

# The Neurodiversity Approach(es): What Are They and What Do They Mean for Researchers?

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## Abstract

This paper presents the concepts of “neurodiversity” and the “neurodiversity approaches” towards disability and discusses how confusion regarding the meaning of these concepts exacerbates debate and conflict surrounding the neurodiversity approaches. For example, some claim the neurodiversity approaches focus solely on society and deny contributions of individual characteristics to disability (a controversial stance), whereas this paper joins other literature in acknowledging the contributions of both individual and society to disability. This paper also addresses other controversies related to neurodiversity, such as uncertainty regarding the scope of the approaches – to whom do they apply? – and their implications for diagnostic categories. Finally, it provides recommendations for developmental researchers who wish to carry out neurodiversity-aligned research: scholars are urged to study both individual neurodivergent people and the contexts around them; to consider both strengths and weaknesses; to recognize their own biases; and to listen to and learn from neurodivergent people.

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One major area of research in developmental science is atypical development: the study of so-called “neurodevelopmental disorders” such as autism or intellectual disability, as well as the development of mental health challenges and more. Research regarding atypical development has traditionally been conducted within the framework of the medical model, which assumes that disabilities are pathological in nature: that they are medical diseases and disorders of the body and mind which lead individuals to have deficits and experience functional limitations. In this model, the appropriate response to disability is to strive to transform disabled people into able-bodied and typically developing individuals. Although the medical model has historically been dominant in shaping views of disability, it has often been poorly received within disability communities (Constantino, 2018; Ne’eman, 2010; Oliver, 1990). Disabled individuals can find its emphasis on cure and normalization frustrating when they may not be able, or willing, to transform themselves into typically developing, “normal” individuals.

Indeed, while the medical model makes normalization the explicit goal of autism research and intervention, qualitative and quantitative research suggest that at-

tempts by autistic people<sup>1</sup> to “camouflage” or “mask” their autism and appear more neurotypical are associated with exhaustion, burnout, anxiety, depression, stress, reduced well-being, and suicidality (Cage & Troxell-Whitman, 2019; Cassidy et al., 2018; Hull et al., 2017, 2019; Livingston et al., 2019; Raymaker et al., 2020). Although the extant camouflaging literature does not establish causality (Mandy, 2019; Williams, 2021), it appears to raise serious questions regarding the core goals of the medical model.

The neurodiversity approaches are an alternative to the medical model. Judy Singer (2016), who coined the term “neurodiversity,” suggested appropriating and modifying the metaphor of biodiversity: Why not propose that just as biodiversity is essential to ecosystem stability, so neurodiversity may be essential for cultural stability? Why not strategically argue that the nurturing of neurodiversity gives society a repository of types who may come into their own under unforeseeable circumstances... (location nos. 1079–1081)

These brief words, and a similarly brief passage in Blume (1998), were the inspiration for the neurodiversity approaches that offer themselves to today’s developmental researchers as an alternative model of atypical development. These neurodiversity approaches are not solely about autism; they can be applied to a wide range of different sorts of disabled minds and brains.

This article aims to present these neurodiversity approaches to the developmental research community. It will attempt to define “neurodiversity,” describe the neurodiversity approaches, discuss controversies surrounding the neurodiversity approaches, and suggest ways in which these issues might be addressed. Finally, this article will discuss ways in which the neurodiversity approaches can inform the work of developmental researchers.

## What Is Neurodiversity?

Unfortunately, defining “neurodiversity” is not particularly easy. Walker (2014) distinguishes between three different meanings of the term. First and most straight-

<sup>1</sup> Although person-first language (“person with autism”) is often used in research, some autistic advocates argue in favor of identity-first language (“autistic”; e.g., Sinclair, 2013). The assumptions underlying person-first language may reflect stigma towards autism (Gernsbacher, 2017). In contrast, advocates of identity-first language emphasize that disability can be an identity to take pride in. Despite controversy (Bury et al., 2020), identity-first language appears to be endorsed by more autistic adults than person-first language (Kenny et al., 2016).

forwardly, “neurodiversity” can simply refer to the reality that diverse minds and brains exist, just as “biodiversity” refers to the factual reality of biological diversity. In this factual sense, even groups of neurotypical people are neurodiverse, as no two individuals have exactly the same mind or brain.

The other usages of “neurodiversity” are much harder to define. Walker (2014) identifies a specific theoretical perspective she refers to as the “neurodiversity paradigm,” though others (e.g., Kapp, 2020; Russell, 2020) prefer the term “neurodiversity framework.” This article will use the terms “neurodiversity approach” and “neurodiversity approaches.”

Walker distinguishes the neurodiversity approaches from the “neurodiversity movement,” an activist movement that seeks to advance the rights and welfare of neurologically atypical disabled people, or “neurodivergent” people.

The neurodiversity approaches will be the main focus of this article. But even defining this usage of “neurodiversity” is challenging. While Walker offers definitions of both the approach/paradigm and the movement, so do other researchers and advocates (e.g., Bailin, 2019; Bölte et al., 2021; Chapman, 2020a; Dwyer, 2019; Robison, 2013; Singer, n.d.; Forest-Vivian et al., n.d.), and these definitions differ from one another in important ways, such as their relationship to the social model of disability, which will be discussed more thoroughly later in this article.

These definitional discrepancies are perhaps unsurprising if the neurodiversity approaches are indeed similar to a scientific “paradigm”; (Kuhn, 2012, p. 46) suggests paradigms are not defined by clear rules. Indeed, paradigms are not necessarily based on clearly articulable theoretical and conceptual assumptions or frameworks; work conducted within a paradigm is simply similar to models or exemplars – to other work conducted under the paradigm – in a manner analogous to subsequent cognitive categorization theories such as prototype (Rosch, 1973) and exemplar (Medin & Schaffer, 1978) theory. However, Kuhnian paradigms are also relatively homogeneous and orthodox. During a period of “normal science,” in which a single paradigm is dominant, scientists merely carry out experiments to confirm predictions informed by the paradigm and extend it to new domains; there is no real controversy about the core of the paradigm.

The neurodiversity approaches do indeed appear similar to a paradigm in many ways. Both are difficult to define, and in the absence of universally accepted defini-

tions, it seems reasonable to assume that people base many of their everyday judgements about whether things follow the neurodiversity approaches on similarity to previous examples that follow a neurodiversity approach. Moreover, the neurodiversity approaches are in large part action-oriented and prescriptive, again similarly to paradigms: the neurodiversity approaches set out to dictate a proper way of proceeding in relation to human neurocognitive diversity, much like paradigms try to dictate the proper way of doing science. Nevertheless, the neurodiversity approaches appear much more heterogeneous than a scientific paradigm. They are not merely challenging to define; different people appear to substantively disagree regarding important principles of what a proper neurodiversity approach should be, as discussed at greater length below. Instead of there being one singular neurodiversity paradigm, it might be more accurate to speak of multiple “neurodiversity approaches.”

