



TOWARDS UNDERSTANDING THE CHALLENGES, NEEDS, AND OPPORTUNITIES
PERTAINING TO ASSESSMENT TECHNIQUES FOR AUTISTIC COLLEGE STUDENTS
IN COMPUTING

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WHY STUDY AUTISTIC COLLEGE STUDENTS' EXPERIENCE?

- In USA, **1** in **36** children identify as *autistic*
- Over half a million autistic children will be in their *adulthood* over the next decade
 - **45%** of them will pursue post-secondary degrees
- Unfortunately, only **38.8%** of post-secondary autistic students are expected to complete their degrees

WHY FOCUS ON COMPUTING EDUCATION?

- At least **1.9%** of the students enrolled in college in the USA are autistic
 - The number is likely to be **much higher** as many autistic and other neurodivergent college students do not disclose their diagnosis status
- Many of these autistic college students choose **Computing** and **STEM majors**
- However, the graduation rate of autistic students is **much lower** than that of **neurotypical students** and **students with other disabilities**

POSITIONALITY AND LANGUAGE

- Positionality
 - Research team consists of 2 autistic student researchers and three faculty researcher who have years of experience teaching and mentoring autistic students
 - The research team align itself with the Social Model of Disability (and Autism)
- Language
 - We use identity-first language (autistic student) as opposed to person-first language (student with autism)
 - Preferred by autistic self-advocates and autistic research team members

RESEARCH QUESTION

- What factors **impact** autistic students' college experience, especially in Computing?

Opportunities

Challenges

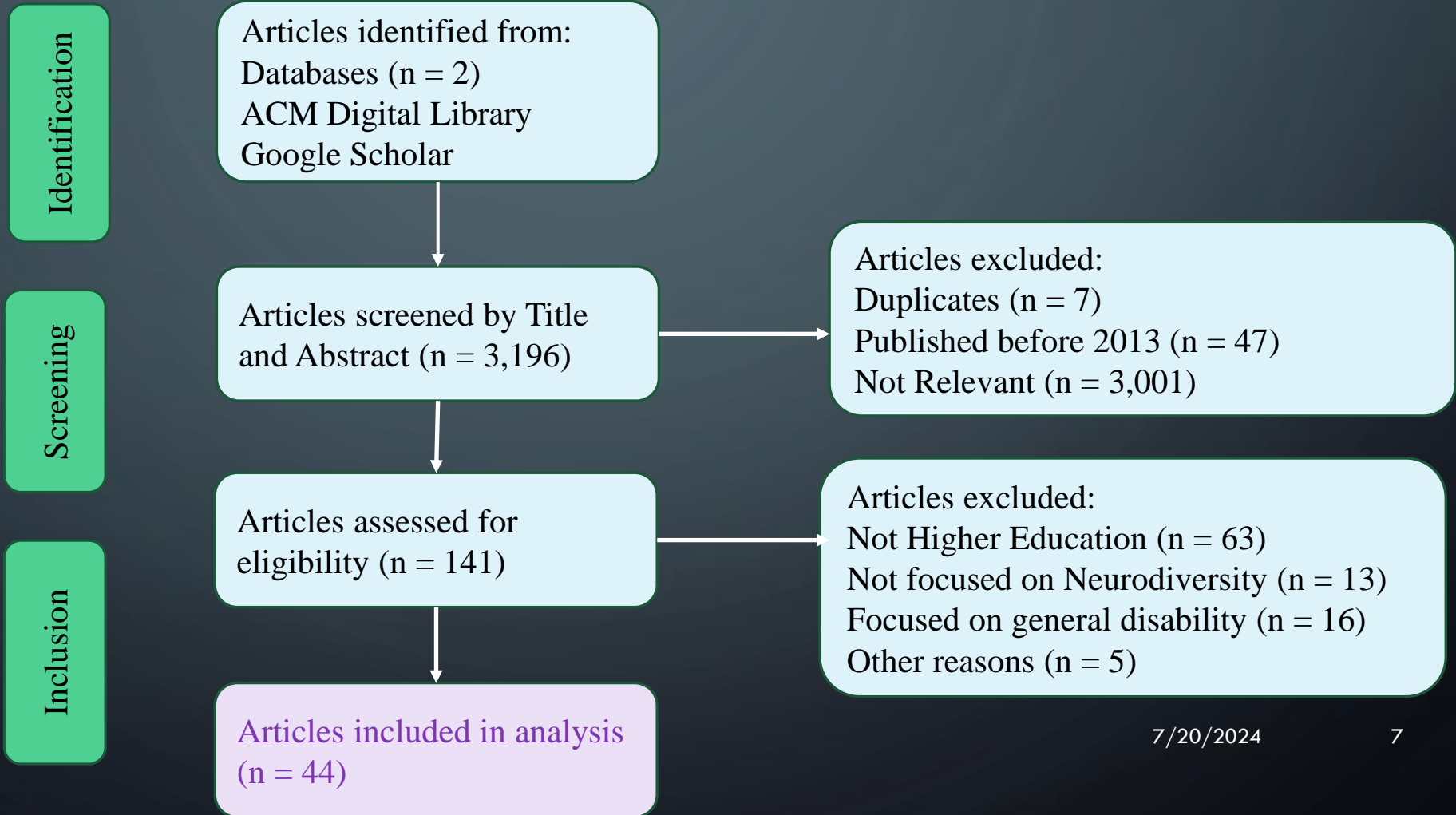
Needs

METHODOLOGY

- **Keyword-based** systematic literature review using the **PRISMA** (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)
- Databases searched: ACM Digital Library and Google Scholar

