

# Study 7: Construct Validity: Convergent and Discriminant Validity analysis

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This document reports the final step of validation studies of a questionnaire for evaluating human interaction with an artificial social agent. After construct validity analysis, specifically convergent and discriminant validity of initial 131 instrument items that involved 532 crowd-workers who were asked to rate human interaction with 14 different artificial social agents (ASAs), the selection of 90 items was resulted for inclusion of the long version of the ASA questionnaire. In addition, a representative item of each construct or dimension was selected to create a 24-item short version of the ASA questionnaire. Whereas the long version is suitable for a comprehensive evaluation of human-ASA interaction, the short version allows quick analysis and description of the interaction with the ASA. To support reporting ASA questionnaire results, we also put forward an ASA chart. The chart provides a quick overview of agent profile.

In the [Artificial Social Agent Evaluation Instrument workgroup](#), scientists from the Intelligent Virtual Agent community are collaborating to create a validated community driven standardized questionnaire instrument for evaluating human interaction with artificial social agents. This instrument can help researchers to make claims about people's perceptions, attitudes, and beliefs towards their agent. It allows agents to be compared across user studies, and importantly, it helps in replicating our scientific findings. This is essential for the community if we want to make valid claims about the impact that our social agents can have in domains such as health, entertainment, and education.

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## Revision History

Date	Version	Description	Author
17 July 2021	1.0	Initial documentation	Siska Fitriane
13 May 2022	1.1	Draft	Siska Fitriane
13 July 2022	1.2	Finalization	Siska Fitriane

## Background

This study is conducted in the research into creating a validated standardized questionnaire instrument to evaluate human interaction with a social agent. The research is conducted within the [Artificial Social Agent Evaluation Instrument workgroup](#) involving researchers around the world. The evaluation instrument can help researchers to make claims about people's perceptions, attitude and beliefs towards their agent. Examples of this agent can be animated conversational characters, robots and conversational (chat) programs. The instrument will consist of measurements (= constructs) that allow agents to be compared across user studies, and importantly, they help in replicating scientific findings. Our previous study has resulted 131 expert-generated, content-validated and reliability analyzed questionnaire items that correspond to 29 measurement constructs/dimensions <sup>1,2,3,4,5,6</sup> (see Appendix A). The questionnaires items are statement with an accompanying rating scale. Note: no questionnaire items for 6.b. Agent's Personality Types, 18.2 Agent's Emotional Intelligence Type and 18.4 User's Emotion Type.

To ensure variability among observed items in the constructs and to gain more information about the interdependencies between these items, we will conduct validation studies. The present study, we determine the final item set by examining construct validity of the item set. Here we examine whether related items operate in a consistent manner (construct validity), specifically, if an item converge with the items of the same construct or dimension (convergent validity) and diverge from items of other constructs or dimensions (discriminate validity)<sup>7</sup>. For this examination, we performed factor analyses to explore the theoretical factor structure of the constructs and their dimensions by analyzing their internal consistency and the underlying relationships between these constructs (and dimensions) and between items. The analysis was based on data obtained from crowd-workers (n = 532); each rated one of fourteen different ASAs. The result of the analysis allowed us to select items that both converge and discriminate for the long version of the questionnaire, i.e. the Artificial-Social-Agent (ASA) Questionnaire. Based on this final set, we selected representative items of constructs or dimensions for a short version for a quick and simple evaluation of an ASA and depicted on a web chart for visualizing the evaluation.

## Research Questions

Can we confirm the questionnaire items for evaluating human interaction with ASAs ?

This study is approved by the Human research Ethics Committee TU Delft date 18-12-2020<sup>8</sup> and registered at Open Science Framework<sup>9</sup>.

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<sup>1</sup> Reported in [Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2020. Technical Report: Study 2 - Define Construct, No. ASAEvalInst-TR#03, Date: 25-January-2020.](#)

<sup>2</sup> Published in Siska Fitrianie, Merijn Bruijnes, Deborah Richards, Andrea Bönsch, and Willem-Paul Brinkman. 2020. [The 19 Unifying Questionnaire Constructs of Artificial Social Agents: An IVA Community Analysis](#). In Proc. of IVA'20. ACM NY USA.

<sup>3</sup> Reported in Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2020. Technical Report: Study 3 - Collect Questionnaire Items, No. ASAEvalInst-TR#04, Date: 01-March-2020. (.pdf).

<sup>4</sup> Reported in Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2020. Technical Report: Study 4 - Towards Defining Questionnaire Items: A List of Potential Candidate Questionnaire Items, No. ASAEvalInst-TR#05 v1.01, Date: 03-July-2020. (.pdf).

<sup>5</sup> Reported in Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2021. Technical Report: Study 6 - Analyzing Reliability of Questionnaire Items, No. ASAEvalInst-TR#07, Date: 17-June-2021. (.pdf).

<sup>6</sup> Siska Fitrianie, Merijn Bruijnes, Fengxiang Li, and Willem-Paul Brinkman. 2021a. Questionnaire Items for Evaluating Artificial Social Agents - Expert Generated, Content Validated and Reliability Analysed. In Proceedings of the 21th ACM International Conference on Intelligent Virtual Agents (IVA '21). Association for Computing Machinery, New York, NY, USA, 84–86. DOI:<https://doi.org/10.1145/3472306.3478341>

<sup>7</sup> Neuman W. Lawrence. 2014. Social Research Methods: Qualitative and Quantitative Approaches (7 ed.). Pearson Education Limited, Harlow.

<sup>8</sup> Data Management Plan, Human Research Ethics Committee TU Delft's checklist and approval.

<sup>9</sup> [Open-Ended Pre-registration](#)

## Method

### Participants

We consider the rules-of-thumb for the number of participants for factor analysis, which vary from 4 to 10 subjects per variable<sup>10</sup> (resulting in it minimum of 524 participants). In addition, we conducted a simulation-run based on the theoretical model (of constructs) to see when it could converge. Based on analyses of simulation-runs with 131 items this results in a minimum of 406 participants (that complete the survey). However, to ensure equal distribution of participants over each of the agents, we aim for 532 participants (14 agents \* 38 participants). Should the model not be able to converge, more participants might be recruited (as funds permit).

Table 1 Participants

<b>#Pilot study submissions</b>	<b>10</b>
<b>#Submissions</b>	567
<b>#Rejected due to video check</b>	33
<b>Reason failed video check:</b>	
• <b>The video is NOT displayed</b>	0
• <b>The video is displayed but it is not playing</b>	32
• <b>The video is displayed but there is no sound</b>	1
<b>Check Score</b>	M=14.83, SD=0.91, range [1 .. 15]
<b>#Rejected due to attention check</b>	2
<b>#Accepted</b>	532

We recruited 567 crowd-workers (see Table 1) from an online crowdsourcing platform and 532 (95.8%) were included in the analysis based on two criteria: (1) having a compatible internet browser with the video format used in the study; and (2) correctly answering at least 12 out of 15 attention check questions. 33 participants failed the video check, and only 2 participants failed the attention check (i.e., the number of correctly answered-attention-questions: M=14.83, SD=.91, range [1 .. 15]). Participants were paid for their time according to the crowd platform's regulations.

### Materials

We decided to use videos of human-ASA interactions as stimuli material, which allowed us to collect data of interaction across a series of ASAs. Essential for establishing the set of ASAs was that it would create an opportunity for the ratings across ASAs to be, to a degree, non-related on constructs and dimensions. We wanted to avoid a situation where, for example, very likeable ASAs always had a human-like appearance, thereby providing no opportunity to examine discriminant validity between items of the constructs agent's likeability and human-like appearance. Therefore, prior to the current study, nine experts were involved in collecting 56 (30-second) video clips corresponding to 56 different agents. The agents vary on types (e.g., robots, chatbots, voice assistants, virtual agents, and real animals), domains (e.g., education, healthcare, personal assistant, and entertainment), environments (i.e., reality, mixed reality, virtual reality, and augmented reality), and development stages (i.e., high or low fidelity agents, partial or full functionality of the system). Some videos show conversations between agents and users, while other videos show how users use agents to help them with some tasks. The videos and related documents (including discussion notes) are online available<sup>11</sup>

As we mentioned before, we set out to select a set of agents that more-or-less cover the range of the constructs we intend to measure, as we need variability among observed items in the constructs, while at the same time allow some degree of independence between the rating of items from different constructs and

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<sup>10</sup> de Vet H.C.W., Adèr H.J., Terwee C.B., and Pouwer F.. 2005.

Are factor analytical techniques used appropriately in the validation of health status questionnaires? A systematic review on the quality of factor analysis of the SF-36. Quality of Life Research. 14: 1203–1218. <https://doi.org/10.1007/s11136-004-5742-3>

<sup>11</sup> Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2020. [Technical Report: Study 5 - Collecting Prototypical Artificial Social Agents, No.ASAEvalInst-TR#06](#), Date: 11-December-2020.



dimensions. Therefore, we included agents that ranged relatively from the highest to the lowest score on the different constructs. To determine this, three experts predicted the ratings of each agent on each construct (high, medium, or low) and used the result to calculate the correlation between agents. We selected a set of agents ( $n=14$ , 13 ASAs: DeepBlue, Siri, Sim Sensei, Sarah (Soul Machines), Chappie, iCAT, Marcus (Terminator), POPPY, AIBO, HAL 9000, NAO, Amy, and Furby, and one dog) that had the least correlation with each other and across the constructs to ensure diversity agent-rates across the constructs.

### Instructions

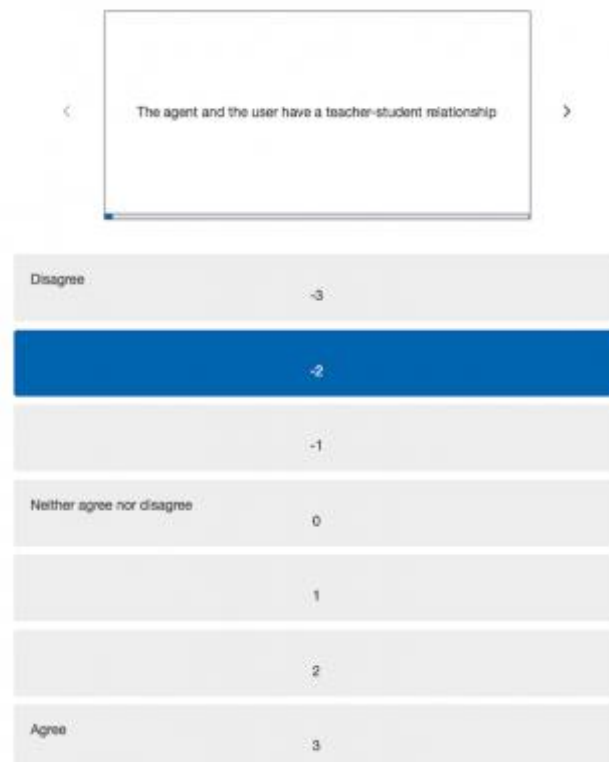
In this study, you will rate an interaction between an "artificial social agent" and its human users, which is displayed in a 30 second video clip. First, you will be asked to watch the movie until it is completed. Then, you will be given a list of statements about the interaction between the agent and its users.

Prior to the real experiment, we will test the compatibility of your internet browser with our video. If you are able to watch the given check-movie, then you can start the experiment and the real movie will be displayed automatically.

There are 146 statements in total. Please read each one and indicate to what extent you agree or disagree with each statement based on what you have seen in the video. To refresh your memory, you can always re-watch the video at the top of the page.

There are 15 attention check questions included. If you fail multiple attention checks, your submission might be rejected and you might not get paid (in accordance with the Prolific rules). Don't worry, if you read carefully you will be fine!

The picture below shows an example of how to indicate your response:



The screenshot shows a rating interface. At the top, there is a statement: "The agent and the user have a teacher-student relationship". Below the statement is a Likert scale with seven options: Disagree (-3), -2, -1, Neither agree nor disagree (0), 1, 2, and Agree (3). The option -2 is highlighted in blue, indicating it is the selected response. To the right of the statement, there are left and right arrow buttons. Below the scale, there is a blue button with a right arrow.

Figure 1 Instruction for the participants. Note: the statement in this figure is not part of the real questionnaire.

To gather the data, we used Qualtrics and the online crowd sourcing platform Prolific Academic. Further, data processing and analysis was conducted using R (v4.0.4) with factor analysis libraries from the package *psych* (v2.1.3) and *lavaan* (v0.6-8). Analyses scripts and data are online available<sup>12</sup>.

The ASA questionnaire items have a 7-point scale on an interval between 'disagree' (value of -3) to 'agree' (value of 3) with the middle point (value of 0) for 'neither agree nor disagree'. Figure 1 shows how the questionnaire items are presented to the participants. They are formulated as a singular statement in such a way they can easily be setup so that they can be answered by a person who interacted with an agent (i.e., first person point of view) and by someone who observed an interaction with an agent (i.e., third point of view).

## Study Design and Procedure

We asked a participant to rate (a video of) an interaction between a human user and an ASA using the questionnaire. The human-ASA interaction was displayed in a 30-second video clip, which was randomly selected from the fourteen videos of the fourteen selected agents. All participants received the same 131 questionnaire items plus 15 attention check questions in random order. Particularly, the items were setup to the third point of view, e.g., "The user likes <the agent>" instead of "I like <the agent>", where <the agent> was replaced with the name of the agent that the participant viewed. Appendix B Initial Questionnaire Items column 'Q 3<sup>rd</sup> POV' presents the 131 questionnaire items used in this study.

All participants had to determine the compatibility of their internet browser with the video format (Appendix C Video Check and Attention Check Questions shows the instruction for the video compatibility check). Only participants who met this criteria could continue to the study. Participants read the instructions (Figure 1) and gave their online informed consent. Then, after watching the video they rated the interaction based on what they have seen in the video. The first viewing of the video was enforced by preventing participants to advance to the next page for the duration of the video, and they could re-watch the video at any time during the remainder of the experiment. Participants had to answer all the 131 items and fifteen attention check questions before they could submit their answers. Appendix C Video Check and Attention Check Questions presents the 15 questions used for the attention check.

## Data Preparation and Analysis Plan

A goal of the analyses was to:

- (i) lessen the number of items that correlate with other constructs/dimensions;
- (ii) balance the coverage within each construct/dimension and the discriminatory power between constructs/dimensions.

Prior to the analysis, the observed data was standardized to allow us to compare the ratings between different ASAs. For this, we calculated the mean and the standard deviation per item per ASA (see the R script in A). Then, for each observed value of an item, we subtracted the mean and divided by the standard deviation based on its corresponding ASA.

In the following sections, we describe how we determined the final item set and the short version of the ASA questionnaire, and we suggest how to present the insights in an ASA chart.

## The Final Questionnaire Items

Running an admissible (i.e., no negative variances are found and no a non-positive definite matrix returned) second-order analysis based on one theoretically grounded conceptual model proved impossible due to the model complexity<sup>13</sup>. To solve this problem, we broke up the theoretical model into smaller models. We first created models containing overlapping (with strong co-linearity) constructs/dimensions to create 'worst-case scenarios' (i.e., if a smaller model is able to resolve these closely related constructs, the full model is likely also able to resolve them). To do this, we took two sequential analyses (ovals in Figure 2):

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<sup>12</sup> Siska Fitrianie, Merijn Bruijnes, Fengxiang Li, Amal Abdulrahman, Willem-Paul Brinkman. 2022. Data and analysis underlying the research into the Artificial-Social-Agent Questionnaire: Establishing the long and short questionnaire versions. <https://doi.org/10.4121/19758436> 4TU.ResearchData.

<sup>13</sup> Niels J. Blunch. 2013. Introduction to Structural Equation Modeling using IBM SPSS Statistics and AMOS (2nd eds. ed.). SAGE, City Road, London. <https://doi.org/10.4135/9781526402257>

1. Convergent validity analysis.  
In this step, we analyze individual constructs' convergence. A Confirmatory Factor Analysis (CFA) was carried out for each construct in isolation to verify the internal consistency of the construct and, for those that have more than one dimensions, to reduce the co-linearity between dimensions.
2. Discriminant validity analysis:  
In this step, we analyze constructs in groups. The constructs (and their dimensions) were grouped into smaller models based on grouping established with an Exploratory Factor Analysis (EFA) on the construct and dimensions scores (i.e. the predicted latent scores derived from the CFA analysis of individual constructs in the convergent validity analysis). Then, these models were analyzed with a CFA. Here, we removed items that had a low discriminatory power between constructs. The remaining items are the final item set of the questionnaire. However, note that discriminant validity is relevant from a statistical point of view, yet due to the expert perspective in our previous work, content validity took precedent. In other words, we optimized for discriminant validity but accepted correlations between constructs<sup>14</sup>: experts are interested in constructs that 'apparently' overlap.

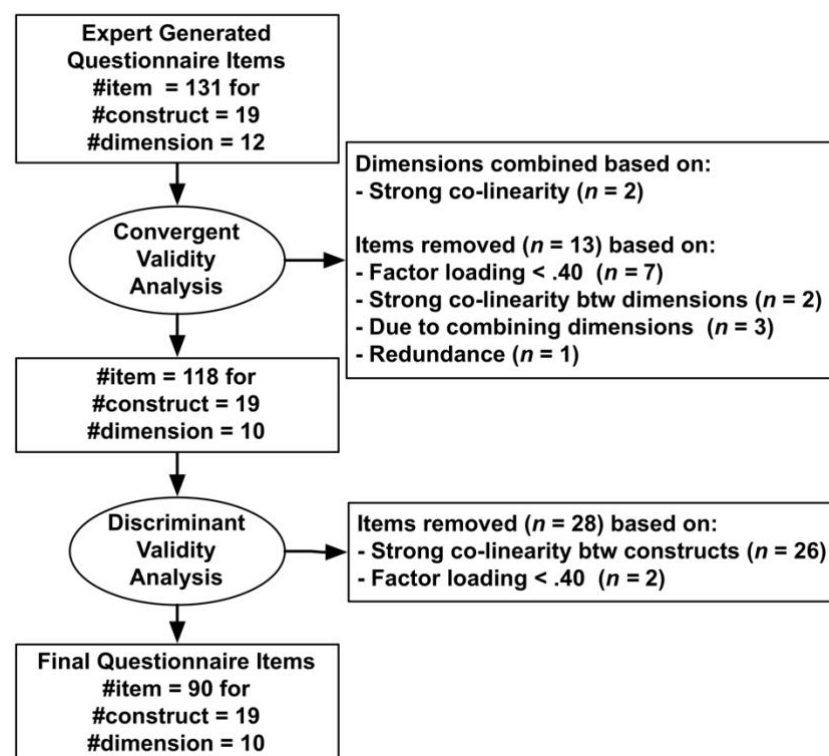


Figure 2 Analysis flow

We carried out all factor analyses via the maximum likelihood method and the Promax rotation method, which allows factors to be correlated. Note that here, all dimensions are treated as separate constructs, as dimensions often strongly correlate with other dimensions of their construct. We observed the model's Comparative Fit Index (CFI) value as an indicator of good model fit. The CFI has a range of 0 to 1 and values closer to 1 are a sign of a better fit<sup>15</sup>.

In each analysis, we aimed to reduce the number of items in constructs (and dimensions), with a minimum of at least three remaining items. An item could be removed when it had:

<sup>14</sup> Mikko Rönkkö and Eunseong Cho. 2022. An Updated Guideline for Assessing Discriminant Validity. *Organizational Research Methods* 25, 1 (2022), 6–14. <https://doi.org/10.1177/1094428120968614>

<sup>15</sup> Niels J. Blunch. 2013. *Introduction to Structural Equation Modeling using IBM SPSS Statistics and AMOS* (2nd eds. ed.). SAGE, City Road, London. <https://doi.org/10.4135/9781526402257>

- a low standardized factor load score. The items are expected to load highly on their intended construct (or dimension) and low on others (i.e., no cross-loading). A priori, a factor loading smaller than .40 was established<sup>16</sup> as unacceptable for this study; or
- a high modification index with other constructs/dimensions or with another item from another construct/dimension. Modification indices suggest that additional links in the model structure would improve the Chi-square of model fit<sup>17</sup>. In our case, a modification index higher than 3.841 (i.e., 0.05 critical value for Chi-square difference test with one degree of freedom<sup>18</sup> of an item associated with another construct/dimension indicates that the item has low discriminatory power for its intended construct (or dimension).

The model (where the item was removed) still had to achieve convergence and be admissible; and the removal of the item should result in a higher CFI score. Additionally, links between two items in the same construct/dimension based on modification indices were considered and added to the model for improving the model fit. These processes were repeated until:

- (i) all models achieved convergence, were admissible, and had a good fit (with CFI  $\geq$  .95); and
- (ii) no overlapping constructs/dimensions in the models.

An item was removed according to these rules and according to the decision of four judges who examined whether or not it made theoretical sense to remove or retain the item. The judges' discussion continued until unanimous agreement was reached.

We aimed to select one representative item from each construct (and dimension) to create a short version of the ASA questionnaire. A representative item should:

- a. have a high standardized factor loading (preferably the highest), and
- b. be able to theoretically represent its intended construct/dimension.

To assess to what extent the short version could be a substitute for the long version, we analyzed the correlation and absolute mean difference between the long and short version of the questionnaire based on the raw observed data ( $n = 532$ ). Here, for the long version, we used the mean of item scores of each construct/dimension. Finally, we compared whether EFAs of the short and long questionnaires would result in a similar grouping of constructs/dimensions.

### ASA Chart

To present the results of the ASA questionnaire in a standardized and easy to view manner, we propose the ASA-(web) chart. In the web chart, each of the constructs/dimensions is displayed on a semi-circle radiating outward. We organized them on the chart in groups following the factorial groupings used in the discriminant validity analysis. Within each group, we used the correlation scores between constructs/dimensions as a reference to place them next to each other. The higher correlation score the closer they were set with each other.

## Results

Data collected in this study is stored in [result\\_all.csv](#) (see Table 2 for its columns' description). Appendix D Data Description presents the statistical description of the dataset.

*Table 2 result\_all.csv tables columns description*

COLUMN	DESCRIPTION	VALUE
PRID	Participant ID	

<sup>16</sup> Eva Knekta, Christopher Runyon, and Sarah Eddy. 2019. One Size Doesn't Fit All: Using Factor Analysis to Gather Validity Evidence When Using Surveys in Your Research. CBE life sciences education 18, 1 (2019), rm1. <https://doi.org/10.1187/cbe.18-04-0064>

<sup>17</sup> Yves Rosseel. 2012. *Lavaan: An R Package for Structural Equation Modeling*. Journal of Statistical Software 48, 2 (2012), 1–36. <http://www.jstatsoft.org/v48/i02/>

<sup>18</sup> Niels J. Blunch. 2013. Introduction to Structural Equation Modeling using IBM SPSS Statistics and AMOS (2nd eds. ed.). SAGE, City Road, London. <https://doi.org/10.4135/9781526402257>

COLUMN	DESCRIPTION	VALUE
STARTDATE	Datetime of the participant starting filling in the questionnaire	YYYY-MM-DD hh:mm:ss
ENDDATE	Datetime of the participant ending filling in the questionnaire	YYYY-MM-DD hh:mm:ss
RECORDDATE	Datetime of the questionnaire recording the participant's data	YYYY-MM-DD hh:mm:ss
GROUP	One of 14 group IDs of the participant	DeepBlue, Siri, Sim Sensei, Sarah, Chappie, Dog, iCAT, Marcus, POPPY, AIBO, HAL 9000, NAO, Amy, and Furby.
CHECKSCORE	The number of correct attention checks	[0..15]
C01D01Q?? .. C19D00Q??	The questionnaire items and the participant's answers Items with ID "R_C??D??Q??" denotes the reverse-scoring items	[-3 .. 3]

## Analysis

Participants ( $n = 532$ ) took on average 19.5 minutes ( $SD = 8$ ) to complete the experiment (including reading the instruction, filling in their consent, and (re)watching the video if needed). The samples of 131 questionnaire items were then standardized, with on average 38 samples ( $SD = 1.24$ , range [36 .. 39]) for each of the 14 ASAs (Table 3). Appendix D Data Description presents the statistical description of each ASA's dataset. This section presents the results of the analyses. First, we describe the validation process, then we present the final questionnaire items, afterward the short version, and finally how to create the ASA chart.

