



**HAL**  
open science

# **ATHOS: a dATabase of 48 3D Human virtual characters with non-emOtional facial expreSsion for virtual reality**

Alice Cartaud, Yann Coello

► **To cite this version:**

Alice Cartaud, Yann Coello. ATHOS: a dATabase of 48 3D Human virtual characters with non-emOtional facial expreSsion for virtual reality. 2023. hal-04137382

**HAL Id: hal-04137382**

**<https://hal.science/hal-04137382>**

Preprint submitted on 23 Jun 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

1           **ATHOS: a dATabase of 48 3D Human virtual characters with non-**  
2           **emOtional facial expreSsion for virtual reality**  
3

4

5

6   Alice Cartaud &amp; Yann Coello

7

8   Department of Psychology, Research Unit on Cognitive and Affective Sciences, University of

9   Lille, Lille, France

10

11   Running head: Set of neutral virtual characters

12

13

14   \*Corresponding author:

15   [yann.coello@univ-lille.fr](mailto:yann.coello@univ-lille.fr) (YC)

16

17

## 18 **Abstract**

19           An increasing number of studies in the Human and Social Sciences and Information and  
20 Communication Technologies and Sciences are conducted in virtual reality. Many of them use  
21 3D human-like computer-generated characters in order to study social interactions in healthy  
22 participants, or the effect mental illness or neurological disorder on social cognition. However,  
23 free access to virtual characters is still not straightforward with often a lack of psychological  
24 evaluation of available characters. We present here the ATHOS database composed of 48  
25 Caucasian male and female virtual characters with non-emotional facial expression available in  
26 the FBX file format. For each of them, we provide an evaluation in terms of valence, reliability,  
27 sympathy and sociability. Concerning these evaluations, inter-rater reliability analysis revealed  
28 a good degree of agreement among raters (between 0.85 and 0.98) and a cluster analysis  
29 highlighted a division of the virtual characters into three groups (low, medium and high  
30 evaluation scores). The ATHOS database of virtual characters, available in open access, can be  
31 used for many different purposes including the development of social immersive virtual  
32 environments, cognitive assessments or even rehabilitation programs in the health domain.

33

34 **Keywords:** Human virtual character; non-emotional facial expression; 3D environment; virtual  
35 reality; inter-rater reliability; cluster analysis, FBX file format

36

37

## 38 **Introduction**

39 Immersive Virtual Reality (IVR) is being increasingly used in everyday life, whether  
40 for entertainments, distance learning, advertising, consulting or business activities [1]. The  
41 expansion of its use is also visible in the field of research with an increasing number of IVR-  
42 based studies in the Human and Social Sciences and Information and Communication  
43 Technologies and Sciences. Virtual environments offer the possibility of getting closer to  
44 ecologic and realistic situations while allowing a strong experimental control [2,3]. Those  
45 conditions, often difficult to combine, are essential to improve acceptance of digital devices  
46 and replicability of experimental research, which makes virtual reality a precious tool in the  
47 domain of perceptual, behavioral, cognitive, affective and social studies.

48 In order to study social interactions and their effects on cognitive processes, many  
49 researches have used naturalistic stimuli such as virtual characters or avatars [2]. Their presence  
50 in a virtual environment is sufficient to develop a feeling of social presence [2], and they are  
51 usually used to investigate social cognition and social skills. Virtual characters are for instance  
52 of great interest in the study the effects of social constraint on the adjustment of interpersonal  
53 distances [4] and the data are consistent with those obtained in real social situations [5]. They  
54 are also increasingly used in the context of pathological populations for diagnosis and for  
55 developing new technological-based therapeutic tools. For instance, virtual characters were  
56 used for training social skills in patients with autistic spectrum disorder [6] or in exposure  
57 therapy associated with social anxiety treatments [7].

58 Despite human-like stimuli are increasingly used in various scientific and applied  
59 domains, there is still a limited access to computer-generated virtual characters, in particular  
60 those that offer realistic design and are freely available online. We present here an open access  
61 database of 48 male and female Caucasian virtual characters with non-emotional facial  
62 expression, which was developed at the University of Lille, on the basis of a survey performed

63 online by a number of spontaneous volunteers. The ATHOS database provides for each of the  
64 virtual characters an evaluation in terms of valence, reliability, sympathy and sociability. The  
65 process for designing and animating the virtual characters is detailed below. The ATHOS  
66 database also provides the raw data and a statistical analysis of the reliability of the inter-raters'  
67 evaluation as well as a cluster analysis of the stimuli (S1).

