Robert Chapman[2], Morénike Giwa Onaiwu[3], Steven K Kapp[4], Abs Stannard Ashley[5] and Nick Walker[6]

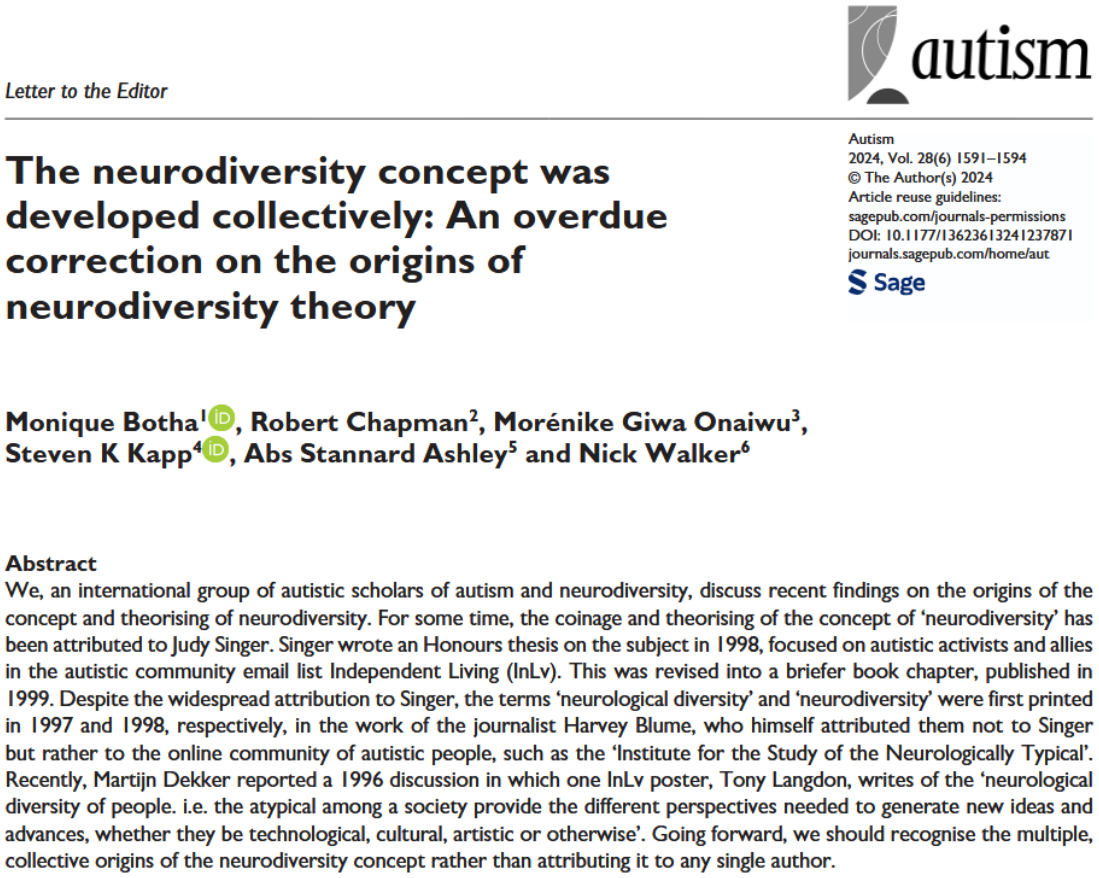
Abstract

We, an international group of autistic scholars of autism and neurodiversity, discuss recent findings on the origins of the concept and theorising of neurodiversity. For some time, the coinage and theorising of the concept of 'neurodiversity' has been attributed to Judy Singer. Singer wrote an Honours thesis on the subject in 1998, focused on autistic activists and allies in the autistic community email list Independent Living (InLv). This was revised into a briefer book chapter, published in 1999. Despite the widespread attribution to Singer, the terms 'neurological diversity' and 'neurodiversity' were first printed in 1997 and 1998, respectively, in the work of the journalist Harvey Blume, who himself attributed them not to Singer but rather to the online community of autistic people, such as the 'Institute for the Study of the Neurologically Typical'. Recently, Martijn Dekker reported a 1996 discussion in which one InLv poster, Tony Langdon, writes of the 'neurological diversity of people. i.e. the atypical among a society provide the different perspectives needed to generate new ideas and advances, whether they be technological, cultural, artistic or otherwise'. Going forward, we should recognise the multiple, collective origins of the neurodiversity concept rather than attributing it to any single author.

Coinage and theorising are often attributed to Judy Singer, who wrote an Honours thesis in 1998, a book chapter in 1999, and published her thesis as a book in 2016.

(Singer, 1999, 2016, cited in Botha *et al.*, 2024)

Origins of neurodiversity



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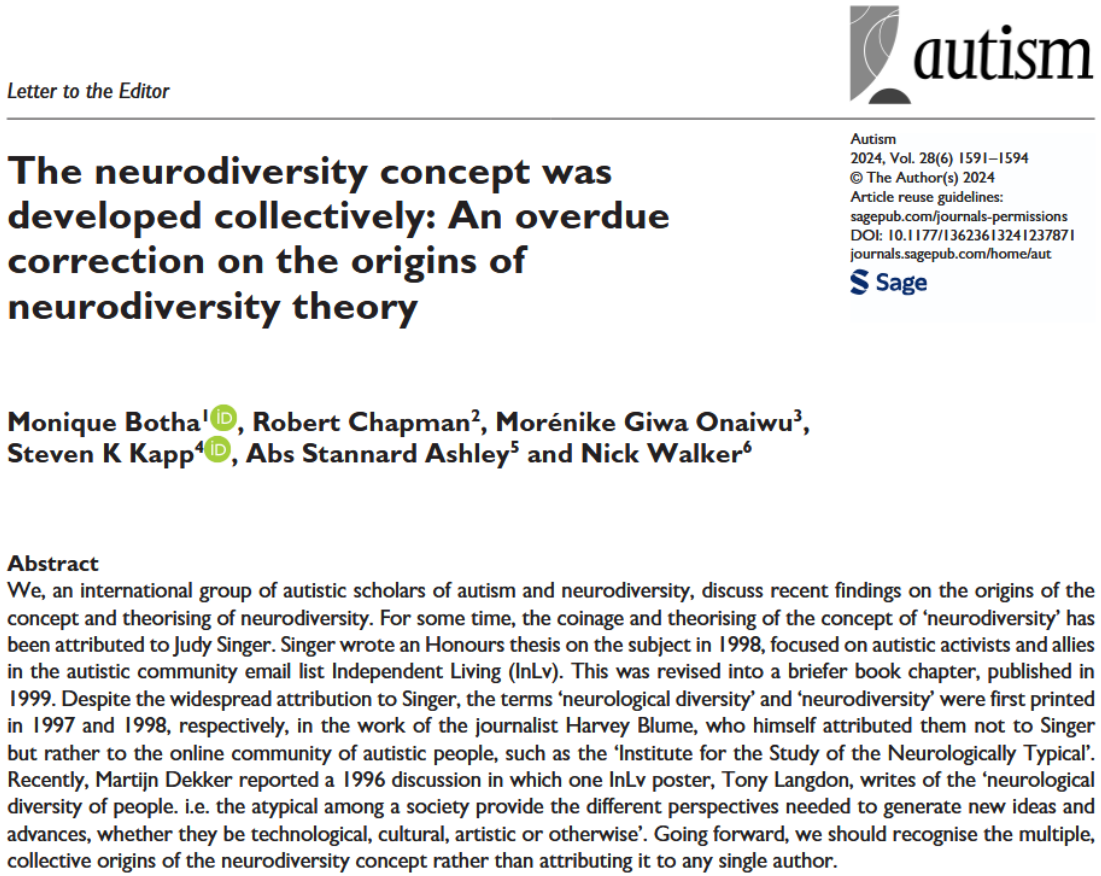
It's wrong!

Origins of neurodiversity



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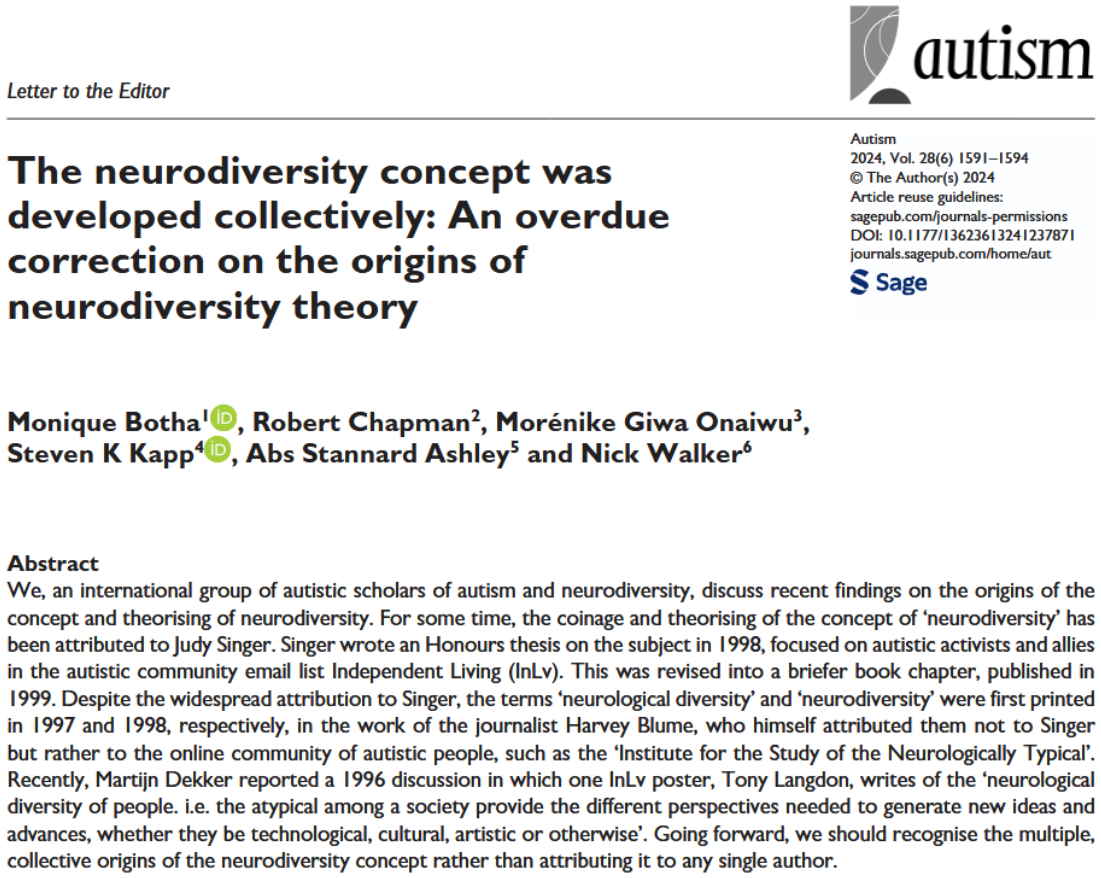
The thesis itself cites earlier articles on the topic by the journalist Harvey Blume.

(Singer, 1999, 2016, cited in Botha *et al.*, 2024)

Origins of neurodiversity



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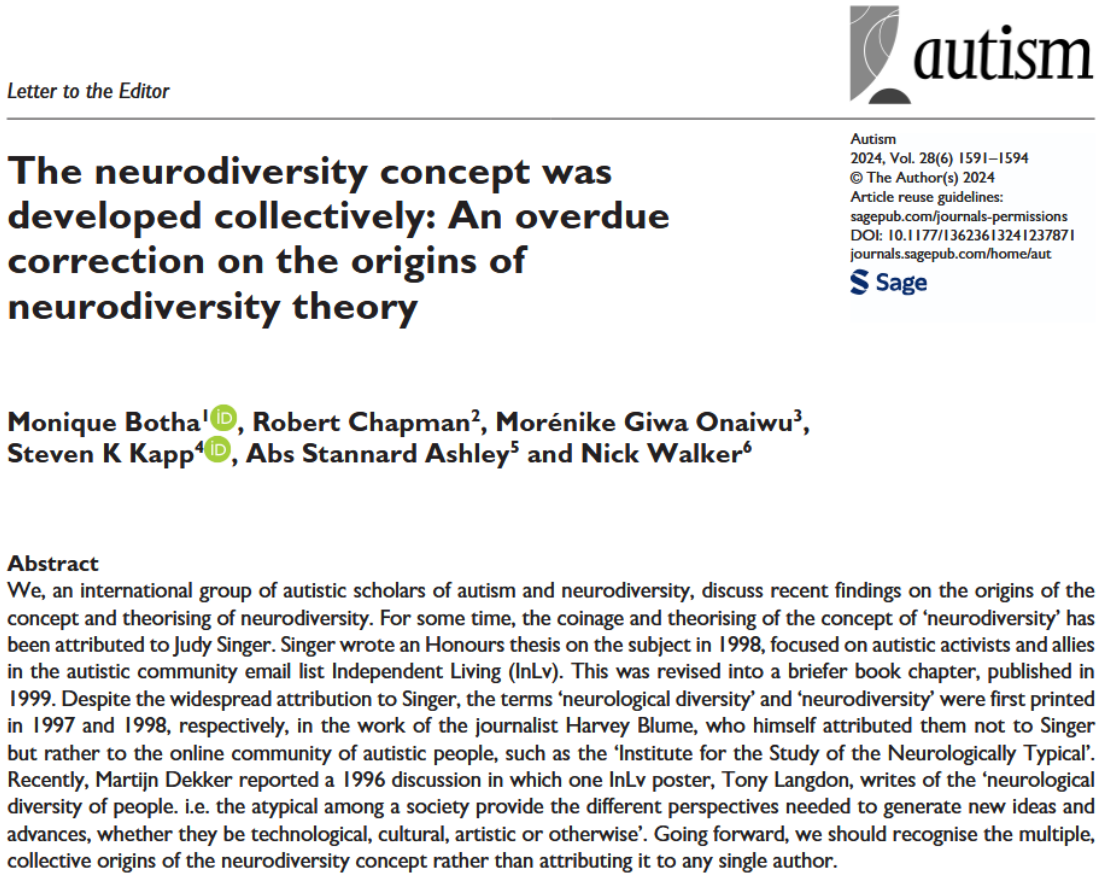
Harvey Blume's articles cite grey literature by the online autistic community in the 1990s.

(Blume, 1997a, 1997b, 1998, cited in Botha *et al.*, 2024)

Origins of neurodiversity



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Evidence that the concept was fully and collectively formed, and being used by the community by 1996, before Singer or Blume was involved.

(Dekker, 2023, cited in Botha *et al.*, 2024)

A question about academic standards

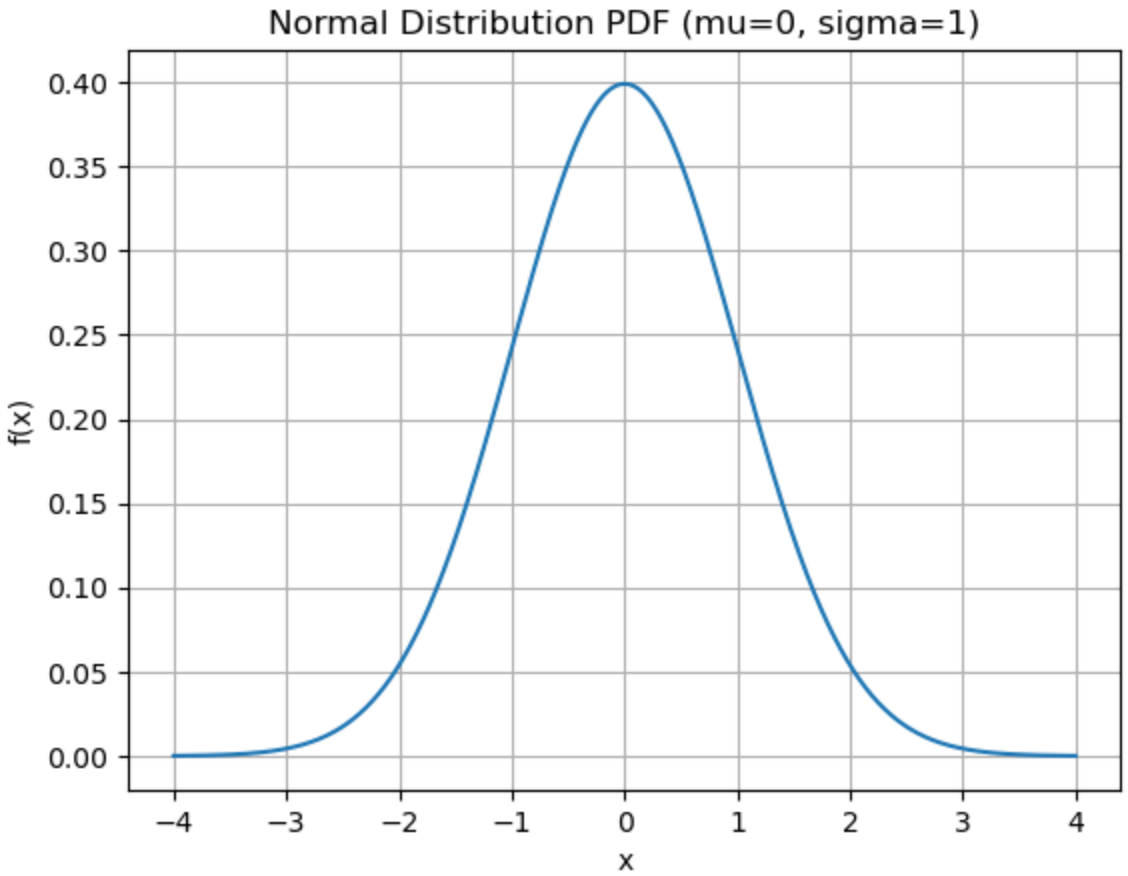
‘It follows our concern that “great man” (or woman) theories of history tend to erase complexity in favour of oversimplified, and ultimately inaccurate, misunderstandings.’

(Botha *et al.*, 2024)

Do assessments, recognition, and prestige erase merits in favour of narrowly defined, and ultimately self-serving standards defined by the powers that be?

