Neurodivergence and Work in Human-Computer Interaction: Mapping the Research Landscape

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ABSTRACT

Work environments are commonly designed with non-disabled people in mind. In this contrasting review, we explore how Human-Computer Interaction (HCI) research approaches neurodivergence in workplace settings. We provide an in-depth analysis of eleven HCI publications focused on this area. Our results show a fragmented research landscape with varying views on disability and purposes of work, not always prioritizing the actual needs and preferences of neurodivergent people. We highlight research opportunities for our community, and advocate for a justice-oriented perspective that centers neurodivergent people and their right to self-determination (i.e., leading life with autonomy and the ability to make their own choices) in the context of work.

CCS CONCEPTS

• **Social and professional topics** → **People with disabilities**; • **Human-centered computing** → **HCI theory, concepts and models**; **Accessibility theory, concepts and paradigms**; **Accessibility technologies**; **Computer supported cooperative work**.

KEYWORDS

Accessibility, Autism, ADHD, Epistemic Violence, Intersectionality, Neurodivergence, Neurodiversity, Literature Review, Workplace

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1 INTRODUCTION

Work environments are associated with access barriers for disabled people[1] as they are commonly designed to cater to non-disabled workers [45]. This extends to individuals with invisible disability [56], i.e., disabilities not immediately apparent to others. In particular, barriers for neurodivergent people, i.e., people with differences in cognitive processes [73], come in different shapes. Barriers may be physical and result from differences in visual (e.g., lighting hypersensitivity [7]) or auditory processing [4]. Likewise, research suggests that neurodivergent people experience social and organizational barriers, e.g., non-acceptance of neurodivergent behaviors and needs [22] or a lack of awareness or consistency in support from leaders [90].

Within the Human-Computer Interaction (HCI) research community, technology has previously been discussed as an opportunity to increase inclusion of disabled people in the workplace, and in the last decade, there has been an increasing awareness regarding invisible disabilities [30, 41, 95]. However, less is known about the experiences of neurodivergent people in particular. In our work, we address this gap, and focus on three of the most common diagnoses [23] under the umbrella of neurodivergence: (1) Attention Deficit Hyperactivity Disorder (ADHD; often presenting as issues in focusing and sustaining attention, filtering stimuli, and impulsive behavior [61, 81]), (2) autism or Autism Spectrum Disorders (a collection of behavioral patterns and differences in interaction and communication [61]), and (3) dyslexia, i.e., challenges in fluent reading irrespective of level of education [61]. We adopt a research perspective that is rooted in disability justice [79], centering the needs of disabled people and their right to workplace access as a way of self-determined participation in and contribution to society [85]. The anger we feel at witnessing the past, present and continuous mistreatment of disabled bodyminds [18, 63] both within and outside of academia is part of the motivation of this work, and we explicitly decided to not cover it up [5].

Our goal is to answer the following research questions (RQs):

RQ1: What technology has been designed to address neurodivergence in the context of work?

RQ2: What is the role of self-determination in currently available technology research for neurodivergent people in the context of work?

To answer these questions, we conducted a contrasting literature review based on close reading [50]. Overall, we found that there

[1]We use mostly characteristic-first language, because (1) it is preferred by many disabled/neurodivergent individuals and (2) we want to focus on the experiences that are shaped by these traits.

is only a limited amount of research in HCI that focuses on neurodivergence in the workplace, with many papers strongly focusing on interventions in (early) childhood instead [76, 78, 87, 92]. The publications that did align with our research topic show a distinct grouping regarding their views on neurodivergence, access, and work. On the one hand, we found research that aspired to establish neurotypical norms through approaches that specifically target the reduction of neurodivergent traits or behaviors (see Section 6.2.1). On the other hand, there is a growing body of literature that approaches the topical complex by centering neurodivergent workers, asking how technology might contribute to their individual access to work and quality of life (see Section 6.1.3). Our findings align with what disability rights and social justice movements have been demanding for decades, and what should be at the core of human-centered design and research: the needs and preferences of the (intended) user, in the specific context, based on the knowledge, skills and tools that might already be available—rather than trying to re-invent everything from scratch [19].

Our contribution is three-fold: We present a detailed view on conceptions of neurodiversity from both a medical and a biopsychosocial [23] point of view; we show how neurodivergence is understood in HCI research in the context of work, and compare it to research on neurodivergence in the context of work; and finally, we discuss areas previous work has left un(der)researched, outlining pathways for future research opportunities through which the Human-Computer Interaction research community can support neurodivergent self-determination in the context of work.

2 BACKGROUND

In this section, we first explore and explain the main concepts with respect to neurodiversity and neurodivergence in the context of work, as well as ADHD, autism, and dyslexia. This is followed by a dive into specific groups of related work (i.e., design frameworks, literature reviews and general works).

2.1 Neurodiversity and Neurodivergence in the Context of Work

Neurodiversity was introduced into HCI via alt.chi [20]. The concept is similar to that of biodiversity, but instead of the variety of species, it refers to the variety of how individuals' cognitive processes work [73, original thesis published 1999]. *Neurodiversity* acknowledges that there are cognitive varieties within a population (neurotypes), where the variety that makes up the majority of the population may be called *neurotypical* (or "normal"). In contrast, *neurodivergence* is an umbrella term that encompasses forms of neurological difference [24], e.g., among others, those that fall under the medical diagnoses of dyslexia, dyscalculia[2], autism, ADHD, and obsessive-compulsive disorder (OCD)[3]. However, as both the understanding of cognition—and thus, diagnoses—and the awareness of neurodivergence change, there is no definitive list of what falls under this umbrella. With respect to the expression of neurodivergence, it often influences how an individual interacts with and experiences the world [16]. Given the big role that work plays in people's lives, it is therefore also relevant to understand how neurodivergent individuals experience this setting. Research shows that neurodivergent people face unique challenges [28, 44], partially because of the responses of neurotypical peers towards neurodivergent behaviors [63, p. 272], and are less likely to be in employment on the first labor market [10, 57].

[2]Individuals with dyscalculia present with challenges in mathematical skills, i.e., accurate calculation, fluent calculation, accurate mathematic reasoning [61].

[3]People with OCD experience intrusive, unwanted, persistent obsessions and/or compulsions in the form of repetitive and persistent thoughts, images, or impulses/urges, often associated with anxiety [61].

