Conceptualizing Celebratory Technologies for Neurodiversity to Reduce Stigma

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ABSTRACT

Social stigma is a complex phenomenon that plagues humanity. Disability is a key target of stigma, with physical, cognitive, emotional conditions being highly scrutinized by society. Many technologies aimed to support disabled people attempt to do so by directly changing their individual interactions with the world. When attention is drawn to affirm disability identities, it risks being perceived as inspiration porn. However, there is another way to level the playing field, to be inclusive rather than objectifying; that aim to empower stigmatized individuals rather than provide a single example of inspiration for the nondisabled observer that does little to reduce the negative stereotype. This paper introduces the concept of Celebratory Technologies for Neurodiversity. Drawing on a framework of social change specific to the stigma of autism; the tenets of the Neurodiversity movement; and the results of a current design probe with an adult with autism, initial suggestions for creating Celebratory Technologies for Neurodiversity support are provided.

CCS CONCEPTS

• **Human-Centered Computing**; • **Interaction Design**; • **Interaction Design theory, concepts and paradigms**;

KEYWORDS

Celebratory Technology, Neurodiversity, Accessibility, Social Justice, Stigma

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1 INTRODUCTION

From the perspective of self-advocates, the biggest unaddressed problem is not the symptoms of an autism spectrum diagnosis, but the social stigma that accompanies the label [7]. This societal perspective contrasts with the focus on many interventions. Historically, most innovative technologies for autism, aim to improve deficits that occur *within the person* [21]. The autistic experience of stigma has recently become a focus of study [1, 4, 7, 11] yet technologies to support reducing social stigma have not kept pace. One study of the autistic experience of living with stigma revealed that autistics feel the label is "value neutral" but because of society's view often must juggle between disclosing their diagnosis or concealing it–resulting in being treated negatively either way [4]. Another study found that "Of those adolescents who noted social difficulties, 78.6% discussed factors related to perceived stigma regarding their diagnosis" [3]. Reducing social stigma has also been studied extensively and researchers provide two mechanics for societal change that could be taken up by HCI researchers. The first is changing public perception of autism through autism knowledge training [11] and the second and possibly more effective per [6], is high quality contact with autistic people. *Celebratory Technologies for Neurodiversity* has taken up this later approach by creating interactions that celebrate positive traits, events, or accomplishments *in response to previous efforts to reduce negative stereotypes.*

Theoretically, the mechanism for change in Celebratory Technologies is based on Contact Theory [8] that purports that providing positive portrayals of otherwise stigmatized events, behaviors, and conditions to familiarize mainstream society with the broader goal of reducing stigma of the single portrayal of an event, or negatively defined dimension of a person's stigmatized stereotyped identity. This is not to be confused with the inspiration porn phenomenon that patronizingly praises ordinary or extraordinary acts by disabled people in a context that often indirectly pities the experience of disabled people [13]. The current work strives to affirm disability identities by introducing disabled individuals to other individuals in their social network rather than portray disability through a single representation via inspiration porn. Celebratory Technology for Neurodiversity involves interactions that are personal and customizable. The goal is to express one's complex identity and learn about others' identity in an easily accessible way.

2 RELATED WORK IN NEURODIVERSITY TECHNOLOGIES

The neurodiversity technology ecosystem continually expands, and each type or paradigm has a goal for a specific audience with specific mechanisms for change. Additionally, each paradigm interacts and evolves with the other types over time. The first interactive paradigm that has existed for 25 years is Assistive which aims to improve deficits that occur within the person. The most common of these target social skills from a normative perspective. These are typically based on a medical model of autism, which focuses on ways to improve or modulate the ailment within the person. This approach runs counter to the Neurodiversity Movement that strives to widen society's academic and social expectations. The other paradigms that have emerged are accessible, inclusive, and

