Mainstreaming Sensory-Integrated Garments: A User-Centred Approach to Fashion Inclusion

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ABSTRACT

The fashion industry is making strides towards inclusivity, yet sensory-integrated garments for neurodivergent adults remain underrepresented, limiting self-expression, social inclusion, and functional dressing opportunities. While adaptive fashion has evolved for children, adults face a scarcity of stylish, sensory-friendly options tailored to their needs. This research utilises a mixed-methods approach, combining user-driven insights with iterative design methodologies to develop garments balancing sensory-friendly features with contemporary aesthetics. By capturing neurodivergent adults' sensory preferences through surveys and user trials, the study generates prototypes prioritising comfort, style, and self-expression. The findings demonstrate how adaptive fashion can foster social inclusion and challenge the utilitarian focus of existing designs. Additionally, this research advocates for a shift in fashion education towards inclusive, human-centred design practices, preparing future designers to address diverse needs. By bridging functionality and aesthetics, the study offers a model for advancing adaptive design and shaping a more inclusive and socially responsible fashion industry.

Keywords: adaptive fashion; inclusivity; neurodivergent adults; sensory integration; user-centred design.

LITERATURE REVIEW

Adaptive fashion refers to clothing designed to meet the functional and aesthetic needs of individuals with disabilities, both visible and invisible (Muzhen et al., 2023). These garments often feature adjustments such as magnetic closures, Velcro fastenings, repositioned openings for medical devices, and seamless designs for sensory sensitivities (Bhandari, 2023). Employing universal design principles and specialised manufacturing processes, adaptive fashion aims to accommodate diverse consumer needs (Dong et al., 2005; Carroll et al., 2007; McBee-Black, 2021). With 24% of the UK population reporting a disability in 2023 (House of Commons, 2024), the demand for inclusive clothing is both significant and urgent.

A pivotal moment in adaptive fashion occurred when Tommy Hilfiger launched an

adaptive childrenswear line, featuring practical modifications whilst maintaining the brand's aesthetic identity (McBee-Black, 2021). This initiative set a new standard, inspiring brands such as Marks & Spencer, ASDA George, and Lucy & Yak to create their own adaptive ranges. These initiatives highlight the increasing recognition of adaptive fashion's role in enhancing functionality, self-expression, and social inclusion (Luu et al., 2022; Bhandari, 2023).

Historically, adaptive clothing followed the medical model of disability, focusing on functionality and 'correcting' impairments (Kosinski et al., 2018), marginalising individuals by neglecting their agency and self-expression (Rana et al., 2024). The model's emphasis on individual limitations perpetuated societal exclusion and ignored systemic barriers (Andrews, 2020; Hayes, 2021). In contrast, the social model of disability shifts the focus to societal structures as the primary obstacles to inclusion, influencing modern adaptive fashion to empower and integrate individuals with disabilities (Kosinski et al., 2018).

Recent literature highlights a shift towards inclusivity in adaptive fashion and neurodiversity. Doyle (2020) examines neurodiversity through the lens of cognitive and sensory processing, offering crucial insights for inclusive fashion. Similarly, Sewell (2022) highlights the intersection of sensory sensitivities and adaptive clothing, while Nathibai et al. (2024) advocate for greater diversity and representation in apparel design. These studies demonstrate a growing commitment to moving beyond the medical model to embrace inclusive design, whilst highlighting persistent gaps in addressing diverse needs.

Sensory integration refers to the ability to process and respond to sensory input, with neurodivergent individuals often experiencing hypersensitivity or hyposensitivity to tactile stimuli (Patil and Kaple, 2023). This can cause discomfort, maladaptive behaviours, and hinder social participation (Urwin and Ballinger, 2005). Fabrics such as wool or polyester are known to exacerbate discomfort, triggering overload and further limiting engagement (Kyriacou et al., 2021). Sensory-friendly clothing, designed to alleviate these challenges, is vital for enabling social and daily participation for neurodivergent adults (Kay et al., 2024). The sensory-friendly fashion market meets needs by using soft textures and eliminating irritations to reduce discomfort (Kyriacou et al., 2023; Kay et al., 2024). However, this sector remains dominated by independent brands offering limited options of scaled-up childrenswear (JettProof UK, 2024; Sam Sensory Clothing, 2024; Sensory Smart, 2024). While adaptive fashion has improved inclusivity, it predominantly caters to children; lacks diversity and style; and follows a medical model (Hines et al., 2014; Marsack-Topolewski et al., 2021; Bagatell et al., 2023). Research highlights a need for more fashionable, versatile sensory-integrated clothing (Morris and Davis, 2024; Nathibai et al., 2024). This paper addresses the gap in sensory-integrated clothing by collaborating with disability outreach programmes, inclusion services, and residential care centres to develop inclusive fashion for