2.2 Common Forms of Neurodivergence: ADHD, Autism, and Dyslexia

In the following sections, we give an overview of three forms of neurodivergence which are three of the most common diagnoses (by prevelance) falling under the umbrella of neurodivergence [23], and are thus central to our work: ADHD, autism, and dyslexia. Beyond clinically relevant traits and characteristics, we want to emphasize the relevance of lived experience which illustrates neurodivergence beyond sets of symptoms, and we invite our research community to carefully engage with these accounts so that we can jointly counter harmful stereotypes that continue to persist in the understanding of neurodivergence in its entirety. Diagnostic criteria and descriptions of ADHD, autism and dyslexia for this section are drawn from ICD-11, where all three can be found in category six, *"Mental, behavioural [sic] or neurodevelopmental disorders"* [61]. Benton et al. [9] discuss the *overlaps* between the three diagnoses listed in ICD-11 .

2.2.1 ADHD. Attention deficit hyperactivity disorder (ADHD) comprises persistent patterns of inattention, hyperactivity and can also include impulsivity [61, 81]. With respect to prevalence, ADHD is diagnosed in around 5% of the world's population [23], with a strong bias towards boys: depending on the source, the ratio might be as high as 6:1 [37]. Evidence suggests that this might have to do with differences in presentation and diagnostic approaches, but not prevalence [14, 65]. The core characteristics listed in ICD-11 include *distractability* (d), *impulsivity* (i), *stimulation-seeking behavior* (s) and *hyperactivity* (h). Based on the individual patient's primary presentation of characteristics, ADHD diagnoses may be described as "predominantly inattentive", "predominantly hyperactive-impulsive" or "combined" types. ICD-11 lists examples for the core traits, the most important ones including: (d) Difficulties in sustained attention, making mistakes or not finishing tasks; (d) prone to distraction by external events; (d) forgetfulness and difficulty planning and organizing; (i) constant talking, frequently interrupting others; (s) frequent immediate responses to stimuli without consideration of risks; (h) constant motor activity, restlessness, and difficulty sitting still. Research suggests that another trait of ADHD is a difference in time perception [64]. Some examples are under- or overestimating the time needed to complete a task, losing track of time, having trouble creating or sticking to a schedule, and procrastinating on tasks [64, 82].

With respect to the lived experience of ADHD, much of the research focuses on children and adolescents, e.g., in the context of school. For example, a meta-review [69] showed that environmental factors have a large impact on living with ADHD, suggesting that for example stigma and inadequate environments (e.g., the expectation that children sit quietly in classrooms for extended periods of time) all contribute to an exacerbation of symptoms. However, the idea that ADHD only affects children is increasingly losing

footing [37]. Rather, research suggests that one's presentation may change (with hyperactivity becoming less observable), while inattentive traits stay part of an ADHDer's life, and the physiological specifics that distinguish ADHD brains from non-ADHD brains can still be observed [11, 72]. Additionally, people with ADHD develop coping mechanisms to better fit into their surroundings, or learn to suppress some of their natural behaviors ("masking") [37, 53]. Specifically addressing the adult lived experience of ADHD in the workplace, research shows that individuals experience difficulties specifically relating to their key symptoms (e.g., needing to be sufficiently challenged by their tasks to remain interested), but also are proficient at self-management of ADHD, and experience satisfaction at work when tasks and work environment meet their needs [34].

2.2.2 Autism. Autism is understood as a collection of "persistent deficits in [...] reciprocal social interaction and social communication" and "a range of restricted, repetitive, and inflexible patterns of behaviour [sic], interests or activities that are clearly atypical or excessive for the individual's age and sociocultural context" [61]. Studies report that around 1% of the worlds' population are diagnosed with autism, with a median male-to-female ratio of 4.2:1 [23, 93]. Social symptoms may present as differences regarding the interpretation of verbal or non-verbal communications of other individuals, under-use of culturally common non-verbal cues, such as eye contact, gestures, facial expressions and body language and, following these, problems with modulation according to the social context (e.g., conducting small talk). Known behavioral patterns may present as difficulty in adapting to new circumstances, causing distress by seemingly trivial changes, and thus a strong adherence to established routines including following familiar routes or daily schedules. Studies also discuss a strong sense of right and wrong possibly caused by "excessive" adherence to rules (e.g., when weighing morality against personal gain [36]), repetitive and stereotyped motor movements ("stimming" [17, 39]), "hyperfixation" and "special interests" [7, 32, 59] as well as hypo- or hypersensitivity to sensory stimuli [7]. Due to the challenges these symptoms may cause in the interaction with neurotypical peers, many autistic individuals develop masking strategies, where they "are able to function adequately in many contexts through exceptional effort" [61]. However, suppressing or warping their natural behaviors can have a negative impact on the individual's mental health and well-being [39] and is reported as stressful part of their everyday [26, 53, 67].

2.2.3 Dyslexia. Dyslexia is a sub-category of developmental learning disorders and presents with problems in reading, i.e., difficulties with accurate and/or fluent word recognition and spelling. This is a distinct difference in comparison to autism and ADHD. It is explicitly not a disorder of intellectual development [61], and is diagnosed in up to 10% of the population [23]. Dyslexic individuals exhibit problems in academic achievement that are unexpected according to their age and general level of intellectual functioning. Sensory impairment, neurological disorder, availability of education, language proficiency or psychosocial adversity can be excluded as underlying causes [61]. Dyslexic individuals may develop compensatory strategies, invest additional time and energy, or manage to obtain the necessary kinds and levels of support to sustain adequate performance in school or work [22]. The symptoms described above can increase the likelihood of school dropout, may be a contributing factor for un(der)employment, and in the long run, increase likelihood for co-occurring depressive symptoms and poor mental health outcomes [8]. Diagnosis of developmental learning disorders are more common among boys. This may be linked to a greater likelihood of clinical referrals due to co-occurring ADHD or problematic externalizing behaviors. The male-to-female ratio ranges from 1.5:1 to 3:1 in community samples to 6:1 in clinical samples [61].

While the exact connections are not yet sufficiently understood, research shows that individuals with developmental learning disorders show shortcomings in, among others, phonological and orthographic processing, memory, and executive functions. This may present as difficulties in time management, written communication and presenting information [8], which can have negative effects on performance in both education and work [22, 90].

Many diagnoses aggregated under the umbrella of neurodivergence do qualify as a disability following, among others, German legal definitions[4] as well as the WHO's understanding of disabilities. However, the situation is not that simple: at least within the disability communit{y/ies}[5], there are discussions about whether neurodivergence is a disability or not, and neurodivergent people themselves are often unsure whether they are "properly" disabled or not [92]. This may be in part related to the fluctuating character of neurodivergences with better days and worse days [54], resulting in struggles being "*intermittently* apparent" [63, p. 272, emphasis in original] to others, in some situations not appearing at all, and often being down-played. We acknowledge these tensions, and consider it important to make them explicit.

