



The Carnation Coat

Chanjuan Chen, Kent State University, Kent, OH, USA
Kendra Lapolla, Kent State University, Kent, OH, USA

Maternity, zero-waste, design research, technology

Currently, maternity clothing is treated as fast fashion meant to be discarded after each phase of pregnancy. While apparel choices for women during pregnancy have become more fashion forward, there is a need for more sustainable and adaptable maternity clothing that can be worn longer and is suitable for a variety of occasions. One of the sustainable methods that many designers are exploring is zero waste design, in which garments generate zero textile waste during production to minimize fabric scraps and increase efficiency (Gwilt & Rissanen, 2011). For example, Holly McQuillan, expert zero-waste cutter, created several men's and women's tailored jacket and trouser sets that were constructed from pieces that fit together like a puzzle (Rissanen & McQuillan, 2016). The purpose of this design is to explore sustainable and marketable design methods for maternity wear. Utilizing the strategy of zero-waste, fashion technology, and outcomes of an online survey, this design considers maternity wear with longer lifespans that can be worn before, during, and after pregnancy thus minimizing both pre-consumer and post-consumer textile waste.

For this design, targeted consumers were initially involved in an online survey to identify challenges and opportunities for the maternity market. Upon IRB approval, a survey link was posted to a Facebook breastfeeding group with moderator approval and sent through Facebook messages for additional snowball sampling. Of 240 women that participated, 13% were currently pregnant and 92% had children under the age of 3. Findings indicated strong desires for clothing that did not look like maternity wear and could be worn longer after pregnancy. As an example, one respondent commented, "Please consider clothing that can be worn before, during, and after pregnancy without appearing too maternity." Few respondents indicated they continued to wear maternity clothing after pregnancy, which mostly consisted of tank tops, cardigans, and leggings. Many felt maternity clothes were costly compared to the short period of use. Furthermore, respondents aspired to have professional clothing with easy access for breastfeeding and pumping.

Upon uncovering these design challenges from the survey, development for possible solutions began through the use of hand sketching, pattern manipulation, surface design, and fashion technology to explore possible solutions. All ideas had to consider wear before, during, and after pregnancy. A coat was considered a specific design challenge because the higher cost investment could make the longer lifespan more beneficial to consumers. The computer aided design (CAD) system, OptiTex, was used for creating the coat patterns. After the initial pattern pieces were drafted in OptiTex, the patterns were manipulated and placed to fit in a 60-inch-wide rectangular box representing the 60-inch-wide Italian grey blended wool fabric used for the coat. The pattern pieces were analyzed on the flexibility with the grain line and shaped to fit in the box. For example, the neckline facing was divided into three smaller pieces to fill negative space and the cuff facing was cut on a bias grain. Some seams were adjusted to fit together like a puzzle while keeping the original fit and design, such as the curved seams on the back and the shape of the cuffs. Less than 5% negative space was left on the fabric and a total 1 3/8 yards was used for the coat. Once the pattern was printed out, the fabric was cut into pieces and embroidery details were added on the hem with a Tajima TEHX-C1501 Embroidery machine. Since floral patterns were the most favorable

pattern by 240 participants from the online survey, inspiration for the embroidery patterns came from carnation flowers which are widely used for Mother's Day and symbolize a mother's undying love (History and Meaning, 2012). The carnation was designed and programmed in 6D embroidery software to create an abstract look. To achieve a zero waste design, leftover fabric pieces were cut into small flower petals, stems, and leaves creating three dimensional appliques stitched within the embroidery.

The coat has a shawl collar design with adjustable front panels which can be worn in two ways. When using the snaps, the front panels fold on the sides for a slimmer fit before or after pregnancy. When unsnapped, it can be worn as a maternity garment for pregnancy. Side pockets were created for convenience. The Italian light gray blended wool coating material adds warmth to a tailored look. A black knit dress was created to wear under the coat to finish the ensemble. The dress was designed to have easy access for breastfeeding and pumping with two zippers on the front and can be worn in a more professional context with the coat.

This design attempts to create a more sustainable maternity apparel by using zero-waste techniques and lengthening the lifespan of the garment through multiple wear functions. Utilizing the outcomes from the survey as a foundation to conduct research, the design provides for consumer and maternity market aspirations. Furthermore, this design contributes to the Stannard, Park, and Morris's (2010) design titled, *Pupa Butterfly*, which also looked at adaptable maternity clothing and one of the researchers' previous designs which explored the zero-waste design method and multiple wear function. With growing numbers of pregnant women working longer into their pregnancies than ever before (Gao & Livingston, 2015), designers can be challenged to find new ways to lengthen the lifespan of maternity apparel while also considering sustainable aspects. This could have implications for designers currently in the maternity market who are positioned to find additional creative ways to lengthen the lifespan of maternity garments.

Gao, G. & Livingston, G. (2015, March 31) Working while pregnant is much more common than it used to be. Retrieved from <http://pewresearch.org/facttank/2015/03/31/working-whilepregnant-is-much-more-common-than-it-used-to-be/>

Gwilt, A., & Rissanen, T. (2011). *Shaping sustainable fashion: Changing the way we make and use clothes*. London: Earthscan.

History and Meaning of Carnations. (2012, August 24). Retrieved from <http://www.proflowers.com/blog/history-and-meaning-of-carnations>

Rissanen, T., & McQuillan, H. (2016). *Zero waste fashion design*. London, England: Bloomsbury Publishing Plc.

Stannard, C., Park, J., & Morris, K. (2010). *Pupa Butterfly Building Alliances – Design Exhibition Catalog*. Garment presented at International Textiles and Apparel Association. Montreal, Quebec, Canada. Retrieved from https://c.ymcdn.com/sites/itaaonline.site-ym.com/resource/resmgr/Publications/2010_exhibit_catalog.pdf