Table 3 Samples per ASA

	ASA	N	M	SD	MIN	MAX
1.	AIBO	39	.79	1.94	-3	3
2.	AMY	39	.33	1.76	-3	3
3.	CHAPPIE	38	.75	1.69	-3	3
4.	DEEPBLUE	39	.25	2.14	-3	3
5.	DOG	39	1.19	1.81	-3	3
6.	FURBY	39	.54	2.03	-3	3
7.	HAL 9000	37	.56	1.93	-3	3
8.	iCAT	36	-.09	2.00	-3	3
9.	NAO	36	.91	1.78	-3	3
10.	POPPY	38	.54	1.83	-3	3
11.	SIM SENSEI	38	.65	1.71	-3	3
12.	SIRI	39	.50	2.01	-3	3
13.	SARAH (SOUL MACHINES)	39	.85	1.72	-3	3
14.	MARCUS (TERMINATOR)	36	.96	1.63	-3	3

## Validity Analysis of Constructs/Dimensions

Preliminary convergent validity analysis of the individual constructs revealed that the dimensions, in three out of four constructs that have dimensions, might not necessarily form one construct (i.e., statistically non-admissible models). To address this, the judges discussed whether to combine such dimensions or to treat them as individual constructs during the analyses. Firstly, the judges decided to combine two dimensions in the construct Performance (i.e., Agent's Performance and User's Performance), because the performance of 'the team' is dependent on the actions of both parties. Secondly, in the construct User-Agent Alliance, the judges agreed to combine the dimensions Task Alliance and Social Alliance, as performing a task in a social setting means both are relevant for the user-agent alliance. Thirdly, the judges decided to analyze two dimensions in the construct Emotional Experience (i.e User's Emotion Presence and Agent's Emotional

Intelligent Presence) as separate constructs because the agent's and user's emotion presence are independent. Finally, these (theoretically based) decisions allowed us to run the statistical models.

### Convergent Validity Analysis

Analyzing individual constructs' convergence aiming for three items per construct, resulted in the removal of 13 (9.9%) out of 131 items. Appendix F The CFA Results of Convergent Validity Analysis shows the resulted CFAs for each individual construct in this convergent validity analysis including reasoning of the removal of items (i.e. resulted from discussion among the judges).

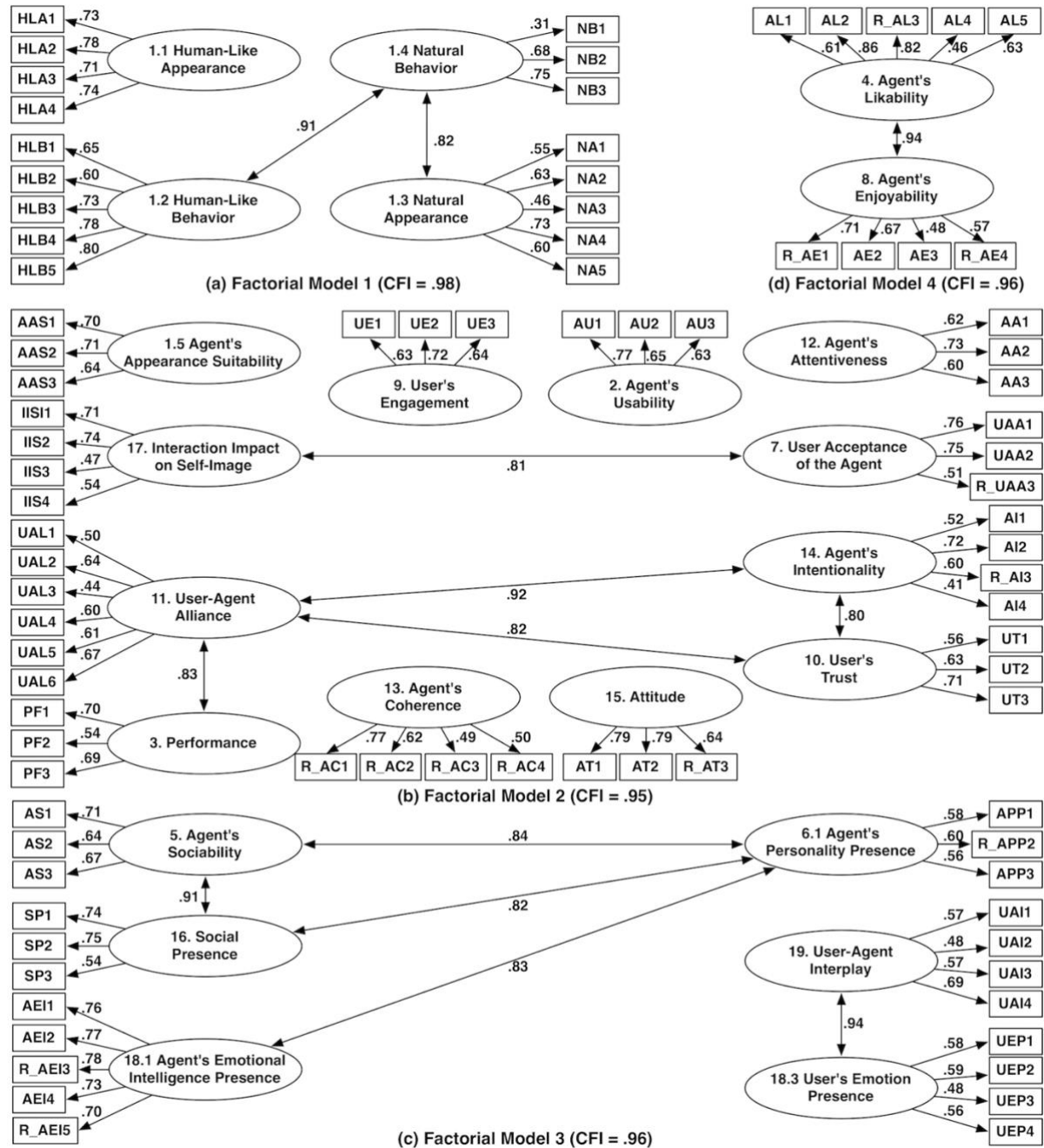


Figure 3 Confirmatory factor analysis diagrams. Links between constructs with correlation  $p \leq .8$  are shown. Note: The construct/dimension numbering: <construct no>.<dimension no> and the item reference IDs following Fitrianie et al. 2022<sup>19</sup>.

<sup>19</sup> Siska Fitrianie, Merijn Bruijnes, Fengxiang Li, Amal Abdulrahman, and Willem-Paul Brinkman. 2022. Artificial Social Agent Questionnaire Instrument. [https://doi.org/10.4121/19650846\\_4TU.ResearchData](https://doi.org/10.4121/19650846_4TU.ResearchData).



As illustrated in Figure 2, seven items were removed due to their low factor loading ( $\beta < .40$ ). Two items were dropped due to a high correlation between dimensions. Further, the combination of two dimensions in the construct Performance led to the removal of three items that measured *only* the user's performance as ASA researchers might be interested predominantly in the ASA's performance. Finally, one item was taken out from the Construct Personality because of similarity. The judges agreed to remove the redundant item with the lowest factor loading. This resulted in 118 (90.1%) convergent validated items in 19 constructs (CFI M=.99, SD=.02, range [.96 .. 1]).

### Discriminant Validity Analysis

The discriminate validity analysis was carried out based on 24 constructs/dimensions resulting from the convergent validity analysis, i.e., 5 dimensions from the construct Agent's Believability, 2 dimensions from the construct Emotional Experience, and 17 individual constructs. The EFA resulted in five factors of constructs/dimensions (with standardized factor load ranging [.41 .. .97], see (see Appendix G The EFA Result of Predicted Latent Scores). Additionally, three constructs/dimensions were loaded on more than one factor (i.e., Natural Behavior, Human-Like Behavior, and Agent's Enjoyability). As mentioned before, however, these factors are **not** intended to have meaning. The factorial grouping allows us to analyze the constructs/dimensions in five separated models, compared to one large (non-admissible) model.

Table 4 The number of items per each construct/dimension reduced during the analysis

No.	Construct/ Dimension	Initial #Items	After Convergent Validity Analysis #Items	After Determinant Validity Analysis #Items
1	C01D01	5	4	4
2	C01D02	5	5	5
3	C01D03	5	5	5
4	C01D04	5	3	3
5	C01D05	5	5	3
6	C02	5	4	3
7	C03*	10	6	3
8	C04	5	5	5
9	C05	5	5	3
10	C06D01	5	4	3
11	C07	5	5	3
12	C08	5	5	4
13	C09	6	4	3
14	C10	5	5	3
15	C11*	10	10	6
16	C12	5	4	3
17	C13	5	5	4
18	C14	5	5	4
19	C15	5	5	3
20	C16	5	5	3
21	C17	5	5	4
22	C18D01	5	5	5
23	C18D03	5	4	4
24	C19	5	5	4
Total		131	118	90

The discriminant validity analysis aiming for three items per construct (see Appendix H The CFA Results of Discriminant Validity Analysis), resulted in the removal of 28 items, i.e. due to a very low factor load ( $\beta < .40$ ; 2 items), or due to a poor discriminatory power for their intended construct ( $MI > 3.84$ ; 26 items). This resulted in 90 validated items (i.e. 76.3% out of 118 items, see table 4) in 19 constructs (on average 4 items per construct/dimension, see Figure 3. The factor loadings of the items range from .31 to .86 (M=.64, SD=.11, Table 5). One item (in the dimension Natural Behavior in the construct Agent's Believability) has a factor loading of  $\beta < .40$ . However, the judges decided to not remove the item as the dimension already has three

items only. Additionally, the internal consistency test of the constructs/dimensions shows an average reliability of Cronbach's  $\alpha = .72$  (SD=.07, ranging from .60 to .86) (see Appendix I CFA and Reliability Analysis Results of Individual Measurement).

Table 5 Classification of items based on their factor loading score

FACTOR (COMPONENT) THRESHOLD <sup>20</sup>	ABS(FACTOR LOAD SCORE)	#ITEM N = 90
<b>EXCELLENT</b>	0.71 – 1.00	32 (35.6%)
<b>VERY GOOD</b>	0.63 – 0.70	21 (23.3 %)
<b>GOOD</b>	0.55 – 0.62	20 (22.2 %)
<b>FAIR</b>	0.45 – 0.54	14 (15.6 %)
<b>POOR</b>	0.32 – 0.44	2 (.02 %)
	< .32	1 (.01 %)

We investigated whether the removal of the items impacted the factorial models. The EFA was re-run and showed that there were now four factorial models, without constructs overlapping into multiple factors (see CFA Results of Four EFA-based Models or Table 6, left side). The CFI scores of the models (CFI range = [.95 .. .98], M=.96, SD=.01, see Figure 3) show a very good fit. This implies that our a priori expectation, the items are grouped as manifestations of their underlying construct/dimensions, matches with the observed data. In Figure 3, we only show correlations between constructs that are of marginal and moderate concern ( $\rho \geq .8$ )<sup>21</sup>. The 90 items constitute the full/long ASA questionnaire<sup>22</sup>.

Table 6 The grouping of 24 constructs/dimensions and 24 representative items into 4 factors

FACTOR	BASED ON 24 CONSTRUCTS	BASED ON 24 ITEMS
<b>1</b>	4 constructs: C01D01, C01D02, C01D03 and C01D04	6 constructs: C01D01, C01D02, C01D03 and C01D04, <b>C05, C11, C16</b>
<b>2</b>	12 constructs: C01D05, C02, C03, C07, C09, C10, <b>C11</b> , C12, C13, C14, C15 and C17	11 constructs: C01D05, C02, C03, C07, C09, C10, C12, C13, C14, C15 and C17
<b>3</b>	6 constructs: <b>C05</b> , C06D01, <b>C16</b> , C18D01, C18D03 and C19	4 constructs: C06D01, C18D01, C18D03 and C19
<b>4</b>	2 constructs: C04 and C08	2 constructs: C04 and C08

## The Long Version of the ASA Questionnaire

Note:

- [R] refers to reverse-scoring questionnaire item
- ITEMREF follows the item reference id in Fitrianie et al., 2022<sup>21</sup>

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<sup>21</sup> Mikko Rönkkö and Eunseong Cho. 2022. An Updated Guideline for Assessing Discriminant Validity.

Organizational Research Methods 25, 1 (2022), 6–14. <https://doi.org/10.1177/1094428120968614>

<sup>22</sup> Siska Fitrianie, Merijn Bruijnes, Fengxiang Li, Amal Abdulrahman, and Willem-Paul Brinkman. 2022. Artificial Social Agent Questionnaire Instrument. <https://doi.org/10.4121/19650846> 4TU.ResearchData.



### C01 Agent's Believability

Definition: The extent to which a user believes that the artefact is a social agent

#### C01D01 Human-Like Appearance

Definition: The extent to which a user believes that the social agent appears like a human

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D01Q3	HLA1	[The agent]'s appearance is human
2.	C01D01Q10	HLA2	[The agent] has the appearance of a human
3.	C01D01Q13	HLA3	[The agent] has a human-like outside
4.	C01D01Q15	HLA4	[The agent]'s appearance makes me think of a human

#### C01D02 Human-Like Behavior

Definition: The extent to which a user believes that the social agent behaves like a human

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D02Q7	HLB1	A human would behave like [the agent]
2.	C01D02Q10	HLB2	[The agent]'s manners are consistent with that of people
3.	C01D02Q0	HLB3	[The agent] behavior makes me think of human behavior
4.	C01D02Q1	HLB4	[The agent] behaves like a real person
5.	C01D02Q9	HLB5	[The agent] has a human-like manner

#### C01D03 Natural Appearance

Definition: The extent to which a user believes that the social agent's appearance could exist in or be derived from nature

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D03Q7	NA1	[The agent] appears like something that could exist in nature
2.	C01D03Q9	NA2	[The agent] has a natural physique
3.	C01D03Q10	NA3	[The agent]'s resemblance has an organic origin
4.	C01D03Q11	NA4	[The agent] seems natural from its outward appearance
5.	C01D03Q12	NA5	How [the agent] is represented is realistic

#### C01D04 Natural Behavior

Definition: The extent to which a user believes that the social agent's behaviour could exist in or be derived from nature

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D04Q0	NB1	[The agent] is alive
2.	C01D04Q13	NB2	[The agent] acts naturally
3.	C01D04Q15	NB3	[The agent] reacts like a living organism

#### C01D05 Agent's Appearance Suitability

Definition: The extent to which the agent's appearance is suitable for its role

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D05Q2	AAS1	[The agent]'s appearance is appropriate
2.	C01D05Q9	AAS2	[The agent]'s physique is suitable for its role
3.	C01D05Q0	AAS3	[The agent]'s appearance was suitable

### C02 Agent's Usability

Definition: The extent to which a user believes that using an agent will be free from effort (future process)

No.	ITEMID	ITEMREF	ITEMQ
1.	C02D00Q1	AU1	[The agent] is easy to use

2.	C02D00Q2	AU2	Learning to work with [the agent] is easy
3.	C02D00Q8	AU3	Learning how to communicate with [the agent] is quick

### C03 Performance

Definition: The extent to which a task was well performed (past performance)

No.	ITEMID	ITEMREF	ITEMQ
1.	C03D01Q7	PF1	[The agent] does its task well
2.	C03D01Q12	PF2	[The agent] does not hinder [me / the user]
3.	C03D02Q10	PF3	[I am / The user is] capable of succeeding with [the agent]

### C04 Agent's Likeability

Definition: The agent's qualities that bring about a favourable regard

No.	ITEMID	ITEMREF	ITEMQ
1.	C04D00Q1	AL1	[The agent]'s appearance is pleasing
2.	C04D00Q10	AL2	I like [the agent]
3.	C04D00Q11	AL3	[R] I dislike [the agent]
4.	C04D00Q4	AL4	[The agent] is cooperative
5.	C04D00Q12	AL5	I want to hang out with [the agent]

### C05 Agent's Sociability

Definition: The agent's quality or state of being sociable

No.	ITEMID	ITEMREF	ITEMQ
1.	C05D00Q6	AS1	[The agent] can easily mix socially
2.	C05D00Q7	AS2	It is easy to mingle with [the agent]
3.	C05D00Q1	AS3	[The agent] interacts socially with [me / the user]

### C06 Agent's Personality

Definition: The combination of characteristics or qualities that form an individual's distinctive character

#### C06D01 Agent's Personality Presence

Definition: To what extent the user believes that the agent has a personality

No.	ITEMID	ITEMREF	ITEMQ
1.	C06D01Q1	APP1	[The agent] has a distinctive character
2.	C06D01Q6	APP2	[R] [The agent] is characterless
3.	C06D01Q11	APP3	[The agent] is an individual

### C07 User Acceptance of the Agent

Definition: The willingness of the user to interact with the agent

No.	ITEMID	ITEMREF	ITEMQ
1.	C07D00Q0	UAA1	[I / The user] will use [the agent] again in the future
2.	C07D00Q11	UAA2	[I / The user] can see [myself / themselves] using [the agent] in the future
3.	C07D00Q15	UAA3	[R] [I oppose / The user opposes] further interaction with [the agent]

### C08 Agent's Enjoyability

Definition: The extent to which a user finds interacting with the agent enjoyable

No.	ITEMID	ITEMREF	ITEMQ
1.	C08D00Q3	AE1	[R] [The agent] is boring
2.	C08D00Q4	AE2	It is interesting to interact with [the agent]

3.	C08D00Q0	AE3	[I enjoy / The user enjoys] interacting with [the agent]
4.	C08D00Q9	AE4	[R] [The agent] is unpleasant to deal with

### C09 User's Engagement

Definition: The extent to which the user feels involved in the interaction with the agent

No.	ITEMID	ITEMREF	ITEMQ
1.	C09D00Q4	UE1	[I / The user] was concentrated during the interaction with [the agent]
2.	C09D00Q10	UE2	The interaction captured [my / the user's] attention
3.	C09D00Q1	UE3	[I / The user] was alert during the interaction with [the agent]

### C10 User's Trust

Definition: The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)

No.	ITEMID	ITEMREF	ITEMQ
1.	C10D00Q6	UT1	[The agent] always gives good advice
2.	C10D00Q16	UT2	[The agent] acts truthfully
3.	C10D00Q18	UT3	[I / The user] can rely on [the agent]

### C11 User-Agent Alliance

Definition: The extent to which a beneficial association is formed

No.	ITEMID	ITEMREF	ITEMQ
1.	C11D01Q9	UAL1	[The agent] and [I / the user] have a strategic alliance
2.	C11D01Q10	UAL2	Collaborating with [the agent] is like a joint venture
3.	C11D01Q11	UAL3	[The agent] joins [me / the user] for mutual benefit
4.	C11D01Q14	UAL4	[The agent] can collaborate in a productive way
5.	C11D02Q4	UAL5	[The agent] and [I / the user] are in sync with each other
6.	C11D02Q7	UAL6	[The agent] understands [me / the user]

### C12 Agent's Attentiveness

Definition: The extent to which the user believes that the agent is aware of and has attention for the user

No.	ITEMID	ITEMREF	ITEMQ
1.	C12D00Q0	AA1	[The agent] remains focused on [me / the user] throughout the interaction
2.	C12D00Q13	AA2	[The agent] is attentive
3.	C12D00Q1	AA3	[I / The user] receives [the agent]'s full attention throughout the interaction

### C13 Agent's Coherence

Definition: The extent to which the agent is perceived as being logical and consistent

No.	ITEMID	ITEMREF	ITEMQ
1.	C13D00Q3	AC1	[R] [The agent]'s behavior does not make sense
2.	C13D00Q11	AC2	[R] [The agent]'s behavior is irrational
3.	C13D00Q6	AC3	[R] [The agent] is inconsistent
4.	C13D00Q15	AC4	[R] [The agent] appears confused

### C14 Agent's Intentionality

Definition: The extent to which the agent is perceived as being deliberate and has deliberations

No.	ITEMID	ITEMREF	ITEMQ
1.	C14D00Q0	AI1	[The agent] acts intentionally

2.	C14D00Q10	AI2	[The agent] knows what it is doing
3.	C14D00Q13	AI3	[R] [The agent] has no clue of what it is doing
4.	C14D00Q16	AI4	[The agent] can make its own decision

### C15 Attitude

Definition: A favourable or unfavourable evaluation toward the interaction with the agent

No.	ITEMID	ITEMREF	ITEMQ
1.	C15D00Q10	AT1	[I see / The user sees] the interaction with [the agent] as something positive
2.	C15D00Q11	AT2	[I view / The user views] the interaction as something favorable
3.	C15D00Q15	AT3	[R] [I think / The user thinks] negatively of the interaction with [the agent]

### C16 Social Presence

Definition: The degree to which the user perceives the presence of a social entity in the interaction

No.	ITEMID	ITEMREF	ITEMQ
1.	C16D00Q12	SP1	[The agent] has a social presence
2.	C16D00Q13	SP2	[The agent] is a social entity
3.	C16D00Q17	SP3	[I have / The user has] the same social presence as [the agent]

### C17 Interaction Impact on Self-Image

Definition: How the user believes others perceive the user because of the interaction with the agent

No.	ITEMID	ITEMREF	ITEMQ
1.	C17D00Q2	IIS1	[My / The user's] friends would recommend [me / them] to use [the agent]
2.	C17D00Q3	IIS2	Others would encourage [me / the user] to use [the agent]
3.	C17D00Q9	IIS3	[The agent] makes [me / the user] look good
4.	C17D00Q10	IIS4	People would look favorably at [me / the user] because of [my / their] interaction with [the agent]

### C18 Emotional Experience

Definition: A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them

#### C18D01 Agent's Emotional Intelligence Presence

Definition: To what extent the user believes that the agent has an emotional experience and can convey its emotions

No.	ITEMID	ITEMREF	ITEMQ
1.	C18D01Q2	AEI1	[The agent] is emotional
2.	C18D01Q3	AEI2	[The agent] experiences emotions
3.	C18D01Q5	AEI3	[R] [The agent] is emotionless
4.	C18D01Q8	AEI4	[The agent] can express its feelings
5.	C18D01Q14	AEI5	[R] [The agent] cannot experience emotions

#### C18D03 User's Emotion Presence

Definition: To what extent the user believes that his/her emotional state is caused by the interaction or the agent

No.	ITEMID	ITEMREF	ITEMQ
1.	C18D03Q0	UEP1	[The agent]'s attitude influences how [I feel / the user feels]
2.	C18D03Q1	UEP2	[I am / The user is] influenced by [the agent]'s moods

No.	ITEMID	ITEMREF	ITEMQ
3.	C18D03Q2	UEP3	The emotions [I feel / the user feels] during the interaction are caused by [the agent]
4.	C18D03Q12	UEP4	[My / The user's] interaction with [the agent] gives [me / them] an emotional sensation

### C19 User-Agent Interplay

Definition: The extent to which the user and the agent have an effect on each other

No.	ITEMID	ITEMREF	ITEMQ
1.	C19D00Q7	UAI1	[My / The user's] emotions influence the mood of the interaction
2.	C19D00Q14	UAI2	[The agent] reciprocates [my / the user's] actions
3.	C19D00Q26	UAI3	[The agent]'s and [my / the user's] behaviors are in direct response to each other's behavior
4.	C19D00Q28	UAI4	[The agent]'s and [my / the user's] emotions change to what [we / they] do to each other

### The Short Version of the ASA Questionnaire

The short version includes one representative item for each construct/dimension. Each representation item was determined based on the factor loading and the theoretical representation, which was decided by the four judges. Appendix J Four Judges Decision on the Highest Loading Items shows the selection process including the reasoning. These 24 representative items serve as the short version of the ASA questionnaire, see Table 7.