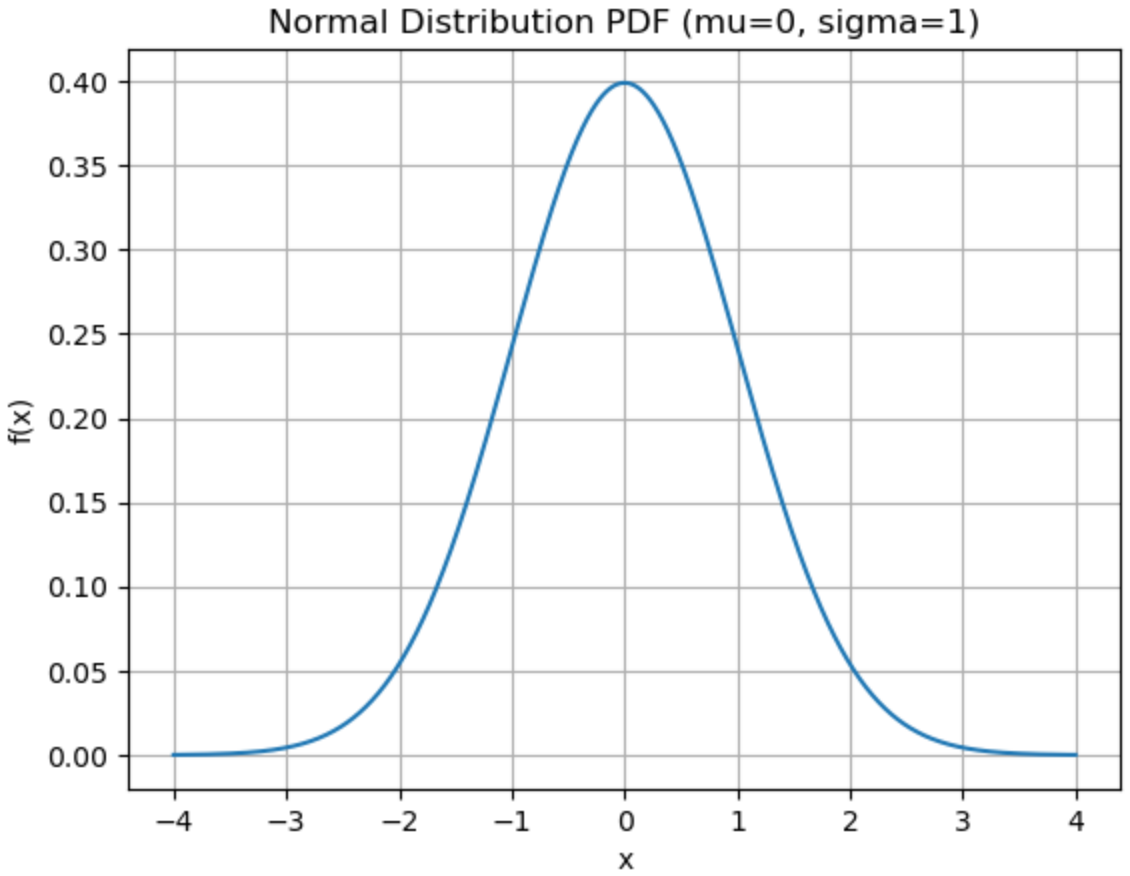
What is neurodiversity?

What is neurodiversity?



$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

What is neurodiversity?

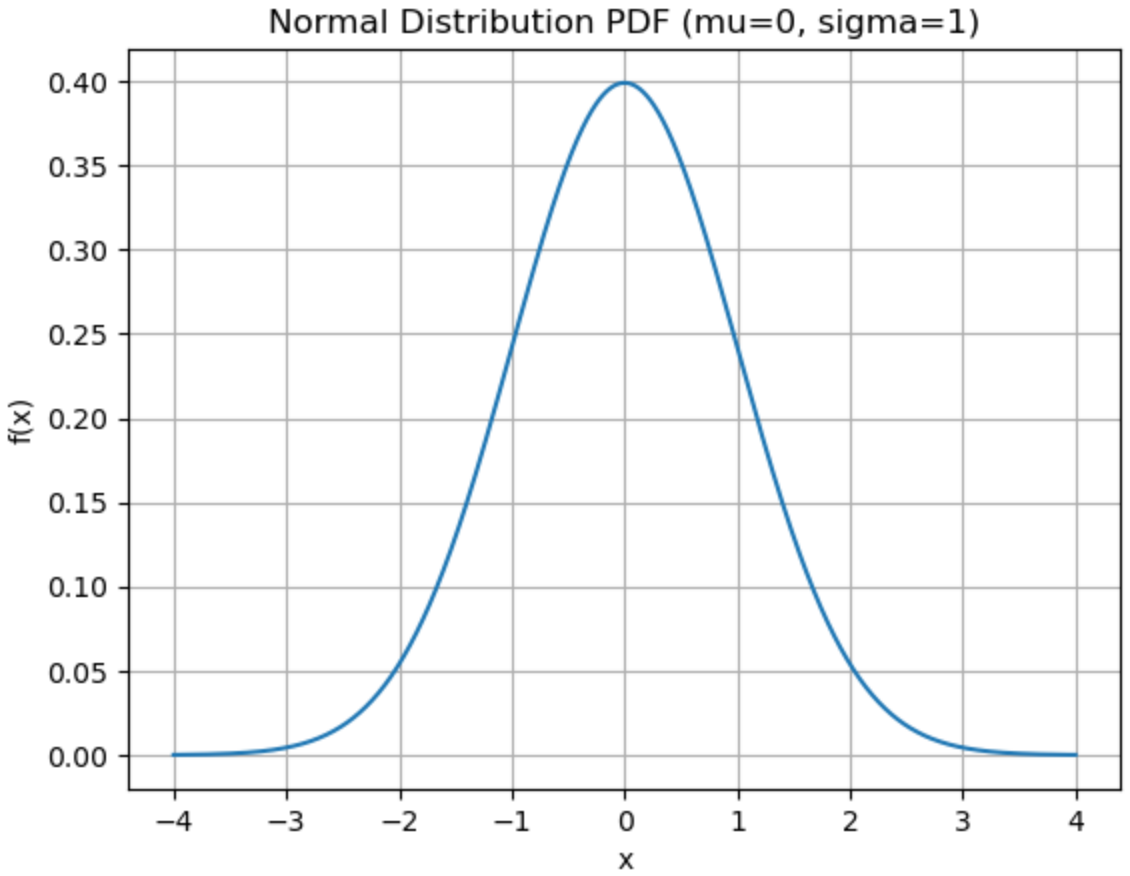


$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

'... variations in brain structure, function, and development should be appreciated and accepted as natural variations in human biology.'

(The Human Neurodiversity Laboratory, no date, cited in Constantino, 2018)

What is neurodiversity?



$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

'Its continued propagation in the population should have some evolutionary explanation; that is, there may be some benefits to possessing the trait, even if they are not clear to us.'

(Constantino, 2018)

I would add *de novo* mutations (new variations) and environmental causes (genetic drift) of neurological changes to the definition of neurodiversity.

What is neurodiversity?

Autism As a Disorder of High Intelligence

Bernard J. Crespi*

Department of Biological Sciences and Human Evolutionary Studies Program, Simon Fraser University, Burnaby, BC, Canada

A suite of recent studies has reported positive genetic correlations between autism risk and measures of mental ability. These findings indicate that alleles for autism overlap broadly with alleles for high intelligence, which appears paradoxical given that autism is characterized, overall, by below-average IQ. This paradox can be resolved under the hypothesis that autism etiology commonly involves enhanced, but imbalanced, components of intelligence. This hypothesis is supported by convergent evidence showing that autism and high IQ share a diverse set of convergent correlates, including large brain size, fast brain growth, increased sensory and visual-spatial abilities, enhanced synaptic functions, increased attentional focus, high socioeconomic status, more deliberative decision-making, profession and occupational interests in engineering and physical sciences, and high levels of positive assortative mating. These findings help to provide an evolutionary basis to understanding autism risk as underlain in part by dysregulation of intelligence, a core human-specific adaptation. In turn, integration of studies on intelligence with studies of autism should provide novel insights into the neurological and genetic causes of high mental abilities, with important implications for cognitive enhancement, artificial intelligence, the relationship of autism with schizophrenia, and the treatment of both autism and intellectual disability.

Keywords: intelligence, autism, schizophrenia, genetic correlation, pleiotropy, evolution

Autism may affect cancer risk.

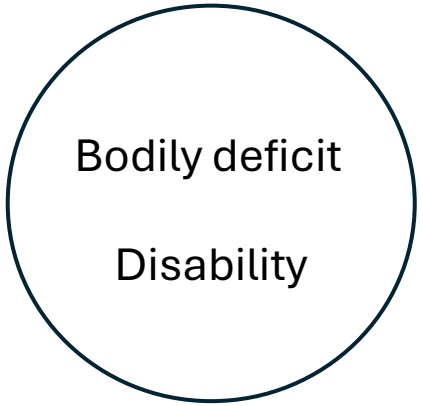
(Crespi, 2011)

'… autism and high IQ share a diverse set of convergent correlates, including large brain size, fast brain growth, increased sensory and visual-spatial abilities, enhanced synaptic functions …'.

(Crespi, 2016)

Conventional medical model

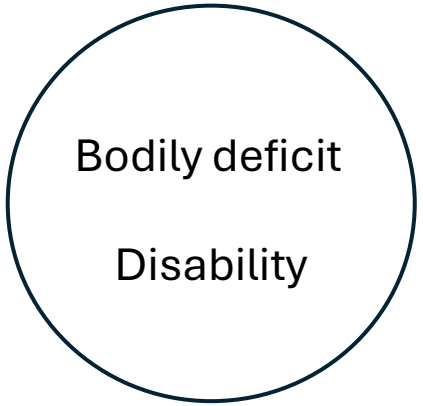
Medical model of disability



World Health Organisation (1980, p. 143, quoted in Pellicano and den Houting, 2022) defines disability as:

‘any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being’.

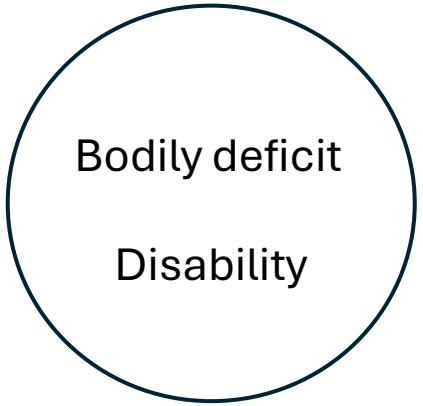
Medical model of disability



‘Treatment … typically aims to bring an individual’s abilities in line with the accepted norm. Treatments … are therefore applied to the disabled person’.

(Pellicano and den Houting, 2022)

Medical model of disability



‘From this point of view, our disorder paradigm promotes the targeting of brain dysfunction to fix neuro-psychological deficits, reduce symptoms/disorder and alleviate impairment.’

(Sonuga-Barke, 2023)

Three major challenges

Annual Research Review: Shifting from 'normal science' to neurodiversity in autism science

Elizabeth Pellicano ✉, Jacquiline den Houting

First published: 03 November 2021 | https://doi.org/10.1111/jcpp.13534 | Citations: 428

Conflict of interest statement: No conflicts declared.

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Abstract

Since its initial description, the concept of autism has been firmly rooted within the conventional medical paradigm of child psychiatry. Increasingly, there have been calls from the autistic community and, more recently, nonautistic researchers, to rethink the way in which autism science is framed and conducted. Neurodiversity, where autism is seen as one form of variation within a diversity of minds, has been proposed as a potential alternative paradigm. In this review, we concentrate on three major challenges to the conventional medical paradigm – an overfocus on deficits, an emphasis on the individual as opposed to their broader context and a narrowness of perspective – each of which necessarily constrains what we can know about autism and how we are able to know it. We then outline the ways in which fundamental elements of the neurodiversity paradigm can potentially help researchers respond to the medical model's limitations. We conclude by considering the implications of a shift towards the neurodiversity paradigm for autism science.

Pellicano and den Houting (2022) raise three major challenges to this model.

Three major challenges: part one

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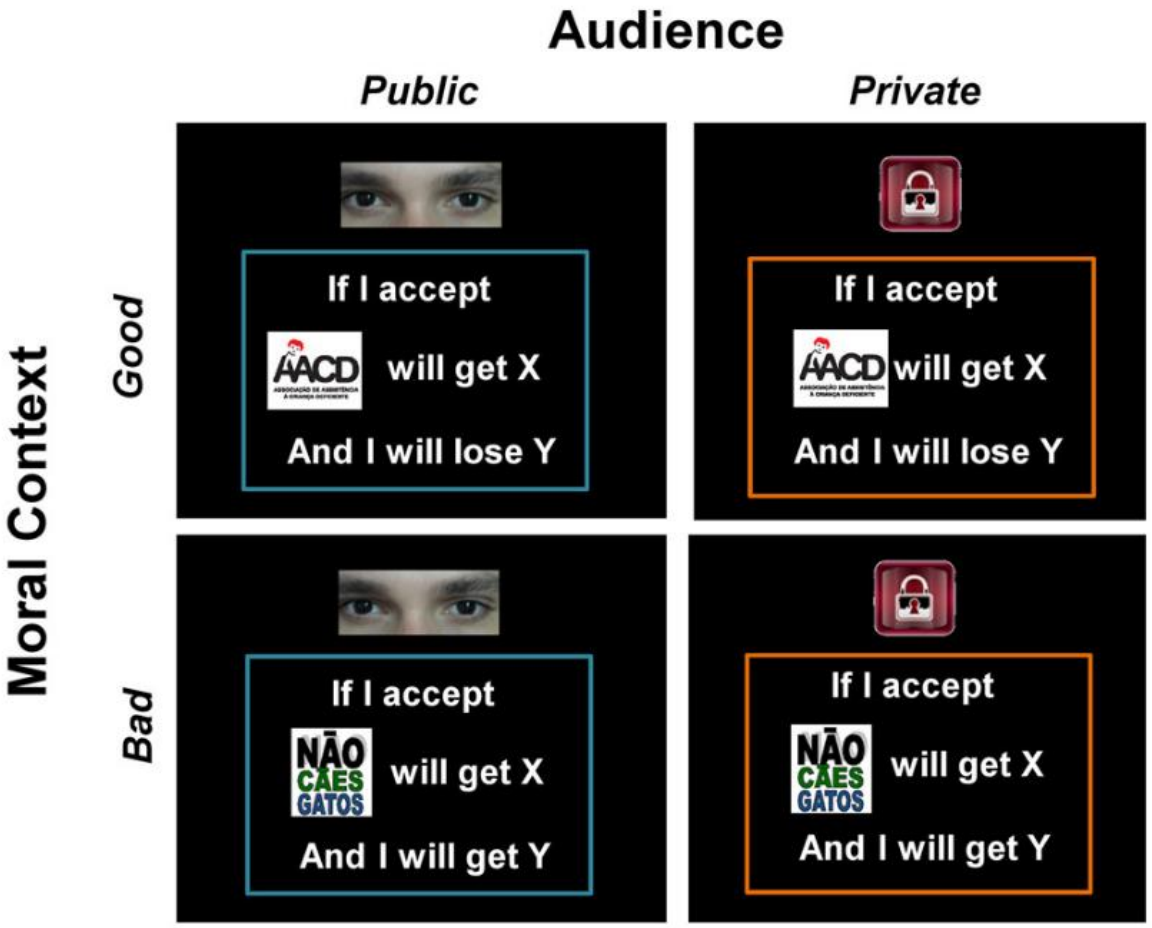
1. Deficits, which are subjective and context-dependent, are magnified. Strengths are ignored.

Deficits are subjective



(Hu *et al.*, 2021)

Hu *et al.* (2021) observed that 20 autistic participants were less selfish than 28 non-autistic participants.

The paper describes this trait as a deficit (inflexibility).

Three major challenges: part one

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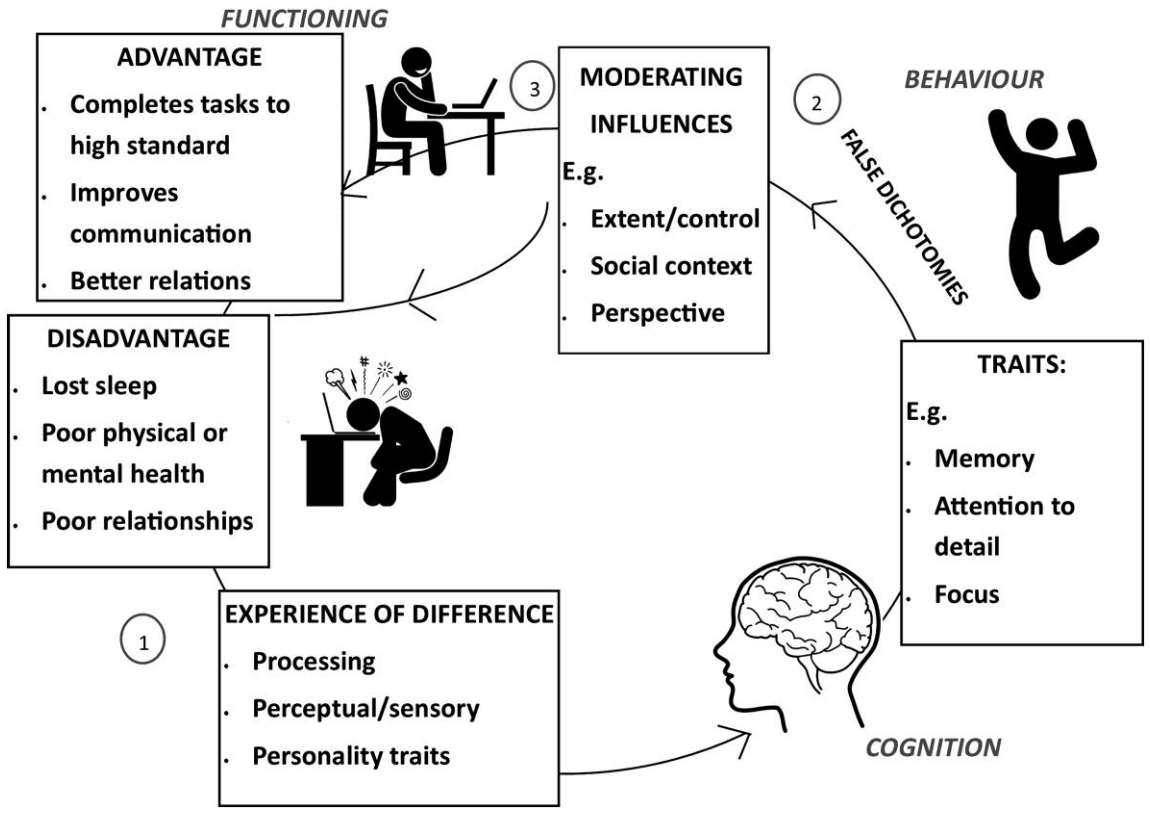
Deficits are context-dependent



(Russell *et al.*, 2019)

'The participant … worked at a supermarket stacking shelves … preoccupation with … sorting was advantageous … could be considered a "preoccupation with unusual objects" as mentioned in DSM-5.'

(Russell *et al.*, 2019)

Negative consequence one: self-fulfilling

‘Once a human trait is subject to the medical gaze, it becomes undesirable.’

(Constantino, 2018)

The stigma to this trait is impairing.

Negative consequence one: self-fulfilling

Homosexuality was classified as a mental disorder in the 1950s, when the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* was first published.

(American Psychiatric Association, 1952, cited in Drescher, 2015)

Negative consequence one: self-fulfilling

‘It was documented that homosexuality caused subjective distress and impaired social functioning.[44]’

‘However, this apparent distress experienced by gay people … was due to living in a society with strong prejudice against homosexuality.’

(Constantino, 2018)

Negative consequence one: self-fulfilling

‘Countless lives damaged’: UK’s dark history of gay conversion practices

New book covers period from 1950s to 1970s, but its author highlights continuing lack of full ban

Protesters calling for a total ban on conversion practices in London in July. Photograph: Guy Bell/Rex/Shutterstock

(Topping, 2022)

The determination to find something wrong within homosexual people resulted in electric shock therapy, chemical castration, and more being forced on them.

