

Published 20 Feb 2023 in *Cognitive Science*, 47(2), e13255
<https://doi.org/10.1111/cogs.13255>

From Puzzle to Progress: How engaging with Neurodiversity can improve Cognitive Science

Marie Adrienne Robles Manalili^{1,2,†}, Amy Pearson^{3,†}, Justin Sulik^{4,†,*}, Louise Creechan^{5,‡}, Mahmoud Elsherif^{6,‡}, Inika Murkumbi^{7,‡}, Flavio Azevedo^{8,§}, Kathryn L. Bonnen^{9,§}, Judy Sein Kim^{10,§}, Konrad Kording^{11,§}, Julie J. Lee^{12,§}, Obscura^{13,§}, Steven K. Kapp¹⁴, Jan Philipp Röer^{15,‡} and Talia Morstead^{16,‡}

¹ Faculty of Education & Society, University College London, UK

² School of Health & Psychological Sciences, City, University of London, UK

³ School of Psychology, University of Sunderland, UK

⁴ Cognition, Values & Behavior, Ludwig Maximilian University of Munich, Germany

⁵ Department of English Studies and Institute for Medical Humanities, Durham University, UK

⁶ Department of Psychology, University of Birmingham, UK

⁷ Department of Social Anthropology, University of Cambridge, UK

⁸ Department of Psychology, University of Cambridge, UK

⁹ School of Optometry, Indiana University Bloomington, USA

¹⁰ University Center for Human Values, Princeton University, USA

¹¹ Departments of Neuroscience and Bioengineering, University of Pennsylvania and CIFAR, USA

¹² Department of Psychology, New York University, USA

¹³ Independent Scholar, Australia

¹⁴ Department of Psychology, University of Portsmouth, UK

¹⁵ Department for Psychology and Psychotherapy, Witten/Herdecke University, Germany

¹⁶ Department of Psychology, University of British Columbia, Canada

Author note

Marie Adrienne Robles Manalili <https://orcid.org/0000-0003-1564-8865>

Amy Pearson <https://orcid.org/0000-0001-7089-6103>

Justin Sulik <https://orcid.org/0000-0002-0978-9496>

Louise Creechan <https://orcid.org/0000-0001-9035-650X>

Mahmoud Elsherif <https://orcid.org/0000-0002-0540-3998>

Inika Murkumbi <https://orcid.org/0000-0002-3233-2689>

Flavio Azevedo <https://orcid.org/0000-0001-9000-8513>

Kathryn L. Bonnen <https://orcid.org/0000-0002-9210-8275>

Judy Sein Kim <https://orcid.org/0000-0001-5808-4081>

Konrad Kording <https://orcid.org/0000-0001-8408-4499>

Julie J Lee <https://orcid.org/0000-0002-7293-8538>

Obscura <https://orcid.org/0000-0002-7233-5374>

Steven K. Kapp <https://orcid.org/0000-0002-4440-1688>

Jan Philipp Röer <https://orcid.org/0000-0001-7774-3433>

Talia Morstead <https://orcid.org/0000-0003-2162-8713>

* Correspondence should be sent to Justin Sulik, Cognition, Values & Behavior, 62

Gabelsbergerstrasse, 80333 Munich, Germany. E-mail: justin.sulik@gmail.com

†, ‡, §, || indicate equal levels of contribution (names arranged alphabetically within each level).

This article is part of the “Progress & Puzzles of Cognitive Science” letter series.

Positionality statement: The meaning of neurodiversity may differ among authors of this manuscript due to our various lived experiences, neurodivergence, ethnicity, gender, epistemological, ontological, and/or methodological perspectives. However, we are united in combating ableism and in believing that cognitive science cannot be truly representative until it empowers and engages with neurodivergent populations; and in emphasizing the intersectional nature of neurodiversity. Social and institutional barriers—such as higher rates of misdiagnosis/misidentification of neurodivergence—disproportionately impact disabled people, people of color, and women (Davis et al., 2022; Diemer et al., 2022; Jack, 2011; Malone et al., 2022; Zener, 2019). Neurodivergence also intersects with queerness and variant gender identity (Walker, 2021). Some forms of neurodivergence are more stigmatized than others (Manalili, 2021).