Thus, out of all the prior definitions of the neurodiversity approaches and movement, those offered by Singer, (n.d.) and Chapman (2020a) might be the most descriptively accurate: both Singer and Chapman emphasize that the meaning of neurodiversity is evolving. As noted previously, the first descriptions of neurodiversity by Blume and by Singer in 1998 were fairly vague. Thus, people using the term “neurodiversity” have been able to make it their own and to change its meaning in the process (Arnold, 2017; Dekker, 2020; Singer, n.d.).

However, although there is no consensus regarding the meaning of the neurodiversity approaches, this article will discuss contemporary questions and controversies in an effort to identify the most useful and appropriate understanding of a neurodiversity approach. This article is thus not primarily attempting to provide a descriptive definition (which might be challenging, if in practice people indeed use resemblances and similarities to classify things as aligned, or not aligned, with neurodiversity approaches), but a prescriptive one.

## Questions and Controversies

### *Neurodiversity, the Social Model, and Intervention*

One crucial question about the neurodiversity approaches concerns their relationship with the “strong” social model of disability, which was developed by physically disabled advocates in the United Kingdom (see Oliver, 1990; UPIAS, 1975). The strong social model is essentially the opposite of the medical model: instead of claiming that pathology within the individual is the sole

cause of disability, the social model suggests that disability emerges entirely from society’s responses to individuals’ “impairments.” 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. However, the social model has been criticized. Shakespeare and Watson (2001) characterize it as an inflexible ideology, and also note that a seemingly absurd conclusion follows from its tenets: if disability is caused by society and not biology, it follows that no efforts need be made to prevent impairing injuries!

The weaknesses of the social model are also apparent when it is applied to neurodevelopmental disabilities such as autism, as many autistic individuals might still find themselves encountering barriers even if societal inclusion of autistic people were improved (Ballou, 2018). For example, someone who struggles with executive function might still encounter time management challenges even if they have access to scheduling apps and accommodations.

Singer (2016) was not only reacting against the medical model when she introduced the term neurodiversity in her thesis. She also rejected the social model’s dismissal of biology and argued that there was a “need to transcend the construction of binary oppositions such as ‘Medical Model vs. Social Model’” (locs. 555–557). Her neurodiversity approach was intended to offer a sort of middle ground.

However, as noted before, others have developed their own understandings of neurodiversity, making Singer’s approach only one among many. Some contemporary views of the neurodiversity approaches indicate that they are aligned with the social model (e.g., Bölte et al., 2021; Krcek, 2013; Labour Party Autism/Neurodiversity Manifesto Steering Group, 2018; Forest-Vivian et al., n.d.), although other authors question this assertion (e.g., Bailin, 2019; Ballou, 2018; Dwyer, 2019; Kapp, 2013; Singer, n.d.).

Admittedly, the social model and the neurodiversity approaches both reject the dominant medical model, so theoretical debates between them may seem abstruse and technical. However, confusion regarding these theoretical points has arguably contributed to fierce debates surrounding the neurodiversity approaches. By stating that all disability-related barriers are a product of society, the strong social model rejects interventions aiming to change or teach skills to disabled people (Shakespeare & Watson, 2001). This is a controversial stance, and the idea that the social model and the neurodiversity approaches are aligned has probably inflamed opposition to the latter.

Moreover, some opponents of the neurodiversity approaches claim they take even more radical stances. Arguments against the neurodiversity approaches often claim the approaches oppose access to supports or that they do not consider autism to be a disability, which are not positions taken by most neurodiversity advocates (den Houting, 2019).

One particularly common objection to the neurodiversity approaches is that they cannot apply to autistic people with intellectual disabilities, sometimes called “low-functioning” (a term many neurodiversity advocates reject as stigmatizing towards those with intellectual disabilities and dismissive of the challenges of other autistics; see, e.g., Brechin, 2018; Flynn, 2018; Sequenzia, n.d.). For example, Jaarsma and Welin (2012) conclude that the neurodiversity approaches are not reasonable when applied to so-called “low-functioning” autistics who might require “care”; they justify this view by suggesting the neurodiversity approaches claim autism “is not to be treated like a disability or a handicap but rather as a natural variation” (p. 23). Although Jaarsma and Welin here misrepresent neurodiversity advocates’ goals (den Houting, 2019), parents have expressed similar concerns regarding need for treatment (e.g., Maurice in Ceglie, 2015). In particular, some parents of autistic individuals who experience particularly serious challenges dismiss the neurodiversity approaches as being for “high-functioning” autistics and irrelevant to their families’ needs (Costandi, 2019; Lutz, 2015).

Perhaps unhelpfully, some neurodiversity advocates not only fuel these concerns by articulating more radical conceptions of neurodiversity but have arguably devoted excessive time and energy to criticizing parents (Mitchell, 2019; Singer, n.d.). Indeed, even some people on the autism spectrum have objected to the perceived extremism of a neurodiversity movement that they believe opposes treatments (e.g., Clements, 2017). While Dekker (2020) describes how the community of neurodivergent people he established in the 1990s respected people on the autism spectrum who held controversial stances, even to the point of supporting cures (Dekker, 2020), those who express unpopular opinions today are often attacked and excluded from neurodivergent communities (Dwyer et al., 2021; Hiari, 2018; Mitchell, 2019).

All of these tensions, and the misunderstandings and misrepresentations that may underlie some of them, make it difficult to move forward productively. In particular, a strong social model focusing solely on society, dismissing the relevance of individual characteristics and dismissing attempts to change people by teaching them

skills in order to ameliorate disability-related challenges (Shakespeare & Watson, 2001), seems to have limited practical utility. Even Oliver (2009), a prominent advocate of the social model, suggests that these gaps make it only a political tool, not a complete theory of disability. Therefore, it seems reasonable to propose that 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 than a more radical, strong social model-aligned approach.

One middle-ground understanding of neurodiversity could draw on social-relational models of disability. These models, which are substantively quite different from the original strong social model, suggest that “disability” arising from society coexists with restrictions arising directly from individual “impairment”/reduced function (Reindal, 2008; Thomas, 2004). However, neurodivergence sometimes comes with strengths (Carter et al., 2015; Russell et al., 2019), whereas social-relational models may, by drawing on the vocabulary of the social model and its use of the term “impairment” to refer to the characteristics of the disabled person, risk implying that neurodivergence is synonymous with impairment/reduced function.

Bölte and colleagues (2021) instead suggest that the World Health Organization’s International Classification of Functioning, Disability, and Health (ICF), insofar as it identifies both bodily and environmental factors relevant to individual function, could form the basis of a middle-ground approach to neurodivergence. Given that the ICF describes over 1,600 categories, it appears to offer a very comprehensive practical framework.

At a theoretical level, though, disability might be more simply and parsimoniously conceptualized as the product of an interaction between an individual’s own characteristics and their environment, in keeping with Scandinavian interactionist models of disability (Gustavsson, 2004; Tøssebro, 2004) and the ecological model recently described by Chapman (2021b). These ecologically grounded, interactionist approaches have the virtues of simplicity and holism: it can be difficult in practice to separate challenges related to individual functional limitations from those due to societal barriers and discrimination, but these interactionist models deal with both together. An interactionist definition of a neurodiversity approach is proposed in Table 1.