(Computing Education OR CS Education OR CS Courses OR STEM) AND
(Survey OR Interview OR Question* OR exam* OR quiz OR assignment) AND
(Neurodiverse OR autis* OR asperger* OR “pervasive developmental disorder” OR ASD
OR ADHD OR ADD OR ADHD-*)

METHODOLOGY



DATA ANALYSIS

- **Atlas.ti** for **Qualitative** coding using **Grounded Theory**

Coding Phase	Number of Codes	Example
Open	203	autism_college_support, challenge: group work, autism_accommodation_solution_strategies, and autism_college_challenges
Axial	11	Accommodation, College Challenges, Online Learning, Universal Design
Thematic	4	Assessment, Accommodation, Multiple Facets of College Experience

FINDINGS: ASSESSMENT CHALLENGES

- Challenges with assessment are **multi-faceted**
 - **Executive Functioning** issues (an autistic trait) and not a lack of academic knowledge and capabilities are **primary reasons** behind academic challenge
 - **Challenges experienced** by students and **Accommodations provided** by universities are **ill-matched**
 - Gap between **Neurotypical** (faculty, TA, peers) and **Neurodivergent Communication-style** impact academic work and success

FINDINGS: ASSESSMENT OPPORTUNITIES

- Opportunities with making assessments **inclusive** are **multi-faceted**
 - Utilizing **Universal Design of Learning Principles** can enhance Accessibility
 - Utilizing Cutting-edge (Generative-AI-based tools) and Everyday Technology (video recording of class) to improve academic experience
 - Providing access to academic materials outside classroom for **review** (to address issues related to **sensory- and cognitive overload**)
 - Help reducing **Anxiety**
 - Supporting Different **Learning Styles** (visual, analytic)

FINDINGS: ACCOMMODATIONS

- Many different types of accommodations are available
 - Example: Different exam space provided by Disability Access Centers
- Almost all these accommodations are designed for **general disability**
 - Example: Note taking for visually-impaired students, Visual aids for hearing-impaired students
- Most existing accommodations **do not cater to autistic students' specific needs**
 - Example: A separate quiet exam space do not provide access to instructors

FINDINGS: ADDITIONAL ACCOMMODATION CHALLENGES

- Accessing accommodations are non-trivial and complex
 - **Disclosing** autistic-identity is challenging in multiple dimensions
 - Social Stigma
 - Lack of **understanding** and **awareness** related to autism
 - Perception of self
 - Socio-communication issues prevalent among autistic students makes it harder to seek accommodation
 - **Absence** (and a lack) of faculty and teaching staff trained to provide adequate accommodations
 - Existing accommodations only focus on **academic aspects**
 - Ignores challenges with **other aspects of college experience** (socialization, mental health, loneliness, depression)

FINDINGS: ACCOMMODATION OPPORTUNITIES

- Designing accommodations based on Social-Model of Disability may enhance acceptability
 - Using **Social model** over **Medical model** may reduce **stigma**
 - Incorporating **autistic voice** in designing accommodation
 - **Strength-based** design vs. need-based design
 - Enhanced **autism-awareness** may improve the accommodation process

DESIGN IMPLICATIONS

- **Personalized and customized academic content** can reduce challenges with **comprehension**
 - Challenge
 - Autism is a spectrum, and as such autistic students' needs are varied
 - Puts additional burden on the instructors
 - Opportunity
 - Using generative-AI based tools that can utilize Large Language Models to appropriate academic content

DESIGN IMPLICATIONS

- **Incorporating Autistic Voice in Accommodation Design process** can enhance effectiveness
 - Challenge
 - Autistic students' may not be willing to disclose identity
 - Preserving privacy and anonymity can be challenging
 - Opportunity
 - Adaptation of Universal Design of Learning and other inclusive academic content creation models can be helpful for ALL students
 - Collaborating with autistic advocates and experts may encourage autistic students' participation

DESIGN IMPLICATIONS

- Well-designed **Mentoring program** can improve college experience
- Challenges
 - Mentoring only works when **mentors and mentees are well-matched**
 - Mentors understand mentees' communication style and experience
 - Finding appropriate mentors is not trivial
 - Many autistic students do not disclose their condition
- Opportunities
 - **Well-designed Online social networking groups** can be used to effectively connect autistic mentors and mentees

LIMITATIONS

- Research aimed to address **challenges faced by autistic adults** (and college students) is **scant**
- Autistic college students' experience in **Computing** (their preferred academic discipline) is also **under-researched** (1 paper in our repository is from computing)
- Research focusing on **college experience holistically** is largely missing
- Almost all research is from economically developed countries (North America, Europe, Australia), making it difficult to generalize findings

CONCLUSION

- Autistic students are increasingly becoming a large part of computing education
- Autistic students' "lesser" success rate can be effectively addressed by enhancing accessibility and inclusiveness of academic content
- Enhanced awareness regarding autism will improve the overall college environment

QUESTION?



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