But these treatments didn’t improve their social functioning.

Negative consequence one: self-fulfilling

(Zadrozny, 2019)

'… pressure to normalize or cure their children using expensive and/or dangerous alternative treatments…'.

(Dwyer, 2022)

Three major challenges: part two

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Pellicano and den Houting (2022) raise three major challenges to this model.

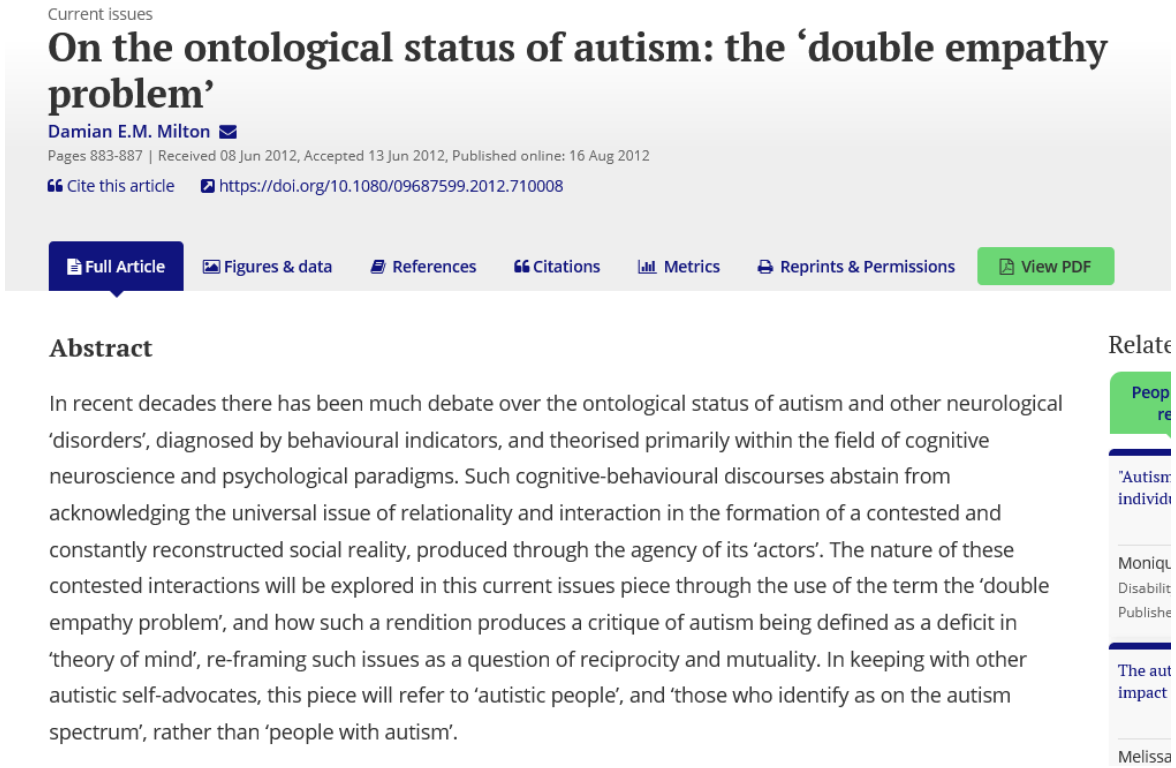
1. Deficits, which are subjective and context-dependent, are magnified. Strengths are ignored.

2. Omission of the environment and social factors.

The double empathy problem illustrates this weakness perfectly.

(Milton, 2012)

Communication is collaborative



Current issues

On the ontological status of autism: the 'double empathy problem'

Damian E.M. Milton

Pages 883-887 | Received 08 Jun 2012, Accepted 13 Jun 2012, Published online: 16 Aug 2012

Cite this article https://doi.org/10.1080/09687599.2012.710008

Full Article | Figures & data | References | Citations | Metrics | Reprints & Permissions | View PDF

Abstract

In recent decades there has been much debate over the ontological status of autism and other neurological 'disorders', diagnosed by behavioural indicators, and theorised primarily within the field of cognitive neuroscience and psychological paradigms. Such cognitive-behavioural discourses abstain from acknowledging the universal issue of relationality and interaction in the formation of a contested and constantly reconstructed social reality, produced through the agency of its 'actors'. The nature of these contested interactions will be explored in this current issues piece through the use of the term the 'double empathy problem', and how such a rendition produces a critique of autism being defined as a deficit in 'theory of mind', re-framing such issues as a question of reciprocity and mutuality. In keeping with other autistic self-advocates, this piece will refer to 'autistic people', and 'those who identify as on the autism spectrum', rather than 'people with autism'.

'Misalignment between the minds of autistic and nonautistic people, highlighting a lack of reciprocity in cross-neurotype interactions as the source of social communication difficulties between autistic and nonautistic people.'

(Milton, 2012, cited in Pellicano and den Houting, 2022)

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Empirical Failures of the Claim That Autistic People Lack a Theory of Mind

Morton Ann Gernsbacher
University of Wisconsin—Madison

Melanie Yergeau
University of Michigan

ABSTRACT

The claim that autistic people lack a theory of mind—that they fail to understand that other people have a mind or that they themselves have a mind—pervades psychology. This article (a) reviews empirical evidence that fails to support the claim that autistic people are uniquely impaired, much less that all autistic people are universally impaired, on theory-of-mind tasks; (b) highlights original findings that have failed to replicate; (c) documents multiple instances in which the various theory-of-mind tasks fail to relate to each other and fail to account for autistic traits, social interaction, and empathy; (c) summarizes a large body of data, collected by researchers working outside the theory-of-mind rubric, that fails to support assertions made by researchers working inside the theory-of-mind rubric; and (d) concludes that the claim that autistic people lack a theory of mind is empirically questionable and societally harmful.

SCIENTIFIC ABSTRACT

The assertion that autistic people lack a theory of mind—that they fail to understand that other people have a mind or that they themselves have a mind—pervades psychology. In this article, we critically examine the empirical basis of this assertion. We review empirical evidence that fails to support the claim that autistic people are uniquely impaired, much less that all autistic people are universally impaired, on theory-of-mind tasks. We highlight seminal theory-of-mind findings that have failed to replicate. We document multiple instances in which the various theory-of-mind tasks fail to converge and fail to predict autistic traits, social interaction, and empathy. We summarize a large body of data, collected by researchers working outside the theory-of-mind rubric, that fails to support assertions made by

Gernsbacher and Yergeau (2019) argue based on empirical evidence that positive results are:

1. Not specific to autistic people.

2. Not universal among autistic people.

3. Not reproducible.

4. Not convergent. Separate theory-of-mind tasks produced different results.

5. Not predictive of autistic traits, social skills, empathy, and so on.

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‘Nonautistic people, for example, struggle to understand autistic people’s facial expressions (e.g. Brewer et al., 2016) and have difficulties interpreting autistic people’s behaviour (Sheppard, Pillai, Wong, Ropar, & Mitchell, 2016) and mental states (Edey et al., 2016).’

(Pellicano and den Houting, 2022)

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‘Nonautistic people also report an unwillingness to interact with autistic people based on first impression judgements (Morrison, DeBrabander, Faso, & Sasson, 2019; Sasson et al., 2017) and brief interactions (Morrison et al., 2020).’

(Pellicano and den Houting, 2022)

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Consistently, Pellicano and den Houting (2022) discuss how autistic people communicate with each other effectively using techniques that work specifically for neurodivergent people.

Three major challenges: part two

Annual Research Review: Shifting from 'normal science' to neurodiversity in autism science

Elizabeth Pellicano ✉, Jacquiline den Houting

First published: 03 November 2021 | https://doi.org/10.1111/jcpp.13534 | Citations: 428

Conflict of interest statement: No conflicts declared.

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Abstract

Since its initial description, the concept of autism has been firmly rooted within the conventional medical paradigm of child psychiatry. Increasingly, there have been calls from the autistic community and, more recently, nonautistic researchers, to rethink the way in which autism science is framed and conducted. Neurodiversity, where autism is seen as one form of variation within a diversity of minds, has been proposed as a potential alternative paradigm. In this review, we concentrate on three major challenges to the conventional medical paradigm – an overfocus on deficits, an emphasis on the individual as opposed to their broader context and a narrowness of perspective – each of which necessarily constrains what we can know about autism and how we are able to know it. We then outline the ways in which fundamental elements of the neurodiversity paradigm can potentially help researchers respond to the medical model's limitations. We conclude by considering the implications of a shift towards the neurodiversity paradigm for autism science.

Pellicano and den Houting (2022) raise three major challenges to this model.

1. Deficits, which are subjective and context-dependent, are magnified. Strengths are ignored.

2. Omission of the environment and social factors.

Could be used as an excuse to deflect attention from unfair policies and structures.

Negative consequence two: victim blaming

‘… I am not taken seriously. My credibility is suspect. My understanding of myself is not considered to be valid, and my perceptions of events are not considered to be based in reality. My rationality is questioned because, regardless of intellect, I still appear odd.’

(Sinclair, 1993, p. 298, quoted in Pellicano and den Houting, 2022)

Negative consequence two: victim blaming

‘My ability to make reasonable decisions, based on my own carefully reasoned priorities, is doubted because I don’t make the same decisions that people with different priorities would make.’

(Sinclair, 1993, p. 298, quoted in Pellicano and den Houting, 2022)

Three major challenges: part three

Annual Research Review: Shifting from 'normal science' to neurodiversity in autism science

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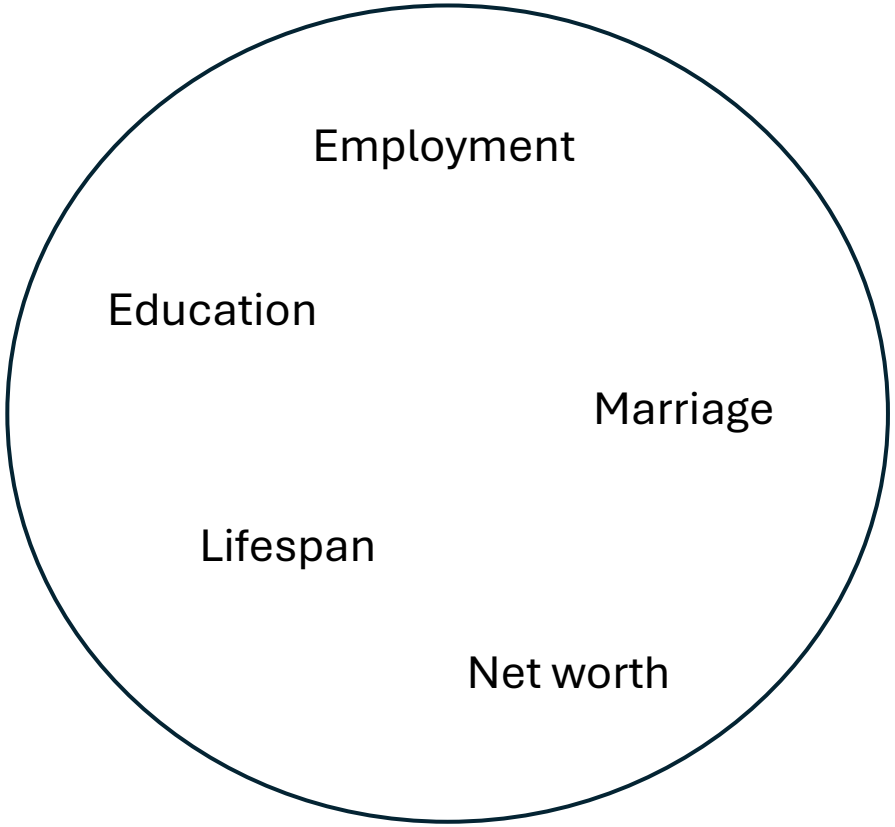
Pellicano and den Houting (2022) raise three major challenges to this model.

1. Deficits, which are subjective and context-dependent, are magnified. Strengths are ignored.

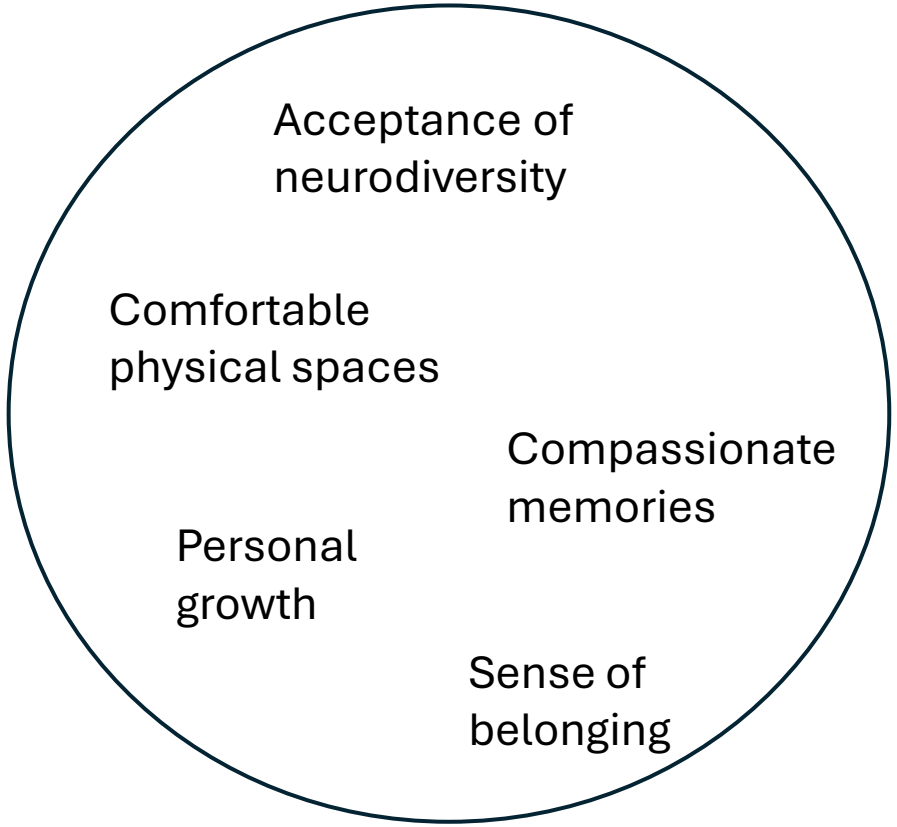
2. Omission of the environment and social factors.

3. Narrow perspectives.

Misalignment leads to useless metrics



Neuronormative definition of well-being.



Neurodiversity-specific values.

'… an autistic person's life may be rich and fulfilling despite bearing little resemblance to the conventional ideal.'

(Pellicano and den Houting, 2022)

Negative consequence three: misallocation

‘… autism research expenditures in different countries … largest share of funding … goes towards understanding individual biology, etiology, and cognition (den Houting & Pellicano, 2019; Krahn & Fenton, 2012; Office of Autism Research Coordination, 2017; Pellicano et al., 2013).’

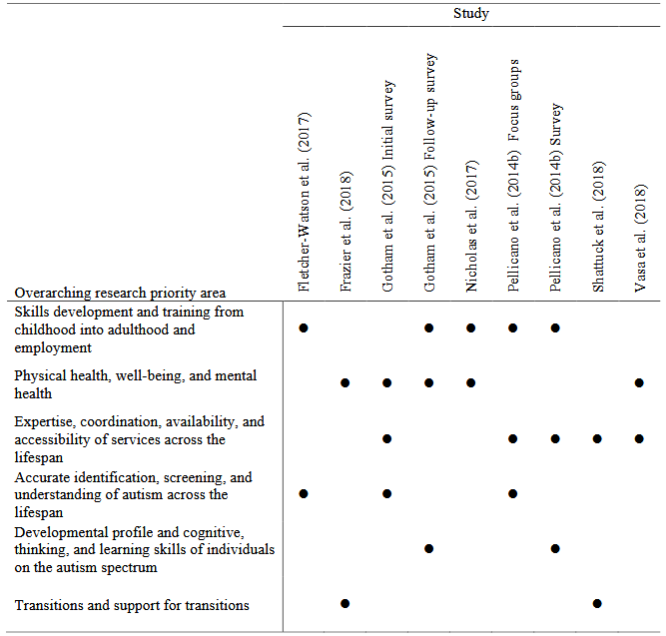
(Dwyer, 2022)

Negative consequence three: misallocation

‘Another substantial share goes to interventions, most outcomes of which focus on normalization of autistic features (Wong et al., 2014).’

(Dwyer, 2022)

Negative consequence three: misallocation



Overarching research priority area	Fletcher-Watson et al. (2017)	Frazier et al. (2018)	Gotham et al. (2015) Initial survey	Gotham et al. (2015) Follow-up survey	Nicholas et al. (2017)	Pellicano et al. (2014b) Focus groups	Pellicano et al. (2014b) Survey	Shattuck et al. (2018)	Vasa et al. (2018)
	Study								
Skills development and training from childhood into adulthood and employment	•			•	•	•	•		
Physical health, well-being, and mental health		•	•	•	•				•
Expertise, coordination, availability, and accessibility of services across the lifespan			•			•	•	•	•
Accurate identification, screening, and understanding of autism across the lifespan	•		•			•			
Developmental profile and cognitive, thinking, and learning skills of individuals on the autism spectrum				•			•		
Transitions and support for transitions		•						•	

relevant stakeholders. The present set of studies explored the research priorities of adults on the spectrum, parents or family members, clinicians, researchers, practitioners, educators, and others. Collectively, stakeholders prioritised research that would create meaningful change in the lives of individuals on the autism spectrum. Specifically, research that aims to increase the expertise within, and access to/availability of interventions and services for physical and mental health challenges, to integrate supports throughout the lifespan, and to explore development of cognitive abilities and skills, and finally, research that promotes accurate identification and knowledge of autism, was prioritised. Across all studies, applied research foci were prioritised over research targeting basic science, despite this being one of the areas to have received the greatest funding to date. Australia's

In a review, Roche, Adams, and Clark (2021) argue that subjective well-being matters more for autistic people.