68

## 69 **Method**

### 70 **Participants**

71 The evaluation of the virtual characters was performed online by self-volunteer  
72 participants using the LimeSurvey website. The link to the survey was shared on social  
73 networks by students in Psychology from the University of Lille (France). From the set of 189  
74 of self-declared participants, only 46 of them completed a minimum of 75% of the survey items  
75 and were retained for the data analysis. Among the participants, twenty-seven were females,  
76 heighten were males and fourteen did not report their gender. Mean age was 22.11 years (18-  
77 36, S.D.= 3.44) and mean study level was 1.80 year after the bachelor's degree (S.D.= 1.56).

78

### 79 **Stimuli**

80 Forty-eight Caucasian virtual characters (24 females) with a non-emotional facial  
81 expression were created from the Beta version of Adobe Fuse CC, using either the Female or  
82 Male "Fit A" model. The proportion of the different body parts was at the medium level  
83 according to the scale of the software. All virtual characters had a casual-to-classic dress code  
84 including no make-up or jewelry. In order to limit any clipping effect resulting from animation,  
85 all virtual characters wore pants. Once created, the virtual characters were exported in OBJ file

86 format and their textures were also saved in PNG file format. The OBJ version of the virtual  
87 characters was uploaded to [www.mixamo.com](http://www.mixamo.com) in order to be manually rigged. This procedure  
88 enabled to associate different animations with each virtual character. Finally, they were  
89 exported in FBX file format. The FBX version of each virtual character as well as their textures  
90 in PNG and a full-body pictures are available at the following address  
91 [https://osf.io/sp938/?view\\_only=7a5c397f51864d88a7f71af2c18bf478](https://osf.io/sp938/?view_only=7a5c397f51864d88a7f71af2c18bf478). The file also contains  
92 the data related to the individual evaluation.

93

## 94 **Evaluation procedure**

95 The evaluation of the virtual characters was performed online using the LimeSurvey  
96 website (version 2.63.1) hosted by the University of Lille' servers. The first page of the website  
97 provided the instructions concerning the evaluation task. On the second page, participants  
98 provided personal information concerning their gender, age and level of education. Then, on  
99 the following pages, successive pictures of one virtual character (randomly selected) was  
100 displayed above four successive evaluation scales. For each visual character, the evaluation was  
101 made by positioning a cursor on a continuous line according to four criteria: valence, reliability,  
102 sympathy and sociability. Each criterion was evaluated according to two opposite levels:  
103 negative/positive for valence, not reliable/reliable for reliability, unsympathetic/sympathetic for  
104 sympathy and not sociable/sociable for sociability. To avoid random evaluation for some of the  
105 criteria, participants were instructed to respond to each criterion only if they can provide an  
106 evaluation. The completion of the survey took about 25 minutes.

## 107        **Data analysis**

### 108            **Inter-rater reliability**

109            The degree of agreement among participants (raters) for each evaluation was carried out  
110 using Intraclass Correlation Coefficients (ICCs) with the `iccNA` function (`irrNA` package,  
111 version 0.1.4, Brueckl & Heuer, 2018) of R and R Studio software (version 3.5.1 and 1.1.463  
112 respectively). This function adopts the ICC conventions of Shrout & Fleiss (1979) and allows  
113 ICCs computation with missing data by approximating the missing raters' individual effects.  
114 ICC estimates and their 95% confident intervals calculation were based on a mean-rating ( $k =$   
115 46 raters), the absolute-agreement, and a 2-way random effects models. The ICC estimate was  
116 significant if p-values  $<.05$ . Conventionally, estimates less than 0.5, between 0.51 and 0.75,  
117 between 0.76 and 0.9, and greater than 0.9 respectively indicated poor, moderate, good and  
118 excellent reliability.

119

### 120            **Cluster analysis**

121            A cluster analysis was performed using the k-means algorithm [8] from the `stats` package  
122 of R (`kmeans` function) as a function of the 4 evaluation criteria. The Elbow method was initially  
123 used to determine the appropriate number of clusters according to the dataset. The k-means  
124 algorithm computed a partition of the virtual characters into different clusters such that the sum  
125 of the Euclidian distances between the virtual characters of the clusters and their center was  
126 minimized. The algorithm performed 20 iterations in order to enhance the odds of selecting the  
127 best clustering model. Then, the Silhouette method was applied for validating the consistency  
128 of the assignment of each virtual character to each cluster. Virtual characters with a Silhouette  
129 width close to 1 were very well clustered, whereas those close to -1 were likely to be assigned  
130 to a wrong cluster. Figs 2 and 3 representing the k-means analysis and the Silhouette method

131 were computed using respectively `fviz_cluster` and `fviz_silhouette` functions (factoextra  
132 package, version 1.0.5).

