PAX Scale Development - Supplementary Materials

This document includes extended information about the analyses conducted during development and validation of the PAX Scale, conducted by Banks and Bowman (in press). The 9 steps are presented here, and correspond sequentially with the findings presented in the main manuscript:


Step 1. PAR Sociality Scale PCA (sample 1, balanced)

A battery of 95 questions derived from exploratory research addressing emergent themes in player-avatar sociality was completed by a broad sample of MMO players (N = 494). A Principal Components Analysis was conducted on the responses from a sub-set of this sample, balanced by self-reported player-avatar relationship type. This analysis resulted in a 16-item, three factor solution.

Table 1. Varimax Factor Structure of the 16-item PAR Sociality Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Anthropomorphic Autonomy (α = .907; M = 2.39, SD = 1.55; 28% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar has its own thoughts and ideas.</td>
<td>.892</td>
<td>.186</td>
<td>.007</td>
</tr>
<tr>
<td>This avatar has its own feelings.</td>
<td>.861</td>
<td>.234</td>
<td>.042</td>
</tr>
<tr>
<td>This avatar is autonomous and acts on its own.</td>
<td>.818</td>
<td>.013</td>
<td>.164</td>
</tr>
<tr>
<td>When I log out of the game, this avatar has its own life.</td>
<td>.743</td>
<td>.134</td>
<td>.149</td>
</tr>
<tr>
<td>This avatar is like a human being.</td>
<td>.734</td>
<td>.134</td>
<td>.149</td>
</tr>
<tr>
<td>This avatar exists independently from me.</td>
<td>.719</td>
<td>.090</td>
<td>.115</td>
</tr>
<tr>
<td>This avatar is a real person.</td>
<td>.684</td>
<td>.112</td>
<td>.221</td>
</tr>
<tr>
<td><strong>Factor 2: Emotional Investment (α = .901; M = 5.42, SD = 1.47; 26% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar is very special to me.</td>
<td>.161</td>
<td>.855</td>
<td>.203</td>
</tr>
<tr>
<td>I don’t really care about this avatar.*</td>
<td>.112</td>
<td>.852</td>
<td>.033</td>
</tr>
<tr>
<td>I have no emotional connection to this avatar.*</td>
<td>.115</td>
<td>.841</td>
<td>.101</td>
</tr>
<tr>
<td>I appreciate this avatar.</td>
<td>.152</td>
<td>.812</td>
<td>.189</td>
</tr>
<tr>
<td>I love this avatar.</td>
<td>.181</td>
<td>.767</td>
<td>.118</td>
</tr>
<tr>
<td>I would be heartbroken if I lost this avatar.</td>
<td>.089</td>
<td>.743</td>
<td>.242</td>
</tr>
<tr>
<td><strong>Factor 3: Sense of Companionship (α = .888; M = 2.91, SD = 1.77; 16% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar understands me.</td>
<td>.234</td>
<td>.154</td>
<td>.885</td>
</tr>
<tr>
<td>This avatar and I are friends.</td>
<td>.237</td>
<td>.230</td>
<td>.881</td>
</tr>
<tr>
<td>This avatar loves me.</td>
<td>.156</td>
<td>.252</td>
<td>.781</td>
</tr>
</tbody>
</table>

*Reverse coded
Step 2. PAR Sociality and Character Attachment Factor Correlations (sample 1, balanced)

To examine the extent to which the PAR sociality dimensions were empirically distinct from CA dimensions, correlations were calculated among the three PAR dimensions and the four CA dimensions. These correlations show a low-to-moderate relationship among

Table 2. Inter- and cross-correlations of the PAR and CA scale dimensions.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAR Sociality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Anthropomorphic</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Emotional</td>
<td>.354***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td>.420***</td>
<td>.431***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Companionship</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Character Attachment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Identification</td>
<td>.647***</td>
<td>.583***</td>
<td>.584***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Suspension of</td>
<td>.468***</td>
<td>.404***</td>
<td>.325***</td>
<td>.578***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disbelief</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Care/Responsibility</td>
<td>.487***</td>
<td>.461***</td>
<td>.465***</td>
<td>.616***</td>
<td>.581***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7. Control</td>
<td>-</td>
<td>.059</td>
<td>-.210**</td>
<td>-.115</td>
<td>.027</td>
<td>-.056</td>
<td>1</td>
</tr>
</tbody>
</table>

NOTE: * = p < .05, ** = p < .01, *** = p < .001 or higher; N = 175
Step 3. PAR Sociality + Character Attachment – Initial PCA (sample 1, balanced)

To evaluate the potential for PAR Sociality and CA dimensions to be integrated into a more compressive and explanatory scale, a PCA was conducted on aggregated responses to a) 16 items from the PAR sociality solution (Step 1, above) and b) 17 items from the CA scale. This analysis resulted in an 18-item, four-factor solution wherein factors from both scales/approaches clustered into unique and interpretable factors. This factor model is called here the Player-Avatar Interaction (PAX) Scale.