It is not difficult to think of cases wherein characteristics of both the individual and their environment contribute towards disability. For example, hyperacusis and

**Table 1.** Core claims of the medical model of disability, the strong social model of disability, and of the interactionist/ecological neurodiversity approach proposed here<sup>1</sup>

Medical model	Neurodiversity approach	Strong social model
<ul style="list-style-type: none"> <li>• Disability reflects disorders, deficits, and diseases that exist within the disabled person</li> <li>• These diseases and disorders may be innate or they may have originated through developmental cascades and interactions with the environment, but either way, they exist within the person</li> <li>• Disability should be addressed by curing or normalizing the disabled person to make them more like an abled, typical individual</li> </ul>	<ul style="list-style-type: none"> <li>• Disability is the product of an interaction between the characteristics of a disabled person and the environment around them</li> <li>• Disability can be addressed by reshaping environments and society (e.g., by working to reduce stigma) or by changing an individual (e.g., by teaching them adaptive skills)</li> <li>• Curing or normalizing the disabled person should not be goals</li> <li>• Diversity of minds and brains should be valued and individuals with neurological disabilities should be accepted for who they are</li> </ul>	<ul style="list-style-type: none"> <li>• Disability is caused by barriers imposed on the disabled person by society</li> <li>• Individuals may have impairments in their minds and biology, but these impairments are not disabling unless society imposes restrictions on people with impairments</li> <li>• Disability should be addressed by reforming society to provide accommodations, increase accessibility, and decrease stigma and discrimination</li> </ul>

<sup>1</sup> As discussed in this article, different individuals can have different understandings of the neurodiversity approaches, and not all such understandings will include the specific claims and recommendations of this neurodiversity approach. These are prescriptive suggestions based on this article's discussion of questions and controversies within and around the neurodiversity approaches.

loudness discomfort reflect internal neurobiological and perceptual differences (Auerbach et al., 2014), but they become disabling only when people's environments force them to expose themselves to distressing noise. Self-injurious behaviors in autism are associated with individual characteristics (e.g., Carter Leno et al., 2019), but also with factors in people's surrounding environments (e.g., O'Reilly et al., 2005).

In this interactionist neurodiversity framework, intervention could operate at the individual level (e.g., stimulant medications for ADHD individuals), by changing the environment (e.g., removing environmental distractors), or by changing both the environment and the individual. The decision between these alternatives should not be based on whether the individual or environment is perceived to be the ultimate cause of the disability but based on which intervention would best enhance quality of life. Neurodivergent individuals will likely have crucial insights regarding which approach would be most helpful for them, and their preferences should be respected to the extent that the person can communicate them.

Although the neurodiversity approach proposed here would allow interventions to attempt to promote well-being by teaching adaptive skills to neurodivergent individuals, it would not endorse interventions that aim to "normalize" neurodivergent people by simply making them more like neurotypicals. For example, autistic people frequently criticize interventions that aim to suppress "stimming" (repetitive motor movements) and intense interests, for these activities reportedly enhance, not

harm, autistic people's well-being (see Bascom, 2011; Grove et al., 2018; Kapp et al., 2019; Milton & Sims, 2016). Admittedly, normalization might sometimes be inadvertent and benign – for example, to the extent that stimming can often be a self-regulatory response to stress (Kapp et al., 2019), placing someone in a context where they are not stressed or overwhelmed might incidentally lead them to stim less. However, this sharply differs from a case where the explicit objective of an intervention is to suppress stimming; the former could be aligned with the proposed neurodiversity approach, but the latter would not be. Even if an intervention aimed at normalizing neurodivergent people was promoted by arguing that the normalization could enhance well-being, the intervention would still reflect a medical model approach.

#### *Valuing Diversity and Use of Language*

The neurodiversity approaches strongly suggest that diversity of minds and brains should be valued. Under the medical model, neurodivergent individuals are described using stigmatizing terms: "deficit," "disorder," "restricted," and so forth. One of the key insights of the neurodiversity approaches is that this language is subjective, value-laden, and unscientific.

To illustrate this, the satirical "Institute for the Study of the Neurologically Typical" (ISNT; Shelley, 1998; see also Singer, 2019a; Tisoncik, 2020) described "Neurotypic Disorder" in the pathological language employed by clinicians and researchers, highlighting "deficits" of typically developing people such as:

- “constant or mindless imitation (e.g., always wave bye-bye; copies mother's domestic activities; mechanical imitation of others' actions whenever perceived to be in context)”
- “gross impairment in ability to make peer friendships (e.g., obsessive interest in making peer friendships with other Neurotypics...)”

“Tragically,” visitors to the site were informed that as many as 96% of all people might be neurotypical and that no cure for this disorder was yet known (Muskie, 2002).

Despite ISNT's facetious nature, it illuminates critical points. Recent research confirms that neurotypical people rapidly negatively judge and are less willing to interact with autistic individuals (DeBrabander et al., 2019; Sasson et al., 2017). Instead of solely attributing the cause of autistic people's social struggles to their “deficits,” there would seem to be grounds for – like ISNT suggests – recognizing the contribution of many neurotypical individuals' lack of motivation to interact with autistics. For these reasons, the neurodiversity approaches have in general a very cautious attitude towards language laden with negative judgements about people.<sup>2</sup>

In contrast, there are many voices outside of the neurodiversity movement that explicitly endorse use of language containing negative judgements of individual characteristics. This is reflected, for example, in the controversial (see Costandi, 2019; Des Roches Rosa, 2019) establishment of the National Council on Severe Autism (<https://www.ncsautism.org/>). Negative value judgements are routinely embedded in terminology from clinical diagnostic criteria and in research publications. These negative value judgements may seem natural. For example, although an interactionist/ecological neurodiversity approach generally appears more reasonable than the medical or strong social models, it is difficult to deny that some individual characteristics (e.g., not understanding spoken or signed language) would be disabling in all but the most bizarre environments.

However, it is not clear that ideas of internal deficit are practically useful. It is possible to teach skills without dismissing individuals who lack the skills as “deficient.” Indeed, this is demonstrated by the successful operation of a general education system teaching skills like mathematics to neurotypical children. Foundational mathematical skills like spatial mapping of numbers do not appear to be

innate (Núñez, 2011), yet typically developing children can be taught these skills. They learn even though their younger selves are not, before they have an opportunity to learn math, dismissed as deficient in their math skills. Indeed, given Pygmalion expectation effects (see Rosenthal, 2002), ideas of deficit might actually be counterproductive. Ideas of deficit could lower the expectations of disabled individuals and those around them, and low expectations have been found to predict low achievement (e.g., Carter et al., 2012).

Therefore, an optimal neurodiversity approach should probably be understood to require acceptance of the disabled individual and use of respectful language to describe them. Even if the disabled individual is to have access to interventions that might aim to teach them new skills, the disabled individual should not feel they are deficient, but that they are accepted and valued as they are. Areas of challenge can and should of course be acknowledged along with strengths, but there is a considerable difference between acknowledging that someone experiences challenges and dismissing them as “disordered” due to their “deficits.”

