

The effect of body-scan virtual avatars on consumers' self-perceptions and well-being

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Background and Purpose. Ensuring the right fit of clothes purchased online has been one of the most challenging problems facing apparel consumers over the past couple of decades (Hernández et al., 2019). To increase the consumer's ability to examine the fit of the clothes in an online environment, several early brands have adopted a 3D body-scan virtual avatar technology that enables consumers to examine the clothes based on their own body measurements (Velasquez, 2020). Interacting with a body-scan virtual avatar creates a unique consumer experience because it allows consumers to see themselves from a third-person perspective (Kim & Sundar, 2012). The concept of self is a critical construct to consider when examining a digital tool that displays a consumer's body because it can directly affect the well-being of consumers by generating negative outcomes such as body dissatisfaction (Baytar & Ashdown, 2015) or positive outcomes like motivation to change (Grogan et al., 2016). Therefore, it is vital for apparel retailers to examine what effects body-scan virtual avatars have on consumers' self-perceptions and well-being before they adopt this technology. The purpose of this study is to examine how different types of avatars alter the way consumers relate to themselves and thus create consequent emotional, psychological, and social impacts. Specifically, we attempted to answer the following three research questions: (1) Will different types of virtual avatars activate a different degree of self-discrepancy? (2) Among the different types of virtual avatars, which avatar type will be received better by consumers? and (3) What kinds of emotional, psychological, and social outcomes will virtual avatars yield?

Methods. We first developed the four versions of avatars including a scanned avatar, a smooth avatar, a statistical avatar, and a measurement avatar. A *scanned avatar* is a digital replica of the subject's body and is monochromatic with some discernible physical features like a face and hair. A *smooth avatar* is similar to a scanned avatar but the surface is more smoothed out. A *statistical avatar* is statistically averaged among bodies that are close to the subject's body scan in size. A *measurement avatar* is created based on the subject's body measurements (not body scanning) and is created with pre-designed body shapes or proportions. For data collection, we recruited 14 female subjects and invited them to the research lab for 3D body scanning. A \$20 cash incentive was offered for participation. Using a Human Solutions Vitus XXL 3D body scanner, we scanned the subject's body and created four different types of avatars for each subject. Further, using Gerber Accumark 3D software, we draped a garment (i.e., a mid-length dress) of appropriate sizes virtually on the avatars so that subjects can view the avatar in the context of clothes fitting. Thus, a total of eight avatars (i.e., four minimally-clothed, four fully-clothed) were created for each subject. Once the avatar images were created, an individual, face-to-face interview was scheduled for each subject. During the interview, subjects were presented

with their virtual avatars in a random order and asked to answer the questions including the perceived likeness to their actual body and their feelings (RQ1), their acceptability and preference for each avatar (RQ2), their feelings, satisfaction/dissatisfaction with each avatar, and other reactions (RQ3), and additional questions where necessary. Each interview lasted 30-40 minutes.

Results and Discussion. For RQ1, participants clearly demonstrated a different degree of self-discrepancy elicited by a different type of avatars. We found that a scanned avatar, that is the most realistic representation of the subject's actual body, elicited the higher degree of self-discrepancy than did other types of avatars. Consistent with previous findings (Gronan et al., 2016; Ridgway, 2018), participants stated that they thought they were skinnier than they were in the avatar image: *"That does not look like me, wow! I didn't think I looked that fat."* (P2); *"That person needs to lose some weight I think."* (P7). This perception increased the perceived discrepancy between their actual and ideal self. On the other hand, participants exhibited the least degree of self-discrepancy in a measurement avatar. Most participants quickly discerned that a measurement avatar is different from the other three types of avatars and does not reflect their actual body: *"I think it's the farthest from my body."* (P9); *"This is not proportionate to how my body truly is."* (P12). We found that participants were able to distance their selves from the measurement avatar because it does not depict their actual body as accurately as other avatars.

As for RQ2, for a minimally-clothed avatar, participants' top choice was quite evenly divided across four avatars. Those who preferred a scanned avatar claimed that the more realistic the better as it helps them examine the clothes fit more accurately. On the other hand, those who preferred a measurement avatar focused more on other features, like how smoothed the avatar looks and how natural the posture is. Interestingly, when it came to a fully-clothed avatar, many participants (six out of 14) preferred the measurement avatar, which is least similar to their actual body. One reason for this result is that the dress covers the body details and thus moves the participants' attention to other things, like the avatar's posture and the fit between the dress and the body: *"When the clothing is covered, there is less difference in avatar because of the shape of the garment."* (P1). Because the measurement avatar tends to create the better clothes fit due to its pre-designed body shapes and proportions, many participants indicated that the measurement avatar helps them focus on the clothes better: *"With clothes it may be better to see less details to look at the clothes instead of the avatar."* (P14).

For RQ3, participants exhibited various emotional reactions to their avatars, including surprise (e.g., *"That is wild, that is crazy! That is definitely me, this is so cool."*), frustration (e.g., *"I don't like any of them . . . because they need to lose some weight."*), disbelief (e.g., *"That's supposed to be me? well, I don't know, I know it's supposed to be me but doesn't seem like me."*), and emotional stress (e.g., *". . . use the measurement avatar in a way that is not as stressful as the others . . . others is 'here's everything' and have to break them all down to get to this shape."*). Overall, we found that the majority of participants exhibited some level of negative emotional and psychological reactions like frustration and emotional stress to their avatars. However, these negative reactions were reduced to some extent when the fully-clothed (vs. the minimally-dressed) avatars were presented. Thus, apparel retailers may need to present the avatar

with the dress on rather than the bare, mannequin-like avatar to minimize any negative effects that might arise among consumers, such as body dissatisfaction and emotional discomfort.

Further, some participants indicated that seeing their own body is hard and they prefer imagining what the garment would look like to viewing a garment on their actual body. This finding provides interesting insights because some consumers may resist using a virtual avatar although they understand the benefits of using it. To some consumers, shopping for clothing may be more of a leisure activity where they imagine their ideal self rather than realizing their actual self: “*I just like the idea of something more of what it could be [with the model picture] rather than the actualization of it [with my virtual avatar].*” (P11). These findings suggest that consumers’ shopping goals vary, and examining the accurate fit is not necessarily the ultimate shopping goal for all consumers. Thus, retailers should understand the different needs from different groups of consumers and tailor the offering to the consumer’s needs. Further, apparel brands that wish to adopt virtual avatars may consider the different types of avatars carefully to identify the most suitable type of avatar for them. This study provides some empirical evidence that consumers generally prefer a measurement-based, fully-clothed avatar. Yet, future research should examine the different types of avatars more deeply with a bigger size sample.

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