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Design

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Disability is an ever-present human condition, an integral part of the continuum of every individual's life. Because everyone will be disabled at some point, disability is not a condition of a minority market (Davis 1995, 2002). Yet designing for disability is often regarded as a specialty area among architects or product designers, who often have to work within legal constraints, such as the building accessibility guidelines set forth in the Americans with Disabilities Act (ADA), in order to accommodate the needs of disabled individuals. Prior to the ADA, the work of very few architects and designers considered sensory impairments or wheelchair access and maneuverability in interior spaces, much less in public ones. By failing to consider and integrate limited perceptual and mobility levels, their designs posed barriers to some users. These barriers, as well as social and economic attitudes and policies that ostracize and exclude, socially construct "disability." In contrast, "inclusive design" is a practice that seeks to avoid such barriers, so that individuals with a diverse range of abilities can function more easily and fluidly within the built environment. The inclusion of curb cuts in sidewalks as a result of disability activism offers a famous early example of a simple change that benefits all users, from wheelchair users to cyclists to people wheeling luggage.

Designers can better serve humanity by integrating human changeability and rangeability into design theory and practice from the outset, rather than isolating less common or less frequent ability ranges within the categories of "disability." This is especially so if designers are serious about a vision of sustainability that not only entails environmental and economic concerns but also strives for social equity (Braungart and McDonough 2002). Spaces and products designed for longevity and usefulness could easily support an individual's transition through a full range of abilities. For example, by designing all buildings with full accessibility features in the form of grouped apartments, the assisted living community Ros Anders Gård in Västerhaninge, Sweden, eliminates the need for disruptive relocations as seniors lose abilities. The apartments open onto common spaces and common kitchens, and they are domestic and homelike rather than institutional, so that residents can come early and live there, as independently as possible, for the duration of their lives (Evans 2009).

Because this type of inclusive design is not yet widespread, consumers accept that they will likely need to buy a new house or cooking tools or clothes as they age or gain some weight. Built-in product limitations, combined with manufacturer's cultivation of planned obsolescence and expendability of goods, which force the purchase of specialty designs for changed abilities, have increased the profitability of mass production. In fact, this unsustainable but profitable design strategy stems from twentieth-century machine-based methods of mass production and standardization. Before the emergence of the industrial processes that made large-scale production possible, clothes were sewn for individual bodies to include the possibility of alterations. The onset of mass-produced clothing arose concurrently with social scientific methods of biometrics, anthropometry, and statistical averaging. Consumers became accustomed to the codification of bodily diversity into a small number of normalized sizes and body types, to the exclusion of others (Banta 1995). This process was carried

to an extreme in clothing made for individuals in state institutions offering physical and mental care; not just the working professionals but also those receiving their care were made to wear uniforms. This "institutional" culture and aesthetic has marked design for nonnormative populations throughout the twentieth century, and only recently have wheelchairs, hearing aids, and fashion become much more stylish, decorative, and customizable for individual preference, expression, and need.

Early twentieth-century institutional practices, such as the medical model of rehabilitation that isolated disabled individuals from society, reinforced ideas of disability as difference from an idealized normality (Silvers 1998; Serlin 2004; Linker 2011). Many modernist designs of the 1930s and 1940s furthered this approach, as principles of streamline design mirrored progressive eugenic sociopolitical policies aiming to eliminate "degeneracy" from the modern world, at the same time emphasizing the "ideal" as standard (Cogdell 2004; Gorman 2006). Marking the beginnings of a changing attitude in the mid-twentieth century, the firm of Henry Dreyfuss Associates created the ergonomic templates for "Joe" and "Josephine," statistical representations of imaginary male and female types that each encompassed a *range* of sizes (Dreyfuss 1955). Dreyfuss used Joe and Josephine as the basis for ergonomic design, exemplified by the iconic Bell telephone design in which the handheld portion conformed to size and angle constraints that would be comfortable to human hands.

This new approach, whereby a single design could serve a wide range of sizes and abilities, laid the foundation for the principles of universal design, initially promoted by designer and disability rights advocate Ron Mace in the late 1980s and popularized later by OXO's Good Grips line of cooking utensils. Inclusive design, Europe's counterpart to universal design, identifies how particular designs exclude users and attempts to promote inclusion throughout the design process (Clarkson et al. 2003; Pullin 2009; Williamson 2011; Hopper 2012). As the most widespread approach today, inclusive design inherently recognizes that disability and difference are normal, aiming to affirm human rights and dignity by designing for all without stigma. Promising trends in culture and design—such as the recent revival of handcraft and the local, and greater attention to fostering human diversity and biodiversity—suggest a changing mind-set that facilitates broader factoring of full rangeability into all levels of design ideation and production.