2.3 Neurodivergence, Technology, and Work

For general orientation into the area, we point to Bodine [12], who provides a general overview of "cognitive impairment" and work, while Wang and Piper [86] present a more specific view into the lived experiences of dyslexic academics. They conducted a mixed-method investigation on the technologies used and appropriated, and analyzed the *social* context of producing publishable text, finding that "[d]yslexia and writing processes [...] are about much more than just spelling." (p. 120:4). Many of their participants were undergraduate students, which is why we did not include the publication in our corpus. Ymous et al. [92] give powerful testament to what it is like doing research in a field that does research on people who are like oneself—the pain inflicted on neurodivergent researchers when they look at work that deals with their fellow neurodivergent beings as "a problem, needy, difficult, unruly", their lived experiences "systematically belittled, disregarded, ignored and dehumanized", their existences seen as something that needs to be corrected, cured, "remov[ed ...] from the range of human experiences" (p. 2). Overall, we want to point out that most of the existing work is focusing on children and adolescents rather than adults. We therefore give a more general overview of research efforts in our

[4]Gesetz zur Gleichstellung von Menschen mit Behinderungen (Behindertengleichstellungsgesetz—BGG), § 3 Menschen mit Behinderungen [Act on Equal Opportunities for Persons with Disabilities (BGG), § 3 Persons with Disabilities]; https://www.gesetze-im-internet.de/bgg/__3.html accessed 2024-01-08

[5]We chose this formulation to highlight that there is not *one "true"* community of disabled people—rather, it might be a community of communities, constantly in flux regarding their (dis)connections and (dis)agreements.

community here, but exclusively focus on workplace technologies for adults in the remainder of our work to address this gap.

Literature Reviews. de Beer et al. [22] conducted a review of qualitative studies, looking at general job satisfaction and work participation of people with developmental dyslexia. They identified 374 factors that influence satisfaction and participation, with 118 personal and 103 environmental factors. This, they stress, indicates that the context is just as important as the personal traits of employees with developmental dyslexia. Further, they found 68 different types of coping strategies, including "Asking for help" (mentioned in seven studies). Deciding whether to disclose one's neurodivergence, the data suggests, is heavily influenced by personal and environmental factors (i.e., regarding reactions of co-workers). Lauder et al. [48] reviewed 143 qualitative and quantitative studies of which 35 reported on different kinds of ADHD therapies (behavioral, medical, combined) and their outcomes regarding workplace related skills. The review of ADHD technology publications conducted by Spiel et al. [78] is marvelously critical, but does not have the focus on work and self-determination that we are aiming for. Sharmin et al. [71] conducted a literature review of 149 publications on smart technology for autistic children, which is the focus for a lot of work in HCI. Their goal was "to investigate how to best design smart technologies to aid children with autism." (p. 102:1)—which begs the question: help them with what, in the sense that a more specific research approach could have informed technology development that does in fact address issues relevant to the target audience. The authors do not discuss the challenges, setups, outcomes, or positives and negatives of most of the works they review, and describe autism with a set of traits including "[…] hyperactivity, impulsivity (acting without thinking), [and] short attention span". Thus, they actually describe autism with co-occurring ADHD (AuDHD). Such mis-understandings of terms are, unfortunately, visible across publications.

Motti [55] presents the outcome of a literature review of smart "technologies for neurodiverse users", but without adding much context or critique. It is mostly a collection of shortened abstracts, often does not provide information on findings or limitations of the reviewed literature, and in parts even misconstrues the cited works. Although ample of Motti's sources cover work on how to support neurodivergent users in their everyday lives, the author focuses on "technologies that assist users, *mediate their behavior*, and *intervene* with their activities of daily living"[p. 3, emphasis added]. They report that said solutions range "from diagnosis and monitoring to intervention tools" [55, p. 3]. We added emphases here to highlight how Motti seems to misunderstand the concept of neurodiversity, talking of mediation and intervention as apparently "necessary" assistance, thus pushing the neurodivergent individuals into a generalized position of depending on assistance rather than living independent lives, or co-creating their lives.

Design Frameworks. In our search, we found three publications that present guidelines and frameworks to design with (or for) neurodivergent people. Benton et al. [9] conducted workshops with autistic and dyslexic children, developing D4D, a framework to involve neurodivergent children in technology design. Turner [84] researched ADHD-friendly design and tested a self-developed framework with prototypes of a video streaming platform and a web/smart TV app. Sonne et al. [74] combined their experiences in working with children with ADHD with five categories of ADHD traits [25] and three categories of assistive technologies. Using this framework, they make visible which junctions (trait × technological category) need further engagement.

3 CORPUS CREATION

Here we describe in detail how we arrived at our corpus. The complete list of publications we analyzed is presented in Table 2.

3.1 Snowballing and Keyword Search Processes

We used a multi-pronged approach, conducting both forward snowballing (following [29]) and multiple keyword searches, setting out to look at what scholars in CS and HCI research and design with and for neurodivergent adults, especially focusing on work.

In the snowballing phase, we started out with select work by Katta Spiel and Rua M. Williams dealing with neurodivergence and technology (in sum, nearly 50 publications) [27, 75, 77, 88]. We chose these works to ensure we would also include critical and progressive research, and these two scholars are adopting critical lenses within HCI. We collected works referencing these publications via both Google Scholar and Web of Science. This way, we arrived at a preliminary corpus of 323 (in addition to the original 50) publications.

We then conducted a keyword search to ensure we would also include broad research results regarding technology, neurodivergence, and work. For this, we decided on trying various keywords in the ACM digital library. Searching for "neurodiver*" in all fields (to capture usages of neurodiversity, neurodivergence, and derivatives thereof) delivered another 56 results (2023-07-26), some of which were also in the snowballing results; some had already been included in that phase, others had been excluded then, and were re-examined to avoid false negatives. As there were not a lot of results covering dyslexia at work, we additionally searched specifically for "dyslexi*" (2023-07-26) to make sure we would not overlook important work. This resulted in another two publications, of which one had already been found earlier.

We also explicitly looked for publications fitting our scope in the CHIWORK proceedings[6] as one of the main HCI venues that address technology in the context of work. We did identify two publications; however, one only mentions neurodivergent users as possible users of the technology they investigate [58]. The other discusses neurotechnology, such as brain-scanning devices, to monitor employees in the workplace [51], where one participant brought up possible discrimination of neurodivergent workers by such technology. However, for both neurodivergence was not a focus, so both were excluded from our review.

In sum, we had collected about 400 search results through the snowballing and keyword search. The next step in constructing our corpus was to filter according to our inclusion and exclusion criteria, which we detail in the next section.

[6] https://dl.acm.org/action/doSearch?AllField=neurodiv*&ConceptID=137645&expand=all, accessed 2024-01-12

3.2 Inclusion & Exclusion Criteria

In this section, we discuss our inclusion and exclusion criteria and their application after the search processes outlined above. For a tabular version of the criteria description, please refer to Table 1.

