

On the Dangers of Autism Automation

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DRAFT

Acknowledgements

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- All of the code and (small) data files can be found on this paper's GitHub repository at github.com/mindsresearch/autism-ai.

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1 Introduction

In *Automating autism* [6], Keyes analyzes two distinct corpora using a Critical Discourse Analysis-based approach to arrive at a set of themes pertaining to the sentiment towards autistic people both in academic research and in the commercial space. In my previous work, [C2C202B PAPER TITLE HERE], I analyzed the current flaws in the workforce sentiment towards autism and neurodiversity in post-secondary employment.

In the present paper, I focus on a more fundamental issue: the genesis of how autism is defined “under a ‘medical’ model of disability” [6, p. 2], subsequent issues stemming from the major flaws in this definition, and the implications of this systemic bias in the present development of AI and machine learning models to diagnose the disorder.

[TODO: Rebuild to make more specific (as a function of development)]

2 The Genesis of Autism

2.1 Following the Footnote Trail

The term “autism” was first coined by Eugen Bleuler in 1913 to describe schizophrenic patients [5, p. 213]. Specifically, Bleuler dubbed “autism” to refer to a state where one “[seems] totally detached from the outside world ... and basking in fantasy” [5, p. 213]¹. However, the history of autism as a syndrome as opposed to Bleuler’s symptom begins some 30 years later with the near-simultaneous descriptions by Leo Kanner in 1943 and Hans Asperger in 1944. The latter’s penning of “autistic psychopathy” adapted the original description by framing it as “a durable way of being..., a different kind of contact with [the world]” [5, p. 213] in response to the rising popularity of intelligence testing in 1930s Vienna. Kanner’s “infantile autism” on the other hand, waived from this definition by incorporating psychogenesis and mental r■■■■ation [5, p. 215].

Division between the two descriptions would then deepen further following the 1971 publication of [8] which created a sharp split between them, noting that Asperger’s description “did not receive the attention it deserves” [8]. Furthermore, the split aligned with Kanner’s desire² to restrict autism to “a rare and unique disorder” fearing that Asperger’s description would “[water] down autism”, thus “[depriving] the category of any relevance” [5, p. 216].

However, [8] represents something *far* more significant than creating this divide - one of many introductions of Asperger’s work to English-reading “researchers” [5, pp. 216-7]. This debunks the common myth, perpetuated in [2], that Asperger’s work was unknown to the English world until 1981 (or in the case of [2], 1997) [5, p. 216]. Rather, the latency in adoption of Asperger’s work stems from an “inability to synthesize [Asperger’s] and Kanner’s descriptions” [5, p. 222].

¹aka “zoning out”/“daydreaming”?

²Kanner was an editor for the journal in which [8] was published.

This carries over into the present popular and academic conceptualization of autism, presented in Simon Baron-Cohen’s 1995 book *Mindblindness* [1] and his 2003 book *The Essential Difference* [2], particularly chapter 10 [6, p. 12]. The latter posits that autism can be described as possessing “the extreme male brain” since the systematization ability of autistic people is enhanced whereas their empathy capabilities are significantly hampered [REPLACE WITH QUOTE]. This lack of empathy is described in the former as an inability to “come up with a sensible interpretation of the causes of [others’] actions” [1, p. 4], and is likened to the social ineptitude [TODO: word choice] of primates, an excerpt of this comparison being shown in Table 1.

group	ID	EDD	SAM	ToMM
autism (A)	+	+	-	-
autism (B)	+	+	+	-
higher primates	+	+	+?	-
normal humans older than 4 years	+	+	+	+

Table 1: Excerpt of table 8.1 on pg. 127 of [1]

Baron-Cohen’s ideas were then applied to “theory and philosophy ... implying that the default state for autists is total ignorance of self” [6, p. 13]. This and subsequent logical leaps were then taken through other works in popular science and medicine to arrive at the present construction of autism: robotic, asocial, non-agentic, and ultimately, non-human [6, pp. 14-5].

2.2 Disability and Dis-humanity in Antiquity

While derivatives of Baron-Cohen’s works popularized the dehumanization of autism, the first belittlement of disability dates back significantly further to the ancient Greek philosopher Plato’s work, *Phaedo*. According to the interpretation on page 145 of *Gendering Disability* [7], disability presents a severe impediment to philosophy. Since the healthy body is a source of “innumerable distractions” in the pursuit of knowledge, the bodily unpredictability of disability compounds this, halting philosophical progress altogether. Virginia Woolf’s 1930 essay *On Being Ill* applies this to literature since both “[aspire] to transcendence”, thus “in illness, the body demands acknowledgement” [7].