Table 3. Varimax factor structure of the 18-item integrated Player-Avatar Interaction (PAX) Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Emotional Investment (α = .910; M = 5.42, SD = 1.47; 24% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar is very special to me.</td>
<td>.863</td>
<td>.161</td>
<td>.162</td>
<td>.015</td>
</tr>
<tr>
<td>I don’t really care about this avatar.*</td>
<td>.811</td>
<td>.126</td>
<td>.118</td>
<td>.031</td>
</tr>
<tr>
<td>I would be heartbroken if I lost this avatar.</td>
<td>.803</td>
<td>.126</td>
<td>.118</td>
<td>-.045</td>
</tr>
<tr>
<td>I have no emotional connection to this avatar.*</td>
<td>.800</td>
<td>.092</td>
<td>.144</td>
<td>-.067</td>
</tr>
<tr>
<td>I appreciate this avatar.</td>
<td>.784</td>
<td>.135</td>
<td>.220</td>
<td>.089</td>
</tr>
<tr>
<td>I love this avatar.</td>
<td>.774</td>
<td>.220</td>
<td>.166</td>
<td>.042</td>
</tr>
<tr>
<td><strong>Factor 2: Anthropomorphic Autonomy (α = .891; M = 2.46, SD = 1.65; 20% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar has its own thoughts and ideas.</td>
<td>.200</td>
<td>.840</td>
<td>.251</td>
<td>-.128</td>
</tr>
<tr>
<td>This avatar has its own feelings.</td>
<td>.232</td>
<td>.823</td>
<td>.266</td>
<td>-.135</td>
</tr>
<tr>
<td>This avatar is autonomous and acts on its own.</td>
<td>.075</td>
<td>.807</td>
<td>.187</td>
<td>-.182</td>
</tr>
<tr>
<td>When I log out of the game, this avatar has its own life.</td>
<td>.163</td>
<td>.805</td>
<td>.155</td>
<td>-.119</td>
</tr>
<tr>
<td>This avatar exists independently from me.</td>
<td>.123</td>
<td>.698</td>
<td>-.013</td>
<td>-.106</td>
</tr>
<tr>
<td><strong>Factor 3: Suspension of Disbelief (α = .891; M = 4.38, SD = 1.80; 17% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is important to check for inconsistencies in this avatar's game.</td>
<td>.240</td>
<td>.111</td>
<td>.859</td>
<td>.090</td>
</tr>
<tr>
<td>I concentrate on inconsistencies in this avatar's story and the game story.</td>
<td>.186</td>
<td>.145</td>
<td>.853</td>
<td>.019</td>
</tr>
<tr>
<td>I pay attention to errors or contradictions in this avatar's world.</td>
<td>.166</td>
<td>.162</td>
<td>.850</td>
<td>.074</td>
</tr>
<tr>
<td>I think about whether this avatar's actions are plausible.</td>
<td>.184</td>
<td>.259</td>
<td>.744</td>
<td>.057</td>
</tr>
<tr>
<td><strong>Factor 4: Sense of Control (α = .796; M = 6.08, SD = 1.09; 12% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I control this avatar.</td>
<td>-.109</td>
<td>-.288</td>
<td>-.006</td>
<td>.854</td>
</tr>
<tr>
<td>This avatar does what I want.</td>
<td>-.057</td>
<td>-.269</td>
<td>.027</td>
<td>.809</td>
</tr>
<tr>
<td>I enjoy controlling this avatar.</td>
<td>.223</td>
<td>-.014</td>
<td>.200</td>
<td>.797</td>
</tr>
</tbody>
</table>

*Item scale: 1 (strongly disagree) to 7 (strongly agree)

*Reverse coded
Step 4. PAX Factor Stability Test via Second-Sample PCA (sample 2)

To test the stability of the factor rotations from the sample 1 PCA (Step 3, above), a second PCA with Varimax rotation was performed on responses to the 18-item integrated PAX Scale. Although this analysis resulted in similar factor loadings as for the first sample, three items fell below the .600 loading threshold and were dropped from the scale. Those items removed, a repeated PCA resulted in a 15-item, four-factor solution explaining 66% of variance. Items in this solution are below:

Table 1. Varimax factor structure of the 15-item integrated Player-Avatar Interaction (PAX) Scale (second sample of WoW players only)

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Emotional Investment (α = .835; M = 4.87, SD = 1.64; 22% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar is very special to me.</td>
<td>.782</td>
<td>.215</td>
<td>.147</td>
<td>.085</td>
</tr>
<tr>
<td>I don’t really care about this avatar.*</td>
<td>.755</td>
<td>-.028</td>
<td>.038</td>
<td>-.034</td>
</tr>
<tr>
<td>I have no emotional connection to this avatar.*</td>
<td>.744</td>
<td>.127</td>
<td>.081</td>
<td>-.077</td>
</tr>
<tr>
<td>I would be heartbroken if I lost this avatar.</td>
<td>.689</td>
<td>.183</td>
<td>.161</td>
<td>.141</td>
</tr>
<tr>
<td>I appreciate this avatar.</td>
<td>.683</td>
<td>.169</td>
<td>.216</td>
<td>.122</td>
</tr>
<tr>
<td>I love this avatar.</td>
<td>.622</td>
<td>.265</td>
<td>.186</td>
<td>.093</td>
</tr>
<tr>
<td><strong>Factor 2: Anthropomorphic Autonomy (α = .876; M = 1.98, SD = 1.52; 20% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar has its own thoughts and ideas.</td>
<td>.223</td>
<td>.822</td>
<td>.246</td>
<td>-.077</td>
</tr>
<tr>
<td>This avatar has its own feelings.</td>
<td>.263</td>
<td>.812</td>
<td>.206</td>
<td>-.050</td>
</tr>
<tr>
<td>This avatar is autonomous and acts on its own.</td>
<td>.072</td>
<td>.800</td>
<td>.144</td>
<td>-.079</td>
</tr>
<tr>
<td>When I log out of the game, this avatar has its own life.</td>
<td>.188</td>
<td>.772</td>
<td>.195</td>
<td>-.107</td>
</tr>
<tr>
<td><strong>Factor 3: Suspension of Disbelief (α = .821; M = 4.07, SD = 1.91; 15% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I pay attention to errors or contradictions in this avatar’s world.</td>
<td>.204</td>
<td>.206</td>
<td>.837</td>
<td>-.024</td>
</tr>
<tr>
<td>It is important to check for inconsistencies in this avatar’s game.</td>
<td>.185</td>
<td>.178</td>
<td>.786</td>
<td>.029</td>
</tr>
<tr>
<td>I concentrate on inconsistencies in this avatar's story and the game story.</td>
<td>.166</td>
<td>.302</td>
<td>.784</td>
<td>.011</td>
</tr>
<tr>
<td><strong>Factor 4: Sense of Control (α = .796; M = 6.27, SD = 1.14; 9% variance explained)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This avatar does what I want.</td>
<td>.114</td>
<td>-.034</td>
<td>-.104</td>
<td>.834</td>
</tr>
<tr>
<td>I control this avatar.</td>
<td>.045</td>
<td>-.185</td>
<td>.118</td>
<td>.777</td>
</tr>
</tbody>
</table>

*Item scale: 1 (strongly disagree) to 7 (strongly agree)

*Reverse coded
Step 5. Confirmatory Factor Analysis (both samples)

A confirmatory factor analysis was conducted to test the measurement below:

Scale data fit the specific model in both data sets without modification. For the broad sample (sample 1), NNFI (Tucker-Lewis index) = .978, IFI = .983, CFI = .982, RMSEA = .046, see below:
For the WoW-specific sample (sample 2), NNFI (TLI) = .972, IFI = .978, CFI = .978, RMSEA = .040.
Step 6. Construct validity testing – Human-like relatedness (broad sample)

Based on Author (2013), a positive relationship is expected with scale factors of anthropomorphic autonomy, suspension of disbelief, and emotional investment, and a negative relationship with sense of control. As expected, there was a statistically significant relationship between human-like relatedness and both emotional investment and anthropomorphic autonomy, as well as the expected non-relationship with sense of control.

Table 5. Step-wise regression for (1) demographics and (2) PAR scale dimensions.