In accordance with our research questions, we chose to include publications documenting research and design with or for (young) adults. We explicitly wanted to exclude work with or for children, particularly those in primary and secondary education given our interest in work. The participants or target group would have to be autistic or dyslexic individuals or people with ADHD. If a publication had a focus on other kinds of disability or made it impossible to know which kind of neurodivergence was central, it would be excluded. Literature reviews and publications without a specific technology description (e.g., [48] and [12]) were excluded to focus on works describing the design, development and/or testing of technologies as well as empirical exploratory studies conducted in the context of work or post-secondary education, excluding everything that aimed at diagnosis, identification, or classification of neurodivergence. The exact outcome—i.e., whether a described technology was successful in what it should achieve or not—was neither a criterion for inclusion or exclusion.

Observant readers already noted that we did not include the term "work" during our keyword search. This was done intentionally, as it is a rather bad filter, being part of many phrases and terms that do not have anything to do with labor (i.e., "working memory", "network", etc). Instead of using it as a keyword for the search, we filtered for work context after the initial phases of corpus creation, reducing the 400 search results to about 70. Screening of title and keywords for adherence to these criteria happened during the search process already. In case these fields were not distinctive enough to make a decision, we moved on, read the abstract and decided based on the information there. We then re-evaluated the collection of publications to filter out everything that was not exploratory empirical studies or design/implementation studies, ending up with a corpus of 11 publications (presented in Table 2). With this selection and its discussion, we aim to showcase the diversity of works that is already available in HCI, and what kinds and areas of research are still open for exploration.

4 CORPUS DESCRIPTION

In this section, we first provide a general overview of our corpus. We list the whole corpus in Table 2 and discuss findings in detail in Section 6. The papers in our corpus were published between 2014 and 2023, and include full papers, journal publications, and one demonstration. Publication venues are CHI, ACM Proceedings on HCI and CSCW, and other HCI venues (some in the broader sense) as well as venues specialized on health research, with the topic leaning towards HCI ([31, 83]).

Alharbi et al. [1] conducted interviews with 21 disabled professionals in the UK and US, recruiting people from various fields who used different (commercial) video conferencing software. The semi-structured interviews elicited access barriers, tensions and opportunities, and showed many examples of participants repairing or establishing accessibility.

Amat et al. [2] developed and tested a collaborative virtual environment to "encourage" autistic people to work in teams with neurotypical people.

Cafaro et al. [15] studied a university library subcontracting disabled workers for digitization efforts. The authors cite the GDPR as a reason to not report explicitly on their participants' disability, instead saying, "two of them were employed via the small co-op which exclusively serves people with Aspergers, while the other two were employed via [...] the larger co-op which serves individuals with intellectual disabilities" (p. 384:8). We are not aware of aspects of the EU's General Data Protection Regulation that would prevent from reporting participants' demographics. In addition, this hinders reproducibility of the presented research.

Das et al. [21] report on the experiences of neurodivergent professionals working from home during the COVID-19 pandemic. The sample consisted of 36 individuals who self-reported one or more of autism, ADHD, learning disabilities or psychosocial disabilities (e.g., anxiety, depression).

Goldfarb et al. [31] studied how initial responses to the COVID-19 pandemic affected labor status and experiences for autistic employees in Israel. The researchers report a rather varied sample regarding their participants' fields of work. They conducted both a quantitative and a qualitative study, exploring the autistic workers' experiences through a lens of self determination theory.

Grund et al. [33] showcase a system to help neurodivergent workers in sheltered workshops learn new assembly tasks. Their system rewards good work with badges, which are reported as being an output of a co-design process (p. 493). However, the authors do not elaborate on this participatory aspect of their work.

Kasatskii et al. [40] recruited 36 Python programmers to test hypotheses around the interplay of perceptual load and ADHD symptoms and monotony.

Tang [80] conducted semi-structured interviews with 25 disabled people across the USA. The sample was very heterogeneous, including sensory disabled people, neurodivergent individuals, people with mobility or dexterity impairments, and chronically ill persons. The interviews focused on remote work tasks, such as video calling, screen sharing, and collaborative editing of documents.

Tomczak et al. [83] conducted a qualitative study on Polish autistic people working remotely. They interviewed autistic employees and co-workers/supervisors of autistic employees. It is unclear whether the participants were each other's co-workers or supervisors, or recruited from unrelated workplaces.

Ringel Morris et al. [68] conducted interviews with ten neurodivergent software engineering employees. The themes they developed based on the interviews were then used as the foundation for a survey, which confirmed that the themes were specific to neurodivergent people, rather than general issues.

Zolyomi et al. [94] conducted interviews with 22 autistic adults to explore how and why they use video calling technologies. They report on their participants' video calling experiences in general, stressors, coping strategies, and how their participants experience interactions with other autistic people.

Table 1: Criteria for inclusion and exclusion of publications in the corpus

Characteristic	Inclusion	Exclusion
Population	ADHD, autism, dyslexia	other kinds of neurodivergence or disability
	(young) adults	children
Intervention	technology developed for specific context, empirical studies	no technology connex or tech aiming at diagnosis, identification, or classification of neurodivergence; literature reviews
Context	work and vocational training	school or general contexts with no explicit examination of work
Outcome	neither an inclusion or exclusion criterion	

Table 2: The papers included in the Literature Review.

Citation	neurodivergence(s)	work context	technology	geographic context
Alharbi et al. [1]	ADHD, autism, "learning disabilities" (and other disabilities)	office work	hybrid meeting technologies	USA, UK
Amat et al. [2]	autism	teamwork skills	collaborative virtual environment	USA
Cafaro et al. [15]	autism and "intellectual disabilities"	archiving tasks	discusses software used	Italy
Das et al. [21]	ADHD, autism, dyslexia	various occupations, incl. academia and software engineering	remote meeting and collaboration technologies	USA
Goldfarb et al. [31]	autism	employment changes around COVID-19	meeting and collaboration technologies	Israel
Grund et al. [33]	unspecified ND and "learning disabilities"	inclusion company	electronic assembling tasks training software	Germany
Kasatskii et al. [40]	users with ADHD traits	programming & debugging	visual load in IDEs	USA
Ringel Morris et al. [68]	autism, ADHD & "learning disabilities"	software engineering employees	general workplace topics	USA, UK
Tang [80]	ADHD, autism, dyslexia (and other disabilities)	various occupations, mostly technical	interactive collaborative tools	USA
Tomczak et al. [83]	autism	various fields and industries	remote work	Poland
Zolyomi et al. [94]	autism	various occupations, mostly technical	video calling	USA

IDE = Integrated Development Environment, ND = neurodivergence

5 ANALYSIS

We employed close reading to analyze our corpus. Close reading is a method of critical discourse analysis [6, 50, 66], which is interested in how texts (re)produce and co-construct power and inequality in society by examining, for example, who gets to be active and who is made passive by use of certain language. Working with a small corpus and this qualitative, interpretative approach allowed us to deeply engage with the publications. This way, we could perform a contextual analysis and can in the following discuss the different approaches and the motivations present in our corpus.