Abstract

In cognitive science, there is a tacit norm that phenomena such as cultural variation or synaesthesia are worthy examples of cognitive diversity that contribute to a better understanding of cognition, but that other forms of cognitive diversity (e.g. autism, ADHD and dyslexia) are primarily interesting only as examples of deficit, dysfunction, or impairment. This status quo is dehumanizing and holds back much-needed research. In contrast, the Neurodiversity Paradigm argues that such experiences are not necessarily deficits, but rather are natural reflections of biodiversity. Here we propose that neurodiversity is an important topic for future research in cognitive science. We discuss why cognitive science has thus far failed to engage with neurodiversity, why this gap presents both ethical and scientific challenges for the field and, crucially, why cognitive science will produce better theories of human cognition if the field engages with neurodiversity in the same way that it values other forms of cognitive diversity. Doing so will not only empower marginalized researchers but will also present an opportunity for cognitive science to benefit from the unique contributions of neurodivergent researchers and communities.

Keywords: cognitive diversity; neurodiversity; norms; social cognition; epistemic injustice; scientific discovery

From Puzzle to Progress: How engaging with Neurodiversity can improve Cognitive Science

Cognitive science recognises the importance of diversity (Barrett, 2020; Bender, 2019; Henrich et al., 2010; Prather et al., 2022; Puthillam et al., 2022; Whitaker & Guest, 2020). It is puzzling, then, that neurodiversity has been absent from the discussion. After describing potential causes of this exclusion, we discuss its ethical and scientific consequences and propose how cognitive science can break new ground by embracing neurodiversity.

What is neurodiversity?

Neurodiversity^{1*} refers to variation in human cognitive functioning (Walker, 2012, 2021), including Takiwātanga*/Autism*, ADHD*, Dyslexia*, Dyspraxia*, Stuttering*, and Plurality*. The *Neurodiversity Paradigm** extends this view by recasting these experiences as differences (neurodivergence*) from common (neurotypical*) forms of cognitive functioning, rather than as pathologized disorders (Asasumasu, 2015; Chapman, 2021; Dwyer, 2022; Elsherif et al., 2022; Walker, 2021). It provides an inclusive view of cognitive diversity, consolidating neurobiological differences with evolving sociocultural contexts of human experiences (Manalili, 2021).

The *Neurodiversity Movement** applies this paradigm to political goals (e.g., resisting ableism* or promoting bodily autonomy, Arnold, 2017; Campbell et al., 2019; Constantino, 2018; Walker, 2021). Here, however, we treat neurodiversity as a theoretical framework that makes heterogeneity a fundamental feature of processes such as executive function, attention, social cognition, communication, decision making, and motor control. As these are core topics in cognitive science, it is surprising that cognitive science has scant engagement with the Neurodiversity Paradigm.

Why has cognitive science had poor engagement with neurodiversity?

Historical approaches misconceptualized neurodivergence as inherently disordered while framing neurotypical functioning as normative rather than common (Bertilisdottir-Rosqvist et al., 2022). This treated neurodivergence as scientifically interesting only when compared to assumed norms

¹ Terms marked * are explained in the accompanying glossary (<https://osf.io/hujzq>). When the terms are multi-word phrases, they are marked in italics.

(Bertilsdottir-Rosqvist et al., 2022; Karmiloff-Smith, 2009) and cognitive theories of neurodivergence highlighted mechanisms of ‘impairment’ rather than manifestations of natural variation.

Some strands of cognitive science rest on similarly normative assumptions²: that research aims to discover rules or principles governing how the mind works, sometimes with the stronger assumption that these are optimal or rational. Such thinking may have evolutionary motivations, viewing biology as generating solutions to ecological problems that approximate optimal behavior (Körding, 2007; Ritter et al., 2019). Alternatively, it may derive from common frameworks, such as Bayesian modeling, which invoke rationality as a norm (Griffiths & Tennenbaum, 2006).

A normative frame commonly treats cognitive differences as variation on species-typical rules and principles due to culture or individual experience (Barrett, 2020), or as disordered breakdowns of those principles. However, neurodivergence is neither like cultural variation³ nor inherently disordered. Rather, it is a manifestation of biodiversity (Chapman, 2021).

When cognitive science frames neurodivergence as inherently disordered, it uses obsolete models of disability*. It would be unfortunate if this were the only frame of reference for areas of cognitive science less directly concerned with neurodiversity. Meanwhile, the humanities and social sciences have been applying the neurodiversity paradigm by rejecting oppressive medical models of disability in favor of *social models** which locate disability in the relationship between a person and their environment rather than being inherent to the person alone (Betts et al., in press; Chapman & Carel, 2022; Creechan, 2022; Kapp, 2013; Milton, 2012; Oliver, 1983; Oliver, 2013; Stenning & Rosqvist, 2021).