#### *The Scope of the Neurodiversity Approaches*

So far, this discussion has not considered exactly to whom the neurodiversity approaches should be applied. Although in its factual usage the term neurodiversity simply refers to the diversity of everyone's minds and brains, the neurodiversity approaches would appear to apply specifically to neurodivergent individuals – people who are neurologically atypical in a way that is associated with disability.

However, it does not seem reasonable to apply the neurodiversity approaches to all neurodivergent people. For example, someone with a cancerous brain tumor could be considered neurodivergent, but it would seem absurd to treat their tumor using any approach other than the medical model.

Nevertheless, the neurodiversity approaches have been applied well beyond autism. For example, Armstrong (2010) argues that the neurodiversity approaches have insights that could be advantageous in the education of individuals with autism, ADHD, dyslexia, depression, anxiety, intellectual disabilities, and schizophrenia. At the core of Armstrong's case is the idea that a focus on positive aspects of neural differences, and efforts to shape the environment around students to fit their needs (“niche construction”), can be more helpful in promoting well-being of students than a focus on deficit. Other authors apply the neurodiversity approaches to still other popula-

<sup>2</sup> Admittedly, this is not always taken to the extreme of abandoning all such language – for example, Singer (n.d.) herself defends the use of terms like “mild,” “moderate,” and “severe,” pointing out that some people may themselves identify as severely disabled.

tions. For example, Constantino (2018) discusses how the ideals of the neurodiversity movement could be applied to stuttering, noting that the goal of fluency (a normalization-based approach to intervention) could sometimes make functional communication harder.

However, the scope of the neurodiversity approaches is contested. For example, although Armstrong (2010) considers anxiety to fall within the scope of the approaches, some autistic individuals strive to eliminate co-occurring anxieties using a medical approach (Holman, 2017; Forest-Vivian et al., n.d.). Clearly, some standard is needed to judge whether a neurodiversity approach or a medical model approach should be applied in any given situation (Chapman, 2019a).

Some definitions of neurodiversity approaches suggest that they are premised on the idea that “natural” diversity should be valued (e.g., Jaarsma & Welin, 2012; Robison, 2013). However, if “natural” is understood to mean “innate” or “evolved,” this criterion does not appear useful. Evolution is driven by the reproduction of genes (Dawkins, 2006); it does not necessarily promote the well-being of sentient creatures. Moreover, autism itself is not always “natural” in this sense: it can be associated with parental illness (e.g., Chess, 1971) and de novo mutations (e.g., Iossifov et al., 2014). Alternatively, if we define “natural” to mean “non-artificial,” the criterion would still exclude some autistics: autism can also be associated with exposure to synthesized substances (e.g., Christensen et al., 2013).

One might instead base the scope of neurodiversity approaches on whether individuals can contribute to society. This would seem to be consistent with Singer (2016)'s comment that neurodivergent individuals could be valuable to society in the right circumstances. However, such an approach could be accused of ableism. Furthermore, the foregoing discussion noted that acceptance of neurodivergent individuals is inherently important to promote well-being. It seems ethically problematic to make this acceptance conditional on individuals' ability to contribute.

Chapman (2019a) considers another criterion: that all individuals born neurodivergent should be considered under the neurodiversity approaches, while those who acquire a neurological disability later should not. However, Chapman swiftly rejects this criterion, noting that some infants may be born with neurological problems of a clearly medical nature (such as anencephaly), while other individuals who acquire a neurological disability late in life may shift their identity to accept this disability.

Chapman (2019a) instead turns to the possibility of using identification and choice as a standard, suggesting

that any individual with a neurological disability should be free to choose whether to accept and identify with this disability, or to reject it as pathology and seek to medically cure it. There is much that is attractive about this proposal. The individual most concerned may be best able to judge which approach will help them.

Indeed, Chapman (2020b) later introduces the concept of “neurotype dysphoria” to describe people who do not identify with and who desire to change their neurotype. In addition to neurodivergent individuals who desire to be neurotypical, “neurotype dysphoria” would also include neurotypicals who desire to be more neurodivergent, which thus puts neurotypical and neurodivergent people on a theoretically even footing. While interventions capable of effectively transforming someone's neurotype might not be available to most people today, under a “neurotype dysphoria”-informed approach, it might someday become possible for people to choose to pursue a sort of neurotype transition, similarly to how individuals experiencing gender dysphoria might pursue a gender transition.

However, Chapman (2019a), recognizing identification and choice cannot be the only standards, also considers the example of anorexia. Some online communities choose to reject the pathologization of eating disorders, instead presenting them as positive lifestyle choices (Borzekowski et al., 2010). Insofar as anorexia can be dangerous, applying a strict neurodiversity approach towards it might not be appropriate. To give another example, Singer (2019b) calls for neurodiversity advocates to consider the “Dark Tetrad” of psychopathy, narcissism, and Machiavellianism; some of these traits might be conducive to dangerous behavior. Where neurodivergence could pose a danger to safety—and where “curing” or “normalizing” the neurodivergence using a medical model approach is possible—it might be best to apply a medical model approach. However, different stakeholders can and often do disagree about the extent to which neurological disabilities are harmful. Therefore, much further debate will likely be needed to determine how any harm criterion should apply in practice.

Furthermore, some individuals could be too young to have an informed opinion about their own neurological disabilities. Others could be minimally verbal<sup>3</sup> and unable to communicate a preference, even through supported

<sup>3</sup> The term “minimally verbal” is used here in preference to “non-speaking” insofar as the latter term might include individuals like Kedar (2012) or Higashida (2013) who can understand language and can communicate complex ideas using tools like letter-boards and iPads (see also Jaswal et al., 2020).

decision-making. As noted earlier, much opposition to the neurodiversity approaches centers around the idea that the approaches should not be applied to so-called “severe” or “low-functioning” autism (Costandi, 2019; Jaarsma & Welin, 2012). These are precisely the individuals who might be least able to express opinions regarding their neurotypes and identities.

Whether the neurodiversity approaches should apply to minimally verbal autism is a complex and challenging question. On the one hand, it is difficult to see how a medical cure that would allow language learning, without any damaging side effects, could be a bad thing. Unfortunately, the medical model may be of little practical help when such a cure is unavailable. Indeed, many of the supports that could be most useful to minimally verbal individuals – such as augmentative and alternative communication supports and assistance with daily and community living – change the environment around the individual, rather than the individual themselves. These supports are not consistent with a strict medical model, yet minimally verbal individuals might have greater need of them than verbally fluent autistics, despite the common view that the medical model should be applied to the former but not the latter group. Moreover, the degree to which others around an autistic person accept their autism is related to mental health (Cage et al., 2018); to avoid damaging a neurodivergent person’s developing sense of self, it may be wise to err on the side of presuming competence to understand others’ negative judgements and, therefore, using a neurodiversity approach.

It is also crucial to note that diagnostic professionals often emphasize the negative aspects of autism (Crane et al., 2018). It is possible that a more neurodiversity-informed diagnostic process (proposed by Brown et al., 2021) could protect parents from feeling pressure to normalize or cure their children using expensive and/or dangerous alternative treatments such as mercury chelation, consumption of industrial bleach, or hyperbaric oxygen therapy (see James et al., 2015, Xiong et al., 2016, Zadrozny, 2019). Therefore, it seems very premature to dismiss the idea that the neurodiversity approaches could support minimally verbal autistics.