133

## 134 **Results and Discussion**

135         Considering the different criteria, the evaluation score was on average 5.03 (SD = 2.09)  
136 for valence, 4.86 (SD = 2.16) for reliability, 5.15 (SD = 2.23) for sympathy and 5.15 (SD =  
137 2.24) for sociability. S1 Table summarizes the mean, standard deviation and the number of  
138 missing ratings for the 4 evaluation criteria and for each virtual character as well as the gender  
139 of each virtual character. The number of responses for the criteria considered together was thus  
140 95.21% (4.79 % of missing data).

141

### 142 **Inter-rater reliability**

143         Intraclass Correlation Coefficients estimates of each evaluation criterion are reported in  
144 Table 1. The corrected mean ratings for each criterion are available in S1 Table (ICC Corrected  
145 Mean). The inter-rater reliability analysis for each evaluation criterion revealed a good degree  
146 of agreement among the raters ( $k = 46$  participants) with a correlation estimate varying between  
147 0.85 and 0.89. Thus, participants were consistent in their judgement throughout the evaluation  
148 of the different virtual characters and they were also consistent with each other.

149

150 **Table 1: Inter-rater analysis**

Criterion	Estimate	p value	95 % CI
Valence	0.88	<0.001	[0.82 - 0.92]
Reliability	0.85	<0.001	[0.78 - 0.9]
Sympathy	0.89	<0.001	[0.85 - 0.93]
Sociability	0.87	<0.001	[0.81 - 0.92]

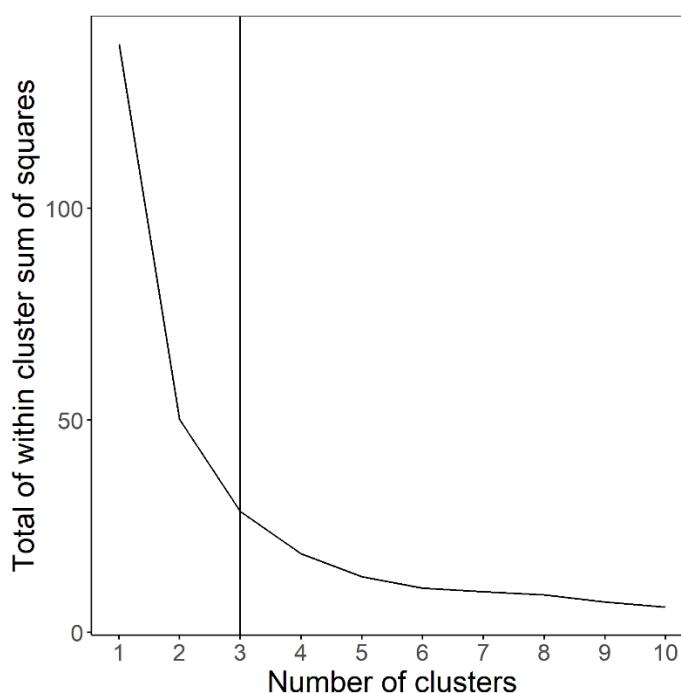


151 ICC estimate of the Absolute-Agreement, 95% Confidence Interval and associated p-value per  
 152 evaluation criterion.

## 153 **Cluster Analysis**

154 As illustrated in Fig 1, an elbow appeared at  $k = 3$  suggesting that the dataset can be  
 155 organized in three clusters, corresponding to low, medium and high evaluation scores.

156



157

158 **Fig 1. Elbow Plot.** Total of within cluster sum of squares as a function of number of clusters  
 159 computed from Elbow method.

160

161 The cluster assignment following the k-means clustering for each virtual character is  
 162 reported in Table S1 and illustrated in Fig 2. The center of each cluster for each evaluation  
 163 criterion and the within cluster sum of squares are reported on Table 2. Cluster 1 gathers 13  
 164 virtual characters (8 males, 5 females) with higher evaluation scores for every criterion, Cluster  
 165 2 gathers 23 virtual characters (12 males, 11 females) with medium evaluation scores for every  
 166 criterion and Cluster 3 gathers 12 virtual characters (4 males, 8 females) with lower evaluation  
 167 scores for every criterion. Thus, even though every virtual character was non-emotional, their

168 facial characteristics varied, as a consequence so did their evaluation, resulting in the emergence  
 169 of three groups of virtual characters. Indeed, the evaluation of an emotionally neutral face can  
 170 vary depending on the potential structural resemblance of the face with an emotional expression  
 171 [9], as it has also been shown in the evaluation of dominance and submissiveness dimensions  
 172 [10].