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Table 7 The short version of the ASA Questionnaire

No.	ITEMID	ITEMREF	ITEMQ
1.	C01D01Q10	HLA2	[The agent] has the appearance of a human
2.	C01D02Q9	HLB5	[The agent] has a human-like manner
3.	C01D03Q11	NA4	[The agent] seems natural from its outward appearance
4.	C01D04Q15	NB3	[The agent] reacts like a living organism
5.	C01D05Q2	AAS1	[The agent]'s appearance is appropriate
6.	C02D00Q1	AU1	[The agent] is easy to use
7.	C03D01Q7	PF1	[The agent] does its task well
8.	C04D00Q10	AL2	I like [the agent]
9.	C05D00Q6	AS1	[The agent] can easily mix socially
10.	C06D01Q1	APP1	[The agent] has a distinctive character
11.	C07D00Q0	UAA1	[I / The user] will use [the agent] again in the future
12.	C08D00Q3	AE1	[R] [The agent] is boring
13.	C09D00Q10	UE2	The interaction captured [my / the user's] attention
14.	C10D00Q18	UT3	[I / The user] can rely on [the agent]
15.	C11D01Q9	UAL1	[The agent] and [I / the user] have a strategic alliance
16.	C12D00Q13	AA2	[The agent] is attentive
17.	C13D00Q3	AC1	[R] [The agent]'s behavior does not make sense
18.	C14D00Q13	AI3	[R] [The agent] has no clue of what it is doing

19.	C15D00Q10	AT1	[I see / The user sees] the interaction with [the agent] as something positive
20.	C16D00Q13	SP2	[The agent] is a social entity
21.	C17D00Q3	IIS2	Others would encourage [me / the user] to use [the agent]
22.	C18D01Q5	AEI3	[R] [The agent] is emotionless
23.	C18D03Q2	UEP3	The emotions [I feel / the user feels] during the interaction are caused by [the agent]
24.	C19D00Q28	UAI4	[The agent]'s and [my / the user's] emotions change to what [we / they] do to each other

Table 8 shows the correlation and the absolute mean different between the long and short versions of the ASA Questionnaire. The short and long version of the ASA questionnaire were highly correlated ( $M=.82$ ,  $SD=.05$ ). The absolute mean difference between any construct's or dimension's mean on the one hand, and its representative item on the other, was small ( $M=.20$ ,  $SD=.18$ ). Running an EFA on the representative items (Appendix K Correlation and EFA Result based on 24 Highest Loading Items) showed a similar grouping of the constructs/dimensions as in the Discriminant Validity Analysis, see Table 5 - right side. Only three constructs (in bold) were grouped differently. This indicates that the short ASA questionnaire is a good representation of the full ASA questionnaire.

*Table 8 Correlation and absolute mean difference between the long version (90 items) and the short version (24 items). Note: the mean of each construct/dimension is used to calculate its correlation and absolute mean different with its corresponding item in the short version of the ASA Questionnaire.*

NO.	CONSTRUCT/DIMENSION	CORRELATION	ABSOLUTE MEAN DIFFERENT
1	C01D01	.93	0.03
2	C01D02	.87	0.15
3	C01D03	.83	0.09
4	C01D04	.84	0.61
5	C01D05	.83	0.08
6	C02	.84	0.11
7	C03*	.80	0.13
8	C04	.88	0.10
9	C05	.85	0.53
10	C06D01	.77	0.39
11	C07	.81	0.05
12	C08	.79	0.48
13	C09	.82	0.07
14	C10	.82	0.09
15	C11*	.71	0.43
16	C12	.78	0.19
17	C13	.76	0.01
18	C14	.77	0.25
19	C15	.89	0.00
20	C16	.85	0.07
21	C17	.79	0.24
22	C18D01	.86	0.38
23	C18D03	.74	0.07
24	C19	.77	0.36

## ASA Chart

An ASA chart is an informative visual tool to display the scores of an ASA on the 24 constructs/dimensions on a two-dimensional plane. The scores are normalized to a 7-point scale with an interval between -3 to 3 and 0 as the middle point. Each score of a construct/dimension is depicted on an axis that emerges from a common central point. We arranged the constructs/dimensions on the ASA chart based on their distance in the factor analyses and theoretical similarities (see and Table 5). The total score, rounded up, of all the

constructs/dimensions is displayed in the middle of the chart which is called the *ASA-score*. The scripts for generating ASA charts are online available<sup>23</sup>.

Appendix L WEB-ASA of 14 ASAs used in the Study shows the ASA charts of all 14 ASAs used in the study. Here, the chart represents values based on the mean of the 90 questionnaire items calculated from the corresponding agents' raw observed data.

## Appendix A Constructs and their Dimensions

Note: ConID = Construct ID, ConName = Construct Name, ConDef = Construct Definition, DimID = Dimension ID, DimName = Dimension Name, DimDef = Dimension Definition

NO.	CONID	CONNAME	CONDEF	DIMID	DIMNAME	DIMDEF
1	C01	Agent's Believability	The extent to which a user believes that the artifact is a social agent	C01D01	Human-Like Appearance	The extent to which a user believes that the social agent appears like a human
2	C01	Agent's Believability	The extent to which a user believes that the artifact is a social agent	C01D02	Human-Like Behavior	The extent to which a user believes that the social agent behaves like a human
3	C01	Agent's Believability	The extent to which a user believes that the artifact is a social agent	C01D03	Natural Appearance	The extent to which a user believes that the social agent's appearance could exist in or be derived from nature
4	C01	Agent's Believability	The extent to which a user believes that the artifact is a social agent	C01D04	Natural Behavior	The extent to which a user believes that the social agent's behavior could exist in or be derived from nature
5	C01	Agent's Believability	The extent to which a user believes that the artifact is a social agent	C01D05	Agent's Appearance Suitability	The extent to which the agent's appearance is suitable for its role
6	C02	Agent's Usability	The extent to which a user believes that using an agent will be free from effort (future process)			
7	C03	Performance	The extent to which a task was well performed (past performance)	C03D01	Agent's Performance	How well an agent does a task
8	C03	Performance	The extent to which a task was well performed (past performance)	C03D02	User's Performance	How well the user does a task

<sup>23</sup> Siska Fitrianie, Merijn Bruijnes, Fengxiang Li, Amal Abdulrahman, and Willem-Paul Brinkman. 2022. Artificial Social Agent Questionnaire Instrument. <https://doi.org/10.4121/19650846.4TU.ResearchData>.

NO.	CONID	CONNAME	CONDEF	DIMID	DIMNAME	DIMDEF
9	C04	Agent's Likeability	The agent's qualities that bring about a favorable regard			
10	C05	Agent's Sociability	The agent's quality or state of being sociable			
11	C06	Agent's Personality	The combination of characteristics or qualities that form an individual's distinctive character	C06D01	Agent's Personality Presence	To what extent the user believes that the agent has a personality
12	C07	User Acceptance of the Agent	The willingness of the user to interact with the agent			
13	C08	Agent's Enjoyability	The extent to which a user finds interacting with the agent enjoyable			
14	C09	User's Engagement	The extent to which the user feels involved in the interaction with the agent			
15	C10	User's Trust	The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)			
16	C11	User-Agent Alliance	The extent to which a beneficial association is formed	C11D01	Task Alliance	The extent to which an association is formed for performing a common goal
17	C11	User-Agent Alliance	The extent to which a beneficial association is formed	C11D02	Social Alliance	The extent to which a close and harmonious association is formed in which both understand each other's feelings and ideas
18	C12	Agent's Attentiveness	The extent to which the user believes that the agent is aware of and has attention for the user			
19	C13	Agent's Coherence	The extent to which the agent is perceived as being logical and consistent			
20	C14	Agent's Intentionality	The extent to which the agent is perceived as being deliberate and has deliberations			
21	C15	Attitude	A favorable or unfavorable evaluation toward the interaction with the agent			



NO.	CONID	CONNAME	CONDEF	DIMID	DIMNAME	DIMDEF
22	C16	Social Presence	The degree to which the user perceives the presence of a social entity in the interaction			
23	C17	Interaction impact on self-image	How the user believes others perceive the user because of the interaction with the agent			
24	C18	Emotional Experience	A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them	C18D01	Agent's Emotional Intelligence Presence	To what extent the user believes that the agent has an emotional experience and can convey its emotions
25	C18	Emotional Experience	A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them	C18D03	User's Emotion Presence	To what extent the user believes that his/her emotional state caused by the interaction or the agent
26	C19	User-Agent Interplay	The extent to which the user and the agent have an effect on each other			

## Appendix B Initial Questionnaire Items

Note:

- CONID = Construct ID, DIMID = Dimension ID, ITEMID = Questionnaire Item ID, Q Original = Initial Questionnaire Items, Q 1<sup>st</sup> POV = Questionnaire Items adapted to First Person Point of View, Q 3<sup>rd</sup> POV = Questionnaire Items adapted to Third Person Point of View.
- <the agent> is setup on the fly to the name of the corresponding agent

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
C01	C01D01	C01D01Q3	[The agent]'s appearance is human	<THE AGENT>'s appearance is human	<THE AGENT>'s appearance is human
C01	C01D01	C01D01Q10	[The agent] has the appearance of a human	<THE AGENT> has the appearance of a human	<THE AGENT> has the appearance of a human
C01	C01D01	C01D01Q13	[The agent] has a human-like outside	<THE AGENT> has a human-like outside	<THE AGENT> has a human-like outside
C01	C01D01	C01D01Q15	[The agent]'s appearance makes me think of a human	<THE AGENT>'s appearance makes me think of a human	<THE AGENT>'s appearance makes me think of a human
C01	C01D01	C01D01Q16	[The agent] has a human likeness	<THE AGENT> has a human likeness	<THE AGENT> has a human likeness
C01	C01D02	C01D02Q7	A human would behave like [the agent]	A human would behave like <THE AGENT>	A human would behave like <THE AGENT>

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
<b>C01</b>	C01D02	C01D02Q10	[The agent]'s manners are consistent with that of people	<THE AGENT>'s manners are consistent with that of people	<THE AGENT>'s manners are consistent with that of people
<b>C01</b>	C01D02	C01D02Q0	[The agent] behavior makes me think of human behavior	<THE AGENT> behavior makes me think of human behavior	<THE AGENT> behavior makes me think of human behavior
<b>C01</b>	C01D02	C01D02Q1	[The agent] behaves like a real person	<THE AGENT> behaves like a real person	<THE AGENT> behaves like a real person
<b>C01</b>	C01D02	C01D02Q9	[The agent] has a human-like manner	<THE AGENT> has a human-like manner	<THE AGENT> has a human-like manner
<b>C01</b>	C01D03	C01D03Q7	[The agent] appears like something that could exist in nature	<THE AGENT> appears like something that could exist in nature	<THE AGENT> appears like something that could exist in nature
<b>C01</b>	C01D03	C01D03Q9	[The agent] has a natural physique	<THE AGENT> has a natural physique	<THE AGENT> has a natural physique
<b>C01</b>	C01D03	C01D03Q10	[The agent]'s resemblance has an organic origin	<THE AGENT>'s resemblance has an organic origin	<THE AGENT>'s resemblance has an organic origin
<b>C01</b>	C01D03	C01D03Q11	[The agent] seems natural from its outward appearance	<THE AGENT> seems natural from its outward appearance	<THE AGENT> seems natural from its outward appearance
<b>C01</b>	C01D03	C01D03Q12	How [the agent] is represented is realistic	How <THE AGENT> is represented is realistic	How <THE AGENT> is represented is realistic
<b>C01</b>	C01D04	C01D04Q0	[The agent] is alive	<THE AGENT> is alive	<THE AGENT> is alive
<b>C01</b>	C01D04	C01D04Q13	[The agent] acts naturally	<THE AGENT> acts naturally	<THE AGENT> acts naturally
<b>C01</b>	C01D04	C01D04Q15	[The agent] reacts like a living organism	<THE AGENT> reacts like a living organism	<THE AGENT> reacts like a living organism
<b>C01</b>	C01D04	C01D04Q8	[The agent]'s behavior is like an animal	<THE AGENT>'s behavior is like an animal	<THE AGENT>'s behavior is like an animal
<b>C01</b>	C01D04	C01D04Q9	There are animals that behave similar to [the agent]	There are animals that behave similar to <THE AGENT>	There are animals that behave similar to <THE AGENT>
<b>C01</b>	C01D05	C01D05Q2	[The agent]'s appearance is appropriate	<THE AGENT>'s appearance is appropriate	<THE AGENT>'s appearance is appropriate
<b>C01</b>	C01D05	C01D05Q9	[The agent]'s physique is suitable for its role	<THE AGENT>'s physique is suitable for its role	<THE AGENT>'s physique is suitable for its role
<b>C01</b>	C01D05	C01D05Q10	The appearance of [the agent] is suitable for its role	The appearance of <THE AGENT> is suitable for its role	The appearance of <THE AGENT> is suitable for its role
<b>C01</b>	C01D05	C01D05Q11	[The agent]'s appearance is functional	<THE AGENT>'s appearance is functional	<THE AGENT>'s appearance is functional
<b>C01</b>	C01D05	C01D05Q12	[The agent]'s physique is fit for purpose	<THE AGENT>'s physique is fit for purpose	<THE AGENT>'s physique is fit for purpose
<b>C02</b>		C02D00Q1	[The agent] is easy to use	<THE AGENT> is easy to use	<THE AGENT> is easy to use

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
C02		C02D00Q2	Learning to work with [the agent] is easy	Learning to work with <THE AGENT> is easy	Learning to work with <THE AGENT> is easy
C02		C02D00Q8	Learning how to communicate with [the agent] is quick	Learning how to communicate with <THE AGENT> is quick	Learning how to communicate with <THE AGENT> is quick
C02		C02D00Q11	[R] A manual is needed to communicate with [the agent]	A manual is needed to communicate with <THE AGENT>	A manual is needed to communicate with <THE AGENT>
C02		C02D00Q15	[R] [The agent] is difficult to use	<THE AGENT> is difficult to use	<THE AGENT> is difficult to use
C03	C03D01	C03D01Q1	The amount time it took to complete the task is acceptable	The amount time it took to complete the task is acceptable	The amount time it took to complete the task is acceptable
C03	C03D01	C03D01Q7	[The agent] does its task well	<THE AGENT> does its task well	<THE AGENT> does its task well
C03	C03D01	C03D01Q5	[The agent] enhances [my / the user's] effectiveness on the task	<THE AGENT> enhances my effectiveness on the task	<THE AGENT> enhances the user's effectiveness on the task
C03	C03D01	C03D01Q6	[The agent] allows [me / the user] to get [my / the user's] task done more quickly	<THE AGENT> allows me to get my task done more quickly	<THE AGENT> allows the user to get the user's task done more quickly
C03	C03D01	C03D01Q12	[The agent] does not hinder [me / the user]	<THE AGENT> does not hinder me	<THE AGENT> does not hinder the user
C03	C03D02	C03D02Q0	[I / The user] did well	I did well	The user did well
C03	C03D02	C03D02Q5	[I am / The user is] able to carry out the task well	I am able to carry out the task well	The user is able to carry out the task well
C03	C03D02	C03D02Q10	[I am / The user is] capable of succeeding with [the agent]	I am capable of succeeding with <THE AGENT>	The user is capable of succeeding with <THE AGENT>
C03	C03D02	C03D02Q13	[R] [I / The user] failed the task	I failed the task	The user failed the task
C03	C03D02	C03D02Q1	[R] [I / The user] did badly	I did badly	The user did badly
C04		C04D00Q1	[The agent]'s appearance is pleasing	<THE AGENT>'s appearance is pleasing	<THE AGENT>'s appearance is pleasing
C04		C04D00Q10	I like [the agent]	I like <THE AGENT>	I like <THE AGENT>
C04		C04D00Q11	[R] I dislike [the agent]	I dislike <THE AGENT>	I dislike <THE AGENT>
C04		C04D00Q4	[The agent] is cooperative	<THE AGENT> is cooperative	<THE AGENT> is cooperative
C04		C04D00Q12	I want to hang out with [the agent]	I want to hang out with <THE AGENT>	I want to hang out with <THE AGENT>
C05		C05D00Q3	[R] Interacting with [the agent] is awkward	Interacting with <THE AGENT> is awkward	Interacting with <THE AGENT> is awkward
C05		C05D00Q6	[The agent] can easily mix socially	<THE AGENT> can easily mix socially	<THE AGENT> can easily mix socially
C05		C05D00Q7	It is easy to mingle with [the agent]	It is easy to mingle with <THE AGENT>	It is easy to mingle with <THE AGENT>
C05		C05D00Q1	[The agent] interacts socially with [me / the user]	<THE AGENT> interacts socially with me	<THE AGENT> interacts socially with the user
C05		C05D00Q18	[The agent] is empathic	<THE AGENT> is empathic	<THE AGENT> is empathic

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
C06	C06D01	C06D01Q1	[The agent] has a distinctive character	<THE AGENT> has a distinctive character	<THE AGENT> has a distinctive character
C06	C06D01	C06D01Q6	[R] [The agent] is characterless	<THE AGENT> is characterless	<THE AGENT> is characterless
C06	C06D01	C06D01Q13	[R] [The agent] lacks character	<THE AGENT> lacks character	<THE AGENT> lacks character
C06	C06D01	C06D01Q8	[The agent] has a coherent identity	<THE AGENT> has a coherent identity	<THE AGENT> has a coherent identity
C06	C06D01	C06D01Q11	[The agent] is an individual	<THE AGENT> is an individual	<THE AGENT> is an individual
C07		C07D00Q0	[I / The user] will use [the agent] again in the future	I will use <THE AGENT> again in the future	The user will use <THE AGENT> again in the future
C07		C07D00Q11	[I / The user] can see [myself / themselves] using [the agent] in the future	I can see myself using <THE AGENT> in the future	The user can see themselves using <THE AGENT> in the future
C07		C07D00Q13	[The agent] is acceptable	<THE AGENT> is acceptable	<THE AGENT> is acceptable
C07		C07D00Q15	[R] [I oppose / The user opposes] further interaction with [the agent]	I oppose further interaction with <THE AGENT>	The user opposes further interaction with <THE AGENT>
C07		C07D00Q14	[I am / The user is] positive about future interactions with [the agent]	I am is positive about future interactions with <THE AGENT>	The user is positive about future interactions with <THE AGENT>
C08		C08D00Q3	[R] [The agent] is boring	<THE AGENT> is boring	<THE AGENT> is boring
C08		C08D00Q4	It is interesting to interact with [the agent]	It is interesting to interact with <THE AGENT>	It is interesting to interact with <THE AGENT>
C08		C08D00Q10	[R] [The agent] is terrible to cope with	<THE AGENT> is terrible to cope with	<THE AGENT> is terrible to cope with
C08		C08D00Q0	[I enjoy / The user enjoys] interacting with [the agent]	I enjoy interacting with <THE AGENT>	The user enjoys interacting with <THE AGENT>
C08		C08D00Q9	[R] [The agent] is unpleasant to deal with	<THE AGENT> is unpleasant to deal with	<THE AGENT> is unpleasant to deal with
C09		C09D00Q4	[I / The user] was concentrated during the interaction with [the agent]	I was concentrated during the interaction with <THE AGENT>	The user was concentrated during the interaction with <THE AGENT>
C09		C09D00Q5	[I / The user] forgot about [my / their] surroundings when interacting with [the agent]	I forgot about their surroundings when interacting with <THE AGENT>	The user forgot about their surroundings when interacting with <THE AGENT>
C09		C09D00Q10	The interaction captured [my / the user's] attention	The interaction captured my attention	The interaction captured the user's attention
C09		C09D00Q3	Interacting with [the agent] was absorbing	Interacting with <THE AGENT> was absorbing	Interacting with <THE AGENT> was absorbing

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
<b>C09</b>		C09D00Q1	[I / The user] was alert during the interaction with [the agent]	I was alert during the interaction with <THE AGENT>	The user was alert during the interaction with <THE AGENT>
<b>C09</b>		C09D00Q9	[R] [I / The user] was looking for distractions during the interaction with [the agent]	I was looking for distractions during the interaction with <THE AGENT>	The user was looking for distractions during the interaction with <THE AGENT>
<b>C10</b>		C10D00Q1	[I am / The user is] confident that the information provided by [the agent] is trustworthy	I am confident that the information provided by <THE AGENT> is trustworthy	The user is confident that the information provided by <THE AGENT> is trustworthy
<b>C10</b>		C10D00Q6	[The agent] always gives good advice	<THE AGENT> always gives good advice	<THE AGENT> always gives good advice
<b>C10</b>		C10D00Q10	[The agent] is an expert in the topic discussed	<THE AGENT> is an expert in the topic discussed	<THE AGENT> is an expert in the topic discussed
<b>C10</b>		C10D00Q16	[The agent] acts truthfully	<THE AGENT> acts truthfully	<THE AGENT> acts truthfully
<b>C10</b>		C10D00Q18	[I / The user] can rely on [the agent]	I can rely on <THE AGENT>	The user can rely on <THE AGENT>
<b>C11</b>	C11D01	C11D01Q6	[The agent] appreciates [my / the user's] efforts	<THE AGENT> appreciates my efforts	<THE AGENT> appreciates the user's efforts
<b>C11</b>	C11D01	C11D01Q9	[The agent] and [I / the user] have a strategic alliance	<THE AGENT> and I have a strategic alliance	<THE AGENT> and the user have a strategic alliance
<b>C11</b>	C11D01	C11D01Q10	Collaborating with [the agent] is like a joint venture	Collaborating with <THE AGENT> is like a joint venture	Collaborating with <THE AGENT> is like a joint venture
<b>C11</b>	C11D01	C11D01Q11	[The agent] joins [me / the user] for mutual benefit	<THE AGENT> joins me for mutual benefit	<THE AGENT> joins the user for mutual benefit
<b>C11</b>	C11D01	C11D01Q14	[The agent] can collaborate in a productive way	<THE AGENT> can collaborate in a productive way	<THE AGENT> can collaborate in a productive way
<b>C11</b>	C11D02	C11D02Q1	[I / The user] can understand [the agent]	I can understand <THE AGENT>	The user can understand <THE AGENT>
<b>C11</b>	C11D02	C11D02Q3	[The agent] cares about [me / the user]	<THE AGENT> cares about me	<THE AGENT> cares about the user
<b>C11</b>	C11D02	C11D02Q4	[The agent] and [I / the user] are in sync with each other	<THE AGENT> and I are in sync with each other	<THE AGENT> and the user are in sync with each other
<b>C11</b>	C11D02	C11D02Q7	[The agent] understands [me / the user]	<THE AGENT> understands me	<THE AGENT> understands the user
<b>C11</b>	C11D02	C11D02Q8	[The agent] and [I / the user] are close	<THE AGENT> and I are close	<THE AGENT> and the user are close
<b>C12</b>		C12D00Q0	[The agent] remains focused on [me / the user] throughout the interaction	<THE AGENT> remains focused on me throughout the interaction	<THE AGENT> remains focused on the user throughout the interaction
<b>C12</b>		C12D00Q13	[The agent] is attentive	<THE AGENT> is attentive	<THE AGENT> is attentive

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
<b>C12</b>		C12D00Q1	[I / The user] receives [the agent]'s full attention throughout the interaction	I receives <THE AGENT>'s full attention throughout the interaction	The user receives <THE AGENT>'s full attention throughout the interaction
<b>C12</b>		C12D00Q8	[The agent] notices if [I leave / the user leaves]	<THE AGENT> notices if I leave	<THE AGENT> notices if the user leaves
<b>C12</b>		C12D00Q6	[R] [The agent] does not notice what happens around it	<THE AGENT> does not notice what happens around it	<THE AGENT> does not notice what happens around it
<b>C13</b>		C13D00Q3	[R] [The agent]'s behavior does not make sense	<THE AGENT>'s behavior does not make sense	<THE AGENT>'s behavior does not make sense
<b>C13</b>		C13D00Q7	[The agent] is logical	<THE AGENT> is logical	<THE AGENT> is logical
<b>C13</b>		C13D00Q11	[R] [The agent]'s behavior is irrational	<THE AGENT>'s behavior is irrational	<THE AGENT>'s behavior is irrational
<b>C13</b>		C13D00Q6	[R] [The agent] is inconsistent	<THE AGENT> is inconsistent	<THE AGENT> is inconsistent
<b>C13</b>		C13D00Q15	[R] [The agent] appears confused	<THE AGENT> appears confused	<THE AGENT> appears confused
<b>C14</b>		C14D00Q0	[The agent] acts intentionally	<THE AGENT> acts intentionally	<THE AGENT> acts intentionally
<b>C14</b>		C14D00Q10	[The agent] knows what it is doing	<THE AGENT> knows what it is doing	<THE AGENT> knows what it is doing
<b>C14</b>		C14D00Q13	[R] [The agent] has no clue of what it is doing	<THE AGENT> has no clue of what it is doing	<THE AGENT> has no clue of what it is doing
<b>C14</b>		C14D00Q15	I can understand [the agent]'s reasoning	I can understand <THE AGENT>'s reasoning	I can understand <THE AGENT>'s reasoning
<b>C14</b>		C14D00Q16	[The agent] can make its own decision	<THE AGENT> can make its own decision	<THE AGENT> can make its own decision
<b>C15</b>		C15D00Q10	[I see / The user sees] the interaction with [the agent] as something positive	I see the interaction with <THE AGENT> as something positive	The user sees the interaction with <THE AGENT> as something positive
<b>C15</b>		C15D00Q11	[I view / The user views] the interaction as something favorable	I view the interaction as something favorable	The user views the interaction as something favorable
<b>C15</b>		C15D00Q8	Interacting with [the agent] is rewarding	Interacting with <THE AGENT> is rewarding	Interacting with <THE AGENT> is rewarding
<b>C15</b>		C15D00Q12	Engaging with [the agent] is a good thing	Engaging with <THE AGENT> is a good thing	Engaging with <THE AGENT> is a good thing
<b>C15</b>		C15D00Q15	[R] [I think / The user thinks] negatively of the interaction with [the agent]	I think negatively of the interaction with <THE AGENT>	The user thinks negatively of the interaction with <THE AGENT>
<b>C16</b>		C16D00Q11	During the interaction [I perceive / the user perceives] [the agent] as a social entity	During the interaction I perceive <THE AGENT> as a social entity	During the interaction the user perceives <THE AGENT> as a social entity
<b>C16</b>		C16D00Q12	[The agent] has a social presence	<THE AGENT> has a social presence	<THE AGENT> has a social presence