There are additional difficulties that arise if identification is used to define the scope of the neurodiversity approaches. At present, neurodivergent individuals usually have to discover the neurodiversity movement for themselves in online explorations (Kapp et al., 2013). Services and supports might be provided under medical assumptions. Language used by neurotypicals might not even offer neurodivergent people the vocabulary to fully articu-

late their experiences (Belek, 2019; Dinishak, 2021), let alone to interpret them in a positive, non-deficit-oriented way (Dinishak, 2021). Indeed, autistic adolescents report few opportunities for any kind of learning about their neurotype (Jarrett, 2014). Moreover, power dynamics vis-à-vis parents and other authorities might lead neurodivergent people to feel pressured into particular identification choices. If more professionals, researchers, and parents adopted concepts from the neurodiversity approaches and openly discussed neurodiversity with neurodivergent children, and if these and other authorities respected the preference of any individuals who preferred to adopt a neurodiversity approach, then neurodivergent people might be able to freely decide whether or not the neurodiversity approaches should apply to them. Today, many individuals might be in no position to make that choice.

Further complicating these issues, there may be a “grey area” where aspects of the neurodiversity approaches and of the medical model both have utility. Chapman (2021a) suggests space should exist for combinations between medical and political interventions. For example, as noted earlier, opinions vary as to whether anxiety should be addressed via a neurodiversity or medical approach (Armstrong, 2010; Holman, 2017; Forest-Vivian et al., n.d.). On the one hand, individuals with clinical anxiety may wish to reduce their anxiety via a medical, cure-oriented approach. On the other hand, individuals with anxiety may desire to be accepted as they are and not be treated as deficient because of their anxiety. Instead of viewing the choice between neurodiversity and medical approaches as a binary and exclusive one, might it sometimes be appropriate to draw on both?

Overall, given the many complications discussed in this section, it does not yet seem possible to offer a set of comprehensive criteria for determining whether a neurodiversity or medical approach should be applied in particular cases and instances. Identification and individual choice are promising, but they are not without issues. Some of these issues reflect contemporary institutions and practices that could be reformed, but other issues appear more fundamental. Fortunately, regardless of what criteria and standards are adopted, creative syntheses between elements of the neurodiversity and medical approaches might provide practical paths forward when neither approach seems appropriate on its own.

#### *Dimensionality, Diversity, and Discrete Identities*

A final key issue with the neurodiversity approaches centers around a possible tension between the idea of



continuums of neural variability implied by the neurodiversity metaphor and, on the other hand, neurodiversity advocates' identification with discrete categorical diagnoses such as autism (Russell, 2020). As noted by Chapman (2019b) and Evans (2021), some advocates even imply that autistic individuals all possess a shared biological essence. This claim is not only empirically dubious (Betancur, 2011; Lombardo et al., 2019), but arguably risks further stigmatizing neurodivergent people as being somehow other (Constantino, 2018).

However, on the whole, biological essentialism is more characteristic of the medical model than the neurodiversity approach (Rosqvist et al., 2020). Indeed, autistic people generally express less interest than other stakeholders in the etiology of their neurotypes (Kapp et al., 2013), and autistic and critical scholars often ponder whether categories like autism might be socially constructed (e.g., Chapman, 2020c; Milton, 2012; Milton & Moon, 2012; Nachman & Brown, 2019), which would be consistent with findings showing that the boundaries of autism have shifted over time (e.g., Arvidsson et al., 2018; Rødgaard et al., 2019).

This being said, diagnostic categories can be useful. They can support community (Sinclair, 2010) and political mobilization (Russell, 2020); moreover, recognition of discrete groups of neurodivergent people may be necessary for them to qualify for supports. Most importantly for researchers, while heterogeneity within diagnostic categories and co-occurrence between them should not be ignored, diagnostic categories may help to advance our understanding of neurodiversity. Separating and distinguishing populations can lead to meaningful research findings. The socially constructed nature of disability categories does not make them useless; they can be useful and do appear quite compatible with the dimensional aspects of the neurodiversity approaches.

Neurodiversity approaches must also recognize that some neurotypes do have a less socially constructed, more genuinely discrete existence based on genetic variants. Though even these genetic classifications can be heterogeneous not only phenotypically (e.g., Hamner et al., 2019; see also Castelbaum et al., 2019) but also genetically (e.g., due to mosaicism, repeat length), categories such as Down syndrome and fragile X syndrome are clearly more biologically discrete than autism. However, whether diversity is dimensional or discrete, it is still diversity, and thus fundamentally seems compatible with a neurodiversity approach.

## Situating Neurodiversity in Developmental Theory

Now that this discussion has proposed a useful understanding of a neurodiversity approach, it is tempting to try to situate this neurodiversity approach in relation to theoretical approaches to typical human development.

Interestingly, the medical model's emphasis on the inherent biological deficits of disabled people might seem somewhat nativist, the social model's focus on environmental experience might seem analogous to empiricism, while an interactionist neurodiversity approach might seem to be rather akin to neuroconstructivism in its search for a middle ground between biological essentialism and biological denialism.

This analogy is inexact, however, as the models of disability are attempting to describe disability as emerging from the individual versus the environment, whereas theoretical approaches to development are attempting to describe development of the individual in innate versus experience-dependent terms. Thus, for example, a researcher within the medical model could be entirely comfortable with the idea that disability can emerge due to complex interactions of environment and genetics, not due to a simple breakdown in a nativist mental module, as long as the disability is understood to be a disorder internal to the individual.

On the other hand, the neurodiversity approach as defined here could be quite accurately described as a type of biopsychosocial approach (Gillespie-Lynch et al., 2017). It simply comes laden with additional normative claims regarding the appropriate way that atypically developing individuals should be treated in society.

### *Implications for Research*

The theoretical neurodiversity approaches clearly have important practical implications for researchers studying neurodivergent people: their normative commitments suggest that many common research practices and research goals are inappropriate or even harmful.

While the following section should not be understood as an exhaustive list of the neurodiversity approaches' implications – readers should think creatively about what other insights and best practices could be derived from neurodiversity approaches – this article will attempt to identify some of the most important ramifications of neurodiversity for academics and researchers. Recommendations are outlined in Table 2 and discussed at greater length below.