173

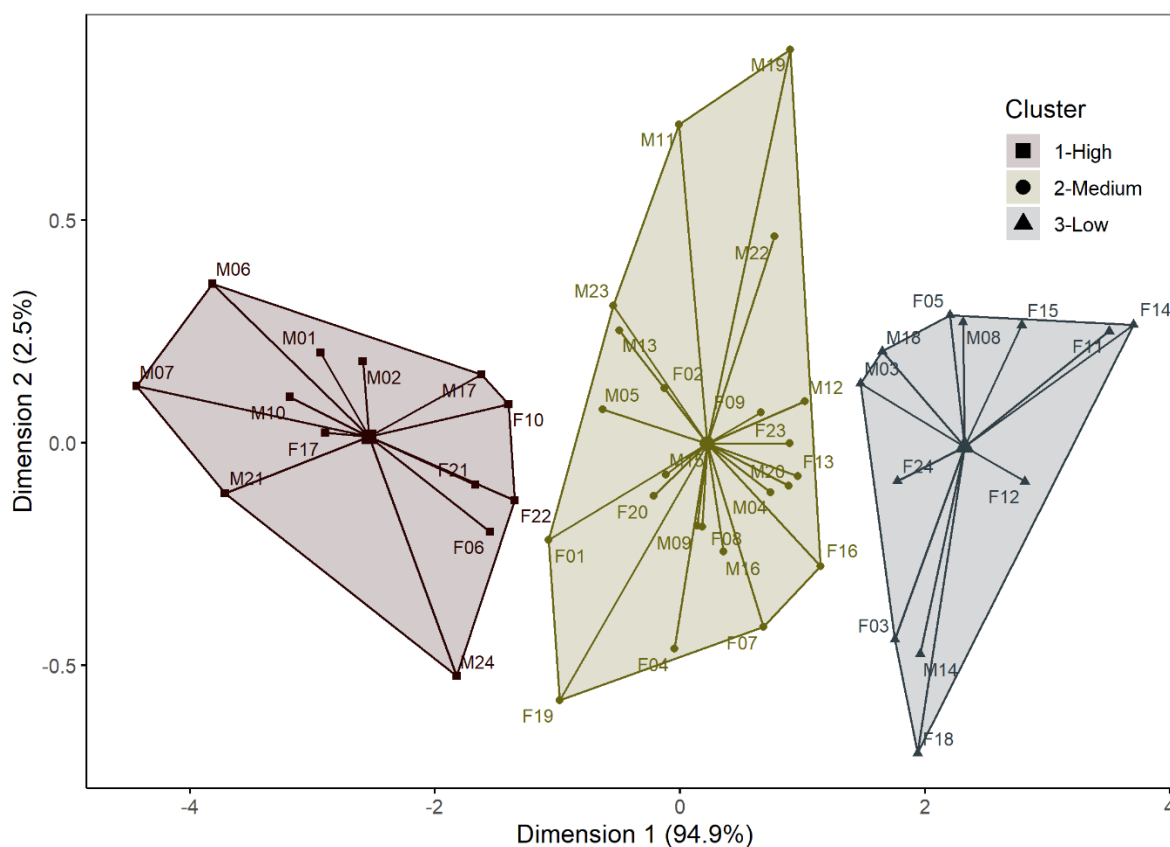
174 **Table 2: Cluster analysis**

175

Cluster	Size	Valence	Reliability	Sympathy	Sociability	Sum of Squares
Cluster 1	13	6.1	5.84	6.28	6.23	11.02
Cluster 2	23	4.9	4.75	5.03	5.05	10.91
Cluster 3	12	4.05	3.93	4.03	4.11	6.61

176 Clusters' size and center for each evaluation criterion, and within cluster sum of squares

177



178

179 **Fig 2. Cluster Plot.** Two-dimensional cluster plot of the virtual characters and their associated  
 180 clusters (high scores: squares, medium scores: circles, low scores: triangles). The (x, y) axes  
 181 represent the first two components, computed directly from the plot function, are derived from