Why is it wrong that cognitive science has not taken neurodiversity seriously?

It is unethical. Framing neurodivergence as ‘abnormal’ is grounded in eugenics (Evans, 2014; Czech, 2018; Rutherford, 2022). Research maintaining this tradition dehumanizes neurodivergent people by treating them as objects—rather than agentic subjects—of research (Botha, 2021; Botha & Cage,

² Cognitive science is not monolithic in its assumptions, though it is all the more puzzling that other strands of research—falling under the broad umbrella of cognitive science but not motivated by such normative assumptions—have ignored neurodiversity.

³ Though degrees and forms of acceptance of neurodiversity vary across cultures.

2022; Kapp, 2019). Theories built on deficit models are used to justify interventions that harm neurodivergent people (Yergeau, 2013), much like how conversion therapy harms gay and trans people by trying to “cure” them. Cognitive science should help prevent this by developing better theories of neurodivergence.

It is unjust. Conducting research about a marginalized group without their inclusion is *epistemic injustice** (Byskov, 2021; Fricker, 2007). Neurodivergent people regularly face epistemic injustice (Catala et al., 2021; Chapman & Carel, 2022). For example, even when tasks are modified to allow for cultural differences, similar calls for accommodation of neurodivergence are ignored (Hillary, 2020). Cognitive science should avoid injustice by empowering neurodivergent standpoints in research.

It is unscientific. For instance, although Theory of Mind (ToM) is increasingly understood as comprising heterogeneous processes (Ahmed & Miller, 2011; Schaafsma et al., 2015; Warnell & Redcay, 2019), deficit-based accounts of neurodivergence talk in monolithic terms (e.g., describing autistic people as simply having a weaker ToM, Baron-Cohen, 2000). Claims about such ‘deficits’ do not replicate reliably (Gernsbacher & Yergeau, 2019), further supporting the view that neurodiversity is more about differences than deficits (Astle & Fletcher-Watson, 2020). This view makes better sense of findings that communication failures are as much the fault of neurotypical people as they are of neurodivergent people (the *Double Empathy Problem**, Milton, 2012) as neurodivergent people understand each other even when neurotypicals do not (Crompton et al., 2020). Cognitive science must develop more robust accounts of cognitive diversity that situate it in social contexts (e.g., second-person approaches, Schilbach et al., 2013).

Why will cognitive science be better if it seriously engages with neurodiversity?

Cognitive science can develop more accurate theories of cognitive diversity by working alongside neurodivergent communities, whereas sidelining of qualitative data from such communities has provided a false sense of objectivity. For instance, community-driven research on autism prioritizes different dimensions than research originating from neurotypical researchers. This has fed into newer quantitative studies and scale development (Garau et al., 2022; Wilson, 2022), though it is still in the minority. Going forward, such work should prioritize intersectionality (e.g., to combat Whiteness-

centered stereotypes of autism, Botha et al., 2022). By analogy, trans healthcare has improved—not by doing more research into harmful conversion therapy or outdated conceptions of autogynephilia—but rather by doing different research that incorporates diverse trans perspectives (Serano, 2020).

Cognitive science can develop more general theories of cognitive diversity by broadening the range of diversity it considers worthy of attention. For instance, it recognizes the value of synaesthesia* in understanding cognitive diversity (Ward, 2019); neurodiversity should be no different. Kidd et al. (2018) highlight individual differences in language processing, yet limit their inquiry to neurotypicals. Future research should include non-deficit-framed language processing in neurodivergent people, including common interactions with attention or motor skills.

A weak way to include neurodiversity is in modeling previously unexplained variance (as might otherwise have been relegated to the random effects of a regression). This is weak because it is business as usual. It is like including autism status as a predictor to conclude that some people display worse ToM than others. It draws focus to how people vary along certain dimensions (such as ToM task scores) where neurotypicals are more central in the distribution and others more peripheral. This misconstrues neurotypicality as having an “average brain”⁴ and treats neurodivergence as defined by its deviation from that average. In any case, as many neurodivergent people do not have formal diagnoses, samples assumed to be neurotypical might not be.

There is a more radical way to embrace the message that neurodiversity is about difference, not deficit. It is analogous to the distinction in diversity metrics between “separation” (e.g., models of means and standard deviations) and “variety” (models of how different types are distributed in a group; Klein & Harrison, 2007). Whereas the weak strategy above treats diversity as separation, neurodiversity includes cognitive variety. This defocuses outcomes (e.g., variation in ToM performance) and instead highlights variety in cognitive mechanisms (e.g., heterogenous ways people tackle ToM tasks, whereby neurotypicality is “common” rather than “average”)⁵.