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
<b>C16</b>		C16D00Q13	[The agent] is a social entity	<THE AGENT> is a social entity	<THE AGENT> is a social entity
<b>C16</b>		C16D00Q16	[I behave / The user behaves] as if [the agent] is a social entity	I behave as if <THE AGENT> is a social entity	The user behaves as if <THE AGENT> is a social entity
<b>C16</b>		C16D00Q17	[I have / The user has] the same social presence as [the agent]	I have the same social presence as <THE AGENT>	The user has the same social presence as <THE AGENT>
<b>C17</b>		C17D00Q2	[My / The user's] friends would recommend [me / them] to use [the agent]	My friends would recommend them to use <THE AGENT>	the user's friends would recommend them to use <THE AGENT>
<b>C17</b>		C17D00Q3	Others would encourage [me / the user] to use [the agent]	Others would encourage me to use <THE AGENT>	Others would encourage the user to use <THE AGENT>
<b>C17</b>		C17D00Q8	[I feel / The user feels] cool when others see [me / them] interacting with [the agent]	I feel cool when others see me interacting with <THE AGENT>	The user feels cool when others see them interacting with <THE AGENT>
<b>C17</b>		C17D00Q9	[The agent] makes [me / the user] look good	<THE AGENT> makes me look good	<THE AGENT> makes the user look good
<b>C17</b>		C17D00Q10	People would look favorably at [me / the user] because of [my / their] interaction with [the agent]	People would look favorably at me because of their interaction with <THE AGENT>	People would look favorably at the user because of their interaction with <THE AGENT>
<b>C18</b>	C18D01	C18D01Q2	[The agent] is emotional	<THE AGENT> is emotional	<THE AGENT> is emotional
<b>C18</b>	C18D01	C18D01Q3	[The agent] experiences emotions	<THE AGENT> experiences emotions	<THE AGENT> experiences emotions
<b>C18</b>	C18D01	C18D01Q5	[R] [The agent] is emotionless	<THE AGENT> is emotionless	<THE AGENT> is emotionless
<b>C18</b>	C18D01	C18D01Q8	[The agent] can express its feelings	<THE AGENT> can express its feelings	<THE AGENT> can express its feelings
<b>C18</b>	C18D01	C18D01Q14	[R] [The agent] cannot experience emotions	<THE AGENT> cannot experience emotions	<THE AGENT> cannot experience emotions
<b>C18</b>	C18D03	C18D03Q0	[The agent]'s attitude influences how [I feel / the user feels]	<THE AGENT>'s attitude influence how I feel	<THE AGENT>'s attitude influences how the user feels
<b>C18</b>	C18D03	C18D03Q1	[I am / The user is] influenced by [the agent]'s moods	I am influenced by <THE AGENT>'s moods	The user is influenced by <THE AGENT>'s moods
<b>C18</b>	C18D03	C18D03Q2	The emotions [I feel / the user feels] during the interaction are caused by [the agent]	The emotions I feel during the interaction are caused by <THE AGENT>	The emotions the user feels during the interaction are caused by <THE AGENT>
<b>C18</b>	C18D03	C18D03Q9	[My / The user's] interaction with [the agent] is an emotional experience	My interaction with <THE AGENT> is an emotional experience	The user's interaction with <THE AGENT> is an emotional experience
<b>C18</b>	C18D03	C18D03Q12	[My / The user's] interaction with [the agent] gives [me / them] an emotional sensation	My interaction with <THE AGENT> gives me an emotional sensation	The user's interaction with <THE AGENT> gives them an emotional sensation

CONID	DIMID	ITEMID	Q ORIGINAL	Q 1 <sup>ST</sup> POV	Q 3 <sup>RD</sup> POV
C19		C19D00Q3	[The agent]'s emotions change to what [I do / the user does]	<THE AGENT>'s emotions change to what I do	<THE AGENT>'s emotions change to what the user does
C19		C19D00Q7	[My / The user's] emotions influence the mood of the interaction	My emotions influence the mood of the interaction	The user's emotions influence the mood of the interaction
C19		C19D00Q14	[The agent] reciprocates [my / the user's] actions	<THE AGENT> reciprocates my actions	<THE AGENT> reciprocates the user's actions
C19		C19D00Q26	[The agent]'s and [my / the user's] behaviors are in direct response to each other's behavior	<THE AGENT>'s and my behaviors are in direct response to each other's behavior	<THE AGENT>'s and the user's behaviors are in direct response to each other's behavior
C19		C19D00Q28	[The agent]'s and [my / the user's] emotions change to what [we / they] do to each other	<THE AGENT>'s and my emotions change to what we do to each other	<THE AGENT>'s and the user's emotions change to what they do to each other

## Appendix C Video Check and Attention Check Questions

Check Video: Ambient Lighting<sup>24</sup>

NO.	VIDEO CHECK QUESTION
1	Is the video above playing? <ul style="list-style-type: none"> <li>Yes (the correct (expected) answer)</li> <li>The video is NOT displayed</li> <li>The video is displayed, but it is not playing</li> <li>The video is displayed, but there is no sound</li> </ul>
2	What is displayed in the video? <ul style="list-style-type: none"> <li>Animals (the correct answer)</li> <li>Cars</li> <li>Houses</li> <li>Robots</li> <li>Books</li> <li>Aircraft</li> <li>Boats</li> </ul>

Note: a participant can continue to participate in the study if they answer both questions above correctly.

NO.	ATTENTION CHECK QUESTION
1	<The agent> is singing, however, to show that you pay attention, select disagree
2	The user can see <the agent>, however, please as attention check select agree
3	<The agent> speaks English, however this is an attention check so please select disagree
4	The user runs toward <the agent>, but to show you pay attention please select disagree
5	<The agent> can walk or not, however, select the middle option labelled with the number to indicate that you are not sleeping
6	You've seen <the agent>. However, to show that you have watched the video please select agree
7	<The agent>'s body color is black. Please ignore the previous statement and select disagree
8	<The agent> talks to the user, but to show you are not a bot, please select agree
9	Make sure you select the middle option labelled with the number zero to show you are not a bot
10	Please select disagree here to show you still pay attention
11	Please select agree to pass this attention check
12	To show you are really reading these questions, please select the option labelled with the number two

<sup>24</sup> Siska Fitrianie, Merijn Bruijnes, and Willem-Paul Brinkman. 2020. [Technical Report: Study 5 - Collecting Prototypical Artificial Social Agents, No.ASAEvalInst-TR#06](#), Date: 11-December-2020.



NO.	ATTENTION CHECK QUESTION
13	To indicate you are still there please select agree
14	To show you are not sleeping, as attention check please select disagree
15	To show you are paying attention, please select the option labelled with the number one

Note: <the agent> is setup on the fly to the name of the corresponding agent

## Appendix D Data Description

Note: N = number of participants, M = mean, SD = standard deviation, RANGE = (MIN, MAX), MIN = minimum value, MAX = maximum value

All data:

ITEM ID	N	M	SD	RANGE
C01D01Q3	532	-0.88	2.21	-3 3
C01D01Q10	532	-0.78	2.24	-3 3
C01D01Q13	532	-0.75	2.22	-3 3
C01D01Q15	532	-0.6	2.23	-3 3
C01D01Q16	532	-0.1	2.07	-3 3
C01D02Q7	532	-0.46	1.94	-3 3
C01D02Q10	532	0.42	1.84	-3 3
C01D02Q0	532	0.24	1.95	-3 3
C01D02Q1	532	-0.18	2.04	-3 3
C01D02Q9	532	0.19	1.99	-3 3
C01D03Q7	532	-0.8	2.12	-3 3
C01D03Q9	532	-0.43	2.05	-3 3
C01D03Q10	532	-0.23	1.99	-3 3
C01D03Q11	532	-0.33	2.05	-3 3
C01D03Q12	532	0.57	1.72	-3 3
C01D04Q0	532	-1.37	2.1	-3 3
C01D04Q13	532	0.18	1.81	-3 3
C01D04Q15	532	0.32	2.02	-3 3
C01D04Q8	532	-1.26	1.97	-3 3
C01D04Q9	532	-0.73	2.05	-3 3
C01D05Q2	532	1.43	1.5	-3 3
C01D05Q9	532	1.23	1.51	-3 3
C01D05Q11	532	1.47	1.34	-3 3
C01D05Q12	532	1.09	1.55	-3 3
C01D05Q0	532	1.38	1.49	-3 3
C02D00Q1	532	1.34	1.44	-3 3
C02D00Q2	532	1.04	1.47	-3 3
C02D00Q8	532	1.32	1.42	-3 3
R_C02D00Q11	532	0.88	1.82	-3 3
R_C02D00Q15	532	1.38	1.48	-3 3
C03D01Q1	532	1.49	1.51	-3 3
C03D01Q7	532	1.44	1.4	-3 3
C03D01Q5	532	0.6	1.61	-3 3
C03D01Q6	532	0.36	1.76	-3 3
C03D01Q12	532	1.16	1.48	-3 3
C03D02Q0	532	1.44	1.31	-3 3
C03D02Q5	532	1.44	1.32	-3 3
C03D02Q10	532	1.32	1.4	-3 3
R_C03D02Q13	532	1.74	1.49	-3 3
R_C03D02Q1	532	1.77	1.33	-3 3
C04D00Q1	532	0.61	1.7	-3 3
C04D00Q10	532	0.87	1.81	-3 3
R_C04D00Q11	532	1.29	1.87	-3 3
C04D00Q4	532	1.54	1.39	-3 3
C04D00Q12	532	-0.45	2.19	-3 3
R_C05D00Q3	532	0.47	1.87	-3 3
C05D00Q6	532	-0.21	1.87	-3 3
C05D00Q7	532	0.35	1.78	-3 3
C05D00Q1	532	0.81	1.79	-3 3
C05D00Q18	532	-0.39	1.85	-3 3

C06D01Q1	532	0.59	1.68	-3	3
R_C06D01Q6	532	0.41	2.03	-3	3
R_C06D01Q13	532	0.27	2	-3	3
C06D01Q8	532	0.45	1.63	-3	3
C06D01Q11	532	-0.4	2.04	-3	3
C07D00Q0	532	1.36	1.42	-3	3
C07D00Q11	532	1.17	1.55	-3	3
C07D00Q13	532	1.48	1.34	-3	3
R_C07D00Q15	532	1.4	1.61	-3	3
C07D00Q14	532	1.11	1.47	-3	3
R_C08D00Q3	532	0.77	1.88	-3	3
C08D00Q4	532	1.35	1.56	-3	3
R_C08D00Q10	532	1.67	1.46	-3	3
C08D00Q0	532	1.25	1.6	-3	3
R_C08D00Q9	532	1.64	1.55	-3	3
C09D00Q4	532	1.69	1.28	-3	3
C09D00Q5	532	0.2	1.63	-3	3
C09D00Q10	532	1.75	1.25	-3	3
C09D00Q3	532	0.49	1.67	-3	3
C09D00Q1	532	2	1.2	-3	3
R_C09D00Q9	532	1.52	1.55	-3	3
C10D00Q1	532	0.93	1.55	-3	3
C10D00Q6	532	-0.21	1.55	-3	3
C10D00Q10	532	0.14	1.93	-3	3
C10D00Q16	532	0.98	1.45	-3	3
C10D00Q18	532	0.52	1.63	-3	3
C11D01Q6	532	0.16	1.78	-3	3
C11D01Q9	532	0.08	1.69	-3	3
C11D01Q10	532	0.5	1.66	-3	3
C11D01Q11	532	0.08	1.69	-3	3
C11D01Q14	532	0.98	1.58	-3	3
C11D02Q1	532	1.81	1.32	-3	3
C11D02Q3	532	-0.3	2	-3	3
C11D02Q4	532	0.61	1.62	-3	3
C11D02Q7	532	0.82	1.76	-3	3
C11D02Q8	532	-0.24	1.82	-3	3
C12D00Q0	532	1.62	1.52	-3	3
C12D00Q13	532	1.47	1.45	-3	3
C12D00Q1	532	1.88	1.36	-3	3
C12D00Q8	532	0.41	1.66	-3	3
R_C12D00Q6	532	0.22	1.96	-3	3
R_C13D00Q3	532	1.56	1.47	-3	3
C13D00Q7	532	1.17	1.62	-3	3
R_C13D00Q11	532	1.75	1.38	-3	3
R_C13D00Q6	532	1.33	1.49	-3	3
R_C13D00Q15	532	1.55	1.6	-3	3
C14D00Q0	532	0.97	1.62	-3	3
C14D00Q10	532	0.83	1.81	-3	3
R_C14D00Q13	532	0.93	1.92	-3	3
C14D00Q15	532	0.84	1.58	-3	3
C14D00Q16	532	0.01	1.91	-3	3
C15D00Q10	532	1.43	1.5	-3	3
C15D00Q11	532	1.29	1.52	-3	3
C15D00Q8	532	0.91	1.52	-3	3
C15D00Q12	532	1.02	1.43	-3	3
R_C15D00Q15	532	1.58	1.53	-3	3
C16D00Q11	532	0.7	1.73	-3	3
C16D00Q12	532	0.34	1.78	-3	3
C16D00Q13	532	-0.1	1.9	-3	3
C16D00Q16	532	1.01	1.73	-3	3
C16D00Q17	532	-0.73	1.89	-3	3
C17D00Q2	532	0.78	1.51	-3	3
C17D00Q3	532	0.89	1.51	-3	3

C17D00Q8	532	0.33	1.69	-3	3
C17D00Q9	532	0.4	1.52	-3	3
C17D00Q10	532	0.52	1.53	-3	3
C18D01Q2	532	-0.92	1.88	-3	3
C18D01Q3	532	-0.82	2.03	-3	3
R_C18D01Q5	532	-0.29	2.1	-3	3
C18D01Q8	532	-0.35	1.99	-3	3
R_C18D01Q14	532	-0.96	2.11	-3	3
C18D03Q0	532	0.86	1.63	-3	3
C18D03Q1	532	0.2	1.81	-3	3
C18D03Q2	532	0.7	1.76	-3	3
C18D03Q9	532	0.24	1.99	-3	3
C18D03Q12	532	0.74	1.82	-3	3
C19D00Q3	532	0.17	1.87	-3	3
C19D00Q7	532	0.72	1.85	-3	3
C19D00Q14	532	0.79	1.58	-3	3
C19D00Q26	532	1.23	1.58	-3	3
C19D00Q28	532	0.44	1.73	-3	3

### Group: AIBO

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	-2.72	0.56	-3	-1
C01D01Q10	39	-2.59	0.88	-3	0
C01D01Q13	39	-2.51	1.21	-3	3
C01D01Q15	39	-2.36	1.29	-3	2
C01D01Q16	39	-1.77	1.86	-3	3
C01D02Q7	39	-1.87	1.32	-3	1
C01D02Q10	39	-0.82	1.89	-3	3
C01D02Q0	39	-1.49	1.52	-3	2
C01D02Q1	39	-2	1.43	-3	3
C01D02Q9	39	-1.77	1.42	-3	2
C01D03Q7	39	-0.46	2.32	-3	3
C01D03Q9	39	-0.03	1.91	-3	3
C01D03Q10	39	0.33	2.19	-3	3
C01D03Q11	39	-0.56	2.21	-3	3
C01D03Q12	39	0.92	1.66	-3	3
C01D04Q0	39	-2.21	1.56	-3	3
C01D04Q13	39	0.62	1.68	-3	3
C01D04Q15	39	0.69	1.88	-3	3
C01D04Q8	39	1.74	1.48	-2	3
C01D04Q9	39	1.87	1.26	-2	3
C01D05Q2	39	2	1.19	-3	3
C01D05Q9	39	2.15	0.84	0	3
C01D05Q11	39	1.33	1.42	-2	3
C01D05Q12	39	1.9	1.12	-1	3
C01D05Q0	39	2.03	1.29	-3	3
C02D00Q1	39	1.95	0.86	0	3
C02D00Q2	39	1.62	1.37	-3	3
C02D00Q8	39	1.77	0.96	0	3
R_C02D00Q11	39	0.13	1.82	-3	3
R_C02D00Q15	39	2	1.21	-2	3
C03D01Q1	39	1.74	1.27	-3	3
C03D01Q7	39	1.9	1.07	-2	3
C03D01Q5	39	0.41	1.46	-3	3
C03D01Q6	39	-0.38	1.63	-3	3
C03D01Q12	39	1.44	1.12	0	3
C03D02Q0	39	2.05	1.07	0	3

C03D02Q5	39	1.87	1.06	-1	3
C03D02Q10	39	1.33	1.44	-3	3
R_C03D02Q13	39	2.56	0.85	0	3
R_C03D02Q1	39	2.31	1.3	-3	3
C04D00Q1	39	1.69	1.42	-3	3
C04D00Q10	39	1.44	1.65	-3	3
R_C04D00Q11	39	1.79	1.52	-2	3
C04D00Q4	39	2.03	1.09	-2	3
C04D00Q12	39	0.46	2.01	-3	3
R_C05D00Q3	39	1.33	1.75	-3	3
C05D00Q6	39	0.54	1.82	-3	3
C05D00Q7	39	1.05	1.56	-3	3
C05D00Q1	39	1.21	1.76	-3	3
C05D00Q18	39	-0.95	1.62	-3	3
C06D01Q1	39	0.82	1.65	-3	3
R_C06D01Q6	39	1.49	1.78	-3	3
R_C06D01Q13	39	1	1.92	-3	3
C06D01Q8	39	0.62	1.77	-3	3
C06D01Q11	39	-1.36	1.63	-3	3
C07D00Q0	39	1.74	1.09	0	3
C07D00Q11	39	1.56	1.39	-3	3
C07D00Q13	39	1.74	1.29	-3	3
R_C07D00Q15	39	2.15	1.01	0	3
C07D00Q14	39	1.64	1.27	-1	3
R_C08D00Q3	39	1.41	1.45	-3	3
C08D00Q4	39	1.64	1.5	-3	3
R_C08D00Q10	39	2.31	1.06	-1	3
C08D00Q0	39	2.54	0.72	0	3
R_C08D00Q9	39	2.23	1.27	-3	3
C09D00Q4	39	2.05	1.21	-2	3
C09D00Q5	39	0.85	1.31	-1	3
C09D00Q10	39	2.31	1.26	-3	3
C09D00Q3	39	1.28	1.41	-3	3
C09D00Q1	39	2.21	1.03	-1	3
R_C09D00Q9	39	1.85	1.31	-1	3
C10D00Q1	39	0.95	1.07	0	3
C10D00Q6	39	-0.95	1.45	-3	2
C10D00Q10	39	-0.62	1.62	-3	2
C10D00Q16	39	0.49	1.43	-3	3
C10D00Q18	39	0.21	1.59	-3	3
C11D01Q6	39	0.31	1.95	-3	3
C11D01Q9	39	-0.13	1.59	-3	3
C11D01Q10	39	0.51	1.78	-3	3
C11D01Q11	39	0.1	1.68	-3	3
C11D01Q14	39	0.13	1.96	-3	3
C11D02Q1	39	1.62	1.55	-3	3
C11D02Q3	39	-0.74	1.96	-3	3
C11D02Q4	39	0.54	1.52	-3	3
C11D02Q7	39	1.03	1.68	-3	3
C11D02Q8	39	0.08	1.58	-3	3
C12D00Q0	39	1.92	1.26	-3	3
C12D00Q13	39	1.69	1.08	-1	3
C12D00Q1	39	1.92	1.11	-2	3
C12D00Q8	39	0.33	1.28	-3	3
R_C12D00Q6	39	0.79	1.87	-3	3
R_C13D00Q3	39	1.92	1.18	-1	3
C13D00Q7	39	0.46	1.59	-3	3

R_C13D00Q11	39	1.92	1.18	-1	3
R_C13D00Q6	39	1.36	1.42	-3	3
R_C13D00Q15	39	1.82	1.35	-2	3
C14D00Q0	39	0.44	1.71	-3	3
C14D00Q10	39	0.77	1.78	-3	3
R_C14D00Q13	39	0.59	2.09	-3	3
C14D00Q15	39	0.28	1.64	-3	3
C14D00Q16	39	-1.26	1.73	-3	3
C15D00Q10	39	2.33	0.77	1	3
C15D00Q11	39	2.15	1.06	-2	3
C15D00Q8	39	1.59	1.21	-1	3
C15D00Q12	39	1.21	1.36	-3	3
R_C15D00Q15	39	2.62	0.78	0	3
C16D00Q11	39	0.95	1.49	-3	3
C16D00Q12	39	0.77	1.44	-3	3
C16D00Q13	39	-0.13	2	-3	3
C16D00Q16	39	1.46	1.6	-3	3
C16D00Q17	39	-0.56	1.86	-3	3
C17D00Q2	39	1.44	1.41	-3	3
C17D00Q3	39	1.28	1.45	-3	3
C17D00Q8	39	1.08	1.24	-1	3
C17D00Q9	39	0.77	1.35	-3	3
C17D00Q10	39	0.77	1.65	-3	3
C18D01Q2	39	-0.95	1.83	-3	3
C18D01Q3	39	-1.15	1.99	-3	3
R_C18D01Q5	39	0.05	2.26	-3	3
C18D01Q8	39	0.05	2.04	-3	3
R_C18D01Q14	39	-1.46	1.82	-3	3
C18D03Q0	39	1.28	1.47	-3	3
C18D03Q1	39	1.26	1.52	-3	3
C18D03Q2	39	1.82	1.1	-1	3
C18D03Q9	39	1.26	1.48	-3	3
C18D03Q12	39	1.67	1.44	-3	3
C19D00Q3	39	0.92	1.81	-3	3
C19D00Q7	39	1.28	1.62	-3	3
C19D00Q14	39	1.21	1.49	-3	3
C19D00Q26	39	1.38	1.63	-3	3
C19D00Q28	39	1.33	1.56	-3	3

Group: AMY

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	0.69	1.92	-3	3
C01D01Q10	39	1.13	1.67	-3	3
C01D01Q13	39	0.82	1.83	-3	3
C01D01Q15	39	0.87	1.54	-3	3
C01D01Q16	39	0.46	1.62	-3	3
C01D02Q7	39	-0.56	1.8	-3	3
C01D02Q10	39	0.51	1.68	-3	3
C01D02Q0	39	0.18	1.89	-3	3
C01D02Q1	39	-0.13	1.88	-3	3
C01D02Q9	39	0.44	1.82	-3	3