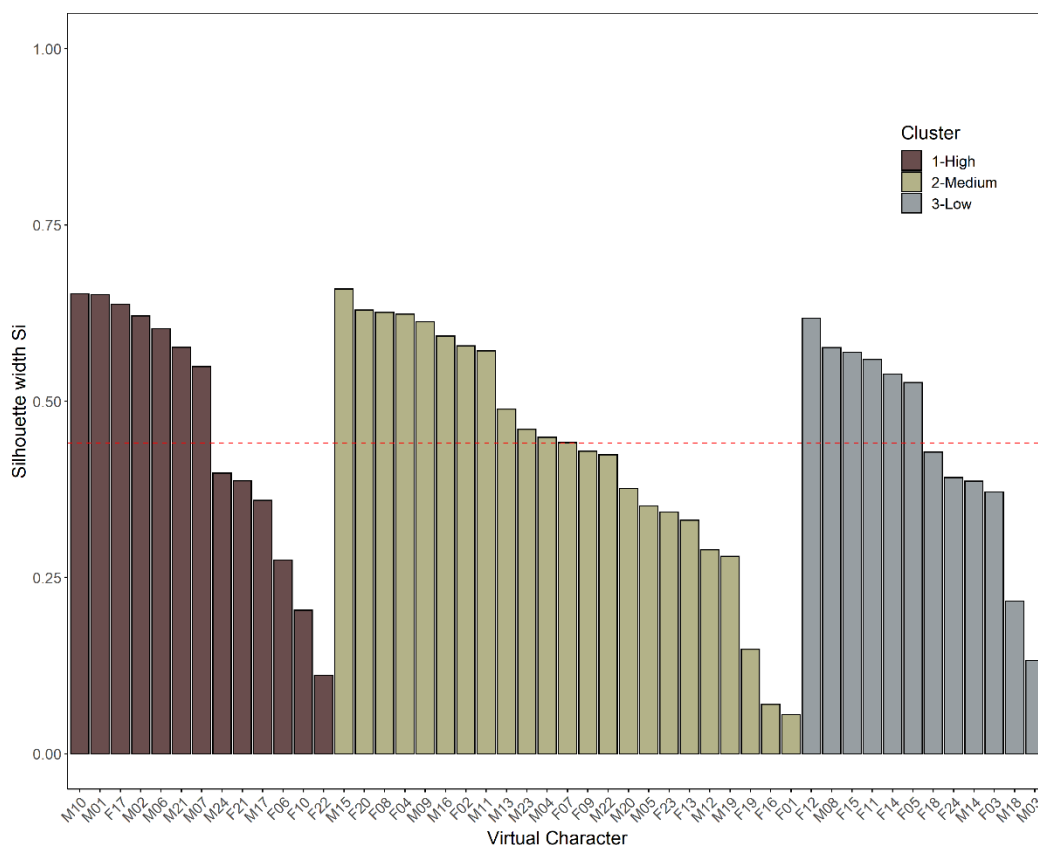
182 the evaluations of the virtual characters and explain 97.4% of their variability. The larger  
183 square, circle and triangle represent the center of each cluster. The distance between each virtual  
184 character and its cluster's center represents the distance between them scaled on the two  
185 components representation.

186

187         The goodness of the assignment of each virtual character to its cluster is illustrated by  
188 the Silhouette analysis. Visual analysis of Fig 3 highlighted the reliability of the assignment of  
189 each virtual character in its respective cluster, although some of them (width close to 0) could  
190 have been assigned to a neighbor cluster. For example, virtual character F01 was assigned to  
191 cluster 2 with a score close to 0, indicating that it could have also been assigned to cluster 1,  
192 the closer cluster neighbor. These variations can be explained by the non-emotional expression  
193 of the virtual characters. Indeed, although the cluster analysis suggested 3 clusters, the center  
194 of each cluster varied only little according to the others, due to the small variations of the  
195 evaluation scores between the virtual characters. Therefore, one can select virtual characters  
196 from this database based on the degree of differences between each other in terms of scores,  
197 but also based on their proximity.

198

199



200

201 **Fig 3. Silhouette Plot.** Ordered silhouette width for each virtual character in their cluster. The  
 202 red Dashed line represents the average silhouette width (0.44).

203

204 To our knowledge, ATHOS is the first database of non-emotional virtual characters,  
 205 freely available online and providing details about design and evaluation. In some previous  
 206 studies using immersive virtual environment, either little information was provided regarding  
 207 the design of the virtual characters [5,11,12], or virtual characters were taken from websites  
 208 proposing only a few visual attributes often with poor design styles and brief descriptions [13].  
 209 In this context, ATHOS database may represent a valuable tool in VR research as well as  
 210 applied domains as it is freely available, and includes validated evaluation of realistic visual  
 211 characters. Indeed, the feeling of social presence in immersive environments seems to depend  
 212 on the realism of the virtual stimuli [2]. As evidence, Iachini and colleagues [14] revealed an  
 213 increase of comfort distance in social interactions when using virtual robots instead of virtual  
 214 characters. In the same vein, Fini and colleagues [15] showed that human virtual characters can

215 be used as allocentric frame of reference but not virtual wooden dummies. Furthermore,  
216 ATHOS database, combined with head-mounted display, may offer new research avenues in  
217 studies looking for an easy to carry installation. The ATHOS database thus offers a number of  
218 advantages for virtual reality providing more immersive stimuli and more social presence than  
219 simply using videos displayed on a computer screen [16] or bulky virtual reality equipment  
220 [12,17–19].

