Can Augmented Reality Help E-shoppers Make Informed Purchases on Apparel Fit, Size, and Product Performance?

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Fit and sizing problems have been among the top complaints from online apparel shoppers. Augmented reality (AR), an interactive technology that integrates computer-generated sensory information to a physical environment in real-time (Lee, 2012), can simulate solutions to consumers' questions prior to purchase and compensate the lack of experiential information from online shopping. This technology allows consumers to virtually try on garments by viewing two-dimensional front and back images of garments on their bodies via a computer monitor with a camera for motion capture. Previous studies in this area particularly focused on the development and usability of the technology, persuasive effects of the technology (Lee, 2012), and perceived value of personalized virtual try-on (Merle, Senecal, & St-Onge, 2012). No study, to our knowledge, has examined consumers' perceptions of using AR for evaluating garment sizes and fit towards making a purchase, and perceived differences compared to actual try-on garment. Therefore, the purpose of our study was to examine consumers' perceived differences in a garment's size, fit, performance, and purchase decisions when using virtual try-on with AR compared to actually trying-on the garment. Two research questions were proposed: RQ1: Can AR applications provide an accurate representation of an actual garment in terms of fit, size and product performance?; and RQ2: Do virtual try-on with AR and actual try-on affect attitudes towards the product and purchase intentions differently?

A field experiment with one factor (i.e. the way of trying-on the test garment) within-subject design was employed. For the actual try-on condition, a gray-colored, short-sleeved fit-and-flare dress out of ten different knee-length dresses was chosen as a result of the pretest among 11 participants. The dress was purchased from a mass-retailer in sizes from XS (0-2) to XL (16-18). For the virtual try-on condition, we contacted an apparel AR developer to be able to use their application. To create the virtual dress in AR, the size medium dress was donned on a dress form, its picture was taken and uploaded to the AR developer's server. Female participants were invited to our research laboratory to use the AR application and virtually try the dress on. After the virtual trying-on experience, participants completed a questionnaire which measured fit and size perceptions of the dress, product performance risk perceptions, attitudes towards the dress, and purchase intentions. Next, participants tried the actual dress on in their respective sizes and answered the same questionnaire as they did in the previous stage. All items, except the fit and size perception scale, were measured with 7-point Likert-type scales. Items used to assess dress fit at seven areas were anchored at too loose/long/wide (1), excellent fit (3), and too tight/short/narrow (5).

Eighty seven female students from a Midwestern university participated in the study. They were on average 24 years old. Majority of them (74.7%) were European Americans, followed by

Asian/ Asian Americans (10.3%). Seventy two percent of the participants wore small (4-6) (35.6%) and medium (8-10) (35.6%) sizes. The large majority (89.7%) indicated that they had bought apparel online. Cronbach's *alpha*s were all greater than 0.8. Paired-sample t-tests were conducted in SPSS 22 to compare participants' answers to the virtual versus actual try-on.

For RQ1, mean differences in perceptions of fit and size and perceived product performance risk were compared between experiences with virtual and actual try-on. Results showed significant differences in seven areas: participants perceived looser fit around bust (ΔM= -.28, SD= 1.00; $t(84) = -1.35$, $p < .05$) and shoulder (ΔM= -.22, SD= .93; $t(86) = -2.01$, $p < .05$) when virtually trying on the dress simulation. However, areas such as waist (ΔM=.39, SD=97; $t(86) = -2.58$, $p < .001$) and hip (ΔM=.43, SD=.83; $t(85) = .4.79$, $p < .001$) were perceived tighter when using AR. When using AR, lengths were perceived to be longer at the following areas: torso (ΔM= -.26, SD= .92; $t(86) = -2.68$, $p < .01$), skirt (ΔM=-37, SD=.94; $t(86) = -3.68$, $p < .001$), and overall dress (ΔM=-.42, SD=.76; $t(84) = -5.13$, $p < .001$). This has probably occurred because the 2D AR dress was superimposed on the participants' 3D images on the screen and it was not wrapping around their bodies, making an accurate fit perception difficult. There was no statistical difference between the dress' virtually perceived size (M= 2.69, SD=1.16) and experienced size (M= 2.65, SD= 1.23) ($t(86) = -1.75$, p= .41), implying that consumers would be able to guess their sizes correctly when using a similar application for online shopping. Regarding product performance risks, nine attributes of the virtual dress (i.e. style, fit, fabric, details, touch, weight, appearance, comfort, and coordination with other items) individuals perceived less performance risk when trying on the virtual dress than the actual dress. However there was no significant difference in garment color between two conditions, implying that AR allowed consumers to guess accurate color of the garment. For RQ2, the results indicated that participants tended to have more favorable attitudes towards the garment (ΔM=.33, SD=1.15; $t(85) = -2.62$, $p < .05$), and greater purchase intentions (ΔM=.48, SD=1.94; $t(85) = -2.32$, $p < .05$; $t(86) = -2.32$, $p < .05$) when they actually tried on the dress than when they tried it on virtually.

The findings implied that consumers would prefer to try on actual garments in their purchase decision making process. Augmented reality applications might have a potential to provide consumers with enough information related to apparel attributes (i.e., size, and color) during online shopping. However, there is a need to improve the AR software to help consumers evaluate fit. Understanding how this new technology would affect consumers' perceptions of garments can help researchers and e-tailers develop ways to reduce consumers' regret caused by post-purchase expectation-reality discrepancy.

References

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