These notions of disability impeding human development are just as prevalent today, albeit in slightly more subtle ways. While special education (SPED) is presented as an exercise in inter-human empathy, its underpinning of something far darker are undeniable - attempting to “train” disability, particularly intellectual disability, out of children in order to force them into the capitalistic societal molds built specifically to exclude them. [SOURCES FOR THIS PARAGRAPH?]

3 Real Harms of Contemporary Definitions

Arguably, [8] marks the division between what is considered today the distinction between "low-functioning" and "high-functioning" autistic people, perpetuated by the "autism (A)" and "autism (B)" sub-groupings in Table 1. As we have explored in section 2, this distinction stems from the differences between Kanner's and Asperger's descriptions of autism and the "inability to synthesize [their] descriptions" [5, p. 222].

Furthermore, this divide is perpetuated through the construction of SPED programs and classrooms [TODO: word choice]. The curriculum of Life Skills, a form of SPED, focuses heavily on teaching the "correct" strategies for social skills and "normal" societal interaction. Some examples include the teaching of white middle-class [TODO: research history of table manners to verify this] version of table manners without acknowledging those of other cultures, an allistic approach to friendships without the expression of authenticity³, and problem solving strategies that focus on minimizing reliance on adults.

4 The State of AI-assisted Autism Diagnosis

AI-assisted Autism diagnosis (AIAD) is a rapidly growing field in machine learning research, motivated by the perception that present autism diagnosis methods are unnecessarily arduous. Researchers therefore seek to employ AI models and other machine learning techniques in the pursuit of streamlining the diagnostic process by identifying additional diagnostic modalities. However, the methods being explored frequently involve the collection and processing of vast quantities of data requiring similarly vast and powerful ML models.

4.1 AI Ethics

As AI models become increasingly larger, so too do the subtlety of the issues that they produce. As described in [3], which we look to as an example of the issues present in AI ethics and their potential consequences, increasing the scale of ML models fundamentally requires increased scale and breadth of data needed to attain "decent" performance.

4.2 General Issues in AI Bias

This subsection builds on the *Stochastic Parrots* [3] implication above, highlighting section 4.3's (pg. 614) statement that AI bias towards intersectionality is greater than the sum of the bias towards its parts.

³thus implicating the concept of "masking", or concealing autistic traits, which can cause substantial mental health issues

4.3 Going Too Far

By Baron-Cohen's own admission, autistic traits cannot reliably be measured in toddlers younger than 18 months. I feel like I've seen AIAD studies that target children younger than that. This subsection investigates the validity of that statement and the corpus thereof.

4.4 Issues in AIAD Research

This subsection summarizes the previous subsections in this section, providing an overview of the major issues in AIAD research.

5 Evaluating the Present AIAD Corpus

In the present research surrounding the use of AI in autism detection and diagnosis, there appear to be two major "tracks" that research follows: optimization of behavioral assessment and analysis of brain imaging. These methods are discussed in turn below.

5.1 Behavioral Assessment

5.2 Neural Imaging

The second major track that AIAD research follows is that of detecting structural differences in autistic versus non-autistic brains through the use of EEG and MRI scanning. [4] provides an "excellent" overview of the work in this track. Here is a list of reasons why [4] is so "amazing":

- Directly mentions Kanner; ASD related to the brain
- Autism is this horrible epidemic that must be addressed at all costs!
- "Unfortunately, this test-based screening method [ADOS] can only diagnose children when they have the ability to communicate." (pg. 2)
- Genetic testing!
- Cerebrospinal fluid increases within first two years of life correlates to ASD (pg. 3)
- "The accuracy of a classifier/predictive model is improved by training the model on large datasets." (pg. 3) - uh... no... not necessarily... unless we're talking about overfitting...?

My thoughts:

- HOW HAS THIS PAPER NOT BEEN RETRACTED!?!?!?!?!?
- It looks like accuracy hovers in the 80s-percent range. Precision/recall scores?

- Stop. Just. Stop. Sure, you might be able to detect autism with some degree of accuracy, but *why*? Getting an MRI, (especially pediatrics?), isn't cheap...
- Table 1 has repeated rows...?
- This paper is so bad that I almost want to print it...

6 Replicating Results

6.1 Behavioral Assessment

6.2 Neural Imaging

7 Discussion

7.1 Approaches to Autism Diagnosis

7.2 Developing Benchmark Datasets

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