221

## 222 **Conclusion**

223 In conclusion, ATHOS database represents the first validated freely available database  
224 of male and female Caucasian virtual characters for researches and applications using  
225 immersive virtual reality. Furthermore, virtual characters in ATHOS database are compatible  
226 with open access software such as Unity or Mixamo, making thus possible their implementation  
227 in a virtual environment with specific gait or animation usually also freely available  
228 (<https://unity.com/>). Thus, the ATHOS database paves the way for future research programs in  
229 immersive virtual environments, encouraging the development of innovative scenario with  
230 improved social presence and enhance potentiality for outcome replicability.

231

## 232 **Funding Sources**

233 Funding: This work was funded by the French National Research Agency (ANR-11-  
234 EQPX-0023) and also supported by the European funds through the program FEDER SCV-  
235 IrDIVE.

236

237 **References**

- 238 1. Fuchs P, Moreau G, Papin JP. *Le traité de la réalité virtuelle*. Paris: Les Presses de l'École  
239 des Mines; 2001.
- 240 2. Blascovich J, Loomis J, Beall AC, Swinth KR, Hoyt CL, Bailenson JN. Immersive  
241 Virtual Environment Technology as a Methodological Tool for Social Psychology.  
242 *Psychol Inq*. 2002;13: 103–124. doi:10.1207/S15327965PLI1302\_01
- 243 3. Loomis JM, Blascovich JJ, Beall AC. Immersive virtual environment technology as a  
244 basic research tool in psychology. *Behav Res Methods, Instruments, Comput*. 1999;31:  
245 557–564. doi:10.3758/BF03200735
- 246 4. Bailenson JN, Blascovich J, Beall AC, Loomis JM. Interpersonal Distance in Immersive  
247 Virtual Environments. *Personal Soc Psychol Bull*. 2003;29: 819–833.  
248 doi:10.1177/0146167203029007002
- 249 5. Iachini T, Coello Y, Frassinetti F, Senese VP, Galante F, Ruggiero G. Peripersonal and  
250 interpersonal space in virtual and real environments: Effects of gender and age. *J Environ*  
251 *Psychol*. 2016;45: 154–164. doi:10.1016/j.jenvp.2016.01.004
- 252 6. Parsons S, Leonard A, Mitchell P. Virtual environments for social skills training:  
253 comments from two adolescents with autistic spectrum disorder. *Comput Educ*. 2006;47:  
254 186–206. doi:10.1016/J.COMPEDU.2004.10.003
- 255 7. Anderson PL, Price M, Edwards SM, Obasaju MA, Schmertz SK, Zimand E, et al.  
256 Virtual reality exposure therapy for social anxiety disorder: A randomized controlled  
257 trial. *J Consult Clin Psychol*. 2013;81: 751–760. doi:10.1037/a0033559
- 258 8. Hartigan JA, Wong MA. Algorithm AS 136: A K-Means Clustering Algorithm. *Appl*  
259 *Stat*. 1979;28: 100. doi:10.2307/2346830
- 260 9. Said CP, Sebe N, Todorov A. Structural Resemblance to Emotional Expressions Predicts  
261 Evaluation of Emotionally Neutral Faces. *Emotion*. 2009;9: 260–264.

262 doi:10.1037/a0014681

- 263 10. Hareli S, Shomrat N, Hess U. Emotional Versus Neutral Expressions and Perceptions of  
264 Social Dominance and Submissiveness Social perception of emotions View project  
265 Emotional and motivational effects of the baby schema View project. *Emotion*. 2009;9:  
266 378–384. doi:10.1037/a0015958
- 267 11. Seinfeld S, Arroyo-Palacios J, Iruretagoyena G, Hortensius R, Zapata LE, Borland D, et  
268 al. Offenders become the victim in virtual reality: impact of changing perspective in  
269 domestic violence. *Sci Rep*. 2018;8. doi:10.1038/s41598-018-19987-7
- 270 12. Taffou M, Ondřej J, O’Sullivan C, Warusfel O, Viaud-Delmon I. Judging crowds’ size  
271 by ear and by eye in virtual reality. *J Multimodal User Interfaces*. 2017;11: 57–65.  
272 doi:10.1007/s12193-016-0228-5
- 273 13. Ruggiero G, Frassinetti F, Coello Y, Rapuano M, Di Cola AS, Iachini T. The effect of  
274 facial expressions on peripersonal and interpersonal spaces. *Psychol Res*. 2017; 1–9.  
275 doi:10.1007/s00426-016-0806-x
- 276 14. Iachini T, Coello Y, Frassinetti F, Ruggiero G. Body space in social interactions: A  
277 comparison of reaching and comfort distance in immersive virtual reality. *PLoS One*.  
278 2014;9: 25–27. doi:10.1371/journal.pone.0111511
- 279 15. Fini C, Brass M, Committeri G. Social scaling of extrapersonal space: Target objects are  
280 judged as closer when the reference frame is a human agent with available movement  
281 potentialities. *Cognition*. 2015;134: 50–56. doi:10.1016/j.cognition.2014.08.014
- 282 16. Nandrino J-L, Ducro C, Iachini T, Coello Y. Perception of Peripersonal and Interpersonal  
283 Space in Patients with Restrictive-type Anorexia. *Eur Eat Disord Rev*. 2017;25: 179–  
284 187. doi:10.1002/erv.2506
- 285 17. Cartaud A, Ruggiero G, Ott L, Iachini T, Coello Y. Physiological response to facial  
286 expressions in peripersonal space determines interpersonal distance in a social  
287 interaction context. *Front Psychol*. 2018;9. doi:doi.org/10.3389/fpsyg.2018.00657