Each publication in the corpus was analyzed in line with the research questions, and the following associated sub-questions:

RQ1: What technology has been designed to address neurodivergence in the context of work? How is neurodivergence characterized? How is the research motivated? What kinds of work are addressed? How is the purpose of work communicated? What technologies are developed? How are they developed? Who do these technologies address?

RQ2: What is the role of self-determination in currently available technology research for neurodivergent people in the context of work? What kind of work is facilitated, does it offer room for growth? Who is involved in research processes with how much power? How does currently available technology help or hinder self-determined participation of neurodivergent people in work?

In particular, we also paid attention to (anti-)crip language, work context and conceptualization, theories underpinning the work, ethical deliberations, and form and extent of participant involvement. Through our work, we want to provide our community with an informed analysis of existing research and design work and ideas and directions for future research opportunities.

5.1 Researcher Positionality

We are western/central European researchers with majority society backgrounds and have experience with (adult) diagnoses of neurodivergences. Our academic backgrounds are in computer science, media studies, and cognitive science with a focus on participatory research and design. Our understanding and experience of neurodivergence is not all-encompassing, especially regarding the intersectional implications of different socio-economic backgrounds and minority race/ethnicity. The literature search and close reading were conducted by the first author with regular check-ins with the second author. The synthesis of findings as well as the conclusions were developed collaboratively.

6 FINDINGS

In this section, we synthesize the information drawn from our close reading of the corpus along several topics and themes that we found to be present in the texts.

6.1 Work and Access

Here, we take a closer look at how accessibility for neurodivergent individuals can and has to be (co-)created, as workplaces are usually designed for non-disabled workers [45].

6.1.1 Concepts and Contexts of Work. We found that authors *conceptualize work* in various ways, often combining different understandings and reasonings why workplaces should be (made) accessible. Many refer to high un- and underemployment rates of disabled people [2, 15, 21, 33, 80, 83], but not all make explicit why they see these high rates as bad. Some see work as a means to be a productive part of a society [15], or as a way to be around other people, using and honing social skills [31]. For Alharbi et al. [1], work is not specifically motivated. This can be read as it just being part of life, and as such, accessibility of workplaces might be seen as a plain necessity. Work as explicitly meaningful, emancipatory, or self-actualizing occupation is never an explicit topic—reports of participants moving up in hierarchies [68] or being self-employed [31, 83] might count as implicit mentions. Das et al. [21] explicitly motivate their own work as a matter of equity, which can be read as an all-encompassing human rights centered approach, covering economic and social participation as well as self-actualization as outcomes of work.

Work context may be located in workplaces specifically dedicated to disabled persons (e.g., what is commonly called a *sheltered* workplace), where participants are tasked with repetitive tasks like digitizing work in a library [15] or assembling electronics [33]. Even if the work does happen at places also frequented by non-disabled persons, such as a university library, disabled workers may be segregated: "[…] the digitization lab is in a separate physical space from the main Catalog office of the library, so opportunities for spontaneous interactions with full-time staff are limited." [15, p. 384:4] At the other end of the spectrum, the researched topics imply primarily white collar work, e.g., in the case of work-from-home or hybrid work meetings [1, 21, 80, 83, 94] or software engineering [40, 68]. Amat et al. [2] do not explicitly specify where their teamwork skill training—one simulating an electronics assembling task and the other warehouse work—could or should be used. Goldfarb et al. [31] interviewed workers from various industries, such as computer and mathematical occupations (ten interviewees), food preparation and service (four), and office and administrative support (two).

6.1.2 The Scourge of Normative Productivity. This section summarizes findings with respect to (expectations of) productivity, and implications for neurodivergent workers.

Workplace-introduced demands of productivity are based on rules that often do not allow for either preparation or rest [21], sometimes making it necessary to extend the boundaries of work hours [31, p. 96]. Some neurodivergent employees report that "[d]espite excellent technical performance" they would receive only average reviews from their higher-ups, "for reasons directly related to my AD[H]D symptoms" [68, p. 180]. For some neurodivergent workers, being present in meetings or in the workplace, "looking like working" is an issue [21]. And even if there is some organizational acceptance for crip time[7], submission and delivery dates are rarely up for discussion [21]. This is made even harder when managers do not think about additional time requirements while making plans [80, p. 30:19]. Some neurodivergent workers may need additional time to properly formulate their thoughts [21, 94], which might make them look slow, not productive (enough) or inattentive.

Productivity as intervention goal is also mentioned. For example, "adding gamification elements to work and learning processes may […] lead to better performance over time, enhancing the overall experience of neurodivergent individuals at work" [33]. The connection in between improved performance and better experience is not explicated, however the authors seem to see the reason for negative human-system interaction in the users [33, p. 492]. Cafaro et al. [15, p. 384:2] point out that disabled workers may encounter negative feedback from their co-workers, which "impacts their ability to be productive".

6.1.3 Accessibility Needs Are Complex. Neurodivergent struggles are individual, subjective, and highly situational (see Section 2.2), possibly fluctuating day by day [94]. Several works discuss accessibility tensions and conflicts where one person's accessibility need creates a barrier for another [35]. For example, while some neurodivergent users might feel more comfortable having their camera turned off during a remote meeting, this will make the meeting less accessible to persons who need to see the other's face when they are talking, e.g., to assist hearing with lip reading and facial expressions [80] or to generally be able to follow what is being said [43, 60]. Zolyomi et al. [94] describe a wide variety of coping strategies in remote meetings to avoid sensory over-stimulation (i.e., dimming lights vs. turning up lights; turning the camera off vs. turning it on). Neurodivergent users have been documented to use

[7]The concept of *crip time* describes the different flow of time for disabled folks: taking longer to get somewhere because you have to wait for accessible public transport, having to spend extra time before a meeting to set up, or having to stay longer to ask questions you could not ask during the call.

accessibility mechanisms intended for other target groups. For example, Alharbi et al. [1] describe the use of subtitles and captioning by users with ADHD (which might be a way to cope with auditory processing disorders [4, 46]), and Das et al. [21] talk about the use of text-to-speech by dyslexic users in hybrid and remote meetings.