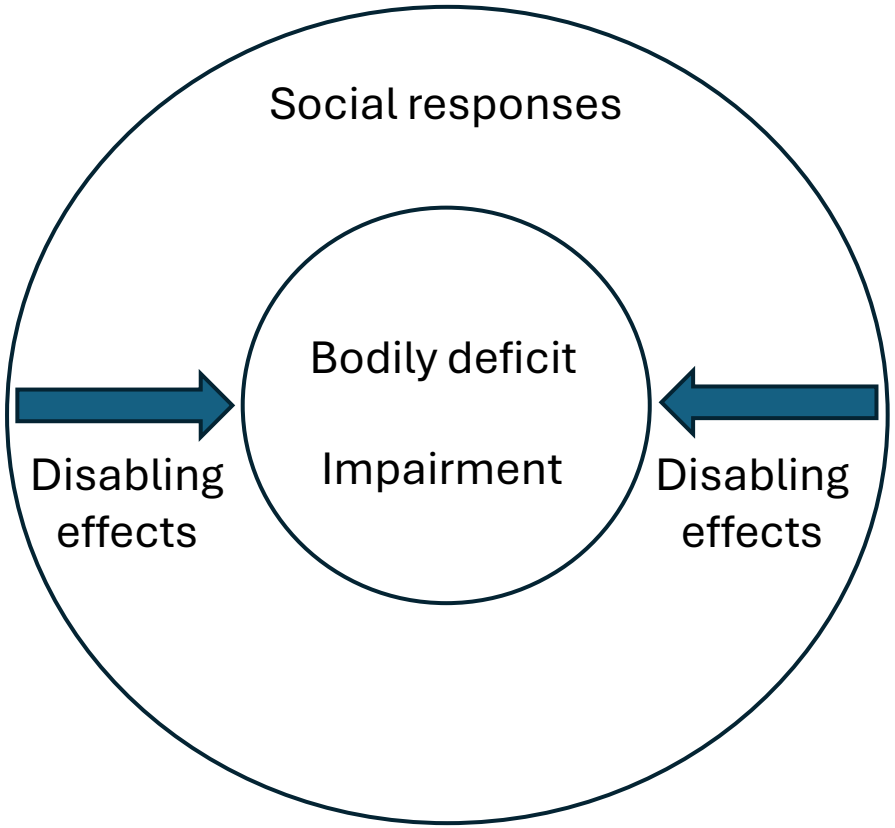
Negative consequence three: misallocation

Interventions targeting putative impaired brain processes associated with ADHD have been unsuccessful so far.

(Westwood *et al.*, 2023, cited in Sonuga-Barke, 2023)

Neurodiversity approaches

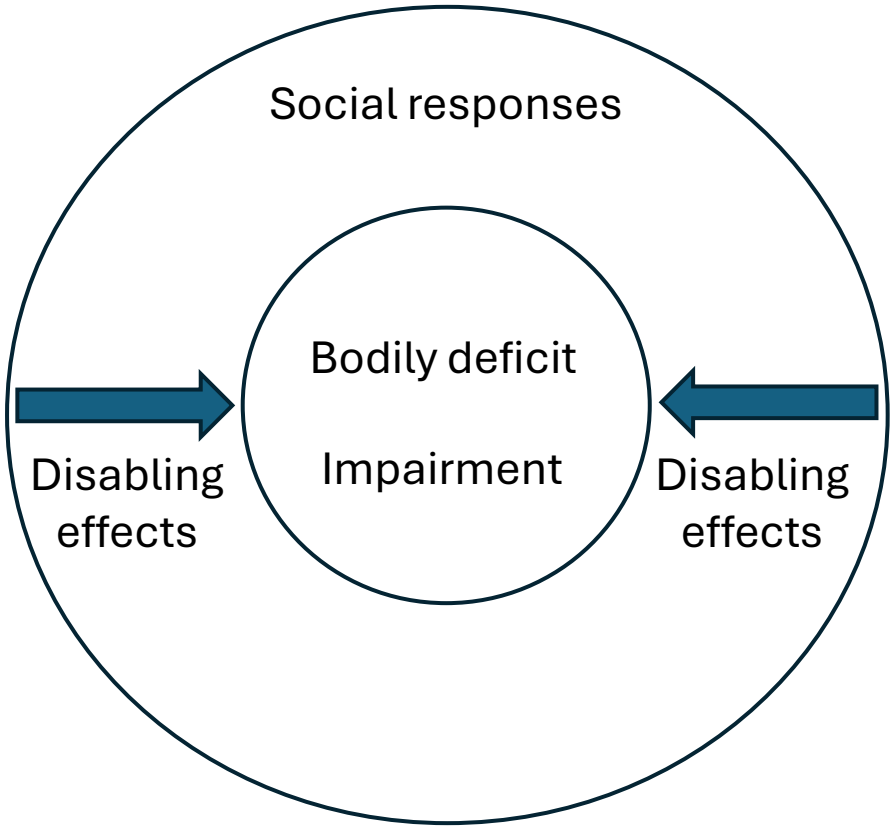
Strong social model of disability



Society disables individuals by responding inadequately to their impairments.

(Dwyer, 2022)

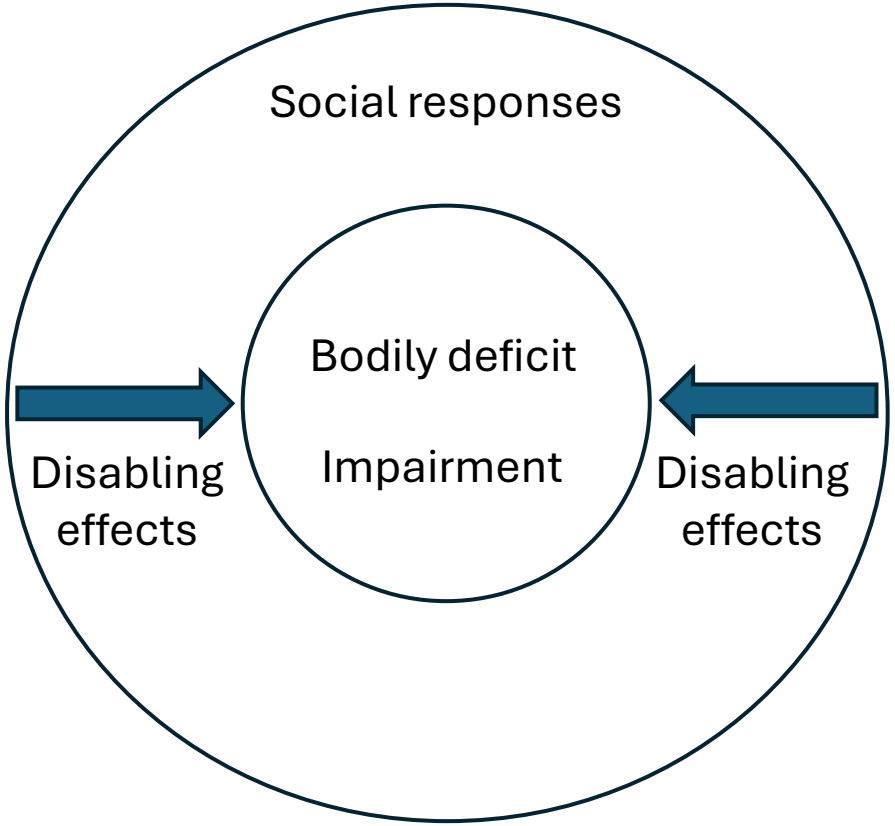
Strong social model of disability



‘Thus, in the classic example, a physically impaired person who is unable to enter a space due to an absence of wheelchair ramps is disabled by inaccessible design, not by their body.’

(Dwyer, 2022)

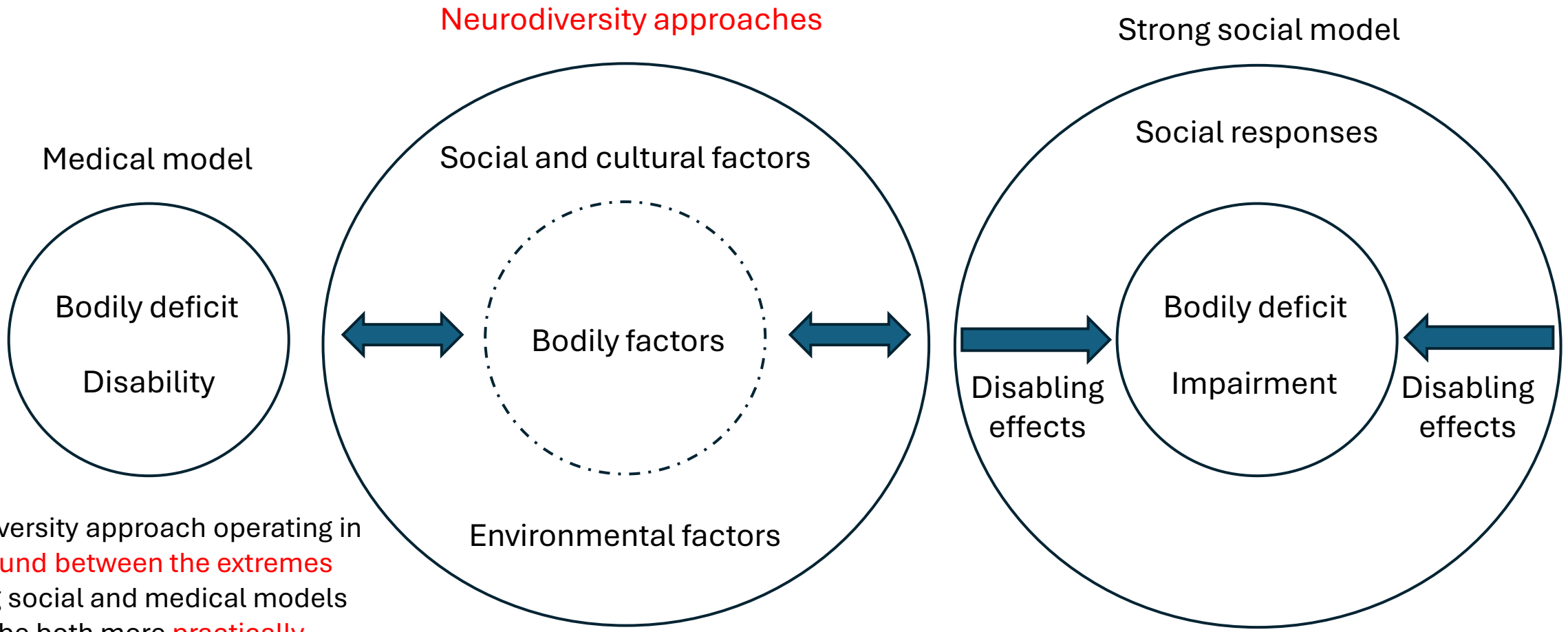
Strong social model of disability



'… if disability is caused by society and not biology, it follows that no efforts need be made to prevent impairing injuries!'

(Shakespeare and Watson, 2001, cited in Dwyer, 2022)

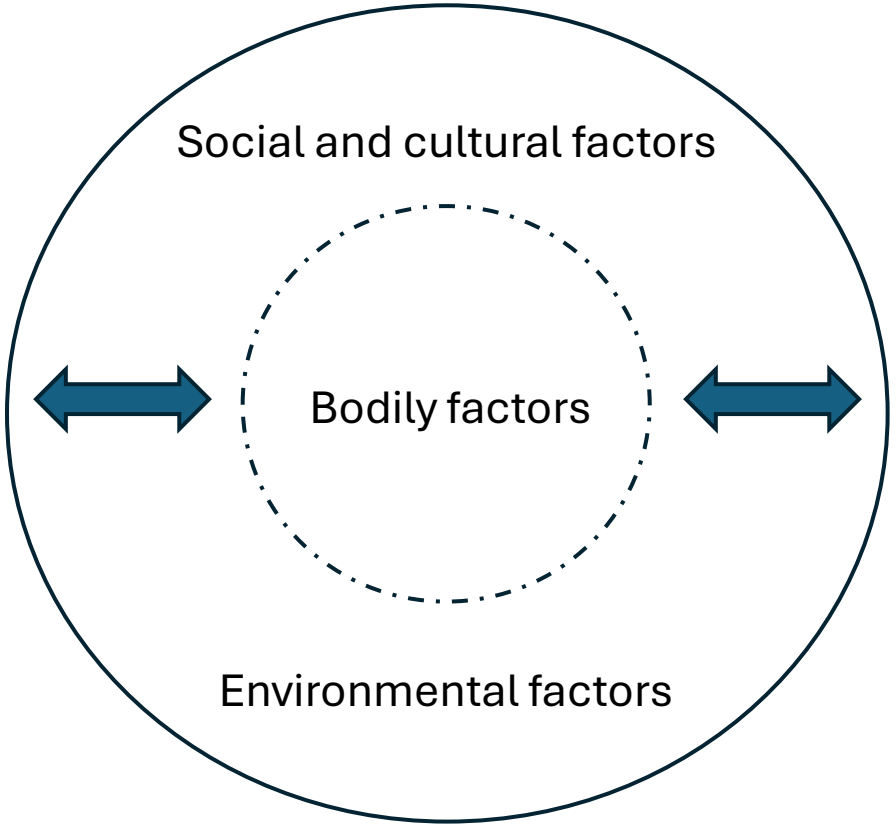
Middle ground between the two extremes



'… a neurodiversity approach operating in a middle ground between the extremes of the strong social and medical models would likely be both more practically useful and less controversial …'.

(Dwyer, 2022)

What are neurodiversity approaches?

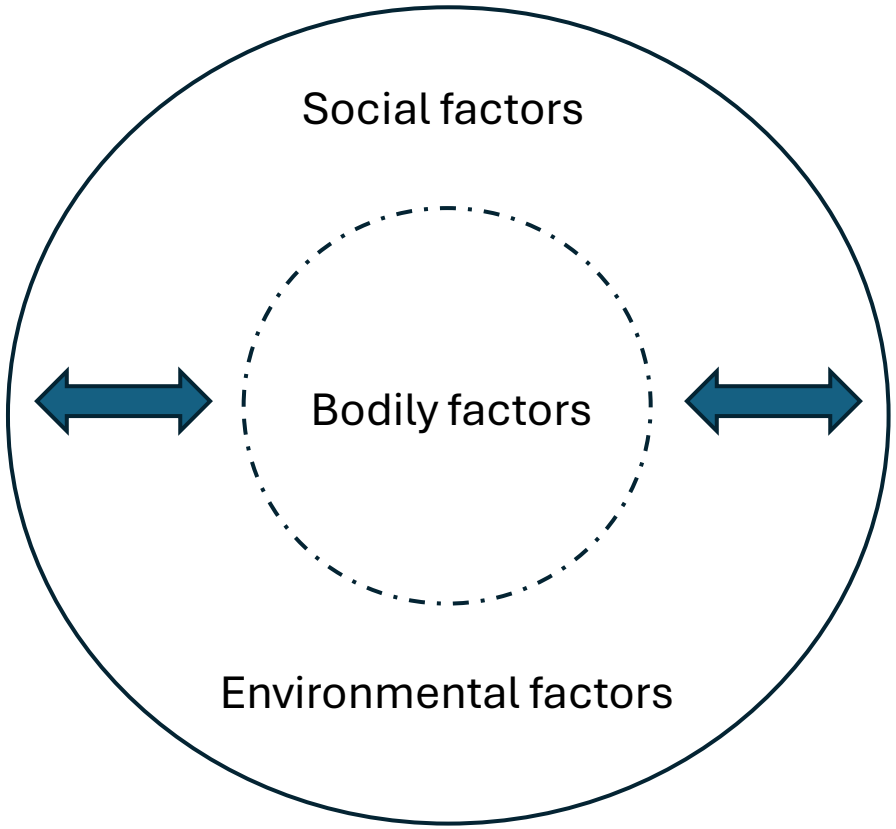


'… there is no consensus regarding the meaning of the neurodiversity approaches … This article is thus not primarily attempting to provide a descriptive definition … but a prescriptive one.'

(Dwyer, 2022)

My attempt here is similar. Prescriptive.

Assumptions of neurodiversity approaches

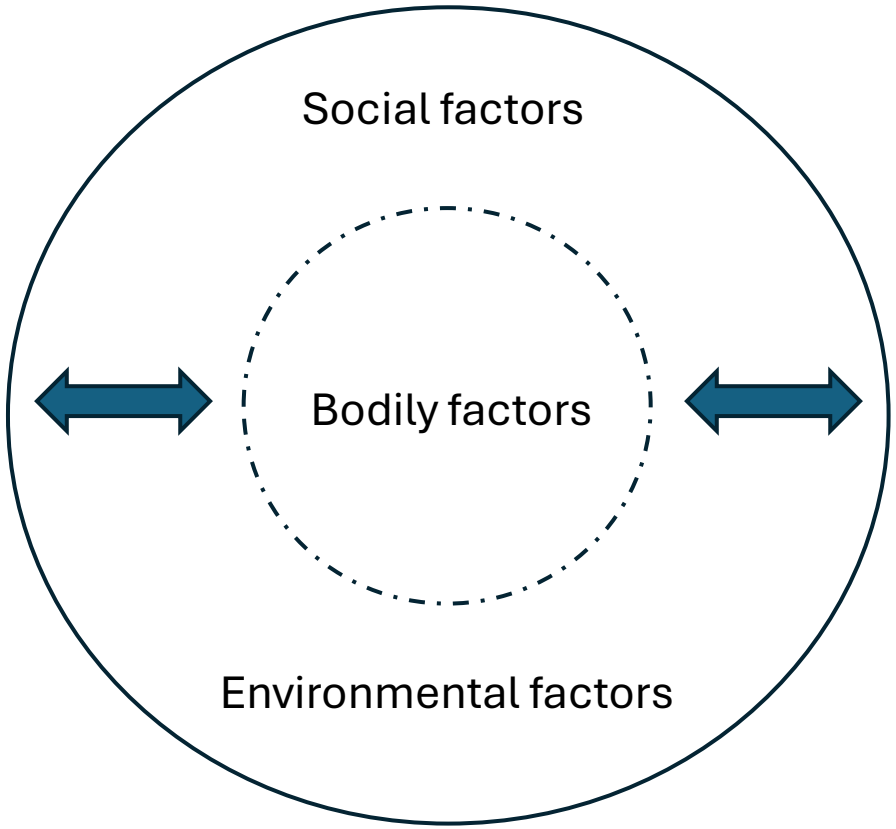


First, bodily factors, not deficits.

‘Typical neurodevelopment is neither superior nor inferior to divergent neurodevelopment.’

(Pellicano and den Houting, 2022)

Assumptions of neurodiversity approaches

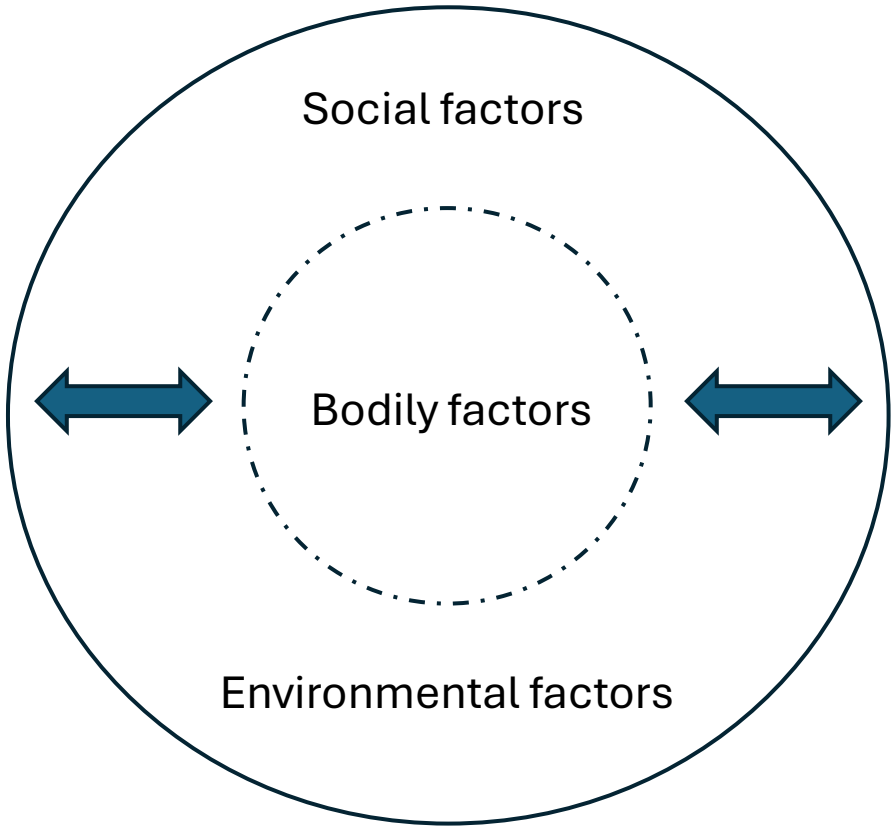


Second, a person's worth is independent of their ability to contribute to society.