- 288 18. Quesque F, Ruggiero G, Mouta S, Santos J, Iachini T, Coello Y. Keeping you at arm's  
289 length: modifying peripersonal space influences interpersonal distance. *Psychol Res.*  
290 2017;81: 709–720. doi:10.1007/s00426-016-0782-1
- 291 19. Welsch R, Hecht H, von Castell C. Psychopathy and the Regulation of Interpersonal  
292 Distance. *Clin Psychol Sci.* 2018;6: 835–847. doi:10.1177/2167702618788874
- 293

## 294 **Supporting information**

295

296



297 **S1 Table: Overview Table.** Mean, standard deviation, number of missing evaluations, and  
298 corrected mean computed from the inter-rater reliability analysis for each virtual character as a  
299 function of the four evaluation criteria: valence (val), reliability (rel), sympathy (sym) and  
300 sociability (soc). For each virtual character, their gender and parent cluster are also provided

Virtual Character	Gender	Mean				Standard Deviation				Number of Missing evaluation				ICC Corrected Mean				Cluster
		Val	Rel	Sym	Soc	Val	Rel	Sym	Soc	Val	Rel	Sym	Soc	Val	Rel	Sym	Soc	
F01	F	5.38	5.39	5.65	5.51	1.98	1.96	1.93	2.31	1	2	2	1	5.4	5.35	5.67	5.52	2
F02	F	4.89	5	4.83	5.58	2.27	2.6	2.54	2.42	2	2	2	0	4.85	5.04	4.85	5.58	2
F03	F	4.16	4.35	4.5	4.1	2.06	2.25	2.45	2.23	1	1	2	1	4.14	4.38	4.48	4.1	3
F04	F	4.86	5.16	5.15	4.99	2.38	2.21	2.25	2.17	1	3	4	1	4.88	5.13	5.14	5	2
F05	F	4.05	3.92	3.82	4.51	2.28	2.3	2.23	2.29	4	3	4	4	4.09	3.97	3.79	4.48	3
F06	F	5.52	5.69	5.64	5.89	1.67	1.62	1.71	1.82	0	1	0	0	5.53	5.63	5.63	5.88	1
F07	F	4.67	4.86	4.76	4.62	1.98	2.22	2.46	2.13	3	0	2	0	4.71	4.9	4.76	4.62	2
F08	F	4.67	4.85	5.17	5.12	2.24	2.19	2.35	2.19	3	4	3	4	4.7	4.8	5.13	5.01	2
F09	F	4.94	4.68	4.47	4.84	2.15	2.17	2.25	1.91	4	5	3	4	4.91	4.59	4.51	4.87	2
F10	F	5.68	5.35	5.72	5.75	1.85	2.14	1.91	2.15	0	0	0	0	5.68	5.39	5.71	5.75	1
F11	F	3.8	3.34	3.35	3.6	2.04	1.64	1.58	1.73	2	5	4	1	3.81	3.26	3.39	3.6	3
F12	F	3.82	3.82	3.74	3.89	2	1.85	1.65	1.87	5	4	3	4	3.83	3.77	3.71	3.8	3
F13	F	4.54	4.5	4.71	4.72	2.23	2.44	2.34	2.42	3	6	5	2	4.6	4.44	4.79	4.75	2
F14	F	3.62	3.29	3.19	3.64	1.93	1.86	1.83	2.26	4	7	6	5	3.65	3.33	3.17	3.65	3
F15	F	3.68	3.7	3.59	4.35	2.13	2.32	2.33	2.28	4	5	4	5	3.66	3.64	3.63	4.29	3
F16	F	4.26	4.72	4.3	4.81	2.22	2.13	2.28	2.06	3	4	4	3	4.31	4.8	4.29	4.82	2
F17	F	6.17	6.06	6.28	6.54	1.98	1.79	2.06	2.35	0	1	0	0	6.17	6.01	6.27	6.54	1
F18	F	4.12	4.54	4.18	3.91	2.18	2.23	1.98	2.06	6	8	9	5	4.19	4.61	4.23	3.95	3
F19	F	5.24	5.54	5.72	5.28	1.67	1.76	2.21	1.81	2	2	1	1	5.26	5.6	5.72	5.29	2
F20	F	5.04	5.01	5.21	5.21	1.88	1.8	2.11	2.33	1	2	1	1	5.05	4.96	5.18	5.22	2
F21	F	5.71	5.59	5.84	5.82	2.02	2.18	2.26	2.37	1	3	2	2	5.73	5.56	5.84	5.82	1
F22	F	5.71	5.56	5.5	5.62	1.76	2.11	2.05	2.06	0	3	1	1	5.71	5.51	5.51	5.61	1
F23	F	4.47	4.58	4.54	4.96	1.95	2.3	2.09	1.96	4	3	4	3	4.45	4.66	4.54	4.96	2
F24	F	4.21	4.33	4.02	4.47	2.01	2.09	1.87	2.26	4	3	4	4	4.25	4.42	4.05	4.56	3
M01	M	6.35	5.84	6.52	6.43	1.71	2	1.69	1.87	1	1	0	0	6.32	5.88	6.5	6.43	1
M02	M	6.03	5.7	6.44	6.4	1.88	1.94	1.84	1.93	2	3	1	1	6	5.66	6.44	6.43	1