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th></th>
<th>Step 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>Sig.</td>
<td>β</td>
</tr>
<tr>
<td>Gender</td>
<td>.092</td>
<td>1.77</td>
<td>.077</td>
<td>-.012</td>
</tr>
<tr>
<td>Age</td>
<td>.060</td>
<td>1.16</td>
<td>.249</td>
<td>.112</td>
</tr>
<tr>
<td>Hours Played</td>
<td>.281</td>
<td>5.51</td>
<td>.000</td>
<td>.130</td>
</tr>
<tr>
<td>Emotional Invest.</td>
<td></td>
<td></td>
<td></td>
<td>.309</td>
</tr>
<tr>
<td>Anthro. Autonomy</td>
<td></td>
<td></td>
<td></td>
<td>.359</td>
</tr>
<tr>
<td>Susp. of Disbelief</td>
<td></td>
<td></td>
<td></td>
<td>.070</td>
</tr>
<tr>
<td>Sense of Control</td>
<td></td>
<td></td>
<td></td>
<td>-.005</td>
</tr>
</tbody>
</table>

\[ F(3,353) = 12.3, p \sim .000, \quad R^2 = .087 \]

\[ F(7,349) = 34.4, p \sim .000, \quad \Delta R^2 = .309 \]

Note: Analyses were only conducted for participants that had complete data on all measured variables.
Step 7. Construct validity testing – PAR type

It was predicted that emotional investment, anthropomorphic autonomy, and suspension of disbelief should be highest among players designating the avatar as symbiotic or separate and lowest among those seeing the avatar as objects or representations; conversely, sense of control should be highest among those with object or representation perspectives and lowest among those with symbiosis and separate-entity perspective.

Table 6. Mean differences for PAR scale dimensions among player-avatar relationships types.

<table>
<thead>
<tr>
<th></th>
<th>Object Mean (SE)</th>
<th>Me Mean (SE)</th>
<th>Symbiote Mean (SE)</th>
<th>Other Mean (SE)</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1 (MMO players, broadly)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion</td>
<td>4.07a (.08)</td>
<td>5.62b (.15)</td>
<td>5.96b (.15)</td>
<td>5.50b (.20)</td>
<td>.273</td>
</tr>
<tr>
<td>Anthro</td>
<td>1.29a (.08)</td>
<td>1.78b (.13)</td>
<td>3.31c (.13)</td>
<td>3.45c (.18)</td>
<td>.352</td>
</tr>
<tr>
<td>SoD</td>
<td>3.57a (.12)</td>
<td>4.47b (.20)</td>
<td>4.86b (.21)</td>
<td>4.50b (.28)</td>
<td>.077</td>
</tr>
<tr>
<td>Control</td>
<td>6.51a (.07)</td>
<td>6.48a (.12)</td>
<td>5.80b (.12)</td>
<td>5.78b (.16)</td>
<td>.079</td>
</tr>
<tr>
<td>Sample 2 (WoW-only players)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion</td>
<td>4.62a (.07)</td>
<td>5.81b (.11)</td>
<td>6.09b (.11)</td>
<td>5.75b (.18)</td>
<td>.269</td>
</tr>
<tr>
<td>Anthro</td>
<td>1.49a (.08)</td>
<td>2.60b (.13)</td>
<td>3.55c (.13)</td>
<td>3.48c (.20)</td>
<td>.343</td>
</tr>
<tr>
<td>SoD</td>
<td>2.88a (.11)</td>
<td>3.87b (.16)</td>
<td>4.31c (.16)</td>
<td>4.42c (.25)</td>
<td>.146</td>
</tr>
<tr>
<td>Control</td>
<td>6.12a (.07)</td>
<td>6.24a (.10)</td>
<td>6.08a (.10)</td>
<td>6.12a (.16)</td>
<td>.005</td>
</tr>
</tbody>
</table>

Note: Means with different subscripts within each row differ at p < .05 level of higher. Bolded rows had an overall significant ANCOVA.
Step 8. Predictive validity testing – Gameplay Motivations

Predictions for PAX factors’ associations with gameplay motivations were as follows:
Both social and immersion motivations should align with high emotional investment, high anthropomorphic autonomy, high control, and low SoD as the avatar serves as a social surrogate (Gee, 2008) and as a real social actor (Author, 2013), respectively. Achievement motivations should have little to no association with emotional investment, anthropomorphic autonomy, or SoD, but should be associated with high sense of control as the avatar is engaged as a tool for achievement (Williams, Yee, & Caplan, 2008).

Table 7. Step-wise regression for social motivations as a function of (Step 1) demographics and (Step 2) PAR scale dimensions.