⁴ Whatever *that* may mean.

⁵ Richters (2021) makes the stronger claim that an outcome-variable oriented (in our terms, “separation”) approach to individual differences assumes homogeneity of underlying psychological structures and processes. For a recent account of philosophical characterizations of cognitive diversity and how they map onto statistical models, see Z. B. Ward (2022).

In some areas, there is already a move in this direction. New research on brain-phenotype relations casts doubt on the validity of unitary cognitive models (Greene et al., 2022); in 3D perception, individuals vary in how they integrate different kinds of cues (Fulvio et al., 2021); a variety of mechanisms underlie ganglia circuit rhythms (Marder et al., 2015); and some people engage linguistic processing when solving spatial problems while others do not (Nedergaard et al., 2022).

Converging on the point about “variety” from another angle: Even when there are evolutionary pressures on cognition and behavior, these are arguably pressures on the group rather than each individual. If there is no drive to optimize individual behavior, there is no single right way to learn, explore, manage attention, or make inferences. When intelligence is framed as a property of collectives (Falandays et al., 2022), true variety in cognitive processing and problem solving—as endorsed by the Neurodiversity Paradigm—can contribute to group outcomes.

Neurodiversity thus presents an opportunity for cognitive science to build fundamentally new models of cognition. These could involve replacing single-agent reinforcement learning models with populations pursuing heterogeneous strategies (related to neurodivergence by Dubois & Hauser, 2022; Yechiam et al., 2010). They could challenge the concept “theory of mind” (Williams, 2004), extending findings that ToM is not monolithic (Ahmed & Miller, 2011; Schaafsma et al., 2015; Warnell & Redcay, 2019) by showing how different neurotypes use different strategies in doing ToM tasks. Models relating group-level success to individual diversity could shift away from varying continuous parameters (Sulik et al., 2021a) towards studying distinct strategies (Devezer et al., 2019).

Finally, there are benefits for cognitive science *qua* science. Above points about ethics, justice, and science converge in the larger question—from indigenous and feminist philosophy of science (Pownall et al., 2021; Smith, 2021; Harding & Hintikka, 2003)—of who gets to contribute to knowledge. A marginalized standpoint allows individuals to see what those in positions of privilege cannot, yielding unique epistemic advantages (Friesen & Goldstein, in press). Diversity is especially important for scientific discovery: identifying questions, framing problems, or uncovering insights (Sulik et al., 2021b). Neurodivergent people explore in different ways than neurotypicals (Dubois & Hauser, 2022; Yechiam et al., 2010) and exploration is part of discovery (Devezer et al., 2019). A variety of strategies—incorporating research led by both neurodivergent and neurotypical people—

could lead to better long-term advances. Increased promotion of Open Science/Scholarship aims may also improve inclusion of neurodivergent researchers (Azevedo et al., 2022; Elsherif et al., 2022).

Without neurodiversity, cognitive science offers an impoverished account of cognitive diversity. It dehumanizes neurodivergent communities and it is missing out on the invaluable contributions of neurodivergent researchers.

Recommendations

For cognitive science as an institution:

- Explicitly include neurodiversity in institutional diversity statements
- Reject models or theories that frame neurodivergence as inherently disordered

For research comparing neurodivergent and neurotypical populations:

- Critically test assumptions that neurodivergence necessarily involves deficits
- Promote neurodivergent-led research and community involvement
- Evaluate whether common tasks are fair measures of heterogeneous cognitive processes

For research on topics commonly implicated in neurodivergence (e.g., executive function, ToM, decision making):

- Do not assume that samples are (or should be) neurotypical
- Explore whether human cognition offers a variety of ways to approach superficially similar tasks

