



Exploration of Transformable Garment Design Strategies on Dresses for Sustainability

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Keywords: transformation, dress, sustainability

According to a recent report, the global apparel market value was estimated at \$1.7 trillion U.S. dollars in 2012 (FashionUnited, 2015). In 2013, about 19 billion garments were consumed in the U.S., with each consumer purchasing an average of 64 garments and spending about \$1,141 (FashionUnited, 2015). Although people have individual wardrobes, only a small portion is worn regularly (Fletcher, 2008; Locker, 2008). Since fast fashion and overconsumption have been major trends for over a decade, introducing negative influences to our environment, economy, and society, more designers and consumers have sought new ways to enhance sustainability (Fletcher, 2008; Locker, 2008). In addition to designing sustainable garments by using eco-friendly materials, upcycling, and zero-waste patternmaking, transformable garments can also satisfy consumers' various needs and wants with versatile looks and functions (Fletcher, 2008; Gwilt & Rissanen, 2011; Locker, 2008; Welters, 2008).

Transformation can be considered in designs that can grow, change, renew, re-figure, re-form, or re-structure (Loschek, 2009). Transformable garments involve technologies that can convert them into different styles or silhouettes, thus reducing the need to purchase new garments and extend the garment's lifecycle (Fletcher, 2008). For example, a dress that can change its style, such as in length or silhouette, can be worn in different ways and in various contexts. Transformable garments have great potential to prevent and minimize waste in a product's lifecycle by encouraging consumers' natural engagement in sustainable fashion acts. However, there is an overall lack of research about transformable garments. The extant research only addresses a limited item compared to the various kinds of products worn by individuals. Thus, the purpose of this research is to understand consumers' preferences and expectations for transformable dresses, focusing on the aesthetic aspects and exploring possible changeable design options for transformable dresses.

Data were collected from a convenient sample of female college student consumers from four universities in the U.S. using an online survey technique. The survey questionnaire was self-developed based on a literature review, including items on transformable dress preferences and focusing on aesthetic aspects (i.e., color/pattern, size/fit, silhouette, garment type, and design details), fashion behaviors regarding wardrobe diversity, dress preference, purchase experiences, reasons for discontinued use of dresses, and demographic characteristics. The questions were mixed with open-ended and close-ended questions. A 7-point Likert scale was used (1=strongly disagree to 7=strongly agree) for the close-ended questions.

The mean age of respondents was 19.6 years with a range of 18 to 54, of which 95% were below 24 years old. The majority of the respondents was White or European (73.4%) and were freshman (63.4%), with a monthly income of less than \$1,000 (90.7%). They mostly purchased two to three dresses in the Spring/Summer (32.2%) and in the Fall/Winter (61%); in black

(95.5%), blue (73.3%), and white (73.6%); organic patterns such as floral (77.4%); with silhouettes of fit and flare (90.1%) and sheath (73.6%); in sleeveless style (88.4%); with a scoop neckline (90.4%); with set-in pocket styles (69.2%); for casual (94.5%) and formal/evening (77.1%) occasions; and in lengths that varied from short to long. As for transformable dresses, the preferred changeable design aspects were style/occasion (47.6%), dress length (41.4%), color/pattern (41.1%), silhouette (37.7%), size/fit (37%), neckline type (25%), sleeve type (19.5%), and pocket type (14.7%). The preferred changeable color/pattern options were black (78.8%), white (51%), and blue (43.5%) with an organic pattern (57.2%); sizes were small (4-6) (56.2%), medium (8-10) (35.3%), and large (12-14) (16.4%); silhouettes were fit and flare (77.1%), sheath (64%), and empire waist (42.5%); styles were for casual (77.1%), formal/evening (61.3%), cocktail (65.8%), work (57.2%), and prom (18.2%); dress lengths were short (72.9%), knee-length (70.2%), and long (62%); sleeve lengths were sleeveless (67.8%), short (59.9%), long sleeve (55.1%), and $\frac{3}{4}$ sleeve (50.3%); sleeve types were sleeveless (76%), standard set-in (53.1%), one-shoulder (35.3%), and cap (34.9%); necklines were V-neck (67.8%), scoop (64.7%), surplice (40.4%), boat (36%), and round (31.8%); pockets were set-in (59.9%), and none (51%). The preferred transformable design techniques were reversible ($m=5$, $SD=1.68$), tying/folding/wrapping types ($m=5.05$, $SD=1.56$), smart clothing ($m=4.91$, $SD=1.55$), modular type ($m=4.82$, $SD=1.46$), and do-it-yourself style ($m=4.72$, $SD=1.75$). Participants moderately favored purchasing the transformable dresses ($m=5.15$, $SD=1.48$). Fifty percent of participants have purchased or worn sustainable clothing, including used or vintage clothing (54.8%), clothing made of recycled materials (28.8%), reformed clothing (13.4%), and transformable clothing (8.2%).

Overall, the participants were open to the idea of purchasing transformable dresses with several key preferences. The results of this research can be beneficial for apparel designers when developing transformable dresses with the guidance of consumers' preferences and expectations. The identified consumers' preferences and expectations may bring insight for merchandisers and retailers in the fashion industry about consumer motivations for purchasing such sustainable dresses.

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