'… even if diversity were not to serve this collective purpose, all people deserve to be treated with dignity and respect … and should be valued for who they are and as they are.'

(Pellicano and den Houting, 2022)

Assumptions of neurodiversity approaches



Second, a person's worth is independent of their ability to contribute to society.

Neurodiversity approaches are inclusive of neurodivergents with the most complex support needs.

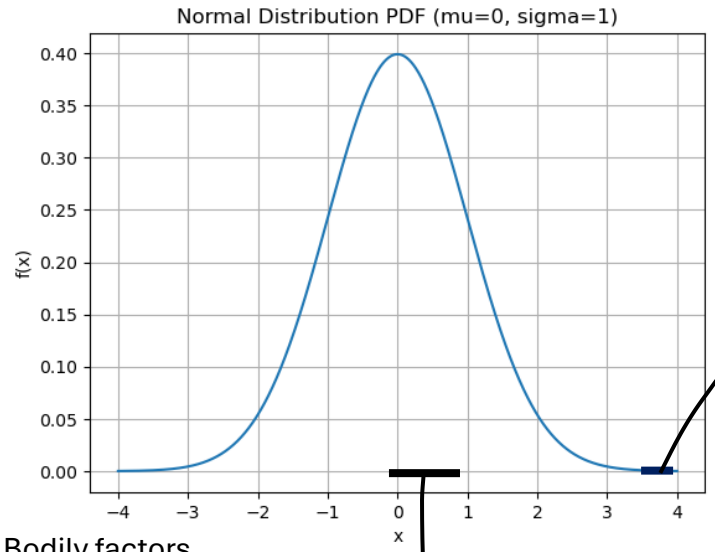
(Pellicano and den Houting, 2022)

What are neurodiversity approaches?

‘… disability might be … conceptualized as the product of an interaction between an individual’s own characteristics and their environment …’.

(Dwyer, 2022)

Mathematical model of neurodiversity

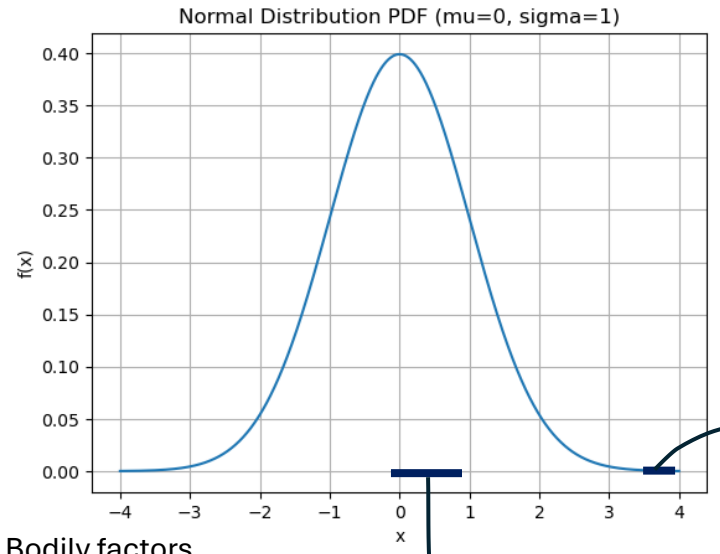


Bodily factors.

My understanding based on (Dwyer, 2022).

Neurodevelopmental conditions are emergent phenomena, so they are abstract and cannot be reified.

Mathematical model of neurodiversity



Bodily factors.

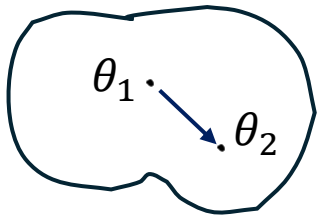
My understanding based on (Dwyer, 2022).

Disabled state.

$g(x;\theta_2)$

Interaction.

State of an individual.



Environment, social, and cultural factors.

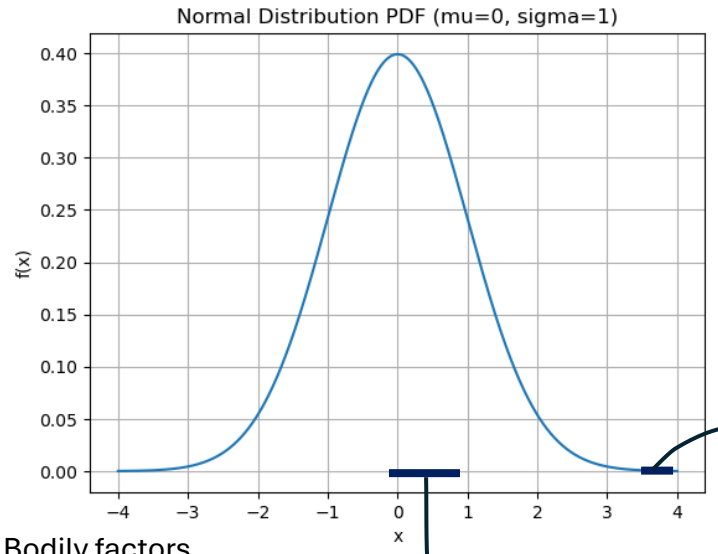
'… severity of stuttering is not static.'

'Once the burden of fluency was lifted off … this often led to less frequent stuttering of shorter duration.'

(Constantino, 2018)

Neurodevelopmental conditions are contingent and dynamic.

Mathematical model of neurodiversity



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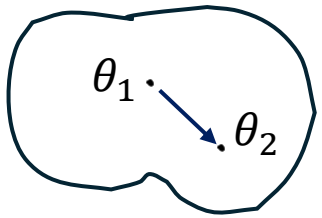

Environment, social, and cultural factors.

‘Using the same validated instrument over more than a decade to assess autism symptoms independent of clinical evaluation we found a decrease in average autism symptom score in clinically diagnosed cases of ASD.’

(Arvidsson *et al.*, 2018)

Neurodevelopmental conditions are social constructs.

Visual model of neurodiversity

A visual model of dyslexia.

‘One might visualise a grand old country house, built, rebuilt, partially demolished and then redesigned and rebuilt again. This is … the dominance of literacy … the criteria … it is part of its bricks and mortar if you will.’

(Collinson, 2012)

Visual model of neurodiversity

A visual model of dyslexia.

‘The grand old house casts a shadow … a scientific or educational construct. The shadow (dyslexia) cannot exist without the house … which shapes it, and is … changed by it as the house is rebuilt … throughout the centuries …’.

(Collinson, 2012)

Visual model of neurodiversity

A visual model of dyslexia.

‘… the sun or other light source can be taken to be the … neurological makeup of the individual dyslexic … The non-dyslexic majority have “suns” that exist in the noon position … no shadow … upwards of 10% or 15% of the population have “suns” … that do cast shadows … each dyslexic is very different from the next.’

(Collinson, 2012)

Visual model of neurodiversity

When the sun is low on the horizon, neurotypical ivory towers are very loud, smell bad, and cast long shadows.

Operationalising neurodiversity

Four dos in operationalising neurodiversity

- Aim to enhance a neurodivergent individual's well-being, not eliminate their condition.

(Dwyer, 2022)

Four dos in operationalising neurodiversity

- Aim to enhance a neurodivergent individual's well-being, not eliminate their condition.
- Interventions could operate at the individual level, the environment, or both.

(Dwyer, 2022)

Four dos in operationalising neurodiversity

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- Choice should maximise well-being, not reflect the perceived causes of the condition.

(Dwyer, 2022)

Four dos in operationalising neurodiversity

- Aim to enhance a neurodivergent individual's well-being, not eliminate their condition.
- Interventions could operate at the individual level, the environment, or both.
- Choice should maximise well-being, not reflect the perceived causes of the condition.
- The neurodivergent individual's preferences should be respected to the extent that they can communicate them.

(Dwyer, 2022)

Four don’ts in operationalising neurodiversity

- Don’t form negative judgements.
- Don’t separate a person from their condition.
- Don’t invalidate or homogenise.
- Don’t dismiss neurodevelopmental conditions as mere excuses.

(Dwyer, 2022)

Don’t form negative judgements

1. Don’t form negative judgements.

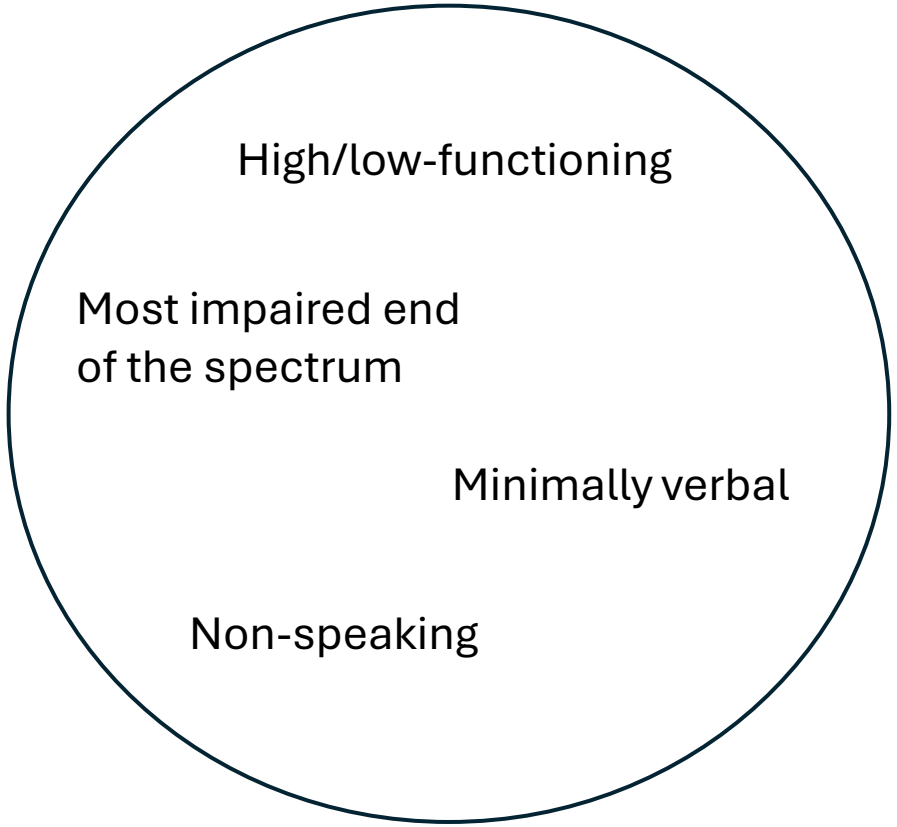
Even when interventions at the individual level are preferred, there’s no need to call someone deficient.

Dyspraxia assessment in 2025.

Started practising yoga in 2008. My motor skills improved, but I was not labelled as deficient.

(Dwyer, 2022)

Don’t form negative judgements



Botha, Hanlon, and Williams (2023) list other terms with negative connotations.

1. Don’t form negative judgements.

Reinforce neurotypical norms.

Dismiss the difficulties of ‘high-functioning individuals’. Infantilise ‘low-functioning’ individuals.

Overfocus on one skill and ignore its contingent nature.

Ascribe vulnerability to functional markers within an individual.

(Dwyer, 2022; Botha, Hanlon, and Williams 2023)

Don’t separate a person from their condition

Journal of Autism and Developmental Disorders (2023) 53:870–878
https://doi.org/10.1007/s10803-020-04858-w

COMMENTARY

Does Language Matter? Identity-First Versus Person-First Language Use in Autism Research: A Response to Vivanti

Monique Botha[1,4] · Jacqueline Hanlon[2] · Gemma Louise Williams[3]

Accepted: 22 December 2020 / Published online: 20 January 2021

Abstract
In response to Vivanti’s ‘Ask The Editor…’ paper [*Journal of Autism and Developmental Disorders, 50*(2), 691–693], we argue that the use of language in autism research has material consequences for autistic people including stigmatisation, dehumanisation, and violence. Further, that the debate in the use of person-first language versus identity-first language should centre first and foremost on the needs, autonomy, and rights of autistic people, so in to preserve their rights to self-determination. Lastly, we provide directions for future research.

Keywords Person-first language · Identity-first language · Stigma · Rights-based approach · Autism

2. Don’t separate a person from their condition.

Autistic person >>> Person with autism.

Botha, Hanlon, and Williams (2023) highlight a clear consensus within the autistic community that the latter (person-first language) is offensive.

Don’t separate a person from their condition

Journal of Autism and Developmental Disorders (2023) 53:870–878
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COMMENTARY

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Keywords Person-first language · Identity-first language · Stigma · Rights-based approach · Autism

2. Don’t separate a person from their condition.

‘If autism can be separated from the person … metaphors around the destruction of it may be used without consideration for the life attached …’.

(Botha, Hanlon, and Williams 2023)

But autism is a part of this person.

Material consequences of separation

Mother convicted of suffocating autistic girl

An Illinois woman who claimed she tried to "fix" her 3-year-old autistic daughter by suffocating her with a plastic bag was convicted of murder Thursday after jurors rejected her insanity plea.

Jan. 18, 2008, 2:36 AM GMT / Source: The Associated Press

A woman who claimed she tried to "fix" her 3-year-old autistic daughter by suffocating her with a plastic bag was convicted of murder Thursday after jurors rejected her insanity plea.

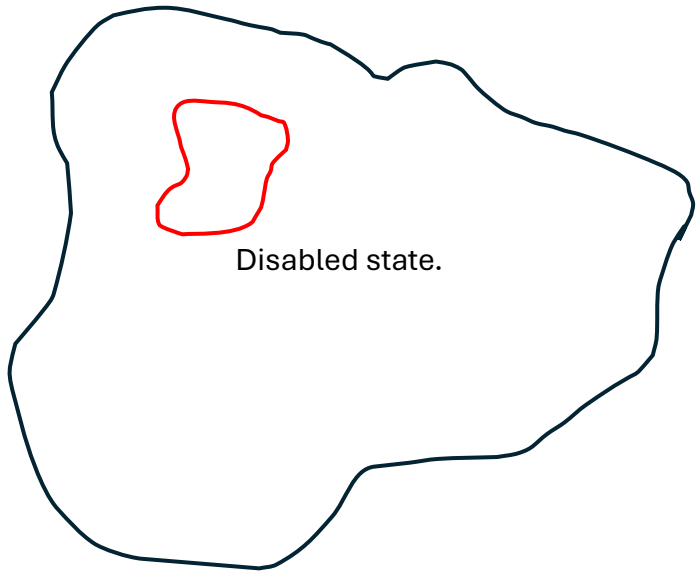
"Maybe I could fix her this way, and in heaven she would be complete," she told police during the interview two days after Katherine "Katie" McCarron's death.

(The Associated Press, 2008)

Violence against autistic and other neurodivergent people can be justified as kindness.

For example, ‘altruistic’ filicides do happen.

Don’t invalidate or homogenise



A region in a high-dimensional space,
not a dot on a line.

3. Don’t invalidate or homogenise.

Neurodivergent people do not owe you explanations.

‘I don’t like noisy places either, but I am not autistic.’ ✖

‘I know a dyslexic person who writes really well’. ✖

Intersectional lens is necessary

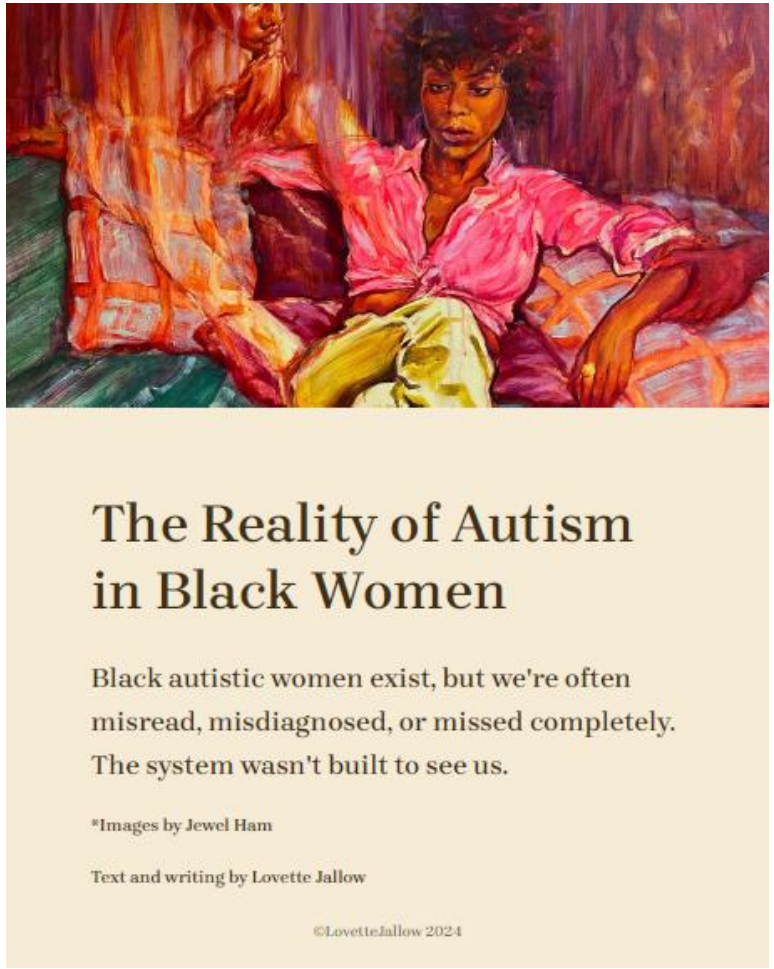
(Elsherif *et al.*, 2022)

Different aspects of a person's identity intersect dynamically to create advantages and disadvantages.

Ignoring neurodiversity, 19 dimensions.

3^19 is over $1e^9$ combinations.

Intersectional lens is necessary



(Jallow, 2024)

Diagnostic tools were designed for some demographic groups only.

Autistic traits are often dismissed due to cultural stereotypes.

Intersectional lens is necessary

Do Chinese Dyslexic Children Have Difficulties Learning English as a Second Language?