References

- Ahmed, F. S., & Stephen Miller, L. (2011). Executive function mechanisms of theory of mind. *Journal of Autism and Developmental Disorders*, 41(5), 667–678. <https://doi.org/10.1007/s10803-010-1087-7>
- Arnold, L. (2017). A brief history of “Neurodiversity” as a concept and perhaps a movement. *Autonomy, the Critical Journal of Interdisciplinary Autism Studies*, 1(5).
- Asasumasu, K. [@sherlocksflataffect] (2015). PSA from the actual coiner of "neurodivergent". Tumbler. <https://sherlocksflataffect.tumblr.com/post/121295972384/psa-from-the-actual-coiner-of-neurodivergent>
- Astle, D. E., & Fletcher-Watson, S. (2020). Beyond the core-deficit hypothesis in developmental disorders. *Current Directions in Psychological Science*, 29(5), 431–437. <https://doi.org/10.1177/0963721420925518>
- Azevedo, F., Middleton, S., Phan, J. M., Kapp, S., Gourdon-Kanhukamwe, A., Iley, B., Elsherif, M.M., & Shaw, J. J. (2022). Navigating Academia as Neurodivergent Researchers: Promoting Neurodiversity Within Open Scholarship. *APS Observer*, 35.
- Baron-Cohen, S. (2000). Theory of mind and autism: A review. In *International Review of Research in Mental Retardation*, 23, 169–184. [https://doi.org/10.1016/S0074-7750\(00\)80010-5](https://doi.org/10.1016/S0074-7750(00)80010-5)
- Barrett, H. C. (2020). Towards a Cognitive Science of the Human: Cross-Cultural Approaches and Their Urgency. *Trends in Cognitive Sciences*, 24(8), 620–638. <https://doi.org/10.1016/j.tics.2020.05.007>
- Bender, A. (2019). The value of diversity in cognitive science. *Topics in Cognitive Science*, 11(4), 853-863. <https://doi.org/10.1111/tops.12464>
- Bertilsdottir-Rosqvist, H., Botha, M., Hens, K., O’Donoghue, S., Pearson, A. and Stenning, A. (2022). Being, knowing and doing: Importing theoretical toolboxes for Autism studies. *Autism in Adulthood*. Advance online publication.
- Betts, K., Creechan, L., Cawkwell, R., Finn-Kelcey, I., Griffin, C. J., Hagopian, A., Hartley, D., Manalili, M. A. R., Murkumbi, I., O’Donoghue, S., Stenning, A., & Zisk, A. H. (in Press). The Narratives of Neurodiversity Network: Exploring Intimacy and Expressive Freedom in the Time of COVID-19. *Social Inclusion*.

- Botha, M. (2021). Academic, Activist, or Advocate? Angry, Entangled, and Emerging: A Critical Reflection on Autism Knowledge Production. *Frontiers in Psychology*, 12, 727542. <https://doi.org/10.3389/fpsyg.2021.727542>
- Botha, M., & Cage, E. (2022, July 14). "Autism Research is in Crisis": A mixed method study of researcher's constructions of autistic people and autism research. <https://doi.org/10.31219/osf.io/w4389>
- Botha, M., Dibb, B., & Frost, D. (2022) "Autism is me": an investigation of how autistic individuals make sense of autism and stigma. *Disability & Society*, 37(3), 427-453. <https://doi.org/10.1080/09687599.2020.1822782>
- Byskov, M. F. (2021). What Makes Epistemic Injustice an "Injustice"? *Journal of Social Philosophy*, 52(1), 114-131. <https://doi.org/10.1111/josp.12348>
- Campbell, P., Constantino, C., & Simpson, S. (2019). *Stammering Pride and Prejudice*. J & R Press Limited.
- Catala, A., Faucher, L., & Poirier, P. (2021). Autism, epistemic injustice, and epistemic disablement: a relational account of epistemic agency. *Synthese*, 199(3), 9013-9039. <https://doi.org/10.1007/s11229-021-03192-7>
- Chapman, R. (2021). Neurodiversity and the Social Ecology of Mental Functions. *Perspectives on Psychological Science*, 16(6), 1360–1372. <https://doi.org/10.1177/1745691620959833>
- Chapman, R., & Carel, H. (2022). Neurodiversity, epistemic injustice, and the good human life. *Journal of Social Philosophy*. <https://doi.org/10.1111/josp.12456>
- Constantino, C. D. (2018). What can stutterers learn from the neurodiversity movement? *Seminars in Speech and Language*, 39(4), 382–396. <https://doi.org/10.1055/s-0038-1667166>
- Creechan, L. (2022). Killing the Letter: Alternate Literacies and Orthographic Distortions in Jude the Obscure. *Journal of Victorian Culture*, 27(3), 493–506. <https://doi.org/10.1093/jvcult/vcac034>
- Crompton, C. J., Ropar, D., Evans-Williams, C. V., Flynn, E. G., & Fletcher-Watson, S. (2020). Autistic peer-to-peer information transfer is highly effective. *Autism*, 24(7), 1704–1712. <https://doi.org/10.1177/1362361320919286>
- Czech, H. (2018). Hans Asperger, national socialism, and "race hygiene" in Nazi-era Vienna. *Molecular autism*, 9(29). <https://doi.org/10.1186/s13229-018-0208-6>

