

Adaptive active – Embedding inclusion into activewear

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Concept and context: For one in five Americans living with a disability, clothing, particularly dressing, can be a major barrier for social participation (Gilleard & Higgs, 2015). Adaptive apparel, or ready-to-wear clothing that includes modifications or “adaptations” to accommodate easier dressing, is one clothing option available to people living with disabilities (Moniuszko, 2018). The adaptive apparel market is emerging as an important segment for potential innovation and growth in the fashion industry. According to a presentation by Coresight Research (Weinswig, 2018), this market is projected to grow to \$51.8 billion by 2020. However even today, the adaptive apparel carries a stigma of being unfashionable, based in medical garments, and for the very old. Kosinski, Orzada, and Kim (2018) purport that apparel manufacturers should create mass-marketed apparel with adaptive features that help individuals with disabilities address their functional, aesthetic, and expressive needs and eliminate the stigma of adaptive clothing. Some examples of adaptive features include easy to use closures, fits for seated positions, access to medical devices or prosthetic limbs, and extra garment ease. In the best versions of adaptive apparel, the modifications are not noticeable and can provide additional functionality for all users, regardless of ability (Feather, 1991).

When compared to mass-market apparel developed for “able-bodied people,” there is a paucity of apparel product choices for people living with disabilities (Gilleard & Higgs, 2015; Strickfaden, Johnson & Tullio-Pow, 2013). This lack of variety in apparel may cause people living with disabilities to feel excluded from participating in certain activities (Kabel, McBee-Black, & Dimka, 2016), particularly when it comes to activities that require specialized garments such as activewear for physical activity and sports. Physical activity and participation in sports for people living with disabilities reduces the risk of developing secondary health conditions that are supplementary to a primary disability (Lakowski, & Long, 2011). Lakowski & Long (2011) state, “In addition to prevention of secondary conditions, individuals with disabilities who participate in sports have higher self-esteem...and skills like teamwork,



Figure 1. Left: Processed standing and sitting 3D body scans ready to be made into half-scale dress forms. Middle: Draping garments on seated position form to check fit and utility. Right: Laser cutting fashion fabric

goal-setting, the pursuit of excellence in performance and other achievement-oriented behaviors necessary for success in the workplace are developed.” A lack of accessible activewear options should not be a barrier for people living with disabilities participation in physical activity. There is a general scarcity of activewear that is designed for people living with disabilities and, as of yet, no major brands or designers have addressed this gap in the market offering. Therefore, the goal of this activewear ensemble was to develop an activewear concept that has adaptive features, is functional, and is fashionable.

Functional and aesthetic properties, visual impact, and cohesion: The design consists of three separate activewear garments including a vest, shell, and jumper, each having features to make the garments more inclusive of people living with disabilities. The design aesthetic for these activewear pieces are in the style of Adidas by Stella McCartney and Vera Wang RTW. The garments in this design are suitable for a variety of summer outdoor sports identified on disabledsportsusa.org. Overall the garments are meant to be lightweight, durable, and have features that make them easy to don and doff. The jacket is a lightweight layer with a relaxed fit. The vest and shell are made from a featherweight ripstop nylon. The vest weighs only 6.2 oz, and the shell weighs 1.3 oz. There are four zippered pockets with large pulls that are easy to locate and pull and an inner draft flap. The three-piece hood has two-way adjustability. The lower half of the vest can be removed for people who are in a seated position and is attached with easy to use button and buttonholes on tabs. The extra-low arm openings add ventilation, are easier for dressing and layering, and add a sporty style. The shell provides a lightweight layer of thermal wind protection with great laser-cut ventilation. It is a wrap style that secures with easy to use closure made of magnets at each shoulder. The jumper is made of a polyester/spandex scuba knit that has great stretch and a moisture wicking finish. This layer has a large neck opening with elastic bindings and a drawstring waistband. The shoulder seam can be unsnapped to create a larger space for the armhole to make it easier when dressing. Overall, the three garments create a breathable garments system that may be easier to put on than traditional active wear. “Able-bodied” consumer may also find these features useful.

Process, techniques, and execution: The author asked an able-bodied model to pose in a standing and seated position while she captured 3D body scans of the fit model. The body scans were used to create half-scale dress forms in both the standing and seated position to drape the garment patterns, ensuring that the garments would fit in both positions. The author acknowledges that best practice would have been to find a fit model representative of individuals with disabilities. The half-scale dress forms were developed following procedures outlined in Vuruskan & Ashdown (2018) and Morris, Aflatoony, and Romine (2018). The draped patterns were transferred to paper and digitized into Optitex. From Optitex, the author exported the half-scale garment patterns to Adobe Illustrator where the laser cutting embellishment was added. Laser cutting was added in this design for aesthetic surface decoration and functional thermal ventilation. The garments were laser cut from muslin in half-scale, sewn, and fit tested on both the standing and seated half-scale forms. This process was repeated for one more iteration to refine the patterns. Once the patterns were finalized, the patterns were increased to full-scale in Illustrator. The author laser cut the garment pattern and surface ornamentation in one process. The final garment was constructed using industrial sewing techniques.

Design contribution and innovation: *Adaptive Active* builds on research that explores reducing apparel-related barriers for people living with disabilities by exploring adaptive apparel features for inclusive activewear. By including adaptive features, the author feels that these garments are marketable to a wide variety of people, regardless of ability. This design adds value to the existing body of work about the apparel needs of people living with disabilities and adaptive apparel by implementing functional features

into ready-to-wear activewear garments. Mainly, this work reflects on need for activewear that is inclusive of people living with disabilities and cogitates that people with disabilities are physically active individuals. Designers should consider the needs of people living with disabilities in the design of ready-to-wear clothing as to not unintentionally develop apparel that excludes certain user groups from participating in activities that enhance well-being.

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Materials: ripstop nylon, polyester/spandex scuba knit

Measurements: Female mannequin size medium (chest: 34", waist: 27"; hip 37")

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