C01D03Q7	39	-1.49	1.43	-3	1
C01D03Q9	39	0.36	1.55	-3	3
C01D03Q10	39	0.1	1.94	-3	3
C01D03Q11	39	-0.46	1.82	-3	3
C01D03Q12	39	0.26	1.7	-3	3
C01D04Q0	39	-1.97	1.58	-3	2
C01D04Q13	39	-0.41	1.74	-3	2
C01D04Q15	39	-0.18	1.92	-3	3
C01D04Q8	39	-2.31	1.06	-3	0
C01D04Q9	39	-2.08	1.24	-3	1
C01D05Q2	39	1.13	1.59	-3	3
C01D05Q9	39	1.03	1.48	-2	3
C01D05Q11	39	1.64	0.93	0	3
C01D05Q12	39	1.1	1.31	-2	3
C01D05Q0	39	1.49	1.41	-2	3
C02D00Q1	39	1.51	1.1	0	3
C02D00Q2	39	1.03	1.37	-3	3
C02D00Q8	39	1.31	1.1	-1	3
R_C02D00Q11	39	1	1.49	-3	3
R_C02D00Q15	39	1.15	1.42	-3	3
C03D01Q1	39	1.51	1.35	-3	3
C03D01Q7	39	0.9	1.48	-3	3
C03D01Q5	39	0.08	1.68	-3	3
C03D01Q6	39	0.33	1.46	-3	3
C03D01Q12	39	0.87	1.45	-2	3
C03D02Q0	39	0.62	1.63	-3	3
C03D02Q5	39	1.1	1.31	-3	3
C03D02Q10	39	0.85	1.35	-3	3
R_C03D02Q13	39	1.08	1.72	-3	3
R_C03D02Q1	39	0.9	1.57	-3	3
C04D00Q1	39	0.54	1.54	-3	3
C04D00Q10	39	-0.05	1.97	-3	3
R_C04D00Q11	39	0.36	1.99	-3	3
C04D00Q4	39	1.26	1.07	-1	3
C04D00Q12	39	-1.72	1.7	-3	2
R_C05D00Q3	39	-0.69	1.67	-3	2
C05D00Q6	39	-1.05	1.54	-3	3
C05D00Q7	39	-0.44	1.73	-3	2
C05D00Q1	39	0.64	1.58	-3	3
C05D00Q18	39	0.23	1.8	-3	3
C06D01Q1	39	0.03	1.56	-3	2
R_C06D01Q6	39	-0.72	1.81	-3	3
R_C06D01Q13	39	-0.82	1.76	-3	3

C06D01Q8	39	0.56	1.52	-3	3
C06D01Q11	39	-0.64	1.65	-3	3
C07D00Q0	39	0.36	1.2	-2	3
C07D00Q11	39	0.62	1.14	-2	3
C07D00Q13	39	0.77	1.42	-2	3
R_C07D00Q15	39	0.92	1.44	-3	3
C07D00Q14	39	0.1	1.05	-3	2
R_C08D00Q3	39	-0.26	1.79	-3	3
C08D00Q4	39	0.67	1.51	-3	3
R_C08D00Q10	39	1.28	1.32	-2	3
C08D00Q0	39	-0.15	1.16	-3	2
R_C08D00Q9	39	0.97	1.6	-3	3
C09D00Q4	39	1.44	1.21	-1	3
C09D00Q5	39	0.28	1.32	-2	3
C09D00Q10	39	1.1	1.23	-1	3
C09D00Q3	39	-0.36	1.56	-3	3
C09D00Q1	39	1.38	1.07	-1	3
R_C09D00Q9	39	1.05	1.38	-2	3
C10D00Q1	39	1.08	1.48	-3	3
C10D00Q6	39	0.33	1.01	-3	2
C10D00Q10	39	0.31	1.75	-3	3
C10D00Q16	39	1.15	1.31	-2	3
C10D00Q18	39	0.33	1.36	-3	3
C11D01Q6	39	-0.13	1.54	-3	3
C11D01Q9	39	-0.23	1.51	-3	3
C11D01Q10	39	0.08	1.51	-3	3
C11D01Q11	39	-0.28	1.57	-3	2
C11D01Q14	39	0.79	1.22	-3	3
C11D02Q1	39	1.56	1.33	-2	3
C11D02Q3	39	-0.33	1.69	-3	2
C11D02Q4	39	0.21	1.52	-3	3
C11D02Q7	39	0.05	1.69	-3	3
C11D02Q8	39	-1.36	1.37	-3	1
C12D00Q0	39	1.74	1.58	-3	3
C12D00Q13	39	1.23	1.55	-3	3
C12D00Q1	39	2	1.08	-1	3
C12D00Q8	39	0.1	1.57	-3	3
R_C12D00Q6	39	-0.13	2.15	-3	3
R_C13D00Q3	39	1.31	1.56	-3	3
C13D00Q7	39	1.41	1.63	-3	3
R_C13D00Q11	39	1.62	1.31	-2	3
R_C13D00Q6	39	1.28	1.54	-2	3
R_C13D00Q15	39	1.79	1.49	-2	3

C14D00Q0	39	0.72	1.86	-3	3
C14D00Q10	39	0.36	1.93	-3	3
R_C14D00Q13	39	0.82	1.68	-3	3
C14D00Q15	39	1.36	1.11	-2	3
C14D00Q16	39	-0.56	2.04	-3	3
C15D00Q10	39	0.44	1.25	-3	3
C15D00Q11	39	0.18	1.23	-2	3
C15D00Q8	39	0.28	1.57	-3	3
C15D00Q12	39	0.64	1.51	-3	3
R_C15D00Q15	39	0.46	1.19	-3	3
C16D00Q11	39	0.23	1.81	-3	3
C16D00Q12	39	-0.08	1.51	-3	3
C16D00Q13	39	-0.18	1.86	-3	3
C16D00Q16	39	0.21	1.56	-3	3
C16D00Q17	39	-1.13	1.66	-3	3
C17D00Q2	39	-0.13	1.26	-3	3
C17D00Q3	39	0.51	1.39	-3	3
C17D00Q8	39	-1.18	1.43	-3	2
C17D00Q9	39	-0.67	1.22	-3	2
C17D00Q10	39	-0.1	1.29	-3	2
C18D01Q2	39	-1.08	1.92	-3	3
C18D01Q3	39	-1.28	1.75	-3	2
R_C18D01Q5	39	-0.36	2.05	-3	3
C18D01Q8	39	-0.1	1.71	-3	3
R_C18D01Q14	39	-1.77	1.55	-3	2
C18D03Q0	39	0.92	1.42	-3	3
C18D03Q1	39	-0.28	1.73	-3	3
C18D03Q2	39	0.03	1.46	-3	2
C18D03Q9	39	0.51	1.94	-3	3
C18D03Q12	39	0.54	1.76	-3	3
C19D00Q3	39	0.44	1.68	-3	3
C19D00Q7	39	1.21	1.42	-3	3
C19D00Q14	39	0.62	1.55	-3	3
C19D00Q26	39	0.54	1.31	-3	3
C19D00Q28	39	0.38	1.33	-3	3

#### Group: CHAPPIE

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	38	-1.42	1.62	-3	2
C01D01Q10	38	-1.21	1.76	-3	2
C01D01Q13	38	-0.95	1.87	-3	2
C01D01Q15	38	-0.79	1.91	-3	2
C01D01Q16	38	0.05	1.68	-3	2
C01D02Q7	38	-0.24	1.7	-3	2
C01D02Q10	38	0.63	1.36	-2	3
C01D02Q0	38	1	1.59	-3	3



C01D02Q1	38	-0.26	1.62	-3	2
C01D02Q9	38	0.42	1.69	-3	2
C01D03Q7	38	-1.37	2.02	-3	3
C01D03Q9	38	-1.5	1.47	-3	2
C01D03Q10	38	-0.74	1.84	-3	3
C01D03Q11	38	-1.13	1.6	-3	2
C01D03Q12	38	0.13	1.77	-3	3
C01D04Q0	38	-0.47	1.97	-3	3
C01D04Q13	38	0.05	1.43	-3	3
C01D04Q15	38	0.89	1.59	-3	3
C01D04Q8	38	-0.68	1.71	-3	3
C01D04Q9	38	0.24	1.72	-3	3
C01D05Q2	38	0.87	1.7	-3	3
C01D05Q9	38	0.95	1.58	-3	3
C01D05Q11	38	1.66	1.07	-1	3
C01D05Q12	38	1.08	1.32	-3	3
C01D05Q0	38	1.03	1.28	-3	3
C02D00Q1	38	0.71	1.37	-3	3
C02D00Q2	38	0.5	1.33	-3	3
C02D00Q8	38	1.03	1.3	-3	3
R_C02D00Q11	38	0.92	1.89	-3	3
R_C02D00Q15	38	0.84	1.35	-3	3
C03D01Q1	38	1.45	1.35	-2	3
C03D01Q7	38	1.29	1.04	-2	3
C03D01Q5	38	0.45	1.29	-3	3
C03D01Q6	38	0.24	1.22	-3	3
C03D01Q12	38	0.87	1.3	-2	3
C03D02Q0	38	1.61	1.37	-3	3
C03D02Q5	38	1.29	1.06	-1	3
C03D02Q10	38	1.24	1.26	-3	3
R_C03D02Q13	38	1.82	1.39	-2	3
R_C03D02Q1	38	1.95	0.98	0	3
C04D00Q1	38	0.47	1.37	-3	3
C04D00Q10	38	1.47	1.5	-3	3
R_C04D00Q11	38	2.11	1.39	-2	3
C04D00Q4	38	1.61	1.03	-1	3
C04D00Q12	38	0.71	1.75	-3	3
R_C05D00Q3	38	0.55	1.62	-2	3
C05D00Q6	38	0.13	1.47	-3	2
C05D00Q7	38	0.82	1.5	-3	3
C05D00Q1	38	0.95	1.71	-3	3
C05D00Q18	38	-0.34	1.46	-3	2
C06D01Q1	38	0.68	1.54	-3	3
R_C06D01Q6	38	1.21	1.79	-3	3
R_C06D01Q13	38	1.13	1.61	-3	3
C06D01Q8	38	0.61	1.39	-3	3
C06D01Q11	38	0.42	1.78	-3	3
C07D00Q0	38	1.71	1.27	-2	3
C07D00Q11	38	0.95	1.69	-3	3
C07D00Q13	38	1.47	1.25	-2	3
R_C07D00Q15	38	1.5	1.69	-3	3
C07D00Q14	38	1.45	1.25	-1	3
R_C08D00Q3	38	1.47	1.47	-3	3
C08D00Q4	38	1.84	1.44	-3	3
R_C08D00Q10	38	1.66	1.4	-3	3
C08D00Q0	38	2.24	0.97	-1	3
R_C08D00Q9	38	1.74	1.35	-2	3

C09D00Q4	38	1.97	1.05	-1	3
C09D00Q5	38	0.74	1.75	-3	3
C09D00Q10	38	2.13	0.91	0	3
C09D00Q3	38	0.76	1.85	-3	3
C09D00Q1	38	2	1.23	-3	3
R_C09D00Q9	38	1.34	1.65	-3	3
C10D00Q1	38	0.47	1.59	-3	3
C10D00Q6	38	-0.47	1.16	-3	2
C10D00Q10	38	-0.92	1.57	-3	2
C10D00Q16	38	0.76	1.5	-3	3
C10D00Q18	38	-0.08	1.51	-3	2
C11D01Q6	38	0.34	1.71	-3	3
C11D01Q9	38	-0.03	1.53	-3	3
C11D01Q10	38	0.89	1.45	-3	3
C11D01Q11	38	0.29	1.41	-3	2
C11D01Q14	38	1.11	1.16	-2	3
C11D02Q1	38	1.5	1.37	-3	3
C11D02Q3	38	0.32	1.76	-3	3
C11D02Q4	38	0.74	1.18	-2	3
C11D02Q7	38	0.92	1.57	-3	3
C11D02Q8	38	0.97	1.33	-2	3
C12D00Q0	38	0.82	1.77	-3	3
C12D00Q13	38	1.11	1.43	-3	3
C12D00Q1	38	1.53	1.33	-2	3
C12D00Q8	38	0.5	1.52	-3	3
R_C12D00Q6	38	1.05	1.31	-2	3
R_C13D00Q3	38	1.45	1.33	-3	3
C13D00Q7	38	0.68	1.3	-3	3
R_C13D00Q11	38	1.55	1.11	0	3
R_C13D00Q6	38	1.18	1.29	-1	3
R_C13D00Q15	38	0.03	1.67	-3	3
C14D00Q0	38	0.42	1.84	-3	3
C14D00Q10	38	0.03	1.6	-3	2
R_C14D00Q13	38	0.53	1.93	-3	3
C14D00Q15	38	0.74	1.27	-2	3
C14D00Q16	38	-0.24	1.48	-3	2
C15D00Q10	38	2	1.29	-3	3
C15D00Q11	38	1.71	1.33	-3	3
C15D00Q8	38	1.11	1.41	-3	3
C15D00Q12	38	1.53	1.29	-3	3
R_C15D00Q15	38	1.87	1.44	-2	3
C16D00Q11	38	1.29	1.25	-2	3
C16D00Q12	38	0.76	1.53	-3	3
C16D00Q13	38	0.42	1.59	-3	3
C16D00Q16	38	1.42	1.78	-3	3
C16D00Q17	38	-0.42	1.81	-3	3
C17D00Q2	38	0.76	1.57	-3	3
C17D00Q3	38	1.21	1.34	-2	3
C17D00Q8	38	0.95	1.51	-3	3
C17D00Q9	38	0.55	1.35	-3	3
C17D00Q10	38	0.97	1.13	-2	3
C18D01Q2	38	0.16	1.64	-3	3
C18D01Q3	38	0.29	1.8	-3	3
R_C18D01Q5	38	0.53	1.77	-3	3
C18D01Q8	38	0.39	1.53	-3	3
R_C18D01Q14	38	-0.08	1.71	-3	2
C18D03Q0	38	1.08	1.67	-3	3

C18D03Q1	38	0.58	1.78	-3	3
C18D03Q2	38	1.55	1.52	-3	3
C18D03Q9	38	1.37	1.73	-3	3
C18D03Q12	38	1.53	1.47	-2	3
C19D00Q3	38	0.79	1.36	-3	3
C19D00Q7	38	0.79	1.83	-3	3
C19D00Q14	38	1.05	1.29	-3	3
C19D00Q26	38	1.45	1.48	-3	3
C19D00Q28	38	0.79	1.32	-3	3

#### Group: DEEPBLUE

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	-2	1.99	-3	3
C01D01Q10	39	-2.1	1.6	-3	3
C01D01Q13	39	-1.87	1.82	-3	3
C01D01Q15	39	-1.85	1.8	-3	3
C01D01Q16	39	-1.15	2.08	-3	3
C01D02Q7	39	-0.59	2.01	-3	3
C01D02Q10	39	-0.62	1.94	-3	3
C01D02Q0	39	0.1	2.19	-3	3
C01D02Q1	39	-0.74	2.17	-3	3
C01D02Q9	39	-0.9	2.05	-3	3
C01D03Q7	39	-2.03	1.65	-3	3
C01D03Q9	39	-1.64	1.78	-3	3
C01D03Q10	39	-1.49	1.97	-3	3
C01D03Q11	39	-1.15	1.83	-3	3
C01D03Q12	39	0.79	1.59	-3	3
C01D04Q0	39	-2.21	1.56	-3	3
C01D04Q13	39	-0.33	2.07	-3	3
C01D04Q15	39	-0.87	2.3	-3	3
C01D04Q8	39	-2.21	1.32	-3	1
C01D04Q9	39	-1.54	1.68	-3	2
C01D05Q2	39	1.18	1.54	-3	3
C01D05Q9	39	0.82	1.79	-3	3
C01D05Q11	39	1.85	1.41	-2	3
C01D05Q12	39	0.46	1.88	-3	3
C01D05Q0	39	1.26	1.41	-2	3
C02D00Q1	39	1.28	1.41	-3	3
C02D00Q2	39	0.69	1.4	-3	3
C02D00Q8	39	0.44	1.43	-3	3
R_C02D00Q11	39	-0.49	1.85	-3	3
R_C02D00Q15	39	0.85	1.41	-2	3
C03D01Q1	39	1.51	1.37	-3	3
C03D01Q7	39	2.51	0.79	0	3
C03D01Q5	39	1.49	1.75	-3	3

C03D01Q6	39	1.41	1.57	-3	3
C03D01Q12	39	1.59	1.39	-3	3
C03D02Q0	39	1.28	1.36	-2	3
C03D02Q5	39	1.85	1.31	-3	3
C03D02Q10	39	1.67	1.42	-2	3
R_C03D02Q13	39	1.33	1.4	-2	3
R_C03D02Q1	39	1.56	1.45	-2	3
C04D00Q1	39	-0.05	1.54	-3	3
C04D00Q10	39	0.85	1.37	-3	3
R_C04D00Q11	39	1.44	1.59	-2	3
C04D00Q4	39	0.82	1.99	-3	3
C04D00Q12	39	-1.41	1.85	-3	3
R_C05D00Q3	39	0.62	1.71	-3	3
C05D00Q6	39	-1.54	1.73	-3	3
C05D00Q7	39	-1.03	1.98	-3	3
C05D00Q1	39	-1.13	1.89	-3	3
C05D00Q18	39	-2.05	1.36	-3	1
C06D01Q1	39	-0.56	1.96	-3	3
R_C06D01Q6	39	-1.77	1.77	-3	3
R_C06D01Q13	39	-1.26	1.96	-3	3
C06D01Q8	39	-0.13	1.91	-3	3
C06D01Q11	39	-1.59	1.8	-3	3
C07D00Q0	39	1.59	1.09	-1	3
C07D00Q11	39	1.21	1.59	-2	3
C07D00Q13	39	1.54	1.23	-1	3
R_C07D00Q15	39	1.23	1.46	-3	3
C07D00Q14	39	1.1	1.41	-3	3
R_C08D00Q3	39	0.33	1.66	-3	3
C08D00Q4	39	1.79	1.06	0	3
R_C08D00Q10	39	1.62	1.31	-2	3
C08D00Q0	39	1.08	1.36	-3	3
R_C08D00Q9	39	1.51	1.52	-2	3
C09D00Q4	39	1.74	1.29	-3	3
C09D00Q5	39	0.15	1.76	-3	3
C09D00Q10	39	1.69	1.28	-3	3
C09D00Q3	39	0.31	1.59	-3	3
C09D00Q1	39	1.97	1.18	-1	3
R_C09D00Q9	39	1.46	1.62	-3	3
C10D00Q1	39	1.87	1.15	-1	3
C10D00Q6	39	0.36	1.84	-3	3
C10D00Q10	39	2.23	1.37	-2	3
C10D00Q16	39	1.62	1.27	0	3
C10D00Q18	39	1.56	1.65	-3	3

C11D01Q6	39	-0.74	1.98	-3	3
C11D01Q9	39	0.46	1.79	-3	3
C11D01Q10	39	0.54	1.85	-3	3
C11D01Q11	39	0.18	1.88	-3	3
C11D01Q14	39	1.51	1.57	-3	3
C11D02Q1	39	1.21	1.47	-3	3
C11D02Q3	39	-1.87	1.87	-3	3
C11D02Q4	39	0.59	1.98	-3	3
C11D02Q7	39	0.49	1.88	-3	3
C11D02Q8	39	-0.69	1.82	-3	3
C12D00Q0	39	0.85	2.08	-3	3
C12D00Q13	39	1.49	1.67	-3	3
C12D00Q1	39	1.62	1.79	-3	3
C12D00Q8	39	0.15	1.87	-3	3
R_C12D00Q6	39	-0.97	1.95	-3	3
R_C13D00Q3	39	2	1.19	-1	3
C13D00Q7	39	2.15	1.46	-3	3
R_C13D00Q11	39	2.03	1.44	-3	3
R_C13D00Q6	39	2.18	1.14	-1	3
R_C13D00Q15	39	2.23	1.29	-3	3
C14D00Q0	39	1.33	1.88	-3	3
C14D00Q10	39	2.1	1.5	-3	3
R_C14D00Q13	39	1.72	1.9	-3	3
C14D00Q15	39	0.59	1.63	-3	3
C14D00Q16	39	1	2	-3	3
C15D00Q10	39	1.38	1.46	-3	3
C15D00Q11	39	1.36	1.37	-3	3
C15D00Q8	39	1.18	1.25	-1	3
C15D00Q12	39	1.1	1.31	-3	3
R_C15D00Q15	39	1.67	1.32	-2	3
C16D00Q11	39	-0.85	1.77	-3	3
C16D00Q12	39	-1.08	1.91	-3	3
C16D00Q13	39	-1.38	1.9	-3	3
C16D00Q16	39	-0.36	2.07	-3	3
C16D00Q17	39	-1.18	1.93	-3	3
C17D00Q2	39	1.15	1.41	-2	3
C17D00Q3	39	1.1	1.59	-3	3
C17D00Q8	39	0.26	1.65	-3	3
C17D00Q9	39	1	1.78	-3	3
C17D00Q10	39	0.05	1.7	-3	3
C18D01Q2	39	-2	1.69	-3	2
C18D01Q3	39	-2.21	1.63	-3	3
R_C18D01Q5	39	-2.41	1.14	-3	3

C18D01Q8	39	-1.97	1.69	-3	3
R_C18D01Q14	39	-2.26	1.52	-3	3
C18D03Q0	39	0.05	2.01	-3	3
C18D03Q1	39	-1.05	1.85	-3	3
C18D03Q2	39	-0.03	2.08	-3	3
C18D03Q9	39	-0.82	1.8	-3	3
C18D03Q12	39	-0.59	1.68	-3	3
C19D00Q3	39	-1.62	1.86	-3	3
C19D00Q7	39	-0.38	2.22	-3	3
C19D00Q14	39	0.87	1.82	-3	3
C19D00Q26	39	1.21	1.69	-3	3
C19D00Q28	39	-1	1.86	-3	3

#### Group: DOG

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	-2.21	1.4	-3	2
C01D01Q10	39	-2.13	1.36	-3	2
C01D01Q13	39	-1.97	1.69	-3	2
C01D01Q15	39	-1.33	2.16	-3	3
C01D01Q16	39	-0.82	2.02	-3	3
C01D02Q7	39	-1.41	1.48	-3	3
C01D02Q10	39	-0.31	1.85	-3	3
C01D02Q0	39	-0.08	1.94	-3	3
C01D02Q1	39	-0.77	1.88	-3	3
C01D02Q9	39	-0.51	2	-3	3
C01D03Q7	39	2.08	1.18	-1	3
C01D03Q9	39	1.64	1.53	-3	3
C01D03Q10	39	1.23	1.63	-3	3
C01D03Q11	39	2.1	1.39	-3	3
C01D03Q12	39	1.44	1.52	-2	3
C01D04Q0	39	2.49	1.37	-3	3
C01D04Q13	39	0.9	1.89	-3	3
C01D04Q15	39	2.28	0.92	0	3
C01D04Q8	39	1.69	1.4	-1	3
C01D04Q9	39	2.08	1.2	-2	3
C01D05Q2	39	2.28	1.23	-3	3
C01D05Q9	39	1.1	1.8	-3	3
C01D05Q11	39	1.13	1.56	-3	3
C01D05Q12	39	1.62	1.37	-2	3
C01D05Q0	39	2.18	1.32	-3	3
C02D00Q1	39	0.74	1.53	-3	3
C02D00Q2	39	0.36	1.35	-2	3
C02D00Q8	39	0.15	1.76	-3	3
R_C02D00Q11	39	1.54	1.55	-3	3
R_C02D00Q15	39	1.18	1.5	-3	3
C03D01Q1	39	1.28	1.82	-3	3
C03D01Q7	39	1.23	1.8	-3	3
C03D01Q5	39	0.31	1.98	-3	3
C03D01Q6	39	-0.82	1.96	-3	3
C03D01Q12	39	1.21	1.69	-3	3
C03D02Q0	39	1.87	1.1	-1	3
C03D02Q5	39	1.41	1.46	-3	3