- Davis, A., Solomon, M., & Belcher, H. (2022). Examination of Race and Autism Intersectionality Among African American/Black Young Adults. *Autism in Adulthood*, 4(4), 306–314. <https://doi.org/10.1089/aut.2021.0091>
- Devezer, B., Nardin, L. G., Baumgaertner, B., & Buzbas, E. O. (2019). Scientific discovery in a model-centric framework: Reproducibility, innovation, and epistemic diversity. *PLoS One*, 14(5), e0216125. <https://doi.org/10.1371/journal.pone.0216125>
- Diemer, M. C., Gerstein, E. D., & Regester, A. (2022). Autism presentation in female and Black populations: Examining the roles of identity, theory, and systemic inequalities. *Autism*, 26(8), 1931–1946. <https://doi.org/10.1177/13623613221113501>
- Dubois, M., & Hauser, T. U. (2022). Value-free random exploration is linked to impulsivity. *Nature Communications*, 13, 4542. <https://doi.org/10.1038/s41467-022-31918-9>
- Dwyer, P. (2022). The Neurodiversity Approach(es): What Are They and What Do They Mean for Researchers? *Human Development*, 66(2), 73–92. <https://doi.org/10.1159/000523723>
- Elsherif, M., Middleton, S., Phan, J. M., Azevedo, F., Iley, B., Grose-Hodge, M., Tyler, S., Kapp, S. K., Gourdon-Kanhukamwe, A., Grafton-Clarke, D., Yeung, S. K., Shaw, J. J., Hartmann, H., & Dokovova, M. (2022). Bridging Neurodiversity and Open Scholarship: How Shared Values Can Guide Best Practices for Research Integrity, Social Justice, and Principled Education. MetaArXiv. <https://doi.org/10.31222/osf.io/k7a9p>
- Evans, B. (2014). The Foundations of Autism: The Law Concerning Psychotic, Schizophrenic, and Autistic Children in 1950s and 1960s Britain. *Bulletin of the History of Medicine*, 88(2), 253. <https://doi.org/10.1353/bhm.2014.0033>
- Falandays, J. B., Kaaronen, R. O., Moser, C. J., Rorot, W., Tan, J., Varma, V., ... Youngblood, M. (2022, December 2). All Intelligence is Collective Intelligence. <https://doi.org/10.31234/osf.io/jhrp6>
- Fricke, M. (2007). *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford University Press.
- Friesen, P., & Goldstein, J. (in press). Standpoint Theory and the Psy Sciences: Can Marginalization and Critical Engagement Lead to an Epistemic Advantage? *Hypatia*.
- Fulvio, J. M., Ji, M., & Rokers, B. (2021). Variations in visual sensitivity predict motion sickness in virtual reality. *Entertainment Computing*, 38, 100423. <https://doi.org/10.1016/j.entcom.2021.100423>

- Gernsbacher, M. A., & Yergeau, M. (2019). Empirical failures of the claim that autistic people lack a theory of mind. *Archives of Scientific Psychology*, 7(1), 102–118. <https://doi.org/10.1037/arc0000067>
- Greene, A.S., Shen, X., Noble, S., Horien, C., Hahn, C.A., Arora, J., Tokoglu, F., Spann, M.N., Carrión, C.I., Barron, D.S., Sanacora, G., Srihari, V.H., Woods, S.W., Scheinost, D., & Constable, R.T.(2022). Brain–phenotype models fail for individuals who defy sample stereotypes. *Nature*. Advance online publication. <https://doi.org/10.1038/s41586-022-05118-w>
- Griffiths, T. L., & Tenenbaum, J. B. (2006). Optimal Predictions in Everyday Cognition. *Psychological Science*, 17(9), 767–773. <https://doi.org/10.1111/j.1467-9280.2006.01780.x>
- Harding, S., & Hintikka, M. B. (Eds.). (2003). *Discovering reality: Feminist perspectives on epistemology, metaphysics, methodology, and philosophy of science*. Kluwer Academic Publishers.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33(2-3), 61-83. <https://doi.org/10.1017/S0140525X0999152X>
- Hillary, A. (2020). Neurodiversity and cross-cultural communication. In H. Rosqvist, N. Chown, N., & A. Stenning (Eds.), *Neurodiversity Studies: A New Critical Paradigm*. Routledge. <https://doi.org/10.4324/9780429322297>
- Jack, J. (2011). “The Extreme Male Brain?” Incrementum and the Rhetorical Gendering of Autism. *Disability Studies Quarterly*, 31(3), Article 3. <https://doi.org/10.18061/dsq.v31i3.1672>
- Kapp, S. K. (2019). How social deficit models exacerbate the medical model: Autism as case in point. *Autism Policy & Practice*, 2(1), 3-28.
- Kapp, S. K. (2013). Interactions between theoretical models and practical stakeholders: The basis for an integrative, collaborative approach to disabilities. In *Empowering Leadership: A Systems Change Guide for Autistic College Students and Those with Other Disabilities* (pp. 104-113). Autistic Self Advocacy Network.
- Karmiloff-Smith, A. (2009). Nativism versus neuroconstructivism: Rethinking the study of developmental disorders. *Developmental Psychology*, 45(1), 56–63. <https://doi.org/10.1037/a0014506>
- Kidd, E., Donnelly, S., & Christiansen, M. H. (2018). Individual differences in language acquisition and processing. *Trends in Cognitive Sciences*, 22(2), 154–169. <https://doi.org/10.1016/j.tics.2017.11.006>