Regarding work environments, Goldfarb et al. [31] present some participants' preferences of working in the office with their co-workers rather than at home, as well as participants reporting "improvement in their subjective feelings of well-being related to the reduction in work-load and less crowded work-environments." (p. 97), suggesting individual access needs.

6.1.4 Accessibility as Afterthought and Add-On. Work environments are usually designed with neurotypical workers as primary target group [45]. Hence, accessibility for neurodivergent individuals is often an additional feature that needs to be explicitly requested and, if at all, is added to spaces and technologies post-hoc. Das et al. [21] describe how accessibility features that are available, e.g., the hand raising feature to maintain proper turn taking in video calls, might be disregarded on purpose, or because they are not well incorporated into the software (i.e., not visible while screen sharing). Work spaces as they became "modern" in the 2010s are described as a problem [68, p. 177], with open floor plans ("bright lighting and noise", p. 180) and lots of communication tools' notifications [21] causing distractions. This points towards workplaces being very neurotypically-oriented, with accessibility as a "nice-to-have" feature rather than a fundamental part of a system [21]. Alharbi et al. [1] describe how disabled users have to spend extra time to get setups working for them, and that accessibility mechanisms have to be called back into (non-disabled) colleagues' minds. This might also point towards an assumption made by non-disabled people: that they *know* who needs which accessibility mechanism, and if "the usual suspects" are not present, the mechanisms are not necessary.

6.1.5 Accessibility Is a Sociotechnical System. The World Health Organization defines accessibility and disability as partially social issues [62]. This also comes up in various publications in our corpus. Social rules may make it difficult to ask for accessibility support. For example, in meetings it might be necessary to interrupt others to ask them to mind turn taking [1, 21], or there might be hierarchies at play that keep junior employees from requesting support [1]. Having to adhere to specific ideas of "paying attention" or "being social" may keep disabled folks from using a second screen for subtitles or sign language interpretation [1] or to take notes [94].

Supervisors and co-workers need certain levels of expertise in the use of technology [21, 83] as well as knowledge of others' individual needs to facilitate access. Flexibility to (partially) choose which tasks to work on, to work from home [68], or to attend fewer meetings to reduce stress or being able to block time for focused work [21] could be provided by supervisors. Work processes and work flows can be restructured to be more accessible, i.e., by sharing materials both before and after meetings and implementing proper turn-taking during meetings [21, 94]. Having breaks during and between remote/hybrid meetings [21] is beneficial not only for disabled employees. Overall, co-workers can become part of working towards accessibility, e.g., when neurodivergent co-workers ask to clarify meeting contents or provide recommendations on how to make things more accessible [1, 21, 94]. This can also lead to active work by following neurodivergent colleagues' preferences [21]. Backing from management is important to show acceptance [21, 83].

Goldfarb et al. [31] close with specific recommendations for both employees and employers on how to make work work better for everyone. Alharbi et al. [1] provide design directions that also apply to the collective level, and make a point about the importance of ethical conduct when developing future technologies "for" disabled users. Video conferencing should be flexible regarding how users can watch or listen to each others' video and audio streams in remote and hybrid settings [1, 21].

6.1.6 (In)Visibility of Access Labor. Alharbi et al. [1] describe how disabled and neurodivergent folks' efforts to attend hybrid meetings often stay invisible. Making access labor visible may in some instances make the non-disabled meeting attendees be more considerate, e.g., with open captions or sign language interpretation visible for everyone, regarding their talking speed or overlapping speech [1]. Both visibility and invisibility are double-edged swords: while invisibility means that the labor is not seen and recognized as work, it also reduces the risk of being seen as disabled. However, this may lead to being judged [68, 80] or considered rude [1, 21]. Another aspect of access labor that often gets overlooked is the amount of emotional labor that goes into it (see also, Subsection 6.1.5) as well as the necessary negotiation of power dynamics [1, 21]. Das et al. [21] point towards the opportunity for neurotypical and non-disabled co-workers to take up the role of allies, questioning the inaccessible norms many settings adhere to. By employing their privileged situation—not having to spend their energy and time asking for access repeatedly, not having to advocate for oneself every day—allies can help improve the situation for the neurodivergent and disabled people in their surroundings.

6.2 Perspectives on Neurodivergence

This section deals with the different views on neurodivergence we found in our analysis of the corpus.

6.2.1 The Burden of Change and Being the Other. In many papers, neurodivergent people are seen to diverge from the norm, as *other*, and in need of adapting to the norm, or accepting their ascribed position outside the norm. Their experiences, knowledge, and personhood may be devalued by their surroundings as well as by researchers, resulting in inequities in involvement in research processes and system design.

For example, in Cafaro et al. [15] this is reflected in the fact that researchers had advance meetings with various project members, but not with the neurodivergent participants, and there is no explanation why the team decided to do so. Additionally, the authors talk about "mixed-ability" teams, but we do not know how abilities within the teams actually differed. The authors point out that they did not include the neurotypical team-lead in this phrasing, and acknowledge that the differences in understanding might be due to different locations in the workplace hierarchy or process rather than, as they assumed in the first place, inherent to difference in neurotype [15]. Explicit othering can be found, e.g., in the work of Kasatskii et al. [40, p. 123]: "people with such conditions

can be socialized but need some accommodations at school and work". Phrases like "people with autism have unique socialization needs" [83, p. 9] posit the need to be accepted as a full person, including one's neurodivergence, as "special", when it is an entirely normal basic human need [3]. Sometimes, othering is inherent in the research goal or question, and sees the neurodivergent in need of change. For example, Amat et al. [2, p. 341] state that "[b]oth users need to communicate well with each other to [complete the task] within a specified time."—however, it is the autistic individual who "needs" the training and needs to adapt to their neurotypical peers. This assumes that the neurotypical person is the one who knows how to "properly" communicate, rather than both having to adapt to each other. In addition, Amat et al. [2] intend to use quantitative measures to assess quality of communication rather than asking their participants how the interaction was for them.

In contrast, Zolyomi et al. [94, p. 134:15] show how autistic folks are othered by their surroundings, e.g., "the pressure to adhere to awkward social pleasantries, namely, small talk". Throughout their work they also report on how their interviewees talk about masking as "faking [neurotypical]" and "passing" (p. 134:18). They point towards the many kinds of masking their natural behaviors to avoid being misunderstood, misinterpreted, or seen as weird. Responding to small talk, maintaining eye contact, etc. take a toll on the neurodivergents' cognitive resources and are exhausting (p. 134:18). Zolyomi et al. [94, p. 134:18] also talk about spaces where neurodivergent individuals felt that masking was not necessary because they felt their behaviors would be accepted.