Connie Suk-Han Ho[1,3] and Kin-Man Fong[2]

The aim of the present study was to examine whether Chinese dyslexic children had difficulties learning English as a second language given the distinctive characteristics of the two scripts. Twenty-five Chinese primary school children with developmental dyslexia and 25 normally achieving children were tested on a number of English vocabulary, reading, and phonological processing tasks. It was found that the Dyslexia group performed significantly worse than the Control group in nearly all the English measures. The findings suggest that Chinese dyslexic children also encounter difficulties in learning English as a second language, and they are generally weak in phonological processing both in Chinese and English. However, phonological skills were found to correlate significantly with English reading but not with Chinese reading in the dyslexic children. It is evident that there are both common and specific causes to reading difficulties in Chinese and English.

KEY WORDS: bilingualism; Chinese; cross-language transfer; developmental dyslexia.

(Ho and Fong, 2005)

Chinese student not dyslexic in the Chinese education system.

They move to the UK and become disabled by the British education system: phonological processing matters more.

‘Speak English properly or f?!k off back to China.’

Intersectional lens is necessary

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KEY WORDS: bilingualism; Chinese; cross-language transfer; developmental dyslexia.

(Ho and Fong, 2005)

British student diagnosed with dyslexia at a relatively young age.

They are supported by the same British education system.

‘If reading aloud in front of the class is uncomfortable, you can just listen.’

Intersectional lens is necessary

LET'S TALK | LANGUAGE

How dyslexia changes in other languages

By Sophie Hardach 10th March 2023

Writing in English can be a challenge – even if it's your mother tongue.

Alex loved books and languages. His parents were native English speakers, and the family lived in Japan, so Alex spoke English at home, and Japanese at school. At the age of 13, however, Alex was diagnosed with dyslexia, a **learning difficulty** that affects reading and writing. According to test results, his English reading level was that of a six-year-old.

The results were a shock. "This test came along and they were like, actually, your writing is horrible," Alex recalls. "I thought I was doing ok. Yes, there was a bit of a struggle, but I assumed everyone else was struggling. In fact, the numbers that came out were quite devastating from my perspective."

To researchers, the even bigger surprise was his performance in the other language he used. When he was tested in Japanese at the age of 16, his literacy was not just good. It was excellent.

(Hardach, 2023)

If you are interested, another story.

Don’t dismiss conditions as excuses

Such examples are only small instances of the ways in which the institutions that govern society at a structural level are typically controlled by and designed for neurotypical people, often with devastating effects for autistic people. Autistic people are disproportionately formally excluded (expelled) from school (e.g. Ambitious about Autism, 2014; Brede, Remington, Kenny, Warren, & Pellicano, 2017), experience frequent bullying and other forms of victimisation (Brown-Lavoie, Viecili, & Weiss, 2014; Maiano et al., 2016), are either unemployed or underemployed at greater rates than other disabled people (Chen, Leader, Sung, & Leahy, 2014; Scott et al., 2019), are at greater risk of physical health conditions (Croen et al., 2015) and have increased vulnerability to mental ill-health (Lai et al., 2019), including high rates of suicide (Cassidy et al., 2014; Kirby et al., 2019). They are also more likely to experience premature death (Hirvikoski et al., 2016). A growing body of research describes the substantial barriers that autistic adults face in accessing physical healthcare, which include such diverse factors as inaccessible sensory environments; providers' knowledge about and attitudes towards autism; and the complexity of healthcare systems (Mason et al., 2019; Nicolaidis et al., 2015). Similar barriers exist across a range of domains, including access to mental healthcare (Adams & Young, 2020), employment (Harmuth et al., 2018) and leisure activities (Askari et al., 2014). According to the neurodiversity paradigm, responding to these facts does not require us to 'change autistic people' but rather to challenge the societal factors that influence these outcomes (Howlin, 2000; Howlin & Magiati, 2017; see Mandy et al., 2016, for an example).

(Pellicano and den Houting, 2022)

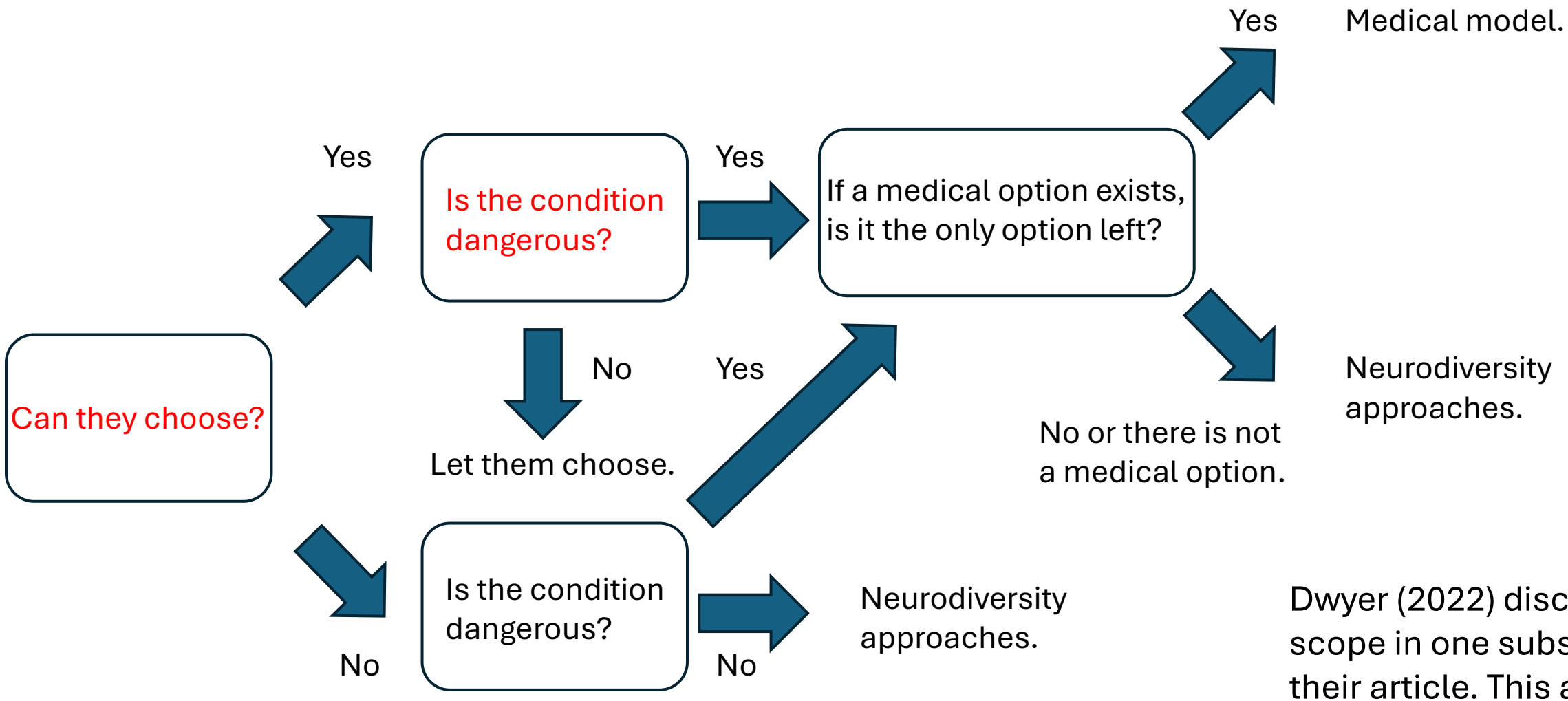
4. Don’t dismiss neurodevelopmental conditions as mere excuses.

The challenges facing autistic people (and other neurodivergents) are real and well documented.

For example, expulsion from school and underemployment.

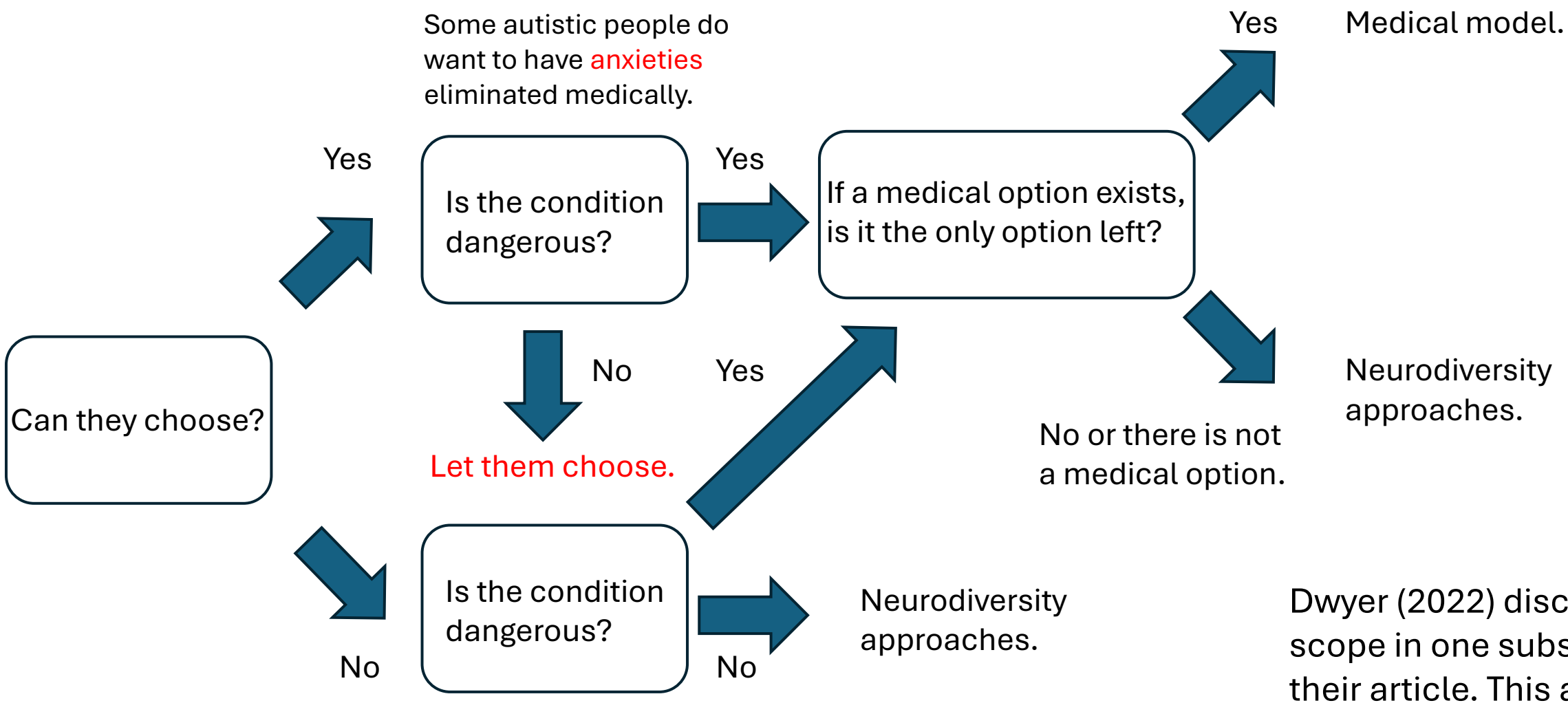
Medical model has its place

Limitations of neurodiversity approaches



Dwyer (2022) discusses the scope in one subsection of their article. This algorithm is based on it.

Limitations of neurodiversity approaches



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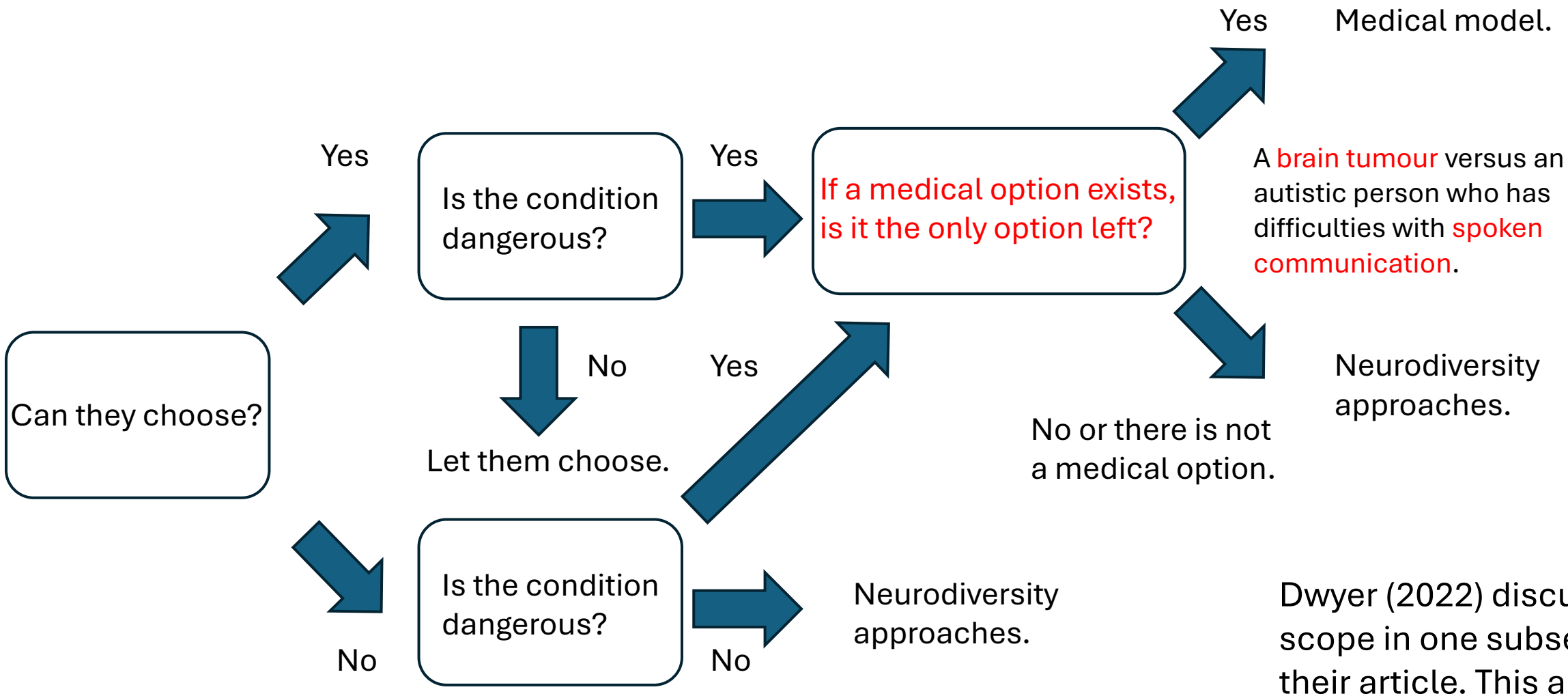

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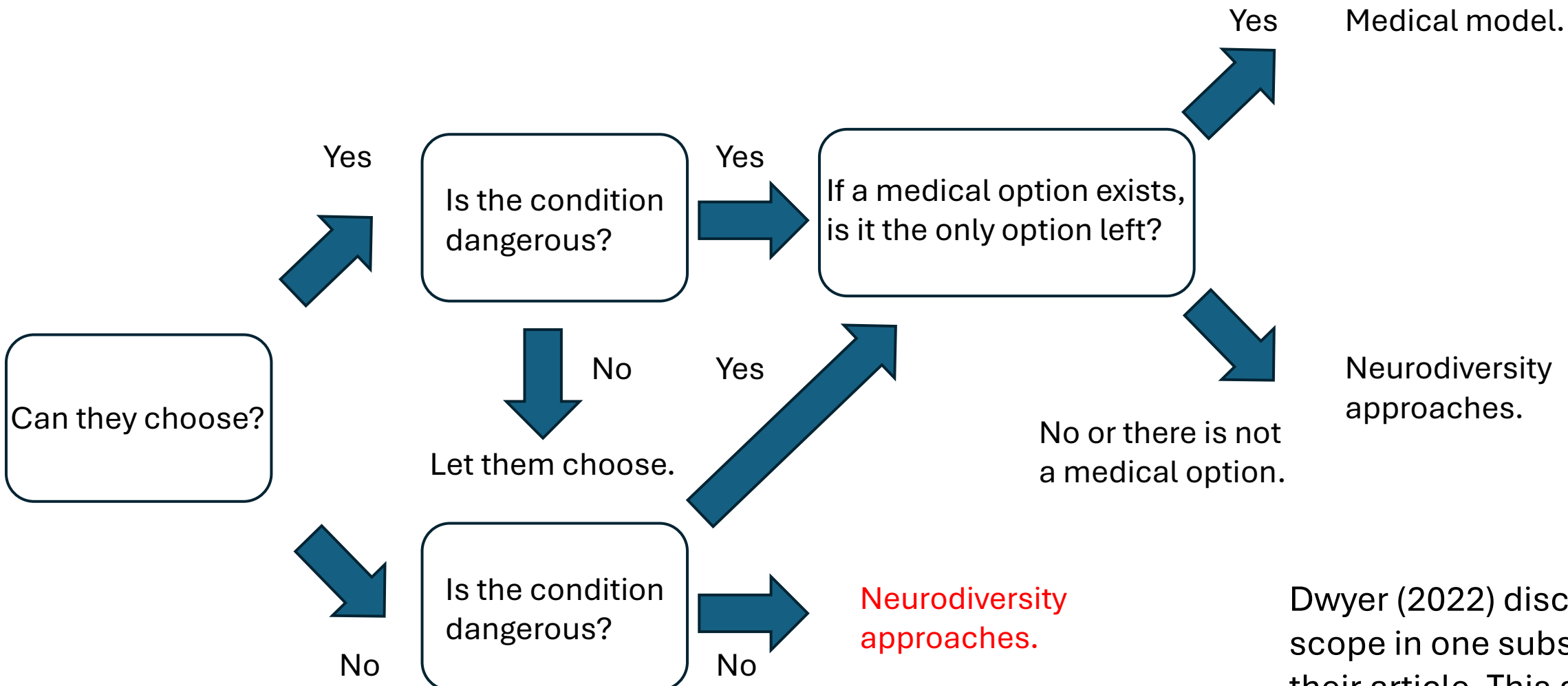

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Implications for biomedical research

Cell
Leading Edge

CellPress

Commentary

Bridge-building between communities: Imagining the future of biomedical autism research

Síofra Heraty,[1,*] Alexandra Lautarescu,[2] David Belton,[3] Alison Boyle,[3] Pietro Cirrincione,[3] Mary Doherty,[3,4] Sarah Douglas,[3] Jan Roderik Derk Plas,[3] Katrien Van Den Bosch,[3] Pierre Violland,[3] Jerneja Tercon,[3,5] Amber Ruigrok,[6,7] Declan G.M. Murphy,[8,9,10] Thomas Bourgeron,[11] Christopher Chatham,[12] Eva Loth,[8] Bethany Oakley,[8] Grainne M. McAlonan,[8,9,10] Tony Charman,[2] Nicolaas Puts,[8,10] Louise Gallagher,[13,14] and Emily J.H. Jones[15]

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A paradigm shift in research culture is required to ease perceived tensions between autistic people and the biomedical research community. As a group of autistic and non-autistic scientists and stakeholders, we contend that through participatory research, we can reject a deficit-based conceptualization of autism while building a shared vision for a neurodiversity-affirmative biomedical research paradigm.

Neurodiversity approaches are compatible with biomedical research.