C03D02Q10	39	1.41	1.79	-3	3
R_C03D02Q13	39	2.03	1.5	-3	3
R_C03D02Q1	39	1.85	1.27	-2	3
C04D00Q1	39	2.23	1.06	-2	3
C04D00Q10	39	2.62	0.75	0	3
R_C04D00Q11	39	2.85	0.54	0	3
C04D00Q4	39	2.21	1.03	-1	3
C04D00Q12	39	1.64	1.77	-3	3
R_C05D00Q3	39	1.72	1.54	-3	3
C05D00Q6	39	1.18	1.3	-2	3
C05D00Q7	39	1.67	1.03	0	3
C05D00Q1	39	1.59	1.46	-3	3
C05D00Q18	39	0.05	1.45	-3	3
C06D01Q1	39	1.21	1.44	-2	3
R_C06D01Q6	39	1.77	1.55	-3	3
R_C06D01Q13	39	1.74	1.57	-2	3
C06D01Q8	39	0.54	1.33	-3	2
C06D01Q11	39	1.44	1.55	-2	3
C07D00Q0	39	2.08	1.06	0	3
C07D00Q11	39	1.9	1.29	-3	3
C07D00Q13	39	2.13	0.95	0	3
R_C07D00Q15	39	2	1.59	-3	3
C07D00Q14	39	2.13	1.17	-2	3
R_C08D00Q3	39	2.03	1.39	-2	3
C08D00Q4	39	1.87	1.4	-3	3
R_C08D00Q10	39	2.21	1.36	-3	3
C08D00Q0	39	2.64	0.67	0	3
R_C08D00Q9	39	2.62	0.81	0	3
C09D00Q4	39	2.05	1.02	-1	3
C09D00Q5	39	0.56	1.94	-3	3
C09D00Q10	39	2.36	0.87	0	3
C09D00Q3	39	1.64	1.14	-1	3
C09D00Q1	39	2.59	0.68	0	3
R_C09D00Q9	39	2.05	1.28	-1	3
C10D00Q1	39	1.15	1.46	-3	3
C10D00Q6	39	-1.33	1.72	-3	3
C10D00Q10	39	-1.18	1.94	-3	3
C10D00Q16	39	0.9	1.43	-3	3
C10D00Q18	39	1.05	1.49	-3	3
C11D01Q6	39	0.64	1.61	-3	3
C11D01Q9	39	0.82	1.7	-3	3
C11D01Q10	39	1.15	1.79	-3	3
C11D01Q11	39	0.92	1.35	-3	3
C11D01Q14	39	0.87	1.75	-3	3
C11D02Q1	39	1.13	1.47	-3	3
C11D02Q3	39	1.51	1.65	-3	3
C11D02Q4	39	1.38	1.37	-3	3
C11D02Q7	39	1	1.64	-3	3
C11D02Q8	39	2.13	0.98	0	3
C12D00Q0	39	1.85	1.31	-2	3
C12D00Q13	39	1.87	1.28	-2	3
C12D00Q1	39	2.03	1.35	-2	3
C12D00Q8	39	0.85	1.97	-3	3
R_C12D00Q6	39	0.69	1.67	-3	3
R_C13D00Q3	39	1.33	1.81	-3	3
C13D00Q7	39	-0.21	1.67	-3	3
R_C13D00Q11	39	1.44	1.47	-3	3

R_C13D00Q6	39	0.77	1.72	-3	3
R_C13D00Q15	39	0.74	1.71	-3	3
C14D00Q0	39	0.69	1.66	-3	3
C14D00Q10	39	0.08	1.78	-3	3
R_C14D00Q13	39	-0.54	1.82	-3	3
C14D00Q15	39	-0.21	1.67	-3	3
C14D00Q16	39	0.59	1.37	-3	3
C15D00Q10	39	2.49	0.97	-1	3
C15D00Q11	39	2.49	0.85	0	3
C15D00Q8	39	2.13	1.06	-1	3
C15D00Q12	39	2.1	1.21	-2	3
R_C15D00Q15	39	2.54	0.97	-1	3
C16D00Q11	39	1.59	1.45	-2	3
C16D00Q12	39	1.1	1.59	-3	3
C16D00Q13	39	1.03	1.61	-3	3
C16D00Q16	39	1.64	1.39	-2	3
C16D00Q17	39	-0.69	1.85	-3	3
C17D00Q2	39	1.21	1.56	-3	3
C17D00Q3	39	1.31	1.42	-2	3
C17D00Q8	39	1.74	1.37	-3	3
C17D00Q9	39	1.26	1.53	-3	3
C17D00Q10	39	1.87	1.28	-3	3
C18D01Q2	39	0.36	1.63	-3	3
C18D01Q3	39	1.56	1.35	-3	3
R_C18D01Q5	39	1.51	1.54	-3	3
C18D01Q8	39	0.38	1.68	-3	3
R_C18D01Q14	39	1.67	1.59	-2	3
C18D03Q0	39	0.97	1.69	-3	3
C18D03Q1	39	0.56	1.85	-3	3
C18D03Q2	39	2.26	0.97	0	3
C18D03Q9	39	1.82	1.07	-1	3
C18D03Q12	39	2.26	1.16	-2	3
C19D00Q3	39	0.69	1.56	-3	3
C19D00Q7	39	1.97	1.27	-2	3
C19D00Q14	39	1.38	1.55	-2	3
C19D00Q26	39	1.69	1.49	-3	3
C19D00Q28	39	1.26	1.58	-3	3

Group: FURBY

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	-2.31	1.47	-3	2
C01D01Q10	39	-2.69	0.8	-3	1
C01D01Q13	39	-1.92	1.71	-3	3
C01D01Q15	39	-1.64	1.98	-3	3
C01D01Q16	39	-0.85	2.24	-3	3
C01D02Q7	39	-0.67	1.99	-3	3
C01D02Q10	39	0.41	1.97	-3	3
C01D02Q0	39	0.41	2.04	-3	3
C01D02Q1	39	-0.85	1.99	-3	3
C01D02Q9	39	0	2.2	-3	3
C01D03Q7	39	-0.95	1.96	-3	3
C01D03Q9	39	-1.46	1.71	-3	3
C01D03Q10	39	-0.49	1.85	-3	3
C01D03Q11	39	-1.1	1.92	-3	3
C01D03Q12	39	-0.23	1.86	-3	3
C01D04Q0	39	-1.95	1.54	-3	2



C01D04Q13	39	-0.08	1.84	-3	3
C01D04Q15	39	0.21	2	-3	3
C01D04Q8	39	-0.59	2.04	-3	3
C01D04Q9	39	-0.1	1.89	-3	3
C01D05Q2	39	1.87	1.26	-3	3
C01D05Q9	39	1.77	1.4	-3	3
C01D05Q11	39	0.95	1.59	-3	3
C01D05Q12	39	1.38	1.6	-3	3
C01D05Q0	39	1.77	1.4	-3	3
C02D00Q1	39	2.18	1.21	-2	3
C02D00Q2	39	1.74	1.29	-2	3
C02D00Q8	39	1.85	1.29	-2	3
R_C02D00Q11	39	0.95	1.88	-3	3
R_C02D00Q15	39	2.18	1.35	-3	3
C03D01Q1	39	1.54	1.57	-3	3
C03D01Q7	39	1.51	1.23	-1	3
C03D01Q5	39	0.05	1.69	-3	3
C03D01Q6	39	-0.82	1.82	-3	3
C03D01Q12	39	1.28	1.52	-2	3
C03D02Q0	39	1.69	1.26	-2	3
C03D02Q5	39	1.97	1.18	-2	3
C03D02Q10	39	0.69	1.58	-3	3
R_C03D02Q13	39	2.18	1.45	-3	3
R_C03D02Q1	39	2.23	1.27	-1	3
C04D00Q1	39	1.28	1.41	-3	3
C04D00Q10	39	0.85	2.06	-3	3
R_C04D00Q11	39	1.05	2.09	-3	3
C04D00Q4	39	1.31	1.66	-3	3
C04D00Q12	39	0.05	2.38	-3	3
R_C05D00Q3	39	0.51	2.05	-3	3
C05D00Q6	39	0	2.09	-3	3
C05D00Q7	39	0.85	1.48	-3	3
C05D00Q1	39	1.33	1.9	-3	3
C05D00Q18	39	-0.49	2.15	-3	3
C06D01Q1	39	1.33	1.74	-3	3
R_C06D01Q6	39	1.36	1.84	-3	3
R_C06D01Q13	39	1.15	1.9	-3	3
C06D01Q8	39	0.41	1.79	-3	3
C06D01Q11	39	-0.46	2.05	-3	3
C07D00Q0	39	1	1.69	-3	3
C07D00Q11	39	0.69	1.79	-3	3
C07D00Q13	39	1.74	1.35	-3	3
R_C07D00Q15	39	1.36	1.78	-3	3
C07D00Q14	39	1.38	1.31	-2	3
R_C08D00Q3	39	0.82	1.99	-3	3
C08D00Q4	39	1.36	1.75	-3	3
R_C08D00Q10	39	1.74	1.68	-3	3
C08D00Q0	39	1.79	1.58	-3	3
R_C08D00Q9	39	1.77	1.66	-3	3
C09D00Q4	39	1.13	1.56	-2	3
C09D00Q5	39	0.13	1.56	-3	3
C09D00Q10	39	1.74	1.31	-3	3
C09D00Q3	39	0.69	2.05	-3	3
C09D00Q1	39	1.64	1.14	-2	3
R_C09D00Q9	39	1.33	1.83	-3	3
C10D00Q1	39	0.33	1.58	-3	3
C10D00Q6	39	-1.03	1.71	-3	3

C10D00Q10	39	-1	1.91	-3	3
C10D00Q16	39	0.23	1.78	-3	3
C10D00Q18	39	-0.59	1.85	-3	3
C11D01Q6	39	0.54	1.9	-3	3
C11D01Q9	39	-0.54	1.85	-3	3
C11D01Q10	39	-0.38	1.91	-3	3
C11D01Q11	39	0.08	1.78	-3	3
C11D01Q14	39	-0.15	1.87	-3	3
C11D02Q1	39	1.62	1.48	-3	3
C11D02Q3	39	-0.54	2.22	-3	3
C11D02Q4	39	0.85	1.63	-3	3
C11D02Q7	39	-0.18	2.05	-3	3
C11D02Q8	39	0.05	1.82	-3	3
C12D00Q0	39	1.1	1.7	-3	3
C12D00Q13	39	0.9	1.73	-3	3
C12D00Q1	39	1.41	1.87	-3	3
C12D00Q8	39	0.49	1.78	-3	3
R_C12D00Q6	39	0.1	1.94	-3	3
R_C13D00Q3	39	1.13	1.73	-3	3
C13D00Q7	39	0.08	1.61	-3	3
R_C13D00Q11	39	1.54	1.67	-3	3
R_C13D00Q6	39	1.21	1.59	-2	3
R_C13D00Q15	39	1.77	1.66	-3	3
C14D00Q0	39	0.36	1.94	-3	3
C14D00Q10	39	-0.64	2.21	-3	3
R_C14D00Q13	39	-0.62	2.21	-3	3
C14D00Q15	39	0.33	1.95	-3	3
C14D00Q16	39	-1.05	1.79	-3	3
C15D00Q10	39	1.54	1.5	-3	3
C15D00Q11	39	1.44	1.29	-3	3
C15D00Q8	39	1.13	1.47	-3	3
C15D00Q12	39	1.05	1.57	-3	3
R_C15D00Q15	39	1.72	1.65	-2	3
C16D00Q11	39	0.77	2.06	-3	3
C16D00Q12	39	0.38	2.09	-3	3
C16D00Q13	39	0	2.27	-3	3
C16D00Q16	39	0.64	1.86	-3	3
C16D00Q17	39	-0.74	1.98	-3	3
C17D00Q2	39	0.85	1.58	-3	3
C17D00Q3	39	0.9	1.65	-3	3
C17D00Q8	39	0.15	1.86	-3	3
C17D00Q9	39	0.26	1.53	-3	3
C17D00Q10	39	0.54	1.76	-3	3
C18D01Q2	39	0.15	1.91	-3	3
C18D01Q3	39	-0.64	2.21	-3	3
R_C18D01Q5	39	0.79	2.09	-3	3
C18D01Q8	39	0.15	2.32	-3	3
R_C18D01Q14	39	-1.21	2.26	-3	3
C18D03Q0	39	1.28	1.61	-3	3
C18D03Q1	39	0.64	1.55	-3	3
C18D03Q2	39	1.1	1.73	-3	3
C18D03Q9	39	0.38	1.82	-3	3
C18D03Q12	39	1.1	1.65	-3	3
C19D00Q3	39	1.23	1.71	-3	3
C19D00Q7	39	0.85	1.89	-3	3
C19D00Q14	39	0.82	1.75	-3	3
C19D00Q26	39	1.38	1.48	-3	3

C19D00Q28	39	1.05	1.82	-3	3
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Group: HAL 9000

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	37	-2.35	1.27	-3	1
C01D01Q10	37	-2.14	1.58	-3	2
C01D01Q13	37	-1.89	1.61	-3	3
C01D01Q15	37	-1.95	1.78	-3	3
C01D01Q16	37	-0.7	2.04	-3	3
C01D02Q7	37	-0.38	1.86	-3	3
C01D02Q10	37	0.84	1.89	-3	3
C01D02Q0	37	0.11	1.84	-3	3
C01D02Q1	37	0.03	2.14	-3	3
C01D02Q9	37	0.54	1.97	-3	3
C01D03Q7	37	-1.62	1.82	-3	2
C01D03Q9	37	-1.97	1.46	-3	2
C01D03Q10	37	-1.78	1.58	-3	1
C01D03Q11	37	-1.62	1.69	-3	3
C01D03Q12	37	1	1.63	-3	3
C01D04Q0	37	-1.3	1.81	-3	3
C01D04Q13	37	0.22	1.9	-3	3
C01D04Q15	37	0	2	-3	3
C01D04Q8	37	-2.49	0.87	-3	0
C01D04Q9	37	-1.97	1.48	-3	2
C01D05Q2	37	1.7	1.1	0	3
C01D05Q9	37	1.32	1.31	-1	3
C01D05Q11	37	2.05	1.22	-2	3
C01D05Q12	37	1.08	1.52	-2	3
C01D05Q0	37	1.14	1.51	-3	3
C02D00Q1	37	1.65	1.16	-1	3
C02D00Q2	37	0.92	1.42	-2	3
C02D00Q8	37	1.59	1.26	-2	3
R_C02D00Q11	37	0.84	1.92	-3	3
R_C02D00Q15	37	1.43	1.41	-2	3
C03D01Q1	37	1.95	1.45	-2	3
C03D01Q7	37	1.43	1.39	-1	3
C03D01Q5	37	1.27	1.24	-1	3
C03D01Q6	37	1.49	1.26	-1	3
C03D01Q12	37	0.73	1.66	-3	3
C03D02Q0	37	1.35	1.21	-1	3
C03D02Q5	37	1.49	1.24	-2	3
C03D02Q10	37	1.38	1.48	-3	3
R_C03D02Q13	37	1.57	1.46	-1	3
R_C03D02Q1	37	1.46	1.22	-1	3
C04D00Q1	37	0.27	1.81	-3	3
C04D00Q10	37	0.41	1.79	-3	3
R_C04D00Q11	37	0.59	1.95	-3	3
C04D00Q4	37	1.3	1.58	-3	3
C04D00Q12	37	-0.76	2.18	-3	3
R_C05D00Q3	37	0.05	1.86	-3	3
C05D00Q6	37	-0.38	1.8	-3	3
C05D00Q7	37	-0.27	1.97	-3	3
C05D00Q1	37	0.78	1.32	-2	3
C05D00Q18	37	-0.19	1.81	-3	3
C06D01Q1	37	0.73	1.74	-3	3
R_C06D01Q6	37	0.41	1.83	-3	3

R_C06D01Q13	37	0.14	2.07	-3	3
C06D01Q8	37	0.81	1.47	-3	3
C06D01Q11	37	-0.27	1.82	-3	3
C07D00Q0	37	1.92	1.23	-1	3
C07D00Q11	37	1.59	1.28	-1	3
C07D00Q13	37	1.35	1.3	-3	3
R_C07D00Q15	37	0.57	1.8	-3	3
C07D00Q14	37	0.41	1.85	-3	3
R_C08D00Q3	37	0.54	1.92	-3	3
C08D00Q4	37	1.51	1.52	-3	3
R_C08D00Q10	37	1.14	1.69	-3	3
C08D00Q0	37	0.24	1.85	-3	3
R_C08D00Q9	37	1.14	1.78	-3	3
C09D00Q4	37	2.08	1.21	-3	3
C09D00Q5	37	-0.16	1.82	-3	3
C09D00Q10	37	1.97	1.28	-2	3
C09D00Q3	37	0.92	1.66	-3	3
C09D00Q1	37	2.3	1.1	-1	3
R_C09D00Q9	37	1.89	1.33	-1	3
C10D00Q1	37	0.3	2.15	-3	3
C10D00Q6	37	-0.14	1.32	-3	2
C10D00Q10	37	1.84	1.21	-1	3
C10D00Q16	37	0.59	1.8	-3	3
C10D00Q18	37	0.76	1.8	-3	3
C11D01Q6	37	0.05	1.99	-3	3
C11D01Q9	37	0.51	1.98	-3	3
C11D01Q10	37	0.73	1.37	-2	3
C11D01Q11	37	0.16	1.74	-3	3
C11D01Q14	37	1.62	1.23	-2	3
C11D02Q1	37	2.22	1.06	-1	3
C11D02Q3	37	-0.27	1.77	-3	3
C11D02Q4	37	0.46	1.69	-3	3
C11D02Q7	37	1.54	1.39	-2	3
C11D02Q8	37	-0.24	1.71	-3	2
C12D00Q0	37	2.03	1.07	-1	3
C12D00Q13	37	2.24	1.06	-1	3
C12D00Q1	37	2.03	0.96	0	3
C12D00Q8	37	0.95	1.6	-3	3
R_C12D00Q6	37	1.05	1.58	-3	3
R_C13D00Q3	37	1.27	1.5	-2	3
C13D00Q7	37	2	1.35	-2	3
R_C13D00Q11	37	1.59	1.59	-3	3
R_C13D00Q6	37	1.7	1.43	-2	3
R_C13D00Q15	37	1.89	1.52	-2	3
C14D00Q0	37	1.46	1.45	-3	3
C14D00Q10	37	1.97	1.24	-1	3
R_C14D00Q13	37	2.3	1.08	0	3
C14D00Q15	37	1.19	1.54	-3	3
C14D00Q16	37	1.46	1.5	-2	3
C15D00Q10	37	0.49	1.77	-3	3
C15D00Q11	37	0.35	1.77	-3	3
C15D00Q8	37	0.46	1.5	-3	3
C15D00Q12	37	0.73	1.33	-2	3
R_C15D00Q15	37	0.38	1.99	-3	3
C16D00Q11	37	0.41	1.66	-3	3
C16D00Q12	37	0.35	1.42	-3	3
C16D00Q13	37	-0.14	1.51	-3	3

C16D00Q16	37	1.05	1.33	-2	3
C16D00Q17	37	-1	1.89	-3	3
C17D00Q2	37	0.7	1.88	-3	3
C17D00Q3	37	0.95	1.51	-3	3
C17D00Q8	37	0.54	1.71	-3	3
C17D00Q9	37	0.62	1.52	-3	3
C17D00Q10	37	0.73	1.26	-3	3
C18D01Q2	37	-1.54	1.68	-3	2
C18D01Q3	37	-1.27	1.45	-3	2
R_C18D01Q5	37	-0.92	1.79	-3	3
C18D01Q8	37	-0.57	1.8	-3	2
R_C18D01Q14	37	-1	1.78	-3	3
C18D03Q0	37	1.32	1.51	-3	3
C18D03Q1	37	0.68	1.62	-3	3
C18D03Q2	37	0.65	1.64	-3	3
C18D03Q9	37	-0.19	1.87	-3	3
C18D03Q12	37	0.57	1.85	-3	3
C19D00Q3	37	-0.14	1.72	-3	3
C19D00Q7	37	0.76	1.57	-3	3
C19D00Q14	37	0.49	1.57	-3	3
C19D00Q26	37	1.32	1.58	-3	3
C19D00Q28	37	0.14	1.46	-3	3

#### Group: iCAT

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	36	-2.25	1.4	-3	2
C01D01Q10	36	-2.19	1.51	-3	2
C01D01Q13	36	-2.22	1.48	-3	2
C01D01Q15	36	-2.17	1.44	-3	1
C01D01Q16	36	-1.83	1.61	-3	2
C01D02Q7	36	-1.72	1.56	-3	3
C01D02Q10	36	-0.31	2.1	-3	3
C01D02Q0	36	-1.47	1.68	-3	2
C01D02Q1	36	-1.69	1.74	-3	2
C01D02Q9	36	-1.22	1.81	-3	3
C01D03Q7	36	-2.11	1.43	-3	2
C01D03Q9	36	-2.17	1.34	-3	1
C01D03Q10	36	-0.44	1.83	-3	3
C01D03Q11	36	-1.81	1.62	-3	2
C01D03Q12	36	-0.97	1.48	-3	2
C01D04Q0	36	-2.64	0.9	-3	1
C01D04Q13	36	-1.36	1.55	-3	3
C01D04Q15	36	-1.64	1.73	-3	3
C01D04Q8	36	-2.19	1.26	-3	2
C01D04Q9	36	-1.67	1.84	-3	3
C01D05Q2	36	0.64	1.66	-3	3
C01D05Q9	36	0.56	1.71	-2	3
C01D05Q11	36	0.75	1.46	-3	3

C01D05Q12	36	0.22	1.88	-3	3
C01D05Q0	36	0.28	1.81	-3	3
C02D00Q1	36	1.25	1.52	-3	3
C02D00Q2	36	0.92	1.48	-3	3
C02D00Q8	36	1.42	1.32	-3	3
R_C02D00Q11	36	0.72	1.73	-2	3
R_C02D00Q15	36	1.58	1.18	-1	3
C03D01Q1	36	1.25	1.5	-2	3
C03D01Q7	36	0.75	1.42	-3	3
C03D01Q5	36	0.03	1.52	-3	3
C03D01Q6	36	-0.58	1.5	-3	2
C03D01Q12	36	0.86	1.51	-2	3
C03D02Q0	36	1.33	1.24	-2	3
C03D02Q5	36	1.19	1.45	-3	3
C03D02Q10	36	1.22	1.27	-3	3
R_C03D02Q13	36	2.03	1.16	0	3
R_C03D02Q1	36	2.19	1.09	0	3
C04D00Q1	36	-1.14	1.62	-3	2
C04D00Q10	36	-0.75	1.75	-3	3
R_C04D00Q11	36	-0.39	2.16	-3	3
C04D00Q4	36	1.14	1.48	-3	3
C04D00Q12	36	-1.69	1.88	-3	3
R_C05D00Q3	36	-0.89	1.72	-3	3
C05D00Q6	36	-1.22	1.91	-3	3
C05D00Q7	36	-0.31	1.95	-3	3
C05D00Q1	36	0.47	1.9	-3	3
C05D00Q18	36	-1.5	1.63	-3	3
C06D01Q1	36	0.28	1.99	-3	3
R_C06D01Q6	36	-0.33	1.93	-3	3
R_C06D01Q13	36	-0.56	1.92	-3	3
C06D01Q8	36	-0.53	1.7	-3	3
C06D01Q11	36	-1.5	1.87	-3	3
C07D00Q0	36	0.5	1.48	-3	3
C07D00Q11	36	0.06	1.67	-3	2
C07D00Q13	36	0.81	1.67	-3	3
R_C07D00Q15	36	1.42	1.66	-3	3
C07D00Q14	36	0.69	1.33	-3	3
R_C08D00Q3	36	-0.5	1.73	-3	3
C08D00Q4	36	0.28	2.02	-3	3
R_C08D00Q10	36	0.64	1.74	-3	3
C08D00Q0	36	1.22	1.48	-3	3
R_C08D00Q9	36	0.86	1.76	-3	3
C09D00Q4	36	1.53	1.36	-3	3