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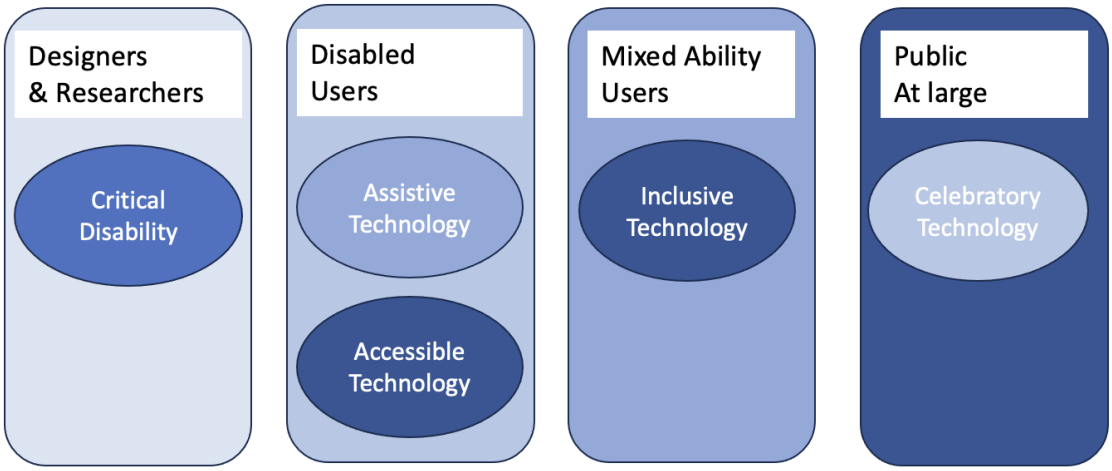

Figure 1: Diagram of range between the variety of technologies made for autism and other neurodivergences at audience levels that range from designers to the public at large.

critical design, yet none of these directly target the largest need: reducing social stigma. This work introduces a shift that goes beyond interventions that target deficits within the disabled body; environmental barriers for the disabled user; and specific accommodations for a collaborative context. Celebratory Technology takes action to address the criticism of existing work. This approach celebrates positive aspects of neurodiversity. Here I add a next paradigm by adding Celebratory Technology, see Figure 1. Technology can also be aimed at the public to change perceptions of others by decreasing stigmas, as stigma is a primary barrier to quality of life for autistic people. The goals of each autism technology need not be in competition given that all types of technology are intended to improve the quality of life. Each paradigm targets different audiences and uses different mechanisms. The current paradigms each target personal change whereas Celebratory Technology targets societal change regarding accepting diversity of human expression. Distinctions between the paradigms are described below.

2.1 Critical Design for Autism

Critical design brings attention to the misalignment between the lived experience and the societal perception of autism. For example, parodies of interventionist work exist to provoke change such as a recent project called *Facesavr*, a face covering that helps allistic adults be more independent in their socially dependent emotional processing [10]. Additionally, from a critical disability studies' perspective, assistive technologies perpetuate harmful normalizing behaviors. Although important, these critical approaches can hit far from the frontline in terms of taking direct action to positively impact end users. From a critical yet more pragmatic perspective, projects such as *Counterventions* [22] provide guidelines through evolving examples to reduce the likelihood of perpetuating ableism in interventionist's work by reflectively analyzing a series of evolving assistive technology projects through a societal lens, thus leveraging the momentum of the evolving ecology of technologies for autism.

2.2 Assistive Technology for Autism

Assistive technologies are those that support a specific need of the user in their daily life. Historically the skills targeted were those deemed below functioning. Across a variety of platforms, early interactive technologies targeted communication, social-emotional, academic, life skills, vocational, sensory motor, and restricted and repetitive behavior [16]. For example, within targeting reading skills, a clinician or educator might want to change the pronunciation of words in a particular student. Theoretically, the mechanism for change in these types of technologies is often based on learning theory for skill acquisition.