'… autistic people who might benefit from a medical model approach to support specific impairments (e.g. … sensory hypersensitivity), but who would be negatively impacted by pathologization of the overall experience of being autistic.'

(Heraty *et al.*, 2023)

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Precision medicine targets specific traits in specific conditions, not broad categories.

Some restricted and repetitive behaviours, such as head banging, are harmful.

Self-regulatory stimming is not.

(Heraty *et al.*, 2023)

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'… clinicians who work with autistic people … could help determine traits of interest and suitability for translational research …'.

(Heraty *et al.*, 2023)

Make a list of precise, contextualised, and co-defined (with neurodivergents) traits of interest.

Participatory research

‘… Participatory Research practices, defined as incorporating the views of neurodivergent individuals and their allies into the whole research cycle, from project design to dissemination and application of findings (Bourke, 2009; Fletcher-Watson et al., 2021).’

(Gourdon-Kanhukamwe *et al.*, 2023)

Participatory research

‘… a) challenge general existing assumptions … b) … neurodivergent individuals as active collaborators … as opposed to passive, tokenised objects (Elsherif et al., 2022; Pellicano & den Houting, 2022); c) reduce bias in theories and interpretations … d) … recruitment … from more diverse … backgrounds …’.

(Gourdon-Kanhukamwe *et al.*, 2023)

Decolonise neurodiversity

‘Psychological and educational research remains disproportionately centred on participants from Western, Educated, Industrialised, Rich, and Democratic (WEIRD) societies (Krys et al., 2024).’

(Fisher *et al.*, 2025)

Decolonise neurodiversity

‘… driven primarily by English-speaking White autistic people and allies … responds to the socio-cultural and political circumstances and concerns of these communities.’

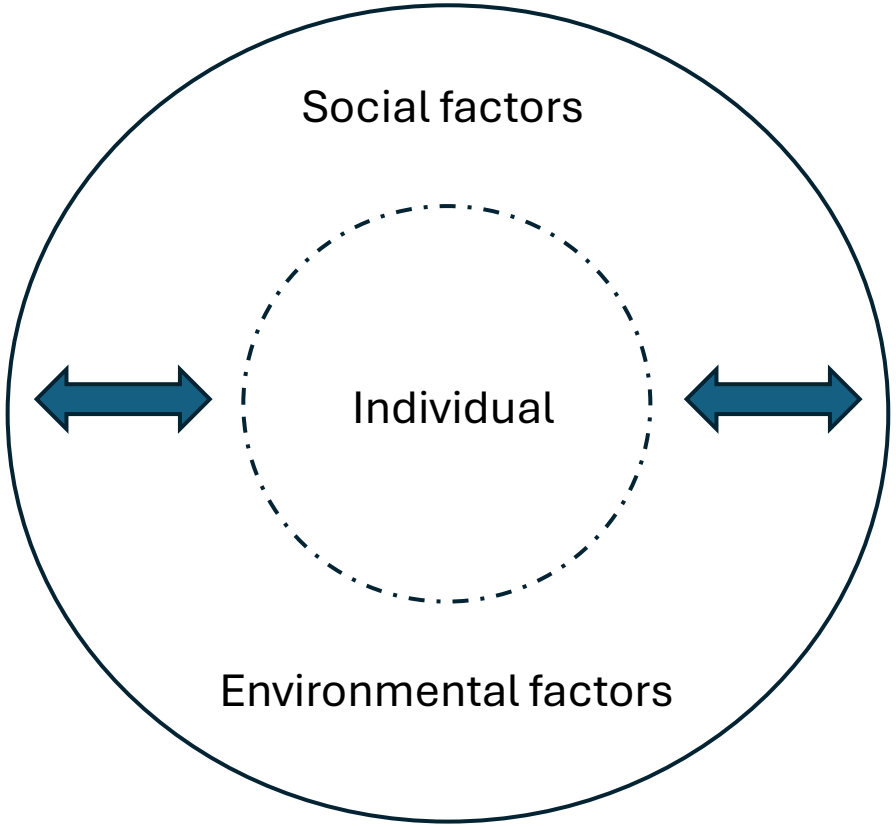
(Cheng *et al.*, 2023)

Decolonise neurodiversity

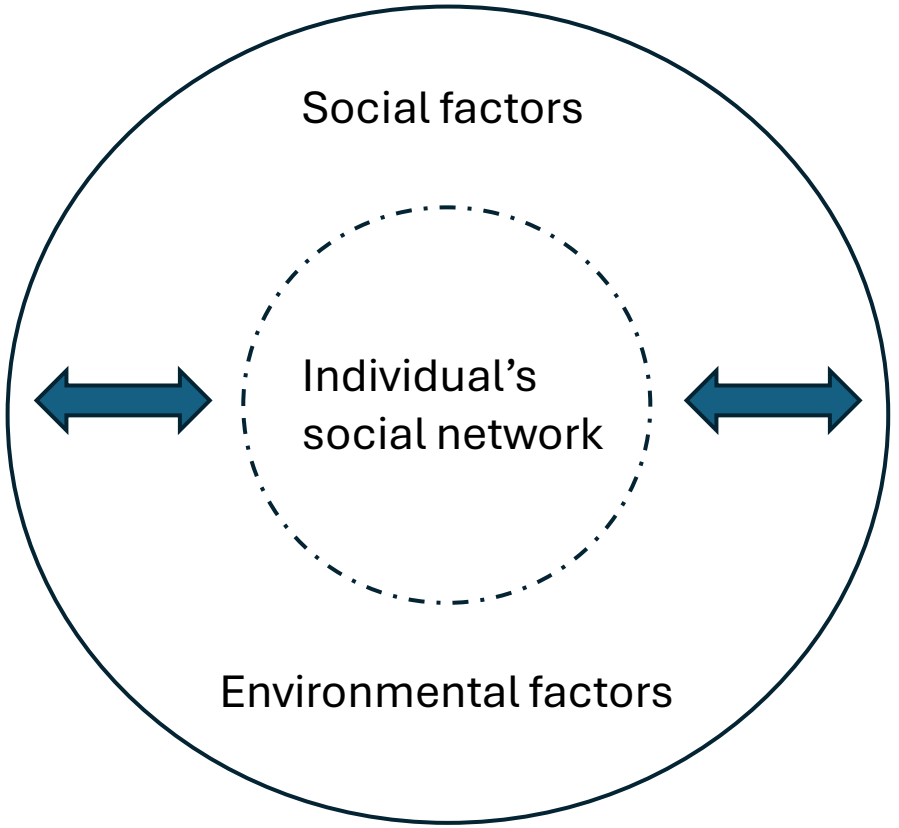
‘… uncritical transportation and application of this wholesale [neurodiversity] framework from European and North American communities to those of Asia and Africa must be avoided.’

(Cheng *et al.*, 2023)

Decolonise neurodiversity



WEIRD model.



Possible Ethiopian model.

Cheng *et al.* (2023) comment that, in Ethiopia, identity is embedded in familial and community collective relationships.

Setting the individual as the fundamental unit may not be a good idea.

Onus of reconciliation is on researchers

'… researchers have recently – within the second half of the twentieth century – performed … problematic studies on disabled children from institutions (e.g., feeding children radioactive cereal …) (Boissoneault, 2017; Krugman, 1986).

(Dwyer, 2022)

Escape from ivory towers

A question about academic standards

‘It follows our concern that “great man” (or woman) theories of history tend to erase complexity in favour of oversimplified, and ultimately inaccurate, misunderstandings.’

(Botha *et al.*, 2024)

Do assessments, recognition, and prestige erase merits in favour of narrowly defined, and ultimately self-serving standards defined by the powers that be?

Neuro-normative academic standards

Neurodiversity
Volume 3, 2025

https://doi.org/10.1177/27546330251353565

Sage Journals

Commentary

Neuro-Normative Epistemic Injustice – Consequences for the UK Education Crisis and School Anxiety

Emmie Fisher [1], Keren MacLennan [2], Sinéad Mullally [3], and Jacqui Rodgers [1]

The UK education system is failing to meet needs, leading to an attendance and school anxiety crisis. However, the system faults those disproportionately and most visibly struggling – namely Neurodivergent and SEND learners – as outliers instead of warning signs. Only through acknowledgement of systemic internal mechanisms can the complexity and scope of the education crisis be addressed. In this commentary, we explore school anxiety through the underlying systemic mechanisms within neuro-normativity, epistemic injustice, and consequent affordances, or opportunities for action. Specifically, we argue that the rigid adherence to neuro-normative academic standards inherently fosters a loss of inclusivity and poor teacher knowledge and attitudes. Student camouflaging, or behavioural changes aimed at minimising overt Neurodivergent characteristics, may, thus, arise to navigate neuro-normativity, exacerbating school anxiety. Ultimately, this piece advocates for a paradigm shift away from pathologizing a context-driven problem as inherent to neurodivergence and instead calls for recognising 'school anxiety', and other educational consequences, as signals of a deeper systemic issue.

'In the UK, neuro-normativity upholds … "Neurotypical" … as superior and healthy (Catala et al., 2021; Legault et al., 2019), reinforcing rigid distinctions between "normal" and "defective" (Bodfield & Culshaw, 2023).'

(Fisher *et al.*, 2025)

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' … a singular neuro-normative trajectory of "how children develop and learn", disregarding alternative developmental paths as "falling behind" (DfE, 2023).'

(Fisher *et al.*, 2025)

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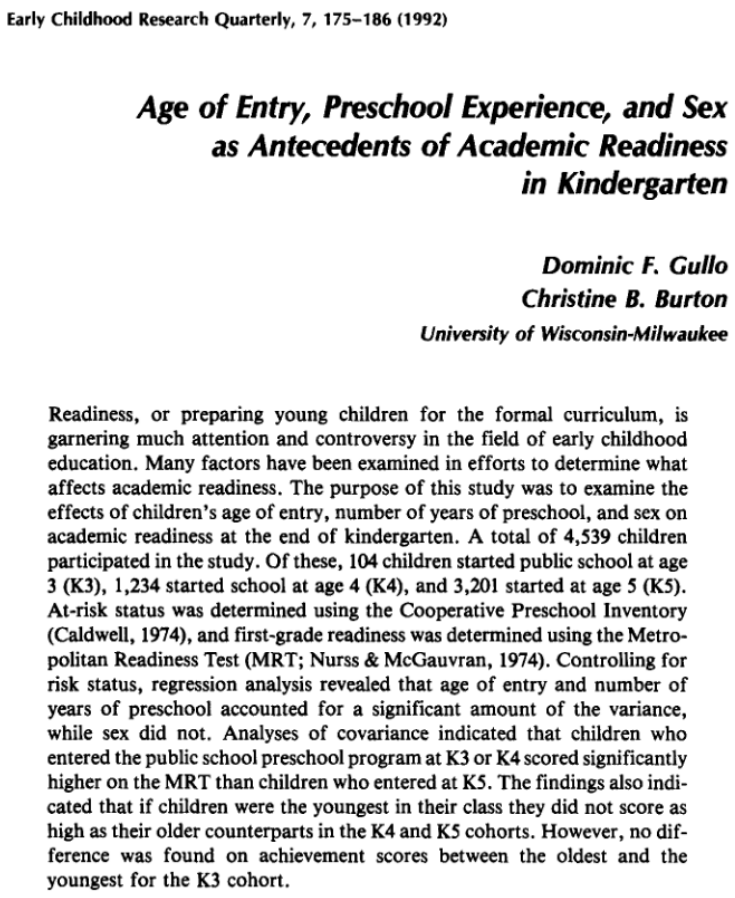
Similarly, national curricula, standardised assessments, Ofsted ratings, and other metrics are cited by Fisher *et al.* (2025) as policies that reinforce neuro-normative academics standards.

Neuro-normative academic standards



Early Childhood Research Quarterly, 7, 175–186 (1992)

Age of Entry, Preschool Experience, and Sex as Antecedents of Academic Readiness in Kindergarten

Dominic F. Gullo
Christine B. Burton
University of Wisconsin-Milwaukee

Readiness, or preparing young children for the formal curriculum, is garnering much attention and controversy in the field of early childhood education. Many factors have been examined in efforts to determine what affects academic readiness. The purpose of this study was to examine the effects of children's age of entry, number of years of preschool, and sex on academic readiness at the end of kindergarten. A total of 4,539 children participated in the study. Of these, 104 children started public school at age 3 (K3), 1,234 started school at age 4 (K4), and 3,201 started at age 5 (K5). At-risk status was determined using the Cooperative Preschool Inventory (Caldwell, 1974), and first-grade readiness was determined using the Metropolitan Readiness Test (MRT; Nurss & McGauvran, 1974). Controlling for risk status, regression analysis revealed that age of entry and number of years of preschool accounted for a significant amount of the variance, while sex did not. Analyses of covariance indicated that children who entered the public school preschool program at K3 or K4 scored significantly higher on the MRT than children who entered at K5. The findings also indicated that if children were the youngest in their class they did not score as high as their older counterparts in the K4 and K5 cohorts. However, no difference was found on achievement scores between the oldest and the youngest for the K3 cohort.

(Gullo and Burton, 1992)

This applies to differences along other dimensions too, such as class.

For example, my parents did not go to university. They misinterpreted research findings and didn't let me enter year one until I was almost seven.

My successes were celebrated less, mistakes judged more harshly.

Testimonial and hermeneutical injustice

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'… experiences and knowledge of Neurodivergent individuals are unjustly dismissed … society lacks the concepts and language to value and understand non-neuro-normative contributions … leads to misunderstandings by those who rely on neuro-normative conventions …'.

(Fisher *et al.*, 2025)

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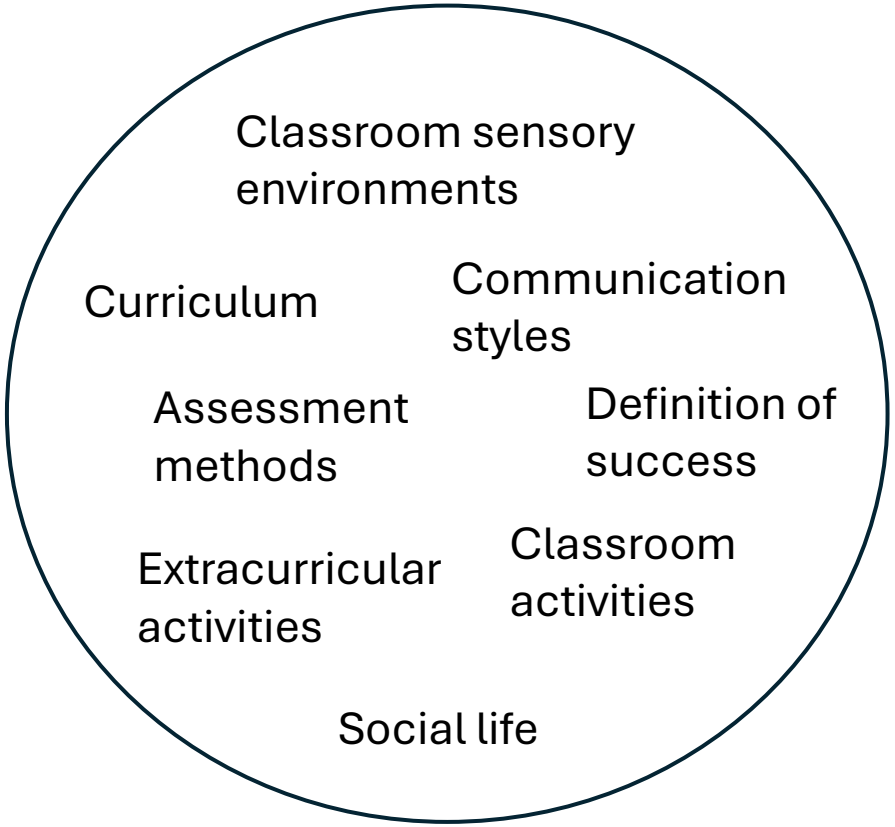
This applies to differences along other dimensions too, such as nationality.

For example, my international student consciously chose not to use the literary present tense.

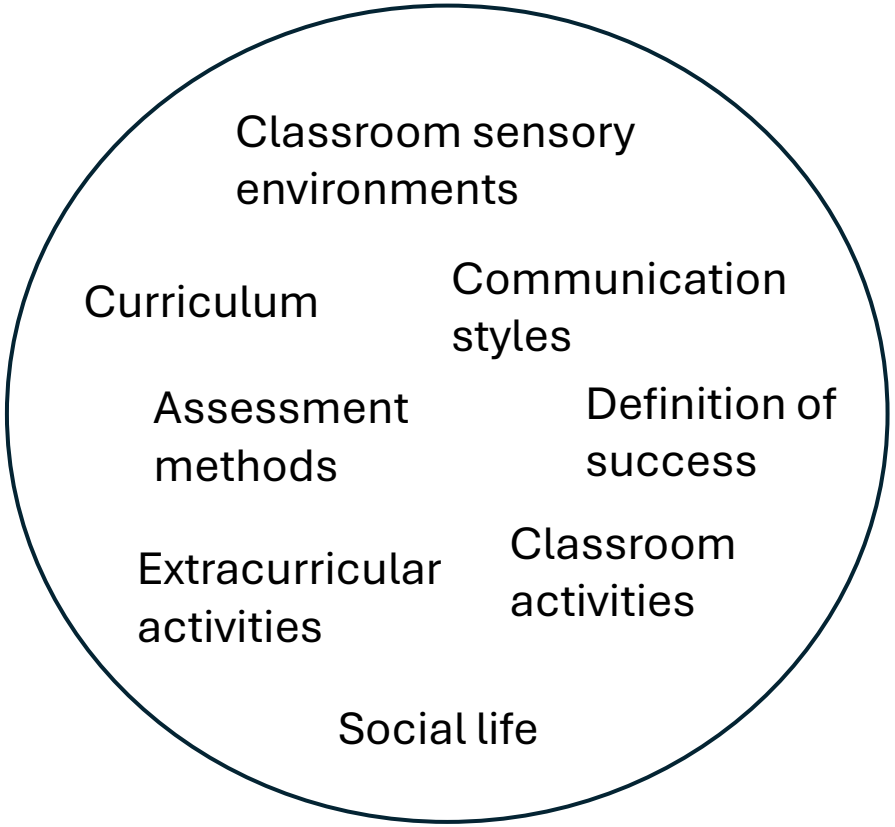
Landscape of affordances



‘Neuro-normative epistemic injustice has resulted in a landscape of affordances designed for, and more easily accessed by, Neurotypical individuals.’

(Fisher *et al.*, 2025)

Landscape of affordances



‘Neuro-normative epistemic injustice has resulted in a landscape of affordances designed for, and more easily accessed by, Neurotypical individuals.’

(Fisher *et al.*, 2025)

Reactive interventions (such as student support plans) target components without considering how they fail to work together in systems.

Landscape of affordances

A visual model of dyslexia.

‘Consider that … the rules of written English … are now more logical … However, the criteria by which this new more logical English is measured against is … stricter … to enable employers and educators to select “the best”.’

(Collinson, 2012)

The number of dyslexics is the same as it is in our world.

Where’s the emergency exit?