<table>
<thead>
<tr>
<th>Sample 1 (MMO players, broadly)</th>
<th>Step 1</th>
<th></th>
<th></th>
<th>Step 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>Sig.</td>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>Gender</td>
<td>-.024</td>
<td>.495</td>
<td>.621</td>
<td>-.098</td>
<td>2.05</td>
</tr>
<tr>
<td>Age</td>
<td>.046</td>
<td>.975</td>
<td>.330</td>
<td>.041</td>
<td>.891</td>
</tr>
<tr>
<td>Hours Played</td>
<td>.172</td>
<td>3.68</td>
<td>~.000</td>
<td>.099</td>
<td>2.11</td>
</tr>
<tr>
<td>Emotion</td>
<td>.323</td>
<td>6.04</td>
<td>~.000</td>
<td>.018</td>
<td>.349</td>
</tr>
<tr>
<td>Anthro</td>
<td>-.025</td>
<td>1.73</td>
<td>.084</td>
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<tr>
<td>SoD</td>
<td>-.007</td>
<td>-1.41</td>
<td>.888</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F(3,451) = 4.65, p = .003, R2 = .02
F(7,447) = 7.75, p ~ .000, ΔR2 = .07

Note: Analyses were only conducted for participants that had complete data on all measured variables.
Table 8. Step-wise regression for immersion motivations as a function of (Step 1) demographics and (Step 2) PAR scale dimensions.

**Sample 1 (MMO players, broadly)**

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th></th>
<th>Step 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>Sig.</td>
<td>β</td>
</tr>
<tr>
<td>Gender</td>
<td>.202</td>
<td>4.33</td>
<td>~.000</td>
<td>.115</td>
</tr>
<tr>
<td>Age</td>
<td>-.011</td>
<td>.241</td>
<td>.810</td>
<td>.006</td>
</tr>
<tr>
<td>Hours Played</td>
<td>.122</td>
<td>2.65</td>
<td>.008</td>
<td>.016</td>
</tr>
<tr>
<td>Emotion</td>
<td></td>
<td></td>
<td></td>
<td>.238</td>
</tr>
<tr>
<td>Anthro</td>
<td></td>
<td></td>
<td></td>
<td>.096</td>
</tr>
<tr>
<td>SoD</td>
<td></td>
<td></td>
<td></td>
<td>.211</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td>.132</td>
</tr>
</tbody>
</table>

F(3,453) = 9.29, p ~ .000, R2 = .05

**Sample 2 (WoW-only players)**

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th></th>
<th>Step 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>Sig.</td>
<td>β</td>
</tr>
<tr>
<td>Gender</td>
<td>.190</td>
<td>4.04</td>
<td>~.000</td>
<td>.090</td>
</tr>
<tr>
<td>Age</td>
<td>-.011</td>
<td>.236</td>
<td>.814</td>
<td>.029</td>
</tr>
<tr>
<td>Hours Played</td>
<td>.068</td>
<td>1.46</td>
<td>.144</td>
<td>.033</td>
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<tr>
<td>Emotion</td>
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<td></td>
<td></td>
<td>.162</td>
</tr>
<tr>
<td>Anthro</td>
<td></td>
<td></td>
<td></td>
<td>.225</td>
</tr>
<tr>
<td>SoD</td>
<td></td>
<td></td>
<td></td>
<td>.169</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td>.034</td>
</tr>
</tbody>
</table>

F(3,442) = 6.25, p ~ .000, R2 = .03

Note: Analyses were only conducted for participants that had complete data on all measured variables.
Step 9. Predictive validity testing – MMO Genre Preference (broad sample)

Table 9. Mean differences for PAR scale dimensions among MMO game genres.

<table>
<thead>
<tr>
<th></th>
<th>Fantasy RPG</th>
<th>Open-World</th>
<th>Sci-Fi RPG</th>
<th>Arena/PvP</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Est. ( M ) (SE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion</td>
<td>4.93a,b (.08)</td>
<td>5.49b (.39)</td>
<td>3.98a (.31)</td>
<td>5.28b (.57)</td>
<td>.028</td>
</tr>
<tr>
<td>Anthro</td>
<td>1.94a (.08)</td>
<td>1.77a (.37)</td>
<td>1.70a (.30)</td>
<td>1.47a (.54)</td>
<td>.004</td>
</tr>
<tr>
<td>SoD</td>
<td>4.12a (.10)</td>
<td>4.76a (.48)</td>
<td>3.12b (.39)</td>
<td>2.80b (.71)</td>
<td>.027</td>
</tr>
<tr>
<td>Control</td>
<td>6.34a (.06)</td>
<td>6.54a (.27)</td>
<td>6.45a (.22)</td>
<td>6.05a (.40)</td>
<td>.003</td>
</tr>
</tbody>
</table>

Note: Means with different subscripts within each row differ at \( p < .05 \) level of higher. Bolded rows had an overall significant ANCOVA.