2.3 Accessible Technology for Autism

Accessible technologies shift from within the body or mind such as targeting a specific skill deficit or impairment to changes in the environment to accommodate an impairment. For example, an accessible technology or reading might provide feedback on a word-by-word basis or develop technology that will give feedback about pronunciation. An example of a technology here would be automating the color of a background to make reading more visible therefore easier for the user [18, 19]. The burden of change is on the technology to change the environment and make things easier. Ultimately, the outcome is the same with the users reading improving, and with the outward pointing version, the user is also likely to be more comfortable. However, this does not replace the benefits of learning to read and proper pronunciation. It is simply a different goal. Theoretically, the mechanism for change in these types of technologies is based on removing barriers to accessing the environment.

2.4 Inclusive Technology for Autism

Inclusive technologies in relation to neurodiversity target collaboration between members in a mixed-ability group. A trailblazer in this domain is *MOSOCO* [9], a mobile phone app for finding friends at recess connected in a mixed group of elementary students who

Awareness	Communication Style
	(Sensory) Sensitivities
	(Dis)ability
Acceptance	Way of doing things
	Level of Quirky
	Favorite Activities
Appreciation	Occupation
	Survivor
	Travel
Generic	Favorite Food
	Where do live
	Relationship status

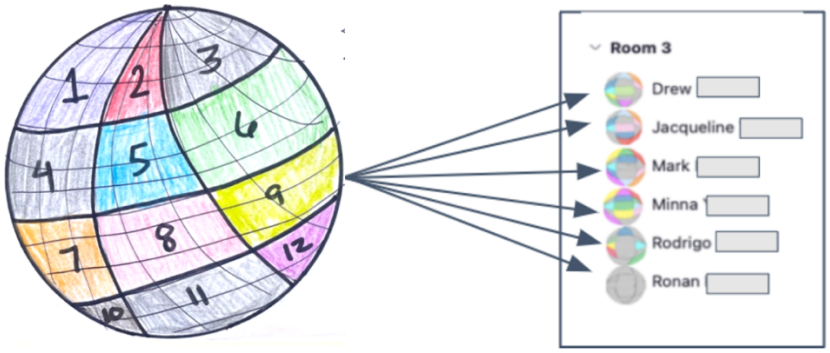

Figure 2: Left: Twelve initial topics derived from participant input. Right: Mockup of personalized Disco Ball Profile Image

all used the same app together. Additionally, *Incloodle* a collaborative Photo-taking app for children of mixed abilities [20], *vrSensory* [5]. Japan art installation modified to include discussion without requiring co-location [14]. Also, interdependencies between people with varying roles and abilities alongside technologies highlights the complex relational dimension of inclusive technologies [2]. Theoretically, the mechanism for change in these types of technologies is based on providing reciprocal support for mixed ability group work, play, or otherwise engaging in collaboration. Technology can also be aimed at the public to change perceptions of others by decreasing stigmas, as stigma is a primary barrier to quality of life for autistic people. The goals of each autism technology need not be incongruent given all paradigms intend to improve the quality of life yet target different audiences using different mechanisms.

2.5 Celebratory Technology for Neurodiversity

Celebratory Technology for Neurodiversity is intended to reduce social stigma by targeting the public at large. Celebratory Technologies aim to support the concept of neurodiversity through the promotion of a positive and broader story of individuals, rather than casting a single, stereotyped story of disability as being "lesser than" with exceptional or ordinary cases of inspiration. The focus here is on appreciating neurodiversity, rather than singling out neurodivergence as an exception. Celebratory Technology offers a new paradigm by shifting the burden of change from the neurodivergent person's skillset or providing accommodation for them to changing society's biases at large. Shifting the focus of research outside of the autistic body (and the others involved in their immediate context) creates a new space for design that extends beyond the bodies of a few and calls on all to embrace humanity as a whole.