M03	M	4.52	4.1	4.58	4.41	2.23	2.06	2.33	2.25	4	2	1	0	4.49	4.13	4.55	4.41	3
M04	M	4.48	4.47	5.13	4.8	1.49	2.19	1.94	2.13	3	3	2	0	4.49	4.52	5.14	4.79	2
M05	M	5.53	4.86	5.75	5.1	2.13	2.3	2.31	2.27	2	2	2	1	5.51	4.91	5.78	5.11	2
M06	M	6.7	6.17	6.78	7	1.64	1.94	1.82	1.87	2	3	2	2	6.73	6.14	6.79	7.04	1
M07	M	6.98	6.58	7.02	7.12	1.37	1.95	1.6	1.75	1	1	0	0	6.94	6.52	7	7.12	1
M08	M	4.15	3.75	4.04	4.22	1.9	2.03	2.11	2.11	4	4	3	4	4.14	3.73	4.07	4.2	3
M09	M	4.63	4.82	5.3	5.15	2.2	2	2.09	2.11	1	3	1	2	4.65	4.8	5.31	5.08	2
M10	M	6.39	6	6.66	6.52	1.79	1.67	1.49	1.78	1	1	0	0	6.36	5.94	6.65	6.52	1
M11	M	5.3	4.39	5.07	5.38	2.1	2.33	2.27	2.38	2	2	1	1	5.34	4.45	5.07	5.38	2
M12	M	4.6	4.3	4.81	4.68	1.46	1.73	1.9	1.79	0	2	0	0	4.6	4.35	4.8	4.67	2
M13	M	5.38	4.84	5.4	5.35	1.81	2.03	2.18	1.94	2	1	1	1	5.35	4.89	5.41	5.37	2
M14	M	4.21	4.15	4.66	3.76	1.91	2.01	2.3	2.04	0	1	2	2	4.22	4.2	4.67	3.77	3
M15	M	5.06	4.96	5.11	5.16	2.26	2.14	2.38	2.3	1	1	0	0	5.02	5	5.1	5.16	2
M16	M	4.87	4.81	5.05	4.77	1.91	1.81	1.99	2.17	3	3	1	2	4.83	4.77	5.06	4.8	2
M17	M	5.74	5.39	5.85	5.9	1.92	2.15	1.99	1.99	3	2	1	1	5.74	5.45	5.86	5.93	1
M18	M	4.26	3.88	4.74	4.45	1.65	1.57	1.87	2.03	3	2	2	3	4.22	3.82	4.65	4.39	3
M19	M	4.99	3.95	4.57	5.07	1.84	1.95	2.16	2.24	3	4	2	3	4.89	3.93	4.51	5.01	2
M20	M	4.64	4.45	4.91	4.6	1.75	1.65	1.92	1.91	2	4	2	3	4.65	4.39	4.92	4.63	2
M21	M	6.74	6.18	7.23	6.35	1.71	2.21	1.55	2.08	1	0	0	0	6.71	6.22	7.22	6.35	1
M22	M	4.88	4.23	4.75	4.95	1.36	1.77	1.55	1.86	5	4	4	4	4.92	4.2	4.76	4.99	2
M23	M	5.44	4.85	5.36	5.4	2.12	2.05	1.87	2.08	2	1	1	2	5.41	4.9	5.36	5.45	2
M24	M	5.55	5.82	6.17	5.69	1.64	1.54	1.65	1.82	2	3	1	1	5.53	5.79	6.18	5.71	1