**Table 2.** Key recommendations for researchers seeking to apply the neurodiversity approach in their own work

- 
- Do not solely focus on studying neurodivergent individuals' internal weaknesses and challenges; balance such research with research investigating:
    - neurodivergent individuals' strengths and how these can be used to promote success and thriving;
    - ways in which neurodivergent individuals' immediate environments, contexts, and social networks (e.g., school, family, peers) might affect them, either in disabling ways or ways that promote resilience and thriving;
    - ways in which society and social institutions can affect neurodivergent people, again either in disabling ways or ways that promote resilience and thriving;
    - discrimination and stigma towards neurodivergent people; and
    - ways in which experiences of barriers, stigma, discrimination, victimization, and trauma can shape and affect neurodivergent people's development.
  - Recognize that research is not an objective process. The social positions and backgrounds of researchers – including the social position of being neurotypical – may contribute towards biasing researchers' perspectives.
  - Consider different interpretations of research findings from different perspectives: instead of assuming that findings reflect individual deficit, are there ways of interpreting findings as evidence of an individual strength, as a difference that is neither a strength nor a weakness, or as a disabling impact of the environment upon the individual?
  - Be mindful of biases, and work to counteract them, when choosing research questions and designing studies.
  - Choose language carefully in order to avoid unnecessarily making negative value judgements regarding neurodivergent individuals. Wherever possible, use neutral or positive terms in place of negative terminology.
  - Learn more about the ideas, theories, and concepts used by neurodivergent people to understand and make sense of their experiences.
    - Consider how these ideas could change your interpretation of research results.
    - Explore whether these ideas could inspire new questions for future research.
  - Recognize ways in which research has failed to serve the interests of, or has harmed, neurodivergent people; work actively to earn and deserve the community's trust and confidence.
    - Understand that the onus of responsibility to promote reconciliation is on researchers, not neurodivergent people.
    - If harm has occurred, be willing to openly acknowledge this and validate the community's opposition.
    - Through your actions, demonstrate a commitment towards listening and responding to the community.
  - Reach out to various community stakeholders, such as neurodivergent individuals and their parents, and include them in decisions about research in the hopes of thereby illuminating and reducing the impact of biases that may be held by any particular group, as well as of increasing the relevance of research to communities. This might involve, for example:
    - forming a community advisory board;
    - promoting involvement of neurodivergent people in academic research; or
    - conducting community-based participatory research.
- 

### *Studying Contexts and Individuals*

One obvious practical ramification of neurodiversity approaches is that the scope of research inquiry should be expanded to include the environment around the disabled person. Reports regarding autism research expenditures in different countries suggest that the largest share of funding consistently 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). Another substantial share goes to interventions, most outcomes of which focus on normalization of autistic features (Wong et al., 2014). Even when the desired outcome of an intervention is not elimination of autistic features per se but, to give one example, employment success, most studies still focus on normalization or teaching skills to the individual rather than on making jobs more accessible for autistic people (Scott et al., 2019). In short, the

current balance of research appears overwhelmingly biased towards studying – and treating – individual “deficits” rather than exploring the role that environments, contexts, and society play in disabling individuals.

Developmental researchers certainly have the expertise to correct this imbalance. A cursory search of this journal reveals numerous papers focusing on individuals' environments, contexts, and relationships (e.g., Gönültaş & Mulvey, 2019; Packer & Cole, 2019; Persram et al., 2019; Pinkard, 2019). If we take autism as one example of a neurodivergent group, researchers wishing to turn their expertise in studying environments and society towards autism might find the following topics to be of particular interest:

- The examination of social functioning in interactive contexts. Autism research has noted the social isolation (Kasari et al., 2011) and victimization and interpersonal trauma experienced by autistic people (e.g., Pfeffer, 2016; Schroeder et al., 2014), but in attempting

to understand these experiences, autism research has traditionally focused on the autistic person's social "deficits." Fortunately, in the past few years, an increasing number of studies have begun to move beyond this restricted lens and consider the contributions of non-autistic individuals towards shaping autistic people's social interactions and relationships (e.g., DeBrabander et al., 2019; Chen et al., 2021; Crompton et al., 2020a, 2020b; Edey et al., 2016; Heasman & Gillespie, 2018; Sasson et al., 2017). Indeed, examining social functioning interactively not only highlights the roles of non-autistic people, but can also increase the naturalistic validity of research regarding individuals' own social processing (Redcay & Warnell, 2018). Further expansion of this nascent literature thus appears highly desirable.

- The exploration of environmental and societal demands affecting autistic individuals. Autistic people often experience distress after exposure to aversive sensory stimuli in their environments (Belek, 2019; Robertson & Simmons, 2015). Research has recently begun to explore the social pressures that lead autistic people to camouflage or mask autism in social interactions (e.g., Bernardin et al., 2021; Cage & Troxell-Whitman, 2019; Livingston et al., 2019). Very recently, autism research has begun to take note of autistic people's experiences of burnout caused by excessive environmental demands: social and sensory demands that may be easy for neurotypicals to meet, but that many autistic people can find exhausting (Raymaker et al., 2020). Additional research regarding these sorts of environmental factors appears highly necessary. What other barriers exist in autistic people's environments? What mechanisms drive their disabling effects on autistic individuals? Do resulting negative experiences have cascading effects on development? Can these environments be reformed to remove barriers and increase accessibility?
- The investigation of the possibility that autistic individuals and other neurodivergent people might, even as they face the elevated environmental demands noted above, simultaneously experience insufficient demands and insufficient room for growth in other areas. For example, do low expectations and excessive dependence on prompting reduce opportunities for academic or employment success (e.g., Carter et al., 2012; Kirby et al., 2019)? What of advocacy skills: how do neurodivergent individuals learn about themselves and their needs and how to navigate systems and institutions? More generally, how do autistic and neurodi-

vergent people learn to exercise autonomy and make choices? What is needed for neurodivergent people to have more opportunities to practice, develop, and exercise self-determination?

- The study of attitudes and stigma towards autism and other atypical neurotypes (e.g., Gillespie-Lynch et al., 2019), and in particular, ways that these attitudes are shaped and how they might be changed (e.g., Engel & Sheppard, 2019; Gillespie-Lynch et al., 2015; Stern and Barnes, 2019). Relatedly, research also shows that neurodivergent people can face outright discrimination in many domains of life, such as employment and hiring decisions, immigration decisions and mobility, and even access to life-saving medical treatments (e.g., Ameri et al., 2018; Harris, 2018; Richards et al., 2009). Further research to document these sources of discrimination, and to explore whether discrimination exists in still other domains, appears urgently necessary in order to inform and drive policy changes to reduce or eliminate such discrimination. Moreover, what are the effects of these experiences of stigma and discrimination on neurodivergent people's development, for example, in terms of mental health, identity, and self-esteem?

#### *Studying Strengths and Weaknesses*

Another important insight of neurodiversity approaches is that the scope of research on individuals themselves can be expanded to cover strengths as well as weaknesses. As Armstrong (2010) notes, individuals might not typically achieve success by focusing on their weaknesses but rather by finding a "niche" that takes advantage of their skills and strengths. An excessive focus on areas of weakness and struggle might not be conducive towards self-esteem, whereas further developing areas of strength might help neurodivergent individuals develop a sense of self-efficacy along with skills that could be applied towards success in life and employment.

To this end, developmental researchers could study whether neurodivergent individuals might often have absolute or relative strengths (e.g., Carter et al., 2015; Russell et al., 2019). For example, autistic intense interests could be conducive to employment success, if they are appropriately balanced by consideration of relevant individual weaknesses and the availability of job opportunities in different fields (Goldfarb et al., 2019). Studies should also consider how what manifests as a weakness in one context could be a source of strength in another: strengths are, to a considerable extent, contextual (Russell et al., 2019).