6.2.2 Disclosure and Discrimination. Disclosing access needs or neurodivergence is important to make working in a team a positive and successful experience for all. Participants observed that with the initial response to the COVID-19 pandemic, it has become more acceptable to talk about mental health, paving the way towards disclosure of neurodivergence [21]. Sometimes, it will be inevitable to disclose one's needs and preferences—e.g., when traveling for work, it is crucial for some people to have enough space either during transit (on the plane or train), as well as during the stay (in a hotel) [68]. Neurodivergent people hope for sensitivity and understanding from their peers [68], but are wary of risks. In the same study, about one fifth of respondents reported having disclosed their neurodivergence to their manager or co-workers on their team, a third had opened up to friends at work—none, however, had disclosed to HR, "for fear of judgment or discrimination" [68, p. 182]. Nearly 17% had not talked about their neurotype with any of the groups selectable in the survey [68]. This wariness is not without reason: people may react negatively to disclosure, and may refuse to adapt their style of work [21, 86]. As even the outlook of receiving negative feedback can be a cause of stress and anxiety in neurodivergent people [49, 70, 89], it is clear how they might shy away from telling their peers or supervisors about their struggles. Trying to over-achieve regarding productivity may be one way of preempting negative comments about using accessibility support [80, p. 30:19].

Interestingly, Ringel Morris et al. [68] point out the tendency to not disclose access needs and neurodivergence may be one reason why companies may underestimate the importance of accessibility labor for neurodivergent employees, which feeds back into the issue of inaccessible workplaces discussed here, too.

6.2.3 Language Reveals Perspectives on Disability. How we as researchers talk about the people we research and design with/for shows the level of respect and understanding that we bring into our work [13]. This holds true regarding the language used to describe the participants and their neurodivergence, as well as the overall tonality of a publication.

Here, we want to discuss some terms that can be seen in many publications, and provide context, keeping in mind that language is in constant flux, and appropriateness of terms changes over time. The term "special needs", e.g., [40], reframes basic human needs and rights like participation, safety or belonging as something out of the ordinary—when it is environments and systems that hinder fulfilling said needs and rights. Pointing out that disabled people are "leading the way [...] for creating accessible and inclusive professional workspaces" idolizes the burden of accessibility labor [21]; similarly, talking about "creativity" and "artfulness" of disabled folks when they have to circumvent inaccessible systems [1] can also be read as people needing to allocate extra time and energy in inaccessible environments. Stating that people "suffer from [a disability]" [15] erases the experiences of many disabled folks, and risks introducing a reductionist perspective on the lives of disabled people. While one may suffer because of specific symptoms, e.g., a higher sensitivity to sensory stimuli, it often is not the disability itself that causes suffering, but inaccessible systems and environments. Similarly to the above, euphemisms like "the differently abled workforce" [40] place the reason for being dis-abled to do certain things on the individual, rather than making clear that disability is, to a vast degree, due to circumstances and environment [62]. We also observe that many of the examples mentioned here seem to be instances of trying to avoid to use the term "disabled" at all, suggesting a disconnect with the preferences of many disabled people [42]. Finally, we also observe a number of inaccurate or vague descriptions of disabled research participants (see Section 6.3.1).

6.3 Methodological Observations

During our analysis, we also came across several methodological similarities among the corpus publications.

6.3.1 Participants and Recruitment. With respect to the perspective on neurodivergence, we found that in most reviewed publications, there is no explicit discussion of different models of disability (i.e., no use of theory). Rather, many authors re-iterate diagnostic criteria and medical descriptions of disability and neurodivergence, showing what Kafer [38] describes as a *curative imaginary*[8]. At times, terms stemming from social or bio-social models of disability are used, i.e., neurodiversity or neurodivergence. However, in both cases we have seen instances where proper understanding of the concept(s) or their bases was missing. For example, mixing up different kinds of diagnoses, Cafaro et al. [15] talk about "cognitive disabilities (including anxiety disorders and autism)" without

[8] "[A]n understanding of disability that not only *expects* and *assumes* intervention but also cannot imagine or comprehend anything other than intervention.", p. 27, emphasis in original.

specifying where this grouping comes from. Grund et al. [33] describe their target group as neurodivergent, but do not provide information on their participants' expression of neurodivergence. Only Zolyomi et al. [94] explicitly talk about the different (historic) theories that make up autism research, and even include the experience-based Spoon Theory [54]. Goldfarb et al. [31] explicitly base their study and analysis on self-determination theory. The intersectional analysis of disability and context within the corpus is often limited to stating geographical location and the industrial sectors participants work in [1, 21, 33]. While some authors explicitly discuss their rather privileged samples [31, 68], others only report on the number of participants, even though context data was collected [40]. Ringel Morris et al. [68] reflect on how their methods may have biased their data, and Das et al. [21] consider aspects such as people having multiple disabilities and complex access needs. Tomczak et al. [83] acknowledge that their sample is skewed both towards neurotypical individuals (19 out of 23 participants) and towards autistic women who work at least part-time as self-advocates.

Along these lines, we observed that *recruitment criteria* vary greatly. While some researchers studied people with certain sets of characteristics [40], others trust their participants' self-reported disability [1, 21, 68]. Yet others base recruitment on medical diagnoses [15, 33] by recruiting in dedicated workplaces for disabled people.

A subset of publications in our corpus mention some form of participant reimbursement, usually of a gift card or voucher worth about U$ 40-75 [1, 21, 31, 68, 80, 94]. Of the other works, one did not include neurodivergent experts at all [2]. It is not made explicit whether participating in the reported user evaluations [15, 33] was counted as working time. We see this as representative of similar discussions in the HCI community at large.

6.3.2 Measurements, Tools and Interventions. As Das et al. [21] point out, "tools for remote work are constantly evolving [...], meaning that what might work well at one moment of [sic] time may not work the same way in the future." One of the included studies did not test their application with their target group [2], falling back on neurotypical volunteers instead, limiting the implications of findings for neurodivergent audiences. Likewise, some evaluations are very brief, e.g., Grund et al. [33] only provide a very cursory look towards user feedback, which positively describes the virtual assistant included in the system. However, this is probably due to the short format (demonstration) of the publication.

Finally, in order to properly enable participants to contribute in research, it may be necessary for researchers to offer accommodations. For example, Ringel Morris et al. [68, p. 175] report that they explicitly stated in their recruitment texts that "interviews would be confidential [...], held outside the employee's regular workspace, and contained a calendar appointment whose title only let on that it was a meeting about software engineering." Zolyomi et al. [94] explain providing accommodations during their interviews, i.e., "taking breaks [...], turning off the video, and not calling attention to any neurotypical masking or lack of masking" (p. 134:10).

7 DISCUSSION

In the following, we situate our findings with regard to the research questions, and we discuss opportunities for future research on neurodivergence, technology and work for the HCI community.