neurodivergent adults, with sensory-friendly garments moving beyond medical models, emphasising inclusivity and personal expression.

Emerging research highlights clothing's potential to enhance social inclusion, independence, and well-being (Nathibai et al., 2024). While a portion of brands have advanced adaptive fashion, stylish sensory-integrated options for adults remain a significant market gap (Kabel et al., 2016; Luu et al., 2022). This study aims to address this gap, bridging functionality and aesthetics to advance inclusive fashion and societal perceptions. Literature further highlights the importance of user-centred, collaborative design approaches in addressing diverse needs across size, gender, and disability (Jun, 2024; Nathibai et al., 2024). Integrating these methods is critical to creating designs that not only meet practical requirements but also challenge conventional norms in fashion education and societal perceptions, advancing inclusivity in both design and culture.

Fashion pedagogy, historically focused on technical skills and industry readiness, has often neglected broader ethical and social discourses (Baeza and Quinn, 2021; Reed et al., 2022). Bednall (2022) argues for a re-evaluation of curricular frameworks to align with contemporary values, including sustainability, inclusivity, and ethics. This research contributes to this evolving landscape by integrating user feedback into design processes and proposing experiential, community-driven learning methods. Human-centred pedagogies encourage students to engage with real-world challenges (Krippendorff, 2005), fostering critical thinking and preparing them to address the complex socio-political and ecological issues shaping the dynamic fashion industry. By situating adaptive fashion within both inclusive design and educational reform, this research bridges gaps between industry, academia, and marginalised communities. It not only aims to create sensory-integrated garments for neurodivergent adults but also equips future designers to approach fashion as a tool for social impact, challenging exclusionary practices and advancing a more inclusive vision for the future.

METHODOLOGY

Recent research emphasises a critical gap in the availability of stylish, functional, sensory-integrated garments for neurodivergent adults. While adaptive clothing has primarily focused on children and adhered to the medical model (Hines et al., 2014; Marsack-Topolewski et al., 2021), there is increasing demand for inclusive, aesthetically diverse options for adults (Sewell, 2022; Morris and Davis, 2024). This research responds to this need by adopting a mixed-methods approach integrating user-driven insights with design-based practices, aiming to develop garments that enhance sensory satisfaction, self-expression, and social inclusion. By bridging functionality with aesthetic appeal, this study advances adaptive fashion and aligns with the growing neurodiversity movement in design (Doyle, 2020; Nathibai et al.,

2024). The mixed-methods approach combines qualitative and quantitative methods to investigate the sensory preferences and design needs of neurodivergent adults. This approach is grounded in a user-centred design ethos and incorporates an iterative framework to address the diverse requirements of the target population, emphasising usability, inclusivity, and cultural relevance.

The first phase involves deploying a detailed questionnaire to capture sensory preferences and challenges related to clothing. The survey explores dimensions such as comfort, style, sensory diets, and dressing routines. By combining closed-ended questions for quantitative analysis and open-ended questions for qualitative insights, the study provides a thorough understanding of user experiences. Descriptive statistics will identify key trends, while thematic analysis of open responses will reveal nuanced themes (Braun and Clarke, 2014; Deterding and Waters, 2021; Christou et al., 2022), enabling a deeper understanding of sensory preferences (Hines et al., 2014; Marsack-Topolewski et al., 2021; Bagatell et al., 2023).