3 PRELIMINARY DATA VIA A DESIGN PROBE

A preliminary design probe with an autistic adult led to the conceptualization of a neurodivergent-friendly alternative or augmentation to a profile picture for classroom applications such as zoom. The concept was an alternative to profile pictures that veers away from the normative view of an image of a person instead to be a collage of positive personal interests, experiences, attributes to be used by all (see Figure 2). This first instantiation of a Celebratory Technologies yielded a use case that could provide a positive first impression to initiate high quality contact using a small icon of a disco ball with 12 tiles as profile image on zoom. The design probe was conducted with an autistic adult who is a self-advocate and disability studies doctoral candidate. A total of 3 hours of interview and design sessions were conducted. The broad interview questions were: "What are ways you think we can celebrate neurodiversity?"; "What would you design to celebrate neurodiversity?"; and "What information would you like to portray about yourself to someone who is newly meeting you." Notes were coded and condensed into themes and translated into an interface sketch. The participant spoke about ways to improve the understanding of autism extensively. He stated: *"There needs to be respect for different abilities. We have different strengths, and nobody is perfect. Respect quirks, we don't do things the same way. . . .no two of us are alike. Understand that socially we are different. We have different tolerances to sensory"*. From these initial statements and similar ones, the themes of Awareness and Acceptance were drawn. When asked how to celebrate he hesitated and mentioned the risk of celebratory efforts being perceived as "inspiration porn" [13]. We discussed this concern at length, and I reiterated that *Celebratory Technology for Neurodiversity* would be a technology for every social media or groupware user. I explained that the goal is not focused on objectifying disability, and that disability status may or may not even be mentioned depending on a user's preference or could be left blank. He then added he would like to be celebrated for his achievements, talents, interests. With design requirements and a touch of celebratory flair, a customizable disco ball shape was imagined. Each tile represents a trait or experience that is assigned a color code, resulting in a unique and beautiful disco ball image of every user. The rationale for the design relates to the idea that a picture (of a face) may be worth 1000 words to some—specifically, those who easily recognize faces and emotions. The disco ball design changes the format of those 1000 words to be an interpretable chart. Similar practices exist in the mainstream such as noting personal details to one's office door or as adding emojis to a person's username. This technologically enabled customized profile information celebrates

neurodiversity. After the sessions, twelve topics were curated from the interview and design session to populate the disco ball profile image. The goal of changing the first impression was operationalized as a customizable disco ball icon as an neurodivergent-friendly alternative to a profile picture. Synthesizing the comments from the interview, the participants for this probe focus on providing information about disability awareness, acceptance, and appreciation. As this is a late breaking work, these insights will be applied to the next step of co-design with a neurodiverse sample of social media users. An initial sketch appears in Figure 2.

4 DISCUSSION

This work introduced a new paradigm to the autism technology ecosystem—namely, Celebratory Technologies. Celebratory Technologies aim to support Neurodiversity by introducing the public to a broader story of an individual, rather than casting a single, stereotyped story of disability as being "lesser than" with exceptional or ordinary cases of inspiration porn. The focus here is on appreciating Neurodiversity—the reality of the word we all live in—rather than singling out neurodivergence as an exception. The paper includes an initial instantiation of Celebratory Technologies. The concept was an alternative to profile pictures that veers from the normative view of an image of a person to instead profile pictures to be a collage of positive personal interests, experiences, attributes to be used by all. Future work will consist of designing options for each question and brainstorming with a research assistant to create two low fidelity alternatives to be applied to future feedback sessions from the same participant as well as expanding to many more design participants.

5 CONCLUSISON

The current work introduces a new paradigm for technologies for autism, borrowing from a paradigm introduced two decades ago around changing the narrative related to undesired eating patterns-Celebratory Health Technology [10, 12] and more recently HCI in a project to motivating women's physical activity by creating "new ways to experience valued behaviors and express valued beliefs [8]. Celebratory Technology shifts from reprimanding individuals for poor habits to celebrating positive aspects of living. This work repurposes Celebratory Health Technology to propose *Celebratory Technology for Neurodiversity.* It intends to reduce social stigma by targeting the public at large. This pilot work sought user requirements that were derived from current research on autism social stigma, the mission of the neurodiversity movement [15], as well as a design session with an autistic adult. Congruence between these two sources revealed three key design implications for technology: provide **awareness** of the autistic experience; generate **acceptance** of the neurodivergent experience; cultivate an **appreciation** for talents and accomplishments of neurodivergent people. This work is a first step toward establishing mechanisms for social change.

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