C09D00Q5	36	0.42	1.38	-3	3
C09D00Q10	36	1.39	1.34	-2	3
C09D00Q3	36	-0.11	1.56	-3	3
C09D00Q1	36	2.08	1.4	-3	3
R_C09D00Q9	36	1.89	1.21	-1	3
C10D00Q1	36	0.92	1.44	-3	3
C10D00Q6	36	-0.86	1.57	-3	2
C10D00Q10	36	-0.47	1.95	-3	3
C10D00Q16	36	0.89	1.41	-3	3
C10D00Q18	36	-0.11	1.62	-3	3
C11D01Q6	36	-0.72	1.81	-3	2
C11D01Q9	36	-0.86	1.71	-3	2
C11D01Q10	36	-0.44	1.78	-3	2
C11D01Q11	36	-0.97	1.52	-3	2
C11D01Q14	36	0.42	1.66	-3	3
C11D02Q1	36	2.11	1.19	-3	3
C11D02Q3	36	-1.56	1.9	-3	3
C11D02Q4	36	0.19	1.85	-3	3
C11D02Q7	36	0.11	1.86	-3	3
C11D02Q8	36	-1.08	1.7	-3	3
C12D00Q0	36	1.64	1.46	-2	3
C12D00Q13	36	0.92	1.75	-3	3
C12D00Q1	36	1.58	1.27	-2	3
C12D00Q8	36	-0.19	1.51	-3	3
R_C12D00Q6	36	-0.56	2.1	-3	3
R_C13D00Q3	36	1.31	1.58	-3	3
C13D00Q7	36	1.08	1.65	-3	3
R_C13D00Q11	36	2.03	1.38	-3	3
R_C13D00Q6	36	1.36	1.44	-3	3
R_C13D00Q15	36	2.03	1.08	0	3
C14D00Q0	36	0.78	1.55	-3	3
C14D00Q10	36	0.06	1.94	-3	3
R_C14D00Q13	36	-0.08	1.87	-3	3
C14D00Q15	36	0.44	1.59	-3	3
C14D00Q16	36	-0.47	1.9	-3	3
C15D00Q10	36	1.11	1.53	-3	3
C15D00Q11	36	0.86	1.66	-3	3
C15D00Q8	36	0.06	1.49	-3	2
C15D00Q12	36	0.14	1.07	-3	2
R_C15D00Q15	36	1.33	1.53	-3	3
C16D00Q11	36	0.56	1.66	-3	3
C16D00Q12	36	-0.39	1.76	-3	3
C16D00Q13	36	-1.14	1.9	-3	3

C16D00Q16	36	0.94	1.6	-3	3
C16D00Q17	36	-1.83	1.86	-3	3
C17D00Q2	36	0.17	1.48	-3	2
C17D00Q3	36	-0.06	1.35	-3	2
C17D00Q8	36	-0.47	1.48	-3	2
C17D00Q9	36	-0.14	1.51	-3	3
C17D00Q10	36	-0.31	1.72	-3	3
C18D01Q2	36	-2.14	1.22	-3	1
C18D01Q3	36	-1.97	1.54	-3	2
R_C18D01Q5	36	-1.83	1.54	-3	2
C18D01Q8	36	-1.61	1.55	-3	2
R_C18D01Q14	36	-1.67	2.06	-3	3
C18D03Q0	36	0.31	1.74	-3	3
C18D03Q1	36	0.22	1.81	-3	3
C18D03Q2	36	0.44	1.46	-3	3
C18D03Q9	36	-1.14	1.81	-3	3
C18D03Q12	36	0.08	1.92	-3	3
C19D00Q3	36	-1.19	1.8	-3	3
C19D00Q7	36	-0.64	1.82	-3	3
C19D00Q14	36	0.14	1.69	-3	3
C19D00Q26	36	0.97	1.56	-3	3
C19D00Q28	36	-0.22	1.73	-3	3

#### Group: MARCUS

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	36	1.58	1.42	-2	3
C01D01Q10	36	1.67	1.45	-3	3
C01D01Q13	36	1.61	1.38	-2	3
C01D01Q15	36	1.92	1.25	-3	3
C01D01Q16	36	1.97	1.21	-1	3
C01D02Q7	36	1.56	1.38	-1	3
C01D02Q10	36	1.36	1.5	-2	3
C01D02Q0	36	1.72	1.23	-1	3
C01D02Q1	36	1.89	1.28	-2	3
C01D02Q9	36	1.97	1.13	-2	3
C01D03Q7	36	-0.14	2.24	-3	3
C01D03Q9	36	0.97	1.7	-2	3
C01D03Q10	36	0.67	2	-3	3
C01D03Q11	36	0.61	2.11	-3	3
C01D03Q12	36	1.22	1.44	-2	3
C01D04Q0	36	0.75	1.93	-3	3
C01D04Q13	36	1.22	1.62	-2	3



C01D04Q15	36	1.67	1.24	-1	3
C01D04Q8	36	-1.33	1.74	-3	3
C01D04Q9	36	-0.5	1.78	-3	3
C01D05Q2	36	0.97	1.52	-3	3
C01D05Q9	36	1.89	1.24	-3	3
C01D05Q11	36	1.17	1.56	-2	3
C01D05Q12	36	1.81	1.12	-1	3
C01D05Q0	36	1.36	1.29	-2	3
C02D00Q1	36	0.25	1.68	-3	3
C02D00Q2	36	0.28	1.65	-3	3
C02D00Q8	36	1.42	1.44	-3	3
R_C02D00Q11	36	1.47	1.84	-3	3
R_C02D00Q15	36	0.72	1.49	-3	3
C03D01Q1	36	1	1.67	-3	3
C03D01Q7	36	1.42	1.08	0	3
C03D01Q5	36	0.92	1.34	-2	3
C03D01Q6	36	0.86	1.51	-3	3
C03D01Q12	36	0.53	1.48	-2	3
C03D02Q0	36	0.69	1.09	-2	3
C03D02Q5	36	0.64	1.33	-3	3
C03D02Q10	36	1.33	1.24	-3	3
R_C03D02Q13	36	1.28	1.37	-2	3
R_C03D02Q1	36	0.97	1.4	-2	3
C04D00Q1	36	-0.19	1.89	-3	3
C04D00Q10	36	0.58	1.57	-3	3
R_C04D00Q11	36	1.17	1.5	-3	3
C04D00Q4	36	0.92	1.44	-3	3
C04D00Q12	36	-0.44	1.65	-3	3
R_C05D00Q3	36	0.42	1.65	-3	3
C05D00Q6	36	0.08	1.68	-3	3
C05D00Q7	36	0.5	1.58	-3	3
C05D00Q1	36	1.67	1.12	-1	3
C05D00Q18	36	0.08	1.56	-3	3
C06D01Q1	36	1.56	1.32	-3	3
R_C06D01Q6	36	1.33	1.57	-3	3
R_C06D01Q13	36	1.17	1.52	-3	3
C06D01Q8	36	1.03	1.48	-3	3
C06D01Q11	36	1.17	1.76	-3	3
C07D00Q0	36	0.72	1.49	-3	3
C07D00Q11	36	0.97	1.56	-3	3
C07D00Q13	36	1.11	1.65	-3	3
R_C07D00Q15	36	0.58	1.59	-3	3
C07D00Q14	36	-0.06	1.49	-3	3

R_C08D00Q3	36	1.31	1.88	-3	3
C08D00Q4	36	1.19	1.6	-3	3
R_C08D00Q10	36	1.28	1.32	-2	3
C08D00Q0	36	-0.64	1.66	-3	3
R_C08D00Q9	36	0.97	1.7	-3	3
C09D00Q4	36	2.08	1.23	-3	3
C09D00Q5	36	0.53	1.8	-3	3
C09D00Q10	36	2.06	1.04	0	3
C09D00Q3	36	1.17	1.21	-2	3
C09D00Q1	36	2.11	1.14	-1	3
R_C09D00Q9	36	1	1.74	-3	3
C10D00Q1	36	-0.22	1.76	-3	3
C10D00Q6	36	-0.28	1.26	-3	3
C10D00Q10	36	0.92	1.3	-2	3
C10D00Q16	36	0.78	1.48	-3	3
C10D00Q18	36	0.42	1.18	-2	3
C11D01Q6	36	0.47	1.18	-2	3
C11D01Q9	36	1.14	1.33	-2	3
C11D01Q10	36	0.83	1.38	-3	3
C11D01Q11	36	1.61	1.2	-1	3
C11D01Q14	36	1.31	1.17	-1	3
C11D02Q1	36	1.67	1.31	-3	3
C11D02Q3	36	0.14	1.38	-3	3
C11D02Q4	36	0.14	1.62	-3	3
C11D02Q7	36	1.39	1.54	-2	3
C11D02Q8	36	-0.78	1.71	-3	2
C12D00Q0	36	2	1.2	-1	3
C12D00Q13	36	1.78	1.1	-1	3
C12D00Q1	36	2.11	1.33	-2	3
C12D00Q8	36	1.33	1.49	-3	3
R_C12D00Q6	36	1.42	1.5	-2	3
R_C13D00Q3	36	1.17	1.48	-2	3
C13D00Q7	36	1.78	1.22	-1	3
R_C13D00Q11	36	1.25	1.52	-2	3
R_C13D00Q6	36	0.97	1.44	-3	3
R_C13D00Q15	36	0.78	1.62	-3	3
C14D00Q0	36	1.75	1.08	-2	3
C14D00Q10	36	1.72	1.34	-1	3
R_C14D00Q13	36	1.83	1.3	-2	3
C14D00Q15	36	1.39	1.18	-1	3
C14D00Q16	36	1.22	1.76	-3	3
C15D00Q10	36	-0.06	1.47	-3	3
C15D00Q11	36	-0.06	1.77	-3	3

C15D00Q8	36	0.58	1.38	-3	3
C15D00Q12	36	0.78	1.4	-2	3
R_C15D00Q15	36	0.08	1.61	-3	3
C16D00Q11	36	0.67	1.8	-3	3
C16D00Q12	36	1.22	1.55	-2	3
C16D00Q13	36	0.53	1.65	-3	3
C16D00Q16	36	1.44	1.66	-3	3
C16D00Q17	36	0.5	1.98	-3	3
C17D00Q2	36	0.31	1.51	-2	3
C17D00Q3	36	0.33	1.51	-3	3
C17D00Q8	36	-0.19	1.39	-3	3
C17D00Q9	36	-0.28	1.21	-3	2
C17D00Q10	36	0.58	1.5	-3	3
C18D01Q2	36	0.36	1.4	-3	3
C18D01Q3	36	0.97	1.7	-3	3
R_C18D01Q5	36	0.69	1.88	-3	3
C18D01Q8	36	1.22	1.74	-3	3
R_C18D01Q14	36	0.64	1.94	-3	3
C18D03Q0	36	1.36	1.38	-3	3
C18D03Q1	36	1.08	1.44	-2	3
C18D03Q2	36	1.39	1.38	-3	3
C18D03Q9	36	1.22	1.55	-3	3
C18D03Q12	36	1.14	1.48	-3	3
C19D00Q3	36	0.75	1.7	-3	3
C19D00Q7	36	1.31	1.53	-3	3
C19D00Q14	36	1.08	1.13	0	3
C19D00Q26	36	2	1.07	0	3
C19D00Q28	36	1.22	1.42	-2	3

### Group: NAO

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	36	-0.94	1.88	-3	3
C01D01Q10	36	-1.17	1.75	-3	3
C01D01Q13	36	-1.11	1.77	-3	3
C01D01Q15	36	-0.5	2.02	-3	3
C01D01Q16	36	0.36	1.79	-3	3
C01D02Q7	36	0.11	1.91	-3	3
C01D02Q10	36	1.22	1.31	-3	3
C01D02Q0	36	1.11	1.56	-3	3
C01D02Q1	36	0.31	1.7	-3	3
C01D02Q9	36	0.97	1.59	-3	3
C01D03Q7	36	-1.33	2.06	-3	3
C01D03Q9	36	-0.64	1.79	-3	3

C01D03Q10	36	-0.83	2.05	-3	3
C01D03Q11	36	-0.89	1.89	-3	3
C01D03Q12	36	0.86	1.64	-3	3
C01D04Q0	36	-1.83	1.7	-3	3
C01D04Q13	36	0.25	1.7	-3	3
C01D04Q15	36	0.5	2.05	-3	3
C01D04Q8	36	-1.47	1.81	-3	3
C01D04Q9	36	-0.56	1.87	-3	3
C01D05Q2	36	2	1.15	-2	3
C01D05Q9	36	1.58	1.16	-1	3
C01D05Q11	36	1.75	0.94	-1	3
C01D05Q12	36	1.17	1.38	-3	3
C01D05Q0	36	1.64	1.38	-3	3
C02D00Q1	36	1.06	1.15	-2	3
C02D00Q2	36	0.75	1.42	-3	3
C02D00Q8	36	1.19	1.49	-3	3
R_C02D00Q11	36	0	1.77	-3	3
R_C02D00Q15	36	1.14	1.51	-3	3
C03D01Q1	36	1.22	1.79	-3	3
C03D01Q7	36	0.69	1.6	-3	3
C03D01Q5	36	0.11	1.89	-3	3
C03D01Q6	36	-0.61	1.57	-3	3
C03D01Q12	36	1.56	1.32	-1	3
C03D02Q0	36	1.44	1.27	-2	3
C03D02Q5	36	1.28	1.52	-3	3
C03D02Q10	36	1.67	1.01	0	3
R_C03D02Q13	36	0.81	1.92	-3	3
R_C03D02Q1	36	1.64	1.44	-3	3
C04D00Q1	36	1.22	1.57	-3	3
C04D00Q10	36	2	1.6	-3	3
R_C04D00Q11	36	2.25	1.4	-3	3
C04D00Q4	36	1.92	1.16	-1	3
C04D00Q12	36	1.33	2.22	-3	3
R_C05D00Q3	36	1.42	1.56	-3	3
C05D00Q6	36	0.5	1.48	-2	3
C05D00Q7	36	0.89	1.33	-2	3
C05D00Q1	36	1.53	1.28	-3	3
C05D00Q18	36	0	1.82	-3	3
C06D01Q1	36	1.31	1.33	-3	3
R_C06D01Q6	36	1.72	1.45	-3	3
R_C06D01Q13	36	1.17	1.68	-3	3
C06D01Q8	36	0.75	1.79	-3	3
C06D01Q11	36	0.17	2.08	-3	3

C07D00Q0	36	1.56	1.56	-3	3
C07D00Q11	36	1.25	1.76	-3	3
C07D00Q13	36	1.94	0.95	0	3
R_C07D00Q15	36	1.92	1.13	0	3
C07D00Q14	36	1.53	1.44	-2	3
R_C08D00Q3	36	1.75	1.61	-3	3
C08D00Q4	36	1.92	1.32	-3	3
R_C08D00Q10	36	1.86	1.4	-2	3
C08D00Q0	36	1.67	1.33	-2	3
R_C08D00Q9	36	2.31	0.92	0	3
C09D00Q4	36	2.11	0.82	1	3
C09D00Q5	36	-0.28	1.83	-3	3
C09D00Q10	36	1.78	1.12	-2	3
C09D00Q3	36	1	1.29	-3	3
C09D00Q1	36	2.44	0.88	0	3
R_C09D00Q9	36	1.81	1.33	-1	3
C10D00Q1	36	0.86	1.2	-3	3
C10D00Q6	36	-0.03	1.42	-3	3
C10D00Q10	36	-0.83	1.59	-3	3
C10D00Q16	36	1.39	1.36	-3	3
C10D00Q18	36	0.17	1.48	-3	2
C11D01Q6	36	0.69	1.86	-3	3
C11D01Q9	36	0.67	1.53	-3	3
C11D01Q10	36	1.31	1.55	-3	3
C11D01Q11	36	0.42	1.52	-3	3
C11D01Q14	36	1.47	1.46	-3	3
C11D02Q1	36	2.03	1.38	-3	3
C11D02Q3	36	0.33	1.87	-3	3
C11D02Q4	36	0.47	1.76	-3	3
C11D02Q7	36	1.31	1.56	-3	3
C11D02Q8	36	1.22	1.24	-2	3
C12D00Q0	36	1.22	1.59	-2	3
C12D00Q13	36	1.56	1.27	-2	3
C12D00Q1	36	2	1.22	-2	3
C12D00Q8	36	0.72	1.28	-3	3
R_C12D00Q6	36	0.78	1.87	-3	3
R_C13D00Q3	36	2	1.15	-1	3
C13D00Q7	36	1.22	1.62	-3	3
R_C13D00Q11	36	1.97	1	0	3
R_C13D00Q6	36	1.11	1.49	-3	3
R_C13D00Q15	36	1.36	1.57	-1	3
C14D00Q0	36	1.28	1.54	-3	3
C14D00Q10	36	0.75	1.54	-3	3

R_C14D00Q13	36	1.14	1.69	-3	3
C14D00Q15	36	1.19	1.45	-3	3
C14D00Q16	36	0.11	1.63	-3	3
C15D00Q10	36	2.03	1.11	-2	3
C15D00Q11	36	1.61	1.25	-1	3
C15D00Q8	36	1.75	1.42	-3	3
C15D00Q12	36	1.72	1.06	-1	3
R_C15D00Q15	36	2.06	1.12	-1	3
C16D00Q11	36	1.22	1.71	-3	3
C16D00Q12	36	1.08	1.42	-3	3
C16D00Q13	36	0.5	1.9	-3	3
C16D00Q16	36	1.61	1.61	-3	3
C16D00Q17	36	-0.39	1.9	-3	3
C17D00Q2	36	1.33	1.57	-3	3
C17D00Q3	36	1.39	1.42	-3	3
C17D00Q8	36	1.06	1.45	-3	3
C17D00Q9	36	0.72	1.52	-3	3
C17D00Q10	36	1.03	1.56	-3	3
C18D01Q2	36	0.06	2.11	-3	3
C18D01Q3	36	-0.33	1.88	-3	3
R_C18D01Q5	36	0.47	2.25	-3	3
C18D01Q8	36	0.5	2.02	-3	3
R_C18D01Q14	36	-0.36	2.22	-3	3
C18D03Q0	36	1.11	1.7	-3	3
C18D03Q1	36	0.67	1.47	-3	3
C18D03Q2	36	1	1.47	-3	3
C18D03Q9	36	0.14	1.82	-3	3
C18D03Q12	36	1.17	1.44	-3	3
C19D00Q3	36	0.89	1.79	-3	3
C19D00Q7	36	1.03	1.59	-3	3
C19D00Q14	36	1.22	1.44	-3	3
C19D00Q26	36	1.11	1.69	-3	3
C19D00Q28	36	1.19	1.62	-2	3

Group: POPPY

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	38	0.63	1.82	-3	3
C01D01Q10	38	0.95	1.54	-3	3
C01D01Q13	38	0.45	1.78	-3	3
C01D01Q15	38	0.53	1.96	-3	3
C01D01Q16	38	0.74	1.64	-3	3
C01D02Q7	38	0.05	1.83	-3	3
C01D02Q10	38	0.76	1.81	-3	3

C01D02Q0	38	0.32	1.86	-3	3
C01D02Q1	38	0.53	1.83	-3	3
C01D02Q9	38	0.87	1.8	-3	3
C01D03Q7	38	-0.66	1.98	-3	3
C01D03Q9	38	-0.39	1.62	-3	3
C01D03Q10	38	-0.11	1.61	-3	3
C01D03Q11	38	-0.18	1.72	-3	3
C01D03Q12	38	-0.18	1.72	-3	3
C01D04Q0	38	-1.95	1.71	-3	2
C01D04Q13	38	0.37	1.72	-3	3
C01D04Q15	38	0.45	1.81	-3	3
C01D04Q8	38	-1.89	1.27	-3	1
C01D04Q9	38	-1.21	1.83	-3	3
C01D05Q2	38	0.87	1.55	-3	3
C01D05Q9	38	0.5	1.62	-3	3
C01D05Q11	38	1.26	1.46	-3	3
C01D05Q12	38	0.42	1.43	-3	3
C01D05Q0	38	0.74	1.73	-3	3
C02D00Q1	38	0.68	1.86	-3	3
C02D00Q2	38	0.84	1.75	-3	3
C02D00Q8	38	1	1.64	-3	3
R_C02D00Q11	38	1.05	1.89	-3	3
R_C02D00Q15	38	0.55	2.01	-3	3
C03D01Q1	38	1.16	1.6	-3	3
C03D01Q7	38	0.92	1.65	-3	3
C03D01Q5	38	0.42	1.33	-3	3
C03D01Q6	38	0.18	1.35	-2	3
C03D01Q12	38	0.87	1.61	-3	3
C03D02Q0	38	1.32	1.63	-3	3
C03D02Q5	38	1.37	1.38	-2	3
C03D02Q10	38	1.03	1.59	-3	3
R_C03D02Q13	38	1.47	1.74	-2	3
R_C03D02Q1	38	1.74	1.41	-1	3
C04D00Q1	38	-0.11	1.71	-3	3
C04D00Q10	38	0.13	1.77	-3	3
R_C04D00Q11	38	0.71	1.99	-3	3
C04D00Q4	38	1.63	1.32	-2	3
C04D00Q12	38	-1.26	1.94	-3	3
R_C05D00Q3	38	-0.11	1.96	-3	3
C05D00Q6	38	0.42	1.65	-3	3
C05D00Q7	38	0.55	1.72	-3	3
C05D00Q1	38	1.29	1.18	-2	3
C05D00Q18	38	0.26	1.88	-3	3

C06D01Q1	38	0.16	1.42	-3	3
R_C06D01Q6	38	0.24	1.91	-3	3
R_C06D01Q13	38	-0.03	2.12	-3	3
C06D01Q8	38	-0.03	1.33	-3	3
C06D01Q11	38	-0.53	1.81	-3	3
C07D00Q0	38	1.53	1.45	-2	3
C07D00Q11	38	1.32	1.53	-3	3
C07D00Q13	38	1.32	1.04	-2	3
R_C07D00Q15	38	1.21	1.79	-3	3
C07D00Q14	38	1.71	1.41	-2	3
R_C08D00Q3	38	-0.13	2.2	-3	3
C08D00Q4	38	1.11	1.67	-3	3
R_C08D00Q10	38	1.61	1.39	-1	3
C08D00Q0	38	1.79	1.3	-3	3
R_C08D00Q9	38	1.34	1.6	-3	3
C09D00Q4	38	2	1.07	-1	3
C09D00Q5	38	-0.21	1.54	-3	3
C09D00Q10	38	1.84	1.48	-3	3
C09D00Q3	38	-0.34	1.66	-3	3
C09D00Q1	38	2.13	1.3	-3	3
R_C09D00Q9	38	1.82	1.25	-2	3
C10D00Q1	38	1.03	1.33	-2	3
C10D00Q6	38	-0.05	1.18	-3	3
C10D00Q10	38	-0.16	1.73	-3	3
C10D00Q16	38	0.84	1.55	-3	3
C10D00Q18	38	0.18	1.57	-3	3
C11D01Q6	38	0.29	1.97	-3	3
C11D01Q9	38	-0.26	1.5	-3	3
C11D01Q10	38	0.39	1.55	-3	3
C11D01Q11	38	-0.08	1.53	-3	3
C11D01Q14	38	0.55	1.45	-3	3
C11D02Q1	38	2.21	1.02	-1	3
C11D02Q3	38	-0.55	2.06	-3	3
C11D02Q4	38	0.42	1.83	-3	3
C11D02Q7	38	0.29	1.97	-3	3
C11D02Q8	38	-0.58	1.75	-3	3
C12D00Q0	38	1.76	1.42	-3	3
C12D00Q13	38	1	1.61	-3	3
C12D00Q1	38	1.74	1.55	-2	3
C12D00Q8	38	-0.13	1.46	-3	3
R_C12D00Q6	38	0.05	2.03	-3	3
R_C13D00Q3	38	1.18	1.75	-3	3
C13D00Q7	38	0.82	1.57	-3	3