The second phase involves sensory-integrated garment user trials (SIGUT) with 15 adults aged 18 to 35, recruited through disability outreach programmes and local services. This age group is selected due to the role of clothing in transitions toward independence, where both functionality and aesthetic appeal are crucial. Participants will trial up to five garment prototypes, developed from questionnaire insights. Data collection includes qualitative feedback from semi-structured interviews and focus groups, alongside quantitative data from pre- and post-trial questionnaires. Additionally, caregivers' insights are integral to the research, by capturing their feedback on the emotional and logistical aspects of dressing routines, the study ensures that the garments address both individual and caregiving needs (Hines et al., 2014; Marsack-Topolewski et al., 2021). This dual approach ensures both participant and caregiver perspectives are captured, providing a holistic understanding of the prototypes' impact. The iterative design process is central to this study, prototypes will evolve based on feedback, ensuring continuous refinement to better meet the practical and aesthetic needs of neurodivergent adults.

This study's mixed-methods approach bridges empirical research with practical garment development, addressing a significant gap in sensory-integrated clothing for neurodivergent adults. By emphasising both functionality and aesthetics, the research highlights the potential of inclusive design to enhance independence, social inclusion, and self-expression. The findings contribute to advancing adaptive fashion while laying the groundwork for future innovation (Rana et al., 2024).

DISCUSSIONS

This study addresses a gap in adaptive fashion by focusing on sensory-integrated garments for neurodivergent adults, a group largely overlooked in current fashion discourse. While specific brands have made strides in children's adaptive fashion, the adult market, particularly for neurodivergent individuals, remains underserved (McBee-Black, 2021; Luu et al., 2022). Existing sensory-friendly garments often prioritise functionality over style, limiting self-expression and social inclusion (Kabel et al., 2016; Kyriacou et al., 2023). This research aims to develop designs addressing sensory needs whilst offering style and comfort for enhanced social participation.

Building on the medical and social models of disability (Kosinski et al., 2018; Casanova and Widman, 2021), this study creates design guidelines that prioritise empowerment and inclusivity. These guidelines integrate insights from user trials, focusing on fabric choices, garment structure, and sensory-friendly features while preserving aesthetic value, The aim is to provide practical principles for fashion brands to develop adaptive garments that accommodate sensory preferences and promote self-expression, aligning with the broader shift from a medical to a social model of disability in design, emphasising dignity and inclusion (Andrews, 2020; McBee-Black, 2021).

Aligned with IFFTI's emphasis on innovative methodologies, this research advocates for a shift towards human-centred design in fashion education. Traditional pedagogies often prioritise technical skills at the expense of inclusivity and sustainability (Postlethwaite, 2020; Murzyn-Kupisz & Hołuj, 2021; Baeza & Quinn, 2021; Reed et al., 2022). Findings will inform the development of educational resources, such as case studies, collaborative workshops, and interdisciplinary projects, promoting experiential and community-driven learning approaches. These initiatives encourage students and practitioners to consider the needs of marginalised groups, particularly neurodivergent individuals, fostering critical thinking and engagement with real-world challenges, and inspiring a more inclusive fashion industry that champions diversity, social responsibility, and sustainability.

By situating adaptive fashion within broader educational frameworks, this study advocates for reimagining fashion education to address contemporary demands for inclusivity, sustainability, and ethics. The proposed guidelines and teaching materials offer a replicable model for integrating inclusive design into curricula across creative disciplines, preparing future designers to challenge exclusionary practices and shape a more equitable and socially responsible fashion industry (Krippendorff, 2005; Bednall, 2022).

CONCLUSION

This research bridges critical gaps in inclusive fashion design and education by addressing the unmet need for stylish, sensory-integrated garments for

neurodivergent adults. By integrating empirical insights with innovative design practices, this study demonstrates how adaptive fashion can enhance dignity, comfort, and social inclusion while fostering sustainability and ethical responsibility. Beyond garment creation, this work seeks to inspire a cultural shift within both the fashion industry and education. It highlights the transformative potential of inclusive design to empower neurodivergent individuals and shape a more equitable fashion ecosystem. The study further calls for the integration of user-centred and inclusive design frameworks into fashion curricula, equipping future designers to address evolving social and ethical demands.

By uniting education, practice, and industry, this research sets a foundation for adaptive fashion solutions that prioritise inclusion and accessibility, offering a vision for a future where fashion serves as a tool for empowerment and social change.

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