- Klein, K. J., & Harrison, D. A. (2007). On the diversity of diversity: Tidy logic, messier realities. *Academy of Management Perspectives*, 21(4), 26-33. <https://doi.org/10.5465/amp.2007.27895337>
- Kording, K. (2007). Decision theory: what "should" the nervous system do? *Science*, 318(5850), 606-610. <https://doi.org/10.1126/science.1142998>
- Malone, K. M., Pearson, J. N., Palazzo, K. N., Manns, L. D., Rivera, A. Q., & Mason Martin, D. L. (2022). The Scholarly Neglect of Black Autistic Adults in Autism Research. *Autism in Adulthood*, 4(4), 271–280. <https://doi.org/10.1089/aut.2021.0086>
- Manalili, M. A. R. (2021). Ableist Ideologies Stifle Neurodiversity and Hinder Inclusive Education. *Ought: The Journal of Autistic Culture*, 3(1), 6.
- Marder, E., Goeritz, M. L., & Otopalik, A. G. (2015). Robust circuit rhythms in small circuits arise from variable circuit components and mechanisms. *Current Opinion in Neurobiology*, 31, 156-163. <https://doi.org/10.1016/j.conb.2014.10.012>
- Milton, D. E. M. (2012). On the ontological status of autism: The ‘double empathy problem.’ *Disability & Society*, 27(6), 883–887. <https://doi.org/10.1080/09687599.2012.710008>
- Nedergaard, J.S.K., Wallentin, M. & Lupyan, G. (2022). Verbal interference paradigms: A systematic review investigating the role of language in cognition. *Psychonomic Bulletin & Review*. <https://doi.org/10.3758/s13423-022-02144-7>
- Oliver, M. (1983). *Social Work with Disabled People*. Basingstoke: Macmillan.
- Oliver, M. (2013). The social model of disability: Thirty years on. *Disability & Society*, 28(7), 1024–1026. <https://doi.org/10.1080/09687599.2013.818773>
- Pownall, M., Talbot, C. V., Henschel, A., Lautarescu, A., Lloyd, K. E., Hartmann, H., ... & Siegel, J. A. (2021). Navigating open science as early career feminist researchers. *Psychology of Women Quarterly*, 45(4), 526-539. <https://doi.org/10.1177/03616843211029255>
- Prather, R. W., Benitez, V. L., Brooks, L. K., Dancy, C. L., Dilworth-Bart, J., Dutra, N. B., Faison, M. O., Figueroa, M., Holden, L. R., Johnson, C., Medrano, J., Miller-Cotto, D., Matthews, P. G., Manly, J. J., & Thomas, A. K. (2022). What Can Cognitive Science Do for People? *Cognitive Science*, 46(6), e13167. <https://doi.org/10.1111/cogs.13167>
- Puthillam, A., Montilla Doble, L. J., Delos, Santos, J. I., Elsherif, M. M., Steltenpohl, C. N., Moreau, D., Pownall, M., & Kapoor, H. (2022, August 1). Guidelines to Improve Internationalization in Psychological Science. PsyArXiv. <https://doi.org/10.31234/osf.io/2u4h5>