It is also important to investigate heterogeneity within neurotypes. For example, while autistic people are often stereotyped as being interested in sciences and “folk physics,” intense interests are much more diverse than this (Baron-Cohen & Wheelwright, 1999). Therefore, in addition to studying strengths at the group level, researchers may wish to explore how neurodivergent people (and their families) can become aware of their own unique, individual strengths and how these abilities can be translated into successes in different domains of life.

### *Bias and Subjectivity*

Unfortunately, researchers often seem to see weaknesses and deficits in neurodivergent people even in cases where there might be good reasons to perceive strengths instead. For example, one recent study found that, when participants believed their actions were unobserved by others, autistic individuals showed more ethically appropriate behavior than neurotypicals (Hu et al., 2020). Regrettably, the authors interpreted the findings as signs of deficits in autism. Instead of assuming that autistic behavior is always pathological, the researchers might have found it helpful to at least consider whether the greater moral integrity they observed in autistic participants might be, in many ways, a good thing.

This overly pathological interpretation of autistic behavior from Hu et al. (2020) reinforces neurodiversity advocates' concern that research regarding neurodivergent people may be biased. While some autistic people have expressed concern that certain advocates may be excessively anti-science (Bolton, 2018; Guest, 2019), much of the neurodiversity movement's skepticism towards science is not without justification. The scientific study of neurodivergent people is carried out largely by neurotypical individuals, and neurotypicals often struggle to understand the perspectives of neurodivergent people (Edey et al., 2016; Heasman & Gillespie, 2018; Milton, 2012). Furthermore, perspective-taking is often reduced in individuals with higher power (Galinsky et al., 2006), and researchers have more power in the research context than their neurodivergent study participants.

Unfortunately, perhaps as a result, science has often not served neurodivergent people well. For example, neurotypical researchers have argued that autistic individuals have deficient empathy (Baron-Cohen, 2002; Baron-Cohen & Wheelwright, 2004); Asperger even suggested that autistic children can be “sa-

distic” (Asperger, 1944/1991, p. 77), that they “don't really love anyone,” and that they have “heartless malice” (Asperger, 1938/2020).<sup>4</sup> While cognitive empathy – theory of mind, or mentalizing – is probably reduced in many autistic people (though far from absent; see Gernsbacher & Yergeau, 2019), and while it is sometimes difficult to pull apart affective and cognitive empathy, research suggests that affective empathy is intact in autism (e.g., Dziobek et al., 2008; Jones et al., 2010). Moreover, as noted earlier, neurotypical people also struggle to have empathy for the autistic perspective. Neurotypicals' difficulties in this area were first noted in autistic accounts (e.g., Milton, 2012; Shelley, 1998); research has subsequently supported these autistic insights by documenting neurotypical difficulties understanding autistic perspectives (Edey et al., 2016; Heasman & Gillespie, 2018). Sadly, the notion of an empathy deficit in autism has probably helped to stigmatize autistic people as cold and indifferent to the welfare of others. Some advocates might understandably see this as an insult added to the injury of autistic people being victimized (Pfeffer, 2016), exploited (Griffiths et al., 2019), or rejected (Kasari et al., 2011) by those around them. Thus, it is not hard to see why many neurodiversity advocates have concerns about science.

Nor is this the only relevant example. Many more could be listed here, including the negative value judgments inherent in the terminology often used to describe “disorders” in research, as well as community frustrations with researchers' focus on normalization rather than improvement of quality of life as the goal of autism treatment. Furthermore, many advocates (e.g., Neumeier & Brown, 2020) stridently oppose what has been called “institutional psychiatry” (e.g., by Szasz, 1970), the involuntary confinement of neurodivergent individuals without due process or cause. It is important to recall that researchers have recently – within the second half of the twentieth century – performed deeply ethically problematic studies on disabled children from institutions (e.g., feeding children radioactive cereal, or deliberately exposing children to hepatitis for research) (Boissoneault, 2017; Krugman, 1986).

In the opinion of the present author, researchers studying neurodivergent individuals have a responsibility to engage with community advocates and to be aware of the legacy of harm that has contributed to advocates' frustration and skepticism. Indeed, some form of reconciliation process between the neurodiversity movement and the research community may be necessary. It is important to recognize that the onus of responsibility to work towards such reconciliation is on researchers, not neurodivergent people: after all, researchers have generally held power over neurodivergent people and not vice versa; similarly,

<sup>4</sup> Note that the 2020 translation of Asperger's paper (originally written 1938) cited here has been criticized; see Czech (2019) and reply by Falk (2019).

researchers have been responsible for harm caused towards neurodivergent people and not vice versa.

In addition to working to promote reconciliation, it seems reasonable to conclude that researchers also have an obligation to be aware of their own biases and to work to address these. For example, researchers should be very mindful of the language they use. Instead of using terminology laden with subjective negative value judgements that might risk causing harm to neurodivergent people, researchers should strive to use neutral descriptive terminology. When using neutral language is impossible, erring on the side of positive, strengths-based terminology may often be appropriate, albeit not to the extreme of denying reality. Dwyer et al. (in press), Gernsbacher (2017), and Bottema-Beutel et al. (2020) provide suggestions regarding appropriate terminology in the autism sphere; similar principles apply to many other neurodivergent groups.

Researchers should also take care to be mindful of, and to disclose, conflicts of interest. Unfortunately, a recent analysis suggests that conflicts of interest are almost never fully disclosed in autism early intervention research (Bottema-Beutel et al., 2021). Moreover, above and beyond overt conflicts of interest, all researchers have an interest in their own careers: researchers might therefore be tempted to interpret findings in exciting, more easily publishable ways, even if this was harmful to neurodivergent communities. Researchers should always be mindful of ways that their biases could affect the way they generate research questions, as well as the way in which they interpret results.

### *Incorporating Neurodivergent Ideas*

Moreover, many communities of neurodivergent adults have developed innovative theoretical frameworks and concepts to understand their own experiences. However, presumably because these neurodivergent communities are often quite segregated from mainstream research communities, neurodivergent people's ideas often seem to trickle into the academic world only slowly. Indeed, these ideas sometimes initially enter the research literature only in publications written by neurodivergent researchers themselves.

For example, autistic researchers have suggested that autistic cognition and perception are fundamentally characterized by a pattern of "monotropism" and hyper-focus: that attention in autistic people is narrower and more tightly focused on stimuli of endogenous interest (Murray et al., 2005). This endogenous hyper-focus might coexist with susceptibility to exogenous capture of hyper-

focussed attention (Dwyer, 2021). The monotropism account of autism appears to be quite popular in online autistic communities, but it has attracted minimal attention in empirical research on autistic cognition and perception (cf. Ocelli et al., 2013).

Other ideas and concepts that were developed by autistics, and that are gradually entering the neurotypical researcher lexicon, include autistic inertia (Buckle et al., 2021); autistic burnout (Raymaker et al., 2020); sensory overload, meltdown, and shutdown (Belek, 2019); and masking/camouflaging (Livingston et al., 2019; Hull et al., 2017, 2019).

