Exploring the Abilities of 3D Printing and its Viability for Consumption in the Fashion Industry

Laura C. Corral, Kaitlyn J. Walker, Stephanie K. Hubert, M.S., Kathleen R. Smith, Ed.D., Lance M. Cheramie, M.S., University of Arkansas, Fayetteville, USA

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With the ever-evolving state of today’s technology, designers and retailers in the apparel industry are seeking out new technological methods that have the capacity to revolutionize and individualize their brand, as well as meet consumer needs and preferences. An emerging technology is 3D printing, which utilizes computer aided technology and a variety of filaments to construct an object. Consumers show interest in its application for fashion and designers have already begun exploring its capabilities in jewelry, footwear, and clothing (Vanderploeg, Lee, and Mamp, 2016). Though 3D printing technology offers the ability for rapid prototyping, a condensed supply chain, and a sustainable additive manufacturing process, there is question as to whether or not consumers are ready for 3D printed clothing to enter their wardrobes. The purpose of this study was to construct a 3D printed garment and measure consumer response to the application of this technology in ready-to-wear clothing.

The technology of 3D printing has been referred to as the “third industrial revolution” because of its potential to dramatically shorten the supply chain and the benefits of additive manufacturing (The Economist, 2012; Istook, 2000). To explore the capabilities of 3D printed technology for fashion design, we designed and created a 3D printed garment. While other designers such as Iris van Herpen have utilized 3D printing in their haute couture collections since 2010, our purpose was to create a wearable, ready-to-wear garment similar to clothing currently found in traditional retailers (Howarth, 2013). Figure 1 illustrates the outcome of the 3D printed garment.

Though a wearable 3D printed garment was successfully created, it was important to understand consumer response to our garment to test the viability and marketability of 3D printed fashion. A 36 question Likert-scale survey was conducted on the University of Arkansas campus to measure consumer response to the project garment. Three primary factors were measured: prior exposure and interest in 3D printing, general fashion interest, and aesthetic appeal of our 3D printed garment. Data analysis indicated an adequate and significant sample size (N=116), and reliability for all three factors. A T-test was conducted between male and female respondents and results indicated a significant difference for the second factor, fashion interest, with females showing a higher interest. Further descriptive statistics were utilized to illustrate differences in response between ethnicity and age groups, although no significant variances were observed in the descriptive data. Based on the overall average for all the three variables, the subjects showed
1. High interest in and a positive perception of 3D printing,
2. High interest in innovative fashion, and
3. A positive opinion on the aesthetics of the garment created by the authors.

Our ability to create a fully 3D printed garment as well as understand consumer response to 3D printed clothing provides insight into this emerging technology. The positive results of this study warrant further research into the capabilities of 3D printing to create wearable garments and how the fashion industry might adopt this technology on a wider scale in coming years. Should 3D printing take off in the apparel industry, there is potential to completely transform everything the industry currently knows about design, manufacturing, and retailing. The results of this research indicate that a major transformation in ready-to-wear style is feasible and beneficial to the apparel industry because of 3D printing.

References


Appendix A

*Figure 1. Completed 3D printed garment designed by the author*