Using Interactive 3D Software to Create Manipulatable Human Figures for Body Perception

Research

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Abstract

The paper presents the use of the DAZ3D program as a measurement tool for body size perception. When studying body schema, researchers often need to manipulate body representations to examine body size perceptions. Often these figures are based on distorted measurements or altered body proportions. Our study figures are based on three-dimensional measurements of a human body. However, human bodies are three-dimensional figures controlled by parameters such as muscle mass. In our study, we aimed to analyze the accuracy of three-dimensional manipulatable figures in assessing body size perception (Nevitt, Cammalleri, & Tovee, 2012). We chose the DAZ3D program over other options (e.g., Body Morph, Fantamorph, Body Virtualizer). It is important to note that figures in these studies were designed to be used as an example of the process of manipulating human bodies. We believe that figures in these studies are more realistic and are therefore more suitable for use in body size perception research. We chose DAZ3D because of the flexibility and overall working capacity of the program compared to other options (e.g., Fantamorph, Body Virtualizer). Additionally, DAZ3D gave visual and bone marker cues for real-world measurement comparisons (see Figures 3, 4, and 5). Finally, DAZ3D was cost effective (important for those of us doing research on a budget). However, getting DAZ3D into a state where an avatar can be readily manipulated was a challenge. Thus, we have made a step-by-step guide to a working human avatar (please use the QR Code above to download a full step-by-step guide to installation).

Introduction

In order to study body schema we identified five characteristics that our computer manipulation program would need to possess. The manipulated figure needed to be three-dimensional and have the ability to be rotated in plane and depth. We needed a program that allowed flexibility of measurement choices. These measurement choices needed to display arbitrary values to the participants, but also needed to be convertible to real world measurements.

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Guide to Installation

Go to http://www.daz3d.com/get_studio to download both the DAZ Install Manager and the DAZ Studio 4.9 Pro.

You will need to install the Install Manager before downloading DAZ Studio Pro, as the Studio is installed through the manager.

Add plugins from the following links:

http://www.daz3d.com/museum-metrics-for-daz-studio

Link: https://www.daz3d.com/presets-2-female-body-morphs

Activate the plugins

Go to http://www.daz3d.com/customer/account

Select “Serial Numbers” and paste the serial code into the box with the grey wrench.

Once we created the avatar, we needed to test ease of use by participants and how well participants used the program to estimate their own body size.

Methods

Participants

• 30 undergraduate women at Linfield College with varied body size (smallest waist circumference 24.5 in, largest was 48 in, mean 32.6).

Materials

• Genesis 2 Female Body Morph plugin for DAZ3D.
• Measure Metrics plugin for DAZ3D.

Procedures

• Participants were presented with Figure 1 as a starting point.
• Participants were asked to manipulate the figure into the best representation of themselves.
• Participants were able to use parameters from Figure 2 for manipulation of Figure 1.
• Participants had real world measurements taken, using the same measurements as those seen in Figures 3, 4, and 5.
• The figure manipulated by participants then had manipulated parameters converted to real life figures via Measure Metrics, as seen in Figure 6.
• Rations were calculated between DAZ measures and real-life measures, as seen in Table 1.

Results

Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>DAZ to Real Life</th>
<th>Mean Ratio</th>
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<tbody>
<tr>
<td>SS</td>
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