- Richters, J. E. (2021). Incredible utility: The lost causes and causal debris of psychological science. *Basic and Applied Social Psychology*, 43(6), 366-405. <https://doi.org/10.1080/01973533.2021.1979003>
- Ritter, F. E., Tehranchi, F., & Oury, J. D. (2019). ACT-R: A cognitive architecture for modeling cognition. *WIREs Cognitive Science*, 10(3), e1488. <https://doi.org/10.1002/wcs.1488>
- Rutherford, A. (2022). *Control: The Dark History and Troubling Present of Eugenics*. Hachette UK.
- Schaafsma, S. M., Pfaff, D. W., Spunt, R. P., & Adolphs, R. (2015). Deconstructing and reconstructing theory of mind. *Trends in Cognitive Sciences*, 19(2), 65–72. <https://doi.org/10.1016/j.tics.2014.11.007>
- Schilbach, L., Timmermans, B., Reddy, V., Costall, A., Bente, G., Schlicht, T., & Vogeley, K. (2013). Toward a second-person neuroscience. *Behavioral and Brain Sciences*, 36(4), 393–414. <https://doi.org/10.1017/S0140525X12000660>
- Serano, J. (2020). Autogynephilia: A scientific review, feminist analysis, and alternative ‘embodiment fantasies’ model. *The Sociological Review*, 68(4), 763–778. <https://doi.org/10.1177/0038026120934690>
- Smith, L. T. (2021). *Decolonizing methodologies: Research and indigenous peoples*. Bloomsbury Publishing.
- Stenning, A., & Rosqvist, H. B. (2021). Neurodiversity studies: Mapping out possibilities of a new critical paradigm. *Disability & Society*, 36(9), 1532–1537. <https://doi.org/10.1080/09687599.2021.1919503>
- Sulik, J., Bahrami, B., & Deroy, O. (2021a). Tolerance for failure unleashes the benefits of cognitive diversity in collective problem solving. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 43, 826–832. <https://escholarship.org/uc/item/2jv0w6kf>.
- Sulik, J., Bahrami, B., & Deroy, O. (2021b). The diversity gap: When diversity matters for knowledge. *Perspectives on Psychological Science*, Advance online publication. <https://doi.org/10.1177/17456916211006070>
- Walker, N. (2012). Throw away the master’s tools: Liberating ourselves from the pathology paradigm. In J. Bascom (Ed.), *Loud hands: Autistic people, speaking* (pp. 225–237). The Autistic Press Washington, DC.

- Walker, N. (2021). *Neuroqueer Heresies: Notes on the Neurodiversity Paradigm, Autistic Empowerment, and Postnormal Possibilities*. Autonomous Press.
- Ward, J. (2019). Synaesthesia: A distinct entity that is an emergent feature of adaptive neurocognitive differences. *Philosophical Transactions of the Royal Society B*, 374(1787), 20180351. <https://doi.org/10.1098/rstb.2018.0351>
- Ward, Z. B. (2022). Cognitive variation: The philosophical landscape. *Philosophy Compass*, 17, e12882, <https://doi.org/10.1111/phc3.12882>
- Warnell, K. R., & Redcay, E. (2019). Minimal coherence among varied theory of mind measures in childhood and adulthood. *Cognition*, 191, 103997. <https://doi.org/10.1016/j.cognition.2019.06.009>
- Whitaker, K., & Guest, O. (2020, November). #bropenscience is broken science. *The Psychologist*, 33, 34–37. <https://doi.org/10.5281/zenodo.4099011>
- Williams, E. (2004). Who really needs a ‘theory’ of mind? An interpretative phenomenological analysis of the autobiographical writings of ten high-functioning individuals with an autism spectrum disorder. *Theory & Psychology*, 14(5), 704-724. <https://doi.org/10.1177/0959354304046180>
- Wilson, A. C. (2022). Development and validation of the conversation questionnaire: A psychometric measure of communication challenges generated from the self-reports of autistic people. *Autism & Developmental Language Impairments*, 7. <https://doi.org/10.1177/2396941522112328>
- Yechiam, E., Arshavsky, O., Shamay-Tsoory, S. G., Yaniv, S., & Aharon, J. (2010). Adapted to explore: Reinforcement learning in autistic spectrum conditions. *Brain and cognition*, 72(2), 317-324. <https://doi.org/10.1016/j.bandc.2009.10.005>
- Yergeau, M. (2013). Clinically significant disturbance: On theorists who theorize theory of mind. *Disability Studies Quarterly*, 33(4).
- Zener, D. (2019). Journey to diagnosis for women with autism. *Advances in Autism*, 5(1), 2–13. <https://doi.org/10.1108/AIA-10-2018-0041>