7.1 RQ1: What technology has been designed to address neurodivergence in the context of work?

Overall, our review shows that the HCI research community has begun to address neurodivergence in the context of work, but with different perspectives on neurodivergence, and a range of system purposes and motivations. Three types of technology discussed in our corpus explicitly address neurodivergence in the workplace: learning systems for workplace routines, training systems for social skills, and systems to improve the ability to focus on programming tasks. While many of these systems align with barriers experienced by neurodivergent people in workplaces (see Section 2.2), some of the learning and training systems are based on the assumption that the neurodivergent workers have "special" needs to learn certain skills that neurotypical people do not need to learn (i.e., team working skills; see Section 6.2.1). Likewise, the kinds of work addressed with the three technologies are either menial, repetitive tasks, located in "inclusionary" settings, or white-collar work in industries like software engineering (see Section 6.1.1), only mapping specific parts of the economy, and completely omitting volunteer or care work. Regarding views on neurodivergence, our results show that often, neurodivergent employees are seen or positioned as "other", and their basic human needs as "special" (Section 6.2.1), which is also reflected in deficit- rather than ability-based [91] approaches to system design (i.e., focusing on perceived weaknesses rather than amplifying strengths).

7.2 RQ2: What is the role of self-determination in currently available technology research for neurodivergent people in the context of work?

Self-determination, i.e., the right and ability to make one's own decisions and articulate personal preferences and needs, was not equally addressed in the research that we included in our review. Work participation was primarily seen as a factor to reduce unemployment rates for neurodivergent people (Section 6.1.1). Making work less stressful was only discussed where the neurodivergent workers themselves were given a voice: in the exploratory interview studies focused mostly on white-collar work, which offered space and time to talk and reflect about struggles at work. Instead, there was a significant body of works that prioritized neurotypical over neurodivergent perspectives, *othering* neurodivergent people, and not all projects within our review included neurodivergent people in research processes as equals alongside neurotypical peers (see Section 6.2.1). A significant body of work focused on sheltered workplaces, i.e., places of work where we know disabled self-determination is limited [47], and that are openly criticized by many members of the disabled community. In-depth and follow-up studies to the specifically developed technologies are missing.

Only technologies that were already in use, i.e., remote collaboration technologies, facilitate mostly white-collar work, thus offering room for growth and self-development (see Section 6.1.1). Likewise, in the technology design processes, neurodivergent people were primarily involved to be observed and studied (see Section 6.2.1), or to provide feedback on technology that had been developed without their input. Overall, while we acknowledge that the HCI community *wants to do good*, it is imperative we as researchers learn more about the communities and the people we want to work with (and for) to actually support self-determination (see Sections 6.3.2 and 6.2.1).

7.3 Research Opportunities for the Community

Based on our analysis of existing research addressing neurodivergence, technology, and work, we have identified a number of research opportunities for our community which we discuss and relate back to other relevant research here.

7.3.1 Adopting the Lens of Neurodiversity and Designing for Workplaces for All. Looking at how complex, at times overlapping, and sometimes conflicting access needs can be (Section 6.1.3 and Hofmann et al. [35]), we argue that the narrative of neurodivergent vs. neurotypical, disabled vs. non-disabled is not helpful. Rather than focusing on and designing for weaknesses and deficits, research should adopt a holistic perspective, designing for strengths *and* weaknesses. Rather than designing for specific, assumed clusters of traits, the HCI community could aspire to create and support flexible work spaces in which different groups of people can thrive. We as the HCI community must acknowledge that universal design does have limits. In these instances, we need to establish and allow for ways of negotiating conflicting access needs. Another line of work could be to create technologies that enable neurodivergent folks to (1) have a better and more neutral (or even positive) understanding of their divergence, which in turn may empower them to better (2) argue for organizational change towards a neurodivergent-inclusive workplace, and (3) lead self-determined lives with room for growth.

7.3.2 Establishing a Broader View on Work. Looking at the limited range of labor that is represented in the currently available research (Section 6.1.1), future work should adopt a broader understanding of "work". By broadening the understanding of work, the HCI community could look at a greater diversity of tasks and user groups [52], including reproductive and care work, and manual work including arts & crafts, no matter whether either is paid or unpaid. Likewise, there is an opportunity for future work to explore different *places* of work—for example, in transportation, or work that is carried out in nature, all distinct from factory or office settings.

7.3.3 Meaningful Participation of and Contribution to Neurodivergent Communities. It seems that there are still harmful stereotypes present in the HCI community regarding what neurodivergent people are: helpless individuals have to be put under supervision in "sheltered" workshops, or extremely smart, high-achieving white collar workers (Sections 6.1.1 and 6.3.1). This view is incomplete and erases many a lived experience. Future HCI research in the area of assistive technologies need to have more (visible and documented) engagement with their target communities. Offering donations to organizations such as AutismSpeaks [68] should not happen—criticism of this organization from autistic communities has been publicly available since shortly after its creation, and when the publication was in progress[9,10,11].

This, to us, also means that there is a need for HCI researchers to do better regarding evidence-based and theory-driven work. We explicitly want to include lived experience in the term evidence-based, as disabled and neurodivergent individuals are the best experts on their own situation in their respective communities and societies. Additionally, the evidence and theory used for research need to be *up-to-date* rather than those that were discarded by (critical) disability studies and other relevant branches years ago.

8 LIMITATIONS

There are a few limitations that need to be considered when interpreting our findings. Because of our specific research focus, we engaged only with a rather small corpus of publications. Additionally, we decided to focus on three prominent diagnoses summarized under the umbrella of neurodivergence. Thus, there remains an opportunity for future work to also consider other kinds of neurodivergence. Considering our method, the detailed analysis was done by the first author and discussed with the second author. By conducting a close reading, we performed a qualitative analysis, going into the depth of the papers—other researchers might come to different conclusions when studying the same set of publications against their own backgrounds. Finally, with respect to the publications included in our review, we observe a geographical bias—this might be due to the publication bias, or cultural differences in addressing neurodivergence.

9 CONCLUSION

In our work, we examined the body of literature on neurodivergence, technology, and work from the perspective of Human- Computer Interaction. We show that while there is a growing body of research available in this space, there remains ample research opportunity for our community that centers on neurodivergent self-determination, adopts a broad perspective on work and examines a range of workplaces. Further, we show that there is potential for future research to be thoroughly grounded in theory and lived experience, and for the establishment of research methods that are accessible to neurodivergent people in the context of work. Overall, we hope that our overview will be helpful for our community in taking steps towards workplaces that are friendly toward technology and neurodiversity, allowing broad groups of people to thrive at work beyond narrow perspectives on productivity.

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