Some similar dynamics can also be observed outside the autism world. (Dodson, 2006; 2016; n.d.), a professional, has championed the concept of Rejection Sensitive Dysphoria (RSD) in ADHD. However, Dodson (n.d.) emphasizes that he was only able to elicit RSD narratives from his clients after establishing trust and showing them that he did not see them as flawed. In this sense, although the term RSD does not come from neurodivergent people, its origin in the ADHD field still emphasizes the benefits of listening to neurodivergent people. Anecdotal observation suggests that the idea of RSD resonates with the experiences of many ADHD adults and that it has gained considerable support in ADHD adult communities; unfortunately, despite this widespread appeal, rejection sensitivity in ADHD appears to remain understudied in academic research (cf. Bondü & Esser, 2015; Canu & Carlson, 2007).

Of course, neurodiversity approaches should not be understood to suggest that neurodivergent community members are always right or that academic researchers' ideas are always wrong. Both neurodivergent people and non-neurodivergent people have certain biases and preconceptions. However, researchers can challenge, counterbalance, and enrich their own preconceived ideas by drawing on neurodivergent people's ideas and frameworks.

That said, there are some dangers to be considered when incorporating neurodivergent ideas. Researchers and advocates have expressed concern that individuals and organizations – including self-interested parties, such as for-profit companies seeking to market their products and services – have drawn on the rhetoric of the neurodiversity approach without understanding or committing to it (den Houting, 2019; Neumeier, 2018; Roberts, 2021). Those drawing on neurodiversity approach rhetoric and neurodivergent people's ideas should take care to fully understand and not misrepresent them, to use them in non-exploitative ways, and to grant appropriate credit to those who developed the ideas.

### *Community Involvement*

Indeed, one important way that researchers can strive to balance their subjectivity and biases is to work with community stakeholders. Collaborations between neurotypical researchers and community stakeholders can help each group learn from one another and challenge their subjective biases and assumptions. Recommendations regarding these collaborations are available from Nicolaidis et al. (2019).

Relevant community stakeholders would of course include neurodivergent people. Gillespie-Lynch and colleagues (2017) have found evidence that autistic adults generally have heightened knowledge of autism and reduced stigma towards autism, signs of important expertise. Family members of neurodivergent people offer a further perspective that is important for many studies.

There are different models whereby community voices can be included in projects to varying extents. One relatively simple approach might be to recruit an advisory board of community members, although in these cases there may be a danger of “tokenization” in the sense that community advisors may not be given opportunities to become fully acquainted with the details of the projects they are advising and may not be consulted often enough or in a sufficiently accessible manner to offer feedback on important decisions. Thus, while this approach may be highly appropriate for many projects, researchers should take care to ensure that partnership scope and goals are clear and understood by all parties (Nicolaidis et al., 2019).

As another approach, this author is aware of research labs in which many neurodivergent students were recruited into research as undergraduate research assistants, allowing them to become more deeply aware of the details of projects and to influence lab culture through ongoing social engagement with other researchers. However, the presumption that neurodivergent individuals should be willing to contribute their expertise as unpaid volunteers may be problematic, and research assistants lack authority compared to more senior investigators. Influencing others' views through unstructured social engagement may also be more difficult for neurodivergent individuals who may encounter social barriers/challenges.

Neurodivergent individuals could instead participate in research as more senior academic researchers, which has the advantage of giving them more opportunities to develop intimate knowledge of the research process and to gain increased power over decisions. However, autistic researchers can have privileges, and interests in academic career advancement, that separate their interests from the interests of the autistic community at large.

A more demanding approach is community-based participatory research (CBPR), in which individuals from communities, who are not academic researchers but who have relevant expertise due to their experiences, are recruited as co-researchers. In full-blown CBPR, these co-researchers are considered to be fully and equally part of the research team and given a role in decisions from the beginning to the end of a project, including in the development of research questions and goals. Nicolaidis et al. (2019) discuss this approach in detail. Further insights are available from Jose et al., (2020), from McDonald and Stack (2016), and from Stark et al. (2021). However, the resources and time required by CBPR may not be appropriate or feasible in all studies.

In addition to including community voices in their own research, researchers may wish to open dialogues with neurodiversity advocates on controversial issues. For example, today's applied behavior analysis (ABA)-based autism interventions have been harshly criticized on ethical grounds (Dawson, 2004; McGill and Robinson, 2020; Sandoval-Norton and Shkedy, 2019; Wilkenfeld and McCarthy, 2020). Based on anecdotal interactions, the author of this article has the impression that many researchers have been unaware of the depth and extent of advocates' concerns regarding behavioral interventions, and indeed, researchers have generally failed to adequately engage with the advocacy movement on this issue. Continued failure to engage the community on controversial issues like ABA risks widening gaps between the neurodiversity movement and researchers.

### **Conclusions**

This article has offered researchers an overview of the neurodiversity approaches, as well as discussion of ongoing theoretical controversies regarding the approaches. Although the neurodiversity approaches are evolving and although their relation to the social model of disability remains a subject of debate, it is here proposed that the optimal neurodiversity approach should take a middle ground between the social and medical models, as suggested by Singer (2016). This neurodiversity approach would consider disability as emerging from an interaction of individual and context, and it would allow interventions to either change individuals in limited ways (e.g., teaching skills, using medication to manage difficulties) or to change environments and societies (see Table 1). This neurodiversity approach would not permit interventions aiming to normalize or cure disabled individuals. This paper has also discussed the positive valuation of neurological diversity in the neurodiversity approaches and how

this affects use of language, arguing that use of positive or neutral terminology need not prevent recognition of disability or provision of supports. Furthermore, the scope of the neurodiversity approaches was addressed. An individual's choice has considerable value as a criterion for determining whether a neurological disability should be approached from a neurodiversity approach or the medical model. However, exceptions might be required for cases involving serious threats to safety. Moreover, younger and minimally verbal individuals might be unable to communicate an informed decision regarding identification, although it was suggested that many aspects of neurodiversity approaches could still be useful to them. Indeed, in some cases, it might be possible to draw on aspects of both neurodiversity approaches and of the medical model.

Finally, practical implications for developmental researchers have been offered (see Table 2). This article has suggested that researchers should expand the scope of investigations regarding neurological disability to include not just individual weaknesses, but the influences of environments and contexts around individuals, as well as areas of individual strength. The article has also acknowledged neurodiversity advocates' concern that research regarding neurological disabilities has suffered from biases and caused harm. This paper has suggested that there may be a need for a sort of reconciliation process, which would require researchers to take further steps to engage with community stakeholders and seek their input in decisions.

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## Statement of Ethics

Not applicable; this article does not present the results of any human studies. The author has endeavored to ensure that the theoretical ideas discussed in this article are respectful towards and conducive to the well-being of neurodivergent people.

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The author identifies as an autistic person and is diagnosed with autism. The author identifies as part of the neurodiversity movement. This positionality affects the views presented in this article.

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## Author Contributions

P.D. drafted and edited this article.

## Data Availability Statement

No empirical data are presented in the present article, which is a theoretical article.

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