

The Impacts of Different Woven Fabrics on Three Draping Techniques

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Keywords: Draping, twist, drabeah, pleats

Draping on a mannequin is to manipulate a flat fabric to accurately fit the 3-D curves of the mannequin body to create desired designs, and is especially important for more complex designs. Fabric drape is influenced not only by fabric factors but also by their complex interactions. Although extensive information of 2-D fabric drape characteristics can be obtained from instrument measurement, Kenkare and Plumlee (2005) suggested that study of the drape characteristics of complex forms requires drape measurement not only on 2-D fabrics, but also on garments since other factors such as construction methods of clothing also affect the drape. The majority of research on draping has been focused on the draping characteristics of 2-D non-seamed fabrics and the fabric properties affecting them. Therefore, the purpose of this study is to investigate the relationship between the fabric's properties and some of the complex draping techniques on the mannequin.

Three synthetic fiber woven fabrics (velvet, taffeta and chiffon), with different fabric weights and thicknesses, and a standard mannequin size 40 were chosen to study three draping techniques including twist, drabeah and pleat. Laboratory testing equipment was used to collect data regarding fabric weight, thickness and drape coefficient. Laboratory testing result showed that velvet has the best drape with the smallest drape coefficient (0.435), followed by chiffon (0.551) and taffeta (0.928). Twist is to turn or spin one or two pieces of cloth (around the central axis) to form regular or random folds or gathers. In this study, twist techniques were divided as simple twist using one piece of fabric (Figs. 1a & 1b) and complex twist using two pieces of fabric (Figs. 1c & 1d). Drabeah is a set of compact cloth folds that sit next to each other, and usually takes the form of the body shape and curve depending on the requirements of the design (Shokry, 2001). Simple square drabeah (Fig. 1e), wide high drabeah (Fig. 1f) and gathering drabeah (Fig. 1g) were the three techniques used in this study. Pleat is a type of fold made by doubling the material upon itself, and can be stitched or unstitched (Blair, 1992). There are different types of pleats depending on their shape and width. Even pleats have the same shape and width while uneven pleats have different shape and width. In a design, pleats can also take different directions such as horizontal, vertical, or diagonal. Three types of pleats were used in this study: even horizontal and diagonal pleats (Fig. 1h), and uneven diagonal pleats (Fig. 1i).

For data collection, the finished draped samples of each technique were videotaped in the same sequence as the questions in the questionnaire. The reliability and validity of the questionnaire were tested using Cronbach's alpha and Spearman-Brown methods. The video was uploaded to a computer, and the aesthetic appearance and the suitability of the fabrics used in these draped samples were evaluated by 26 subjects (faculty in clothing and textiles discipline) using the questionnaire.

A one-way ANOVA was used to examine the differences among the three woven fabrics used in different draping techniques. The results showed that when the fabrics were used to drape the twists, chiffon gave the best result ($\alpha=0.05$) for the second complex twist (Fig. 1d), followed by taffeta and then velvet, while there was no significant difference for the other two simple and one complex twists. For the drabeah techniques, only the wide high drabeah (Fig. 1f) showed significant differences ($\alpha=0.05$) among the three fabrics; chiffon also gave the best result, followed by taffeta and finally velvet. The results indicated that as the difficulties of the twist and drabeah techniques increased, thin and light weight fabric such as chiffon would achieve the best result. However, for all pleat techniques (Figs. 1h & 1i), taffeta appeared to give the best result ($\alpha=0.05$), while chiffon and velvet were comparable. The results suggested that a combination of specific fabric properties is needed in order to achieve desirable pleats. In this case, taffeta has a stiffer hand compared to chiffon and velvet, but the fabric weight and thickness are in between chiffon and velvet.

In summary, fabric characteristics are the key role player in the development of the draping design process. Draping on the mannequin uses special techniques which require not only accuracy in implementation but also an understanding of the materials used. Results of this study showed the impacts of different woven fabrics, with distinct fabric characteristics, on three draping techniques. Among the three fabrics tested, chiffon appeared to be the most suitable fabric and showed the best aesthetic appearance for a complex twist and the wide high drabeah. However, for fabrics used to drape the pleats, taffeta turned out to be better than both chiffon and velvet. Although the laboratory testing results showed that both chiffon and taffeta have higher drape coefficients (meaning stiffer fabrics) than velvet, this study demonstrated that the drape coefficient, a commonly used parameter to predict fabric drape, alone is not necessarily adequate when consider fabrics for draping more complex techniques such as twist, deabeah, and pleats.

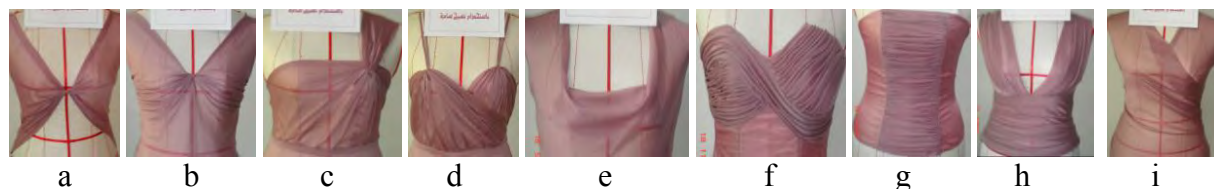


Figure 1: Images of the draping techniques

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