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Compassionate pedagogy for neurodiversity in higher education: A conceptual analysis

Lorna G. Hamilton* and Stephanie Petty

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The neurodiversity paradigm challenges pathologising accounts of neurodevelopmental differences, including autism, attention deficit disorder (ADHD), dyslexia, developmental language disorder (DLD) and others. From a neurodiversity perspective, these differences in the way people perceive, learn about and interact with the world are conceptualised as naturally occurring cognitive variation, akin to biodiversity in the natural environment, which may bring unique strengths and challenges for individuals. An implication of this approach is that interventions designed to create contexts in which neurodivergent people can thrive are needed, in addition to those that seek to ameliorate individual-level difficulties. In this conceptual review, we consider how higher education can offer a context in which cognitive diversity can be noticed, welcomed and accepted with warmth. In universities, neurodiversity is one dimension of difference within an increasingly diverse student population, which overlaps – but is not synonymous – with disability. We argue that improving experience and outcomes for neurodivergent students should be a priority for universities aiming to produce graduates equipped to tackle the complex problems of contemporary society. Drawing on the foundational principles of compassion-focused psychological therapies, we consider how compassion can be enacted within interpersonal interaction, curriculum design, and leadership culture in universities. We apply the insights of double empathy theory to the problem of overcoming barriers of difference in the classroom. Finally, we make recommendations for Universal Design for Learning (UDL) and strengths-based pedagogical approaches, which create a fit-for-purpose educational environment for the widest possible range of learners. This realignment with the neurodiversity paradigm offers an antidote to bolt-on provisions for students who differ from the neuro-normative, and might enable neurodivergent thinkers to flourish within and beyond higher education.

KEYWORDS

neurodiversity, higher education, compassion, double empathy, Universal Design for Learning

‘… university cultures … are often characterised by “subtle, but powerful, competition and striving for prestige and dominance … [stifling] the conditions in which compassionate pedagogy can survive and flourish.”’

(Hamilton and Petty, 2023)

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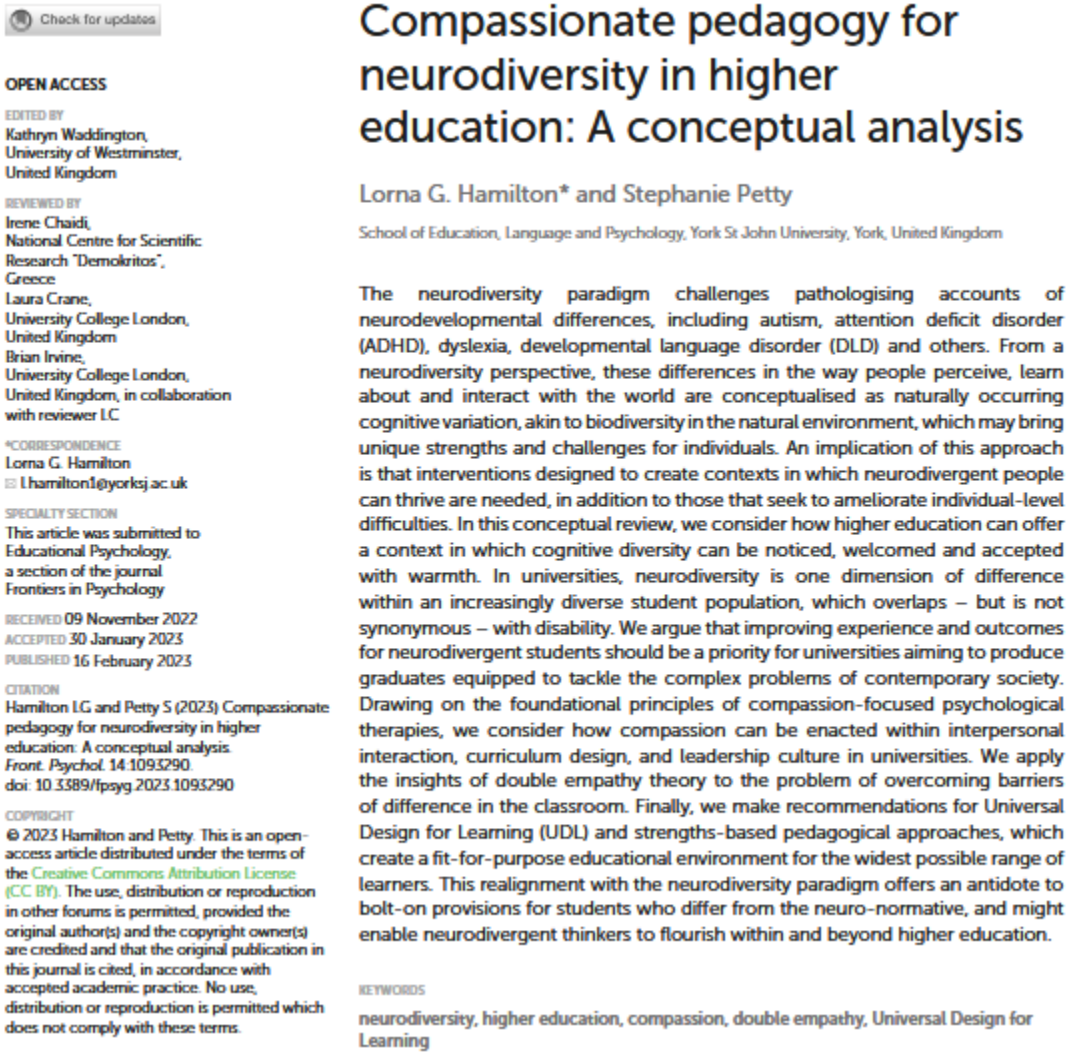

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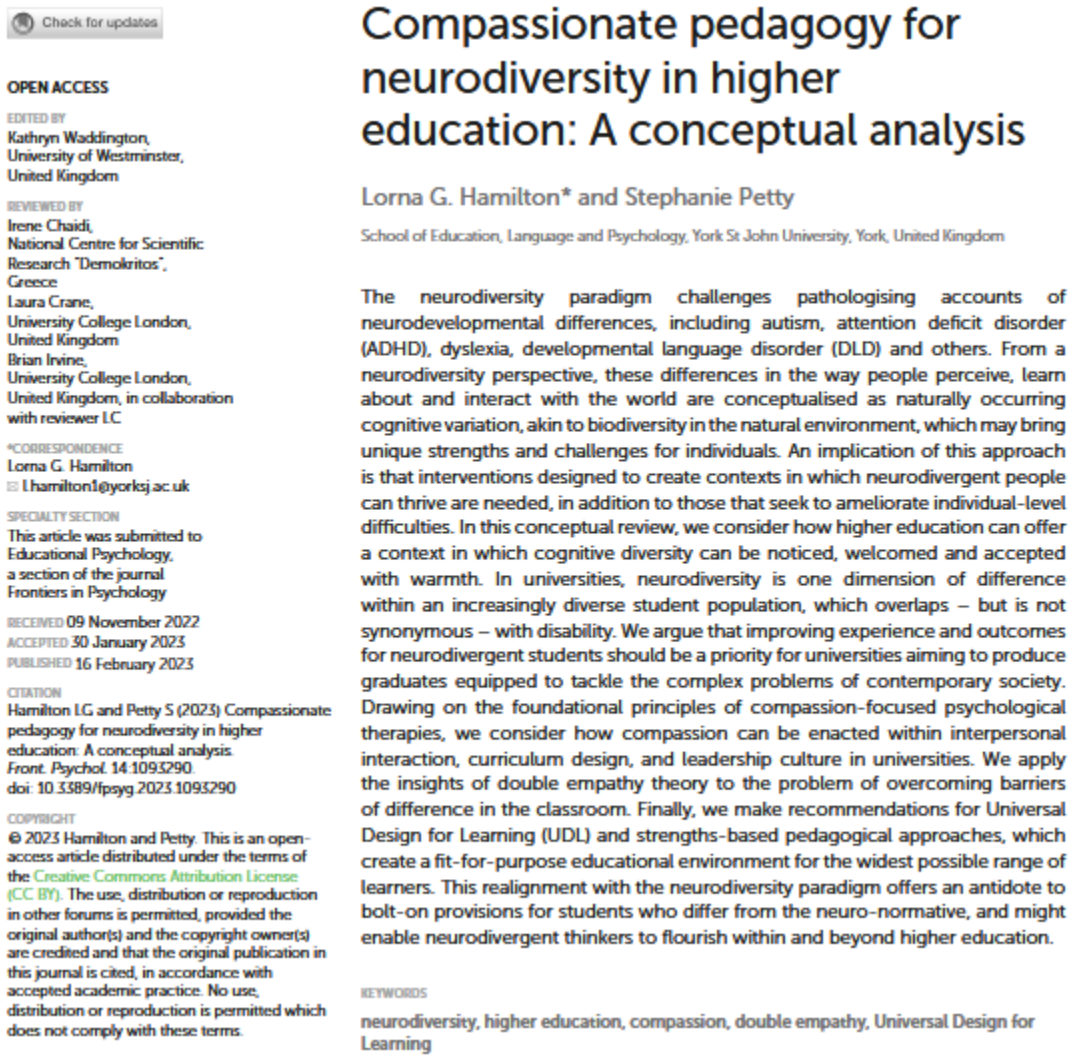
KEYWORDS

neurodiversity, higher education, compassion, double empathy, Universal Design for Learning

Diego Maradona didn’t win many trophies. He played his best football at SSC Napoli, not FC Barcelona.

Where's the emergency exit?



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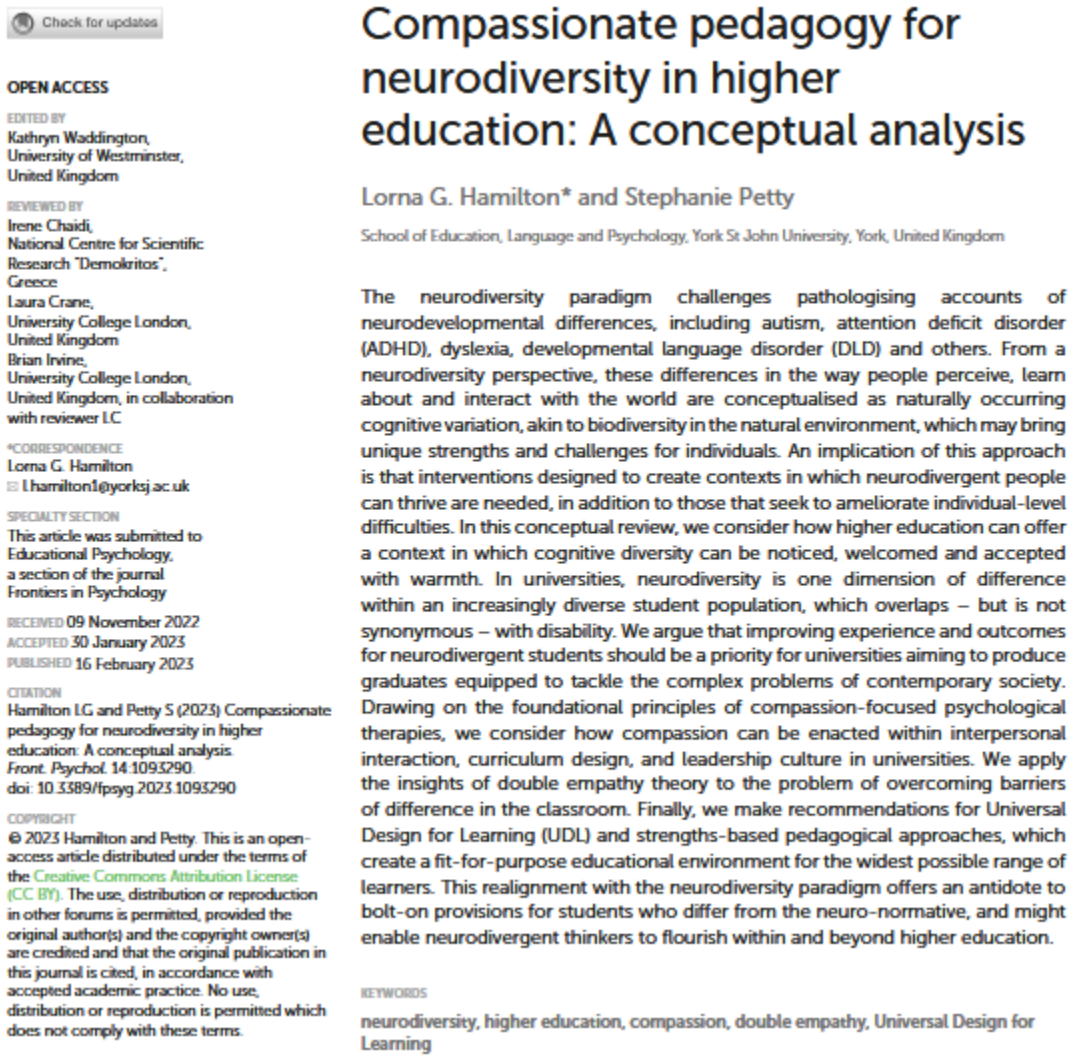
KEYWORDS

neurodiversity, higher education, compassion, double empathy, Universal Design for Learning

Hamilton and Petty (2023) reimagine the goals of education.

- Create memories of positive interpersonal interactions through experience and reflection.
- Provide a space where everyone can contribute and find a sense of belonging.
- Foster a desire to grow further.
- Empower students to look forward with hope for success.

Where's the emergency exit?



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KEYWORDS

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Hamilton and Petty (2023) discuss the principles of Universal Design for Learning, an antidote.

- Flexibility and choice are embedded.
- Knowledge is transmitted clearly and can be accessed in multiple modalities with ease.
- Competence can be demonstrated in multiple ways at different rates.

In my restless dreams, I see that school

Art	A
Biology	B
Chemistry	C
Economics	B
English	A
History	B
Mathematics	A
Physics	A

Out!

How I would put it into practice

- Divide each subject into a list of fundamental building blocks.

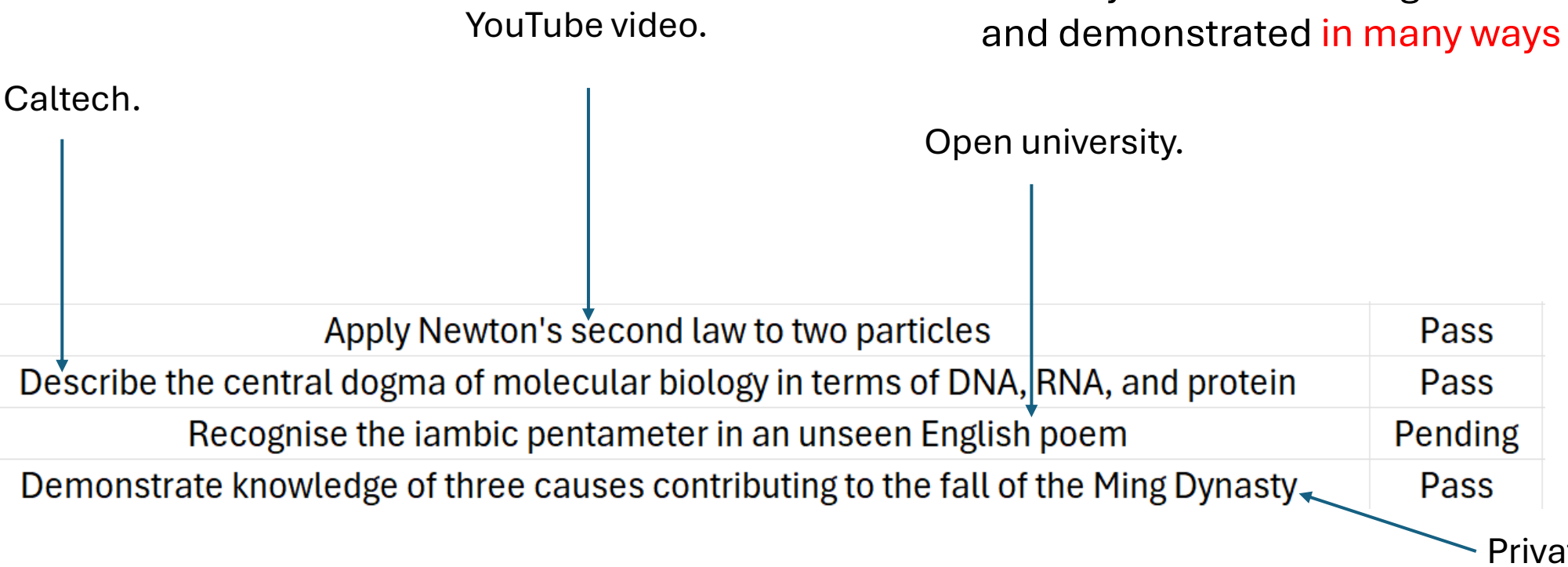
Apply Newton's second law to two particles	Pass
Describe the central dogma of molecular biology in terms of DNA, RNA, and protein	Pass
Recognise the iambic pentameter in an unseen English poem	Pending
Demonstrate knowledge of three causes contributing to the fall of the Ming Dynasty	Pass

In!

In my restless dreams, I see that school

How I would put it into practice

- Divide each subject into a list of fundamental building blocks.
- Mastery of each building block can be gained and demonstrated in many ways any time.



In my restless dreams, I see that school

How I would put it into practice

- Divide each subject into a list of fundamental building blocks.
- Mastery of each building block can be gained and demonstrated in many ways any time.

Presentation. Teaching a classmate. Solving a textbook problem in class. Exam.

Apply Newton's second law to two particles	Pass
Describe the central dogma of molecular biology in terms of DNA, RNA, and protein	Pass
Recognise the iambic pentameter in an unseen English poem	Pending
Demonstrate knowledge of three causes contributing to the fall of the Ming Dynasty	Pass

In my restless dreams, I see that school

Achieving a personal task unlocks an interpersonal task and *vice versa*!

How I would put it into practice

- Divide each subject into a list of fundamental building blocks.
- Mastery of each building block can be gained and demonstrated in many ways any time.
- Every achievement unlocks a new task.

Apply Newton's second law to two particles	Pass
Describe the central dogma of molecular biology in terms of DNA, RNA, and protein	Pass
Recognise the iambic pentameter in an unseen English poem	Pending
Demonstrate knowledge of three causes contributing to the fall of the Ming Dynasty	Pass
Demonstrate compassion to a classmate struggling with Newton's second law	Pending

In my restless dreams, I see that school

Everyone has their own developmental trajectory.

Every path is worth the same, neither superior nor inferior.

“‘I wonder,” he said, “whether the stars are set alight in heaven so that one day each one of us may find his [*sic*] own again…”’

(Saint-Exupéry, 1943)

Summary

- Neurodiversity was collectively developed in independent dialogues.
- Having different brains and minds is normal and good.
- Medical and social models of disability are both incomplete.
- Neurodiversity approaches acknowledge bodily, environmental, social, and cultural factors. They interact to disable individuals.
- Four dos and four don’ts in operationalising neurodiversity.
- Participatory research is relevant to biomedical research, but reconciliation and decolonisation are necessary.
- Inclusive education respects all developmental trajectories, not rigid academic standards.

How can we get there?

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