R_C13D00Q11	38	1.66	1.62	-3	3
R_C13D00Q6	38	0.92	1.75	-3	3
R_C13D00Q15	38	1.13	1.63	-3	3
C14D00Q0	38	0.68	1.32	-3	3
C14D00Q10	38	0.76	1.44	-3	3
R_C14D00Q13	38	0.61	1.76	-3	3
C14D00Q15	38	0.55	1.66	-3	3
C14D00Q16	38	-0.29	1.77	-3	3
C15D00Q10	38	1.63	1.57	-3	3
C15D00Q11	38	1.66	1.48	-3	3
C15D00Q8	38	0.39	1.7	-3	3
C15D00Q12	38	0.29	1.64	-3	3
R_C15D00Q15	38	1.76	1.51	-2	3
C16D00Q11	38	1.18	1.59	-3	3
C16D00Q12	38	0.42	1.76	-3	3
C16D00Q13	38	0.05	1.68	-3	3
C16D00Q16	38	1.53	1.41	-3	3
C16D00Q17	38	-0.37	1.88	-3	3
C17D00Q2	38	0.21	1.42	-3	2
C17D00Q3	38	0.37	1.76	-3	3
C17D00Q8	38	0.71	1.64	-3	3
C17D00Q9	38	0.18	1.74	-3	3
C17D00Q10	38	0.08	1.65	-3	3
C18D01Q2	38	-1.24	1.87	-3	3
C18D01Q3	38	-0.92	2.11	-3	3
R_C18D01Q5	38	-0.21	1.85	-3	3
C18D01Q8	38	-0.24	1.85	-3	3
R_C18D01Q14	38	-1.05	1.93	-3	3
C18D03Q0	38	0.53	1.75	-3	3
C18D03Q1	38	0.21	1.82	-3	3
C18D03Q2	38	0.61	1.62	-3	3
C18D03Q9	38	0.08	1.75	-3	3
C18D03Q12	38	0.63	1.78	-3	3
C19D00Q3	38	0.71	1.72	-3	3
C19D00Q7	38	0.68	1.97	-3	3
C19D00Q14	38	0.61	1.52	-3	3
C19D00Q26	38	1.05	1.77	-3	3
C19D00Q28	38	0.37	1.73	-3	3

Group: SARAH

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	39	1.77	1.16	-1	3
C01D01Q10	39	1.87	1.26	-2	3

C01D01Q13	39	1.85	1.33	-2	3
C01D01Q15	39	1.15	1.76	-3	3
C01D01Q16	39	1.44	1.25	-3	3
C01D02Q7	39	0.21	1.84	-3	3
C01D02Q10	39	0.85	1.58	-3	3
C01D02Q0	39	0.69	1.66	-3	3
C01D02Q1	39	0.92	1.55	-3	3
C01D02Q9	39	0.87	1.4	-3	3
C01D03Q7	39	0.1	1.86	-3	3
C01D03Q9	39	0.97	1.66	-3	3
C01D03Q10	39	0.97	1.63	-3	3
C01D03Q11	39	1	1.56	-2	3
C01D03Q12	39	1.31	1.45	-3	3
C01D04Q0	39	-1.62	2.02	-3	3
C01D04Q13	39	0.28	1.47	-2	3
C01D04Q15	39	0.36	1.75	-3	3
C01D04Q8	39	-2.13	1.22	-3	1
C01D04Q9	39	-1.38	1.41	-3	1
C01D05Q2	39	1.85	1.01	-1	3
C01D05Q9	39	1.56	1.23	-2	3
C01D05Q11	39	1.67	1.08	-2	3
C01D05Q12	39	1.46	1.17	-1	3
C01D05Q0	39	1.82	0.88	0	3
C02D00Q1	39	1.72	1.3	-2	3
C02D00Q2	39	1.64	1.22	-2	3
C02D00Q8	39	1.77	1.13	-2	3
R_C02D00Q11	39	1.69	1.38	-1	3
R_C02D00Q15	39	2.05	0.97	0	3
C03D01Q1	39	1.9	1.25	-3	3
C03D01Q7	39	1.87	1.1	-2	3
C03D01Q5	39	0.79	1.42	-3	3
C03D01Q6	39	1.33	1.51	-3	3
C03D01Q12	39	1.54	1.25	-2	3
C03D02Q0	39	1.59	0.94	0	3
C03D02Q5	39	1.46	0.94	-1	3
C03D02Q10	39	1.74	1.02	-2	3
R_C03D02Q13	39	2.33	1.06	0	3
R_C03D02Q1	39	1.97	1.11	-1	3
C04D00Q1	39	1.18	1.25	-2	3
C04D00Q10	39	0.59	1.73	-3	3
R_C04D00Q11	39	1.1	1.89	-3	3
C04D00Q4	39	2.15	0.9	0	3
C04D00Q12	39	-1.15	1.91	-3	3

R_C05D00Q3	39	0.23	1.9	-3	3
C05D00Q6	39	-0.46	1.76	-3	3
C05D00Q7	39	0.03	1.8	-3	3
C05D00Q1	39	0.56	1.74	-3	3
C05D00Q18	39	-0.23	1.77	-3	3
C06D01Q1	39	0.18	1.37	-3	3
R_C06D01Q6	39	-0.56	1.74	-3	3
R_C06D01Q13	39	-0.59	1.82	-3	3
C06D01Q8	39	1.1	1.21	-3	3
C06D01Q11	39	-0.13	1.99	-3	3
C07D00Q0	39	1.31	1.15	-1	3
C07D00Q11	39	1.51	1.14	-2	3
C07D00Q13	39	1.67	1.13	-2	3
R_C07D00Q15	39	1.72	1.56	-3	3
C07D00Q14	39	1.13	1	-1	3
R_C08D00Q3	39	0.41	1.85	-3	3
C08D00Q4	39	1.23	1.37	-3	3
R_C08D00Q10	39	1.95	1.39	-3	3
C08D00Q0	39	0.97	1.04	-1	3
R_C08D00Q9	39	1.82	1.43	-3	3
C09D00Q4	39	1.59	0.88	-1	3
C09D00Q5	39	0.18	1.35	-3	3
C09D00Q10	39	1.59	0.91	0	3
C09D00Q3	39	-0.08	1.58	-3	3
C09D00Q1	39	1.82	1.02	-2	3
R_C09D00Q9	39	2	1.26	-2	3
C10D00Q1	39	1.64	0.96	0	3
C10D00Q6	39	0.9	1.35	-3	3
C10D00Q10	39	1.13	1.42	-3	3
C10D00Q16	39	1.51	1.02	-1	3
C10D00Q18	39	1.49	1	-1	3
C11D01Q6	39	0.28	1.59	-3	3
C11D01Q9	39	0.41	1.35	-3	2
C11D01Q10	39	0.59	1.29	-3	2
C11D01Q11	39	-0.05	1.7	-3	3
C11D01Q14	39	1.44	0.97	-1	3
C11D02Q1	39	2.26	0.88	0	3
C11D02Q3	39	-0.23	1.84	-3	3
C11D02Q4	39	0.92	1.35	-3	3
C11D02Q7	39	1.41	1.45	-3	3
C11D02Q8	39	-1.46	1.39	-3	2
C12D00Q0	39	1.97	1.22	-1	3
C12D00Q13	39	1.79	1.15	-1	3

C12D00Q1	39	2.36	0.87	0	3
C12D00Q8	39	0.26	1.52	-3	3
R_C12D00Q6	39	-0.36	1.69	-3	3
R_C13D00Q3	39	2.08	1.09	-1	3
C13D00Q7	39	1.87	1.2	-3	3
R_C13D00Q11	39	2.05	1.17	-2	3
R_C13D00Q6	39	1.72	1.38	-1	3
R_C13D00Q15	39	1.85	1.44	-3	3
C14D00Q0	39	1.72	1.02	0	3
C14D00Q10	39	1.59	1.29	-1	3
R_C14D00Q13	39	1.69	1.28	-2	3
C14D00Q15	39	1.69	0.89	0	3
C14D00Q16	39	0.44	1.8	-3	3
C15D00Q10	39	1.62	1.04	-1	3
C15D00Q11	39	1.69	1	0	3
C15D00Q8	39	0.87	1.22	-3	3
C15D00Q12	39	0.92	1.31	-2	3
R_C15D00Q15	39	1.87	1.2	-2	3
C16D00Q11	39	1.08	1.09	-3	3
C16D00Q12	39	0.64	1.55	-3	3
C16D00Q13	39	0.03	1.71	-3	3
C16D00Q16	39	1.31	1.51	-3	3
C16D00Q17	39	-0.49	1.93	-3	3
C17D00Q2	39	1	1.05	-1	3
C17D00Q3	39	1.08	1.18	-1	3
C17D00Q8	39	0.23	1.33	-3	3
C17D00Q9	39	0.44	1.29	-3	3
C17D00Q10	39	0.62	1.04	-2	3
C18D01Q2	39	-1.74	1.37	-3	1
C18D01Q3	39	-1.54	1.73	-3	2
R_C18D01Q5	39	-0.9	1.82	-3	3
C18D01Q8	39	-1.08	1.77	-3	2
R_C18D01Q14	39	-1.54	1.86	-3	3
C18D03Q0	39	1.08	1.26	-3	3
C18D03Q1	39	-0.26	1.57	-3	3
C18D03Q2	39	0.05	1.62	-3	3
C18D03Q9	39	-1.54	1.65	-3	3
C18D03Q12	39	-0.28	1.7	-3	3
C19D00Q3	39	-0.26	1.55	-3	3
C19D00Q7	39	0.18	1.47	-3	3
C19D00Q14	39	0.31	1.72	-3	3
C19D00Q26	39	1.21	1.63	-3	3
C19D00Q28	39	-0.1	1.19	-3	2

Group: SIM SENSEI

ITEM ID	N	M	SD	MIN	MAX
C01D01Q3	38	1.18	1.56	-3	3
C01D01Q10	38	1.42	1.57	-3	3
C01D01Q13	38	1.32	1.71	-3	3
C01D01Q15	38	1.21	1.86	-3	3
C01D01Q16	38	1.11	1.71	-3	3
C01D02Q7	38	0.55	1.81	-3	3
C01D02Q10	38	0.95	1.58	-3	3
C01D02Q0	38	1.05	1.58	-3	3
C01D02Q1	38	0.82	1.66	-3	3
C01D02Q9	38	1.21	1.61	-2	3
C01D03Q7	38	0.05	1.83	-3	3
C01D03Q9	38	1.05	1.86	-3	3
C01D03Q10	38	0.37	1.36	-3	3
C01D03Q11	38	0.71	1.74	-3	3
C01D03Q12	38	0.87	1.61	-3	3
C01D04Q0	38	-2.11	1.43	-3	2
C01D04Q13	38	0.53	1.78	-3	3
C01D04Q15	38	0.5	1.8	-3	3
C01D04Q8	38	-1.89	1.33	-3	2
C01D04Q9	38	-1.37	1.38	-3	2
C01D05Q2	38	1.66	1.49	-3	3
C01D05Q9	38	1.39	1.41	-3	3
C01D05Q11	38	1.76	1.15	-1	3
C01D05Q12	38	1.37	1.42	-2	3
C01D05Q0	38	1.61	1.44	-2	3
C02D00Q1	38	1.45	1.33	-3	3
C02D00Q2	38	0.97	1.24	-3	3
C02D00Q8	38	1.34	1.38	-3	3
R_C02D00Q11	38	0.87	1.76	-3	3
R_C02D00Q15	38	1.39	1.2	-2	3
C03D01Q1	38	1.13	1.53	-3	3
C03D01Q7	38	1.26	1.37	-3	3
C03D01Q5	38	0.37	1.55	-3	3
C03D01Q6	38	0.11	1.45	-3	3
C03D01Q12	38	1.03	1.59	-3	3
C03D02Q0	38	1.45	1.16	0	3
C03D02Q5	38	0.95	1.41	-3	3
C03D02Q10	38	0.82	1.45	-3	3
R_C03D02Q13	38	1.45	1.37	-2	3
R_C03D02Q1	38	1.82	1.18	0	3

C04D00Q1	38	0.61	1.39	-2	3
C04D00Q10	38	0.53	1.57	-3	3
R_C04D00Q11	38	1.47	1.56	-3	3
C04D00Q4	38	1.37	1.5	-3	3
C04D00Q12	38	-0.92	1.98	-3	3
R_C05D00Q3	38	0.32	1.8	-3	3
C05D00Q6	38	-0.26	1.73	-3	3
C05D00Q7	38	0.03	1.6	-3	3
C05D00Q1	38	0.63	1.75	-3	3
C05D00Q18	38	0.76	1.75	-3	3
C06D01Q1	38	0.32	1.56	-3	3
R_C06D01Q6	38	0.32	1.74	-3	3
R_C06D01Q13	38	-0.08	1.81	-3	3
C06D01Q8	38	0.71	1.39	-3	3
C06D01Q11	38	-0.61	2.03	-3	3
C07D00Q0	38	0.58	1.33	-3	3
C07D00Q11	38	0.55	1.5	-3	3
C07D00Q13	38	1.21	1.47	-3	3
R_C07D00Q15	38	1.08	1.62	-3	3
C07D00Q14	38	0.37	1.38	-3	3
R_C08D00Q3	38	0.66	1.76	-3	3
C08D00Q4	38	1	1.58	-3	3
R_C08D00Q10	38	1.92	1.22	0	3
C08D00Q0	38	0.32	1.3	-3	3
R_C08D00Q9	38	1.47	1.54	-3	3
C09D00Q4	38	0.63	1.7	-3	3
C09D00Q5	38	0.08	1.53	-3	3
C09D00Q10	38	1.11	1.27	-2	3
C09D00Q3	38	0.13	1.56	-3	3
C09D00Q1	38	1.39	1.64	-3	3
R_C09D00Q9	38	-0.03	1.81	-3	3
C10D00Q1	38	0.55	1.46	-3	3
C10D00Q6	38	0	1.25	-3	3
C10D00Q10	38	0.08	1.68	-3	3
C10D00Q16	38	1.08	1.02	0	3
C10D00Q18	38	0.37	1.75	-3	3
C11D01Q6	38	0.61	1.6	-3	3
C11D01Q9	38	-0.79	1.23	-3	1
C11D01Q10	38	0.45	1.48	-3	3
C11D01Q11	38	-0.58	1.46	-3	3
C11D01Q14	38	1.16	1.69	-3	3
C11D02Q1	38	1.87	1.28	-3	3
C11D02Q3	38	0.18	1.9	-3	3

C11D02Q4	38	0.66	1.71	-3	3
C11D02Q7	38	1	1.43	-3	3
C11D02Q8	38	-0.95	1.43	-3	2
C12D00Q0	38	1.79	1.47	-3	3
C12D00Q13	38	1.61	1.31	-2	3
C12D00Q1	38	1.89	1.35	-2	3
C12D00Q8	38	0.84	1.53	-3	3
R_C12D00Q6	38	0.39	1.7	-3	3
R_C13D00Q3	38	1.61	1.35	-1	3
C13D00Q7	38	1.13	1.32	-3	3
R_C13D00Q11	38	1.74	1.35	-2	3
R_C13D00Q6	38	1.26	1.54	-3	3
R_C13D00Q15	38	1.71	1.69	-2	3
C14D00Q0	38	1.13	1.14	-1	3
C14D00Q10	38	0.92	1.6	-3	3
R_C14D00Q13	38	1.24	1.75	-3	3
C14D00Q15	38	1.03	1.57	-3	3
C14D00Q16	38	0.11	1.61	-3	3
C15D00Q10	38	0.84	1.42	-3	3
C15D00Q11	38	0.55	1.33	-3	3
C15D00Q8	38	0.21	1.49	-3	3
C15D00Q12	38	0.61	1.48	-3	3
R_C15D00Q15	38	1.37	1.24	-1	3
C16D00Q11	38	0.71	1.51	-3	3
C16D00Q12	38	0.32	1.77	-3	3
C16D00Q13	38	0.05	1.8	-3	3
C16D00Q16	38	1.13	1.53	-3	3
C16D00Q17	38	-0.55	1.7	-3	3
C17D00Q2	38	0.47	1.27	-3	3
C17D00Q3	38	0.71	1.52	-3	3
C17D00Q8	38	-0.42	1.59	-3	3
C17D00Q9	38	0.05	1.33	-3	3
C17D00Q10	38	0.18	1.14	-3	3
C18D01Q2	38	-1.21	1.36	-3	2
C18D01Q3	38	-0.89	1.66	-3	3
R_C18D01Q5	38	0.16	1.6	-3	3
C18D01Q8	38	-0.29	1.68	-3	3
R_C18D01Q14	38	-1	1.99	-3	3
C18D03Q0	38	0.74	1.27	-2	3
C18D03Q1	38	-0.16	1.69	-3	3
C18D03Q2	38	-0.45	1.74	-3	3
C18D03Q9	38	1.53	1.59	-3	3
C18D03Q12	38	1.29	1.47	-3	3

<b>C19D00Q3</b>	38	0.53	1.61	-3	3
<b>C19D00Q7</b>	38	1.68	1.23	-2	3
<b>C19D00Q14</b>	38	0.34	1.62	-3	3
<b>C19D00Q26</b>	38	1	1.76	-3	3
<b>C19D00Q28</b>	38	0.79	1.61	-3	3

#### Group: SIRI

ITEM ID	N	M	SD	MIN	MAX
<b>C01D01Q3</b>	39	-1.9	1.41	-3	3
<b>C01D01Q10</b>	39	-1.72	1.61	-3	3
<b>C01D01Q13</b>	39	-2	1.21	-3	1
<b>C01D01Q15</b>	39	-1.44	1.68	-3	2
<b>C01D01Q16</b>	39	-0.28	1.57	-3	2
<b>C01D02Q7</b>	39	-1.36	1.74	-3	2
<b>C01D02Q10</b>	39	0.59	1.62	-3	3
<b>C01D02Q0</b>	39	-0.15	1.9	-3	3
<b>C01D02Q1</b>	39	-0.44	2.02	-3	3
<b>C01D02Q9</b>	39	-0.03	1.77	-3	3
<b>C01D03Q7</b>	39	-1.41	1.87	-3	3
<b>C01D03Q9</b>	39	-1.33	1.68	-3	3
<b>C01D03Q10</b>	39	-1.03	1.78	-3	3
<b>C01D03Q11</b>	39	-0.28	1.65	-3	3
<b>C01D03Q12</b>	39	0.56	1.43	-3	3
<b>C01D04Q0</b>	39	-2.18	1.27	-3	2
<b>C01D04Q13</b>	39	0.21	1.7	-3	3
<b>C01D04Q15</b>	39	-0.46	1.85	-3	3
<b>C01D04Q8</b>	39	-2	1.43	-3	2
<b>C01D04Q9</b>	39	-2.1	1.45	-3	2
<b>C01D05Q2</b>	39	0.9	1.68	-3	3
<b>C01D05Q9</b>	39	0.62	1.29	-2	3
<b>C01D05Q11</b>	39	1.64	1.22	-1	3
<b>C01D05Q12</b>	39	0.23	1.74	-3	3
<b>C01D05Q0</b>	39	0.9	1.5	-3	3
<b>C02D00Q1</b>	39	2.26	0.88	0	3
<b>C02D00Q2</b>	39	2.21	0.98	-1	3
<b>C02D00Q8</b>	39	2.18	0.94	0	3
<b>R_C02D00Q11</b>	39	1.62	1.43	-2	3
<b>R_C02D00Q15</b>	39	2.13	1.3	-3	3
<b>C03D01Q1</b>	39	2.15	1.18	-3	3
<b>C03D01Q7</b>	39	2.28	0.89	0	3
<b>C03D01Q5</b>	39	1.72	1.02	-1	3
<b>C03D01Q6</b>	39	2.18	1.14	-3	3
<b>C03D01Q12</b>	39	1.79	1.24	-2	3



C03D02Q0	39	1.85	1.18	0	3
C03D02Q5	39	2.13	0.98	0	3
C03D02Q10	39	2.13	0.95	0	3
R_C03D02Q13	39	2.33	1.06	0	3
R_C03D02Q1	39	2.18	1.02	0	3
C04D00Q1	39	0.31	1.26	-3	3
C04D00Q10	39	1.38	1.29	-2	3
R_C04D00Q11	39	1.46	1.8	-3	3
C04D00Q4	39	1.85	1.06	0	3
C04D00Q12	39	-1.15	1.66	-3	3
R_C05D00Q3	39	1	1.62	-2	3
C05D00Q6	39	-0.87	2.1	-3	3
C05D00Q7	39	0.54	1.74	-3	3
C05D00Q1	39	-0.08	2.09	-3	3
C05D00Q18	39	-1	1.86	-3	3
C06D01Q1	39	0.33	1.59	-3	3
R_C06D01Q6	39	-0.59	1.68	-3	3
R_C06D01Q13	39	-0.26	1.53	-3	3
C06D01Q8	39	-0.1	1.89	-3	3
C06D01Q11	39	-1.67	1.75	-3	3
C07D00Q0	39	2.36	0.96	0	3
C07D00Q11	39	2.18	0.94	0	3
C07D00Q13	39	1.87	1.15	-1	3
R_C07D00Q15	39	1.85	1.48	-3	3
C07D00Q14	39	1.82	1.02	0	3
R_C08D00Q3	39	0.97	1.74	-3	3
C08D00Q4	39	1.38	1.27	-2	3
R_C08D00Q10	39	2.1	1.27	-2	3
C08D00Q0	39	1.67	1.15	-1	3
R_C08D00Q9	39	2.1	1.35	-3	3
C09D00Q4	39	1.33	1.2	-1	3
C09D00Q5	39	-0.46	1.37	-3	3
C09D00Q10	39	1.38	1.33	-3	3
C09D00Q3	39	-0.05	1.52	-3	3
C09D00Q1	39	1.95	1.17	-1	3
R_C09D00Q9	39	1.82	1.39	-1	3
C10D00Q1	39	1.9	1.35	-3	3
C10D00Q6	39	0.56	1.47	-3	3
C10D00Q10	39	0.62	1.7	-3	3
C10D00Q16	39	1.46	1.19	-2	3
C10D00Q18	39	1.49	1.05	-1	3
C11D01Q6	39	-0.44	1.47	-3	3
C11D01Q9	39	0.03	1.72	-3	3

C11D01Q10	39	0.33	1.71	-3	3
C11D01Q11	39	-0.59	1.77	-3	3
C11D01Q14	39	1.56	1.48	-3	3
C11D02Q1	39	2.38	0.85	0	3
C11D02Q3	39	-0.59	1.96	-3	3
C11D02Q4	39	0.87	1.36	-3	3
C11D02Q7	39	1.23	1.83	-3	3
C11D02Q8	39	-0.62	1.43	-3	3
C12D00Q0	39	1.97	1.29	-3	3
C12D00Q13	39	1.36	1.58	-3	3
C12D00Q1	39	2.05	1.43	-3	3
C12D00Q8	39	-0.36	1.91	-3	3
R_C12D00Q6	39	-1.05	2.09	-3	3
R_C13D00Q3	39	2.1	1.14	0	3
C13D00Q7	39	2	1.1	-1	3
R_C13D00Q11	39	2.13	1.24	-2	3
R_C13D00Q6	39	1.62	1.27	-1	3
R_C13D00Q15	39	2.46	0.76	0	3
C14D00Q0	39	0.9	1.67	-3	3
C14D00Q10	39	1.18	1.57	-3	3
R_C14D00Q13	39	1.87	1.4	-2	3
C14D00Q15	39	1.26	1.62	-3	3
C14D00Q16	39	-0.77	1.98	-3	3
C15D00Q10	39	2.05	0.97	0	3
C15D00Q11	39	1.87	1.06	-1	3
C15D00Q8	39	0.92	1.55	-3	3
C15D00Q12	39	1.33	1.18	-1	3
R_C15D00Q15	39	2.18	1.02	0	3
C16D00Q11	39	-0.03	1.8	-3	3
C16D00Q12	39	-0.64	1.88	-3	3
C16D00Q13	39	-0.95	1.78	-3	3
C16D00Q16	39	0.21	1.89	-3	3
C16D00Q17	39	-1.38	1.5	-3	2
C17D00Q2	39	1.44	1.17	-1	3
C17D00Q3	39	1.28	1.3	-3	3
C17D00Q8	39	0.21	1.76	-3	3
C17D00Q9	39	0.79	1.3	-3	3
C17D00Q10	39	0.21	1.42	-3	3
C18D01Q2	39	-1.97	1.39	-3	1
C18D01Q3	39	-2.03	1.4	-3	1
R_C18D01Q5	39	-1.67	1.56	-3	1
C18D01Q8	39	-1.69	1.58	-3	3
R_C18D01Q14	39	-2.18	1.45	-3	3

<b>C18D03Q0</b>	39	0	1.56	-3	3
<b>C18D03Q1</b>	39	-1.21	1.81	-3	3
<b>C18D03Q2</b>	39	-0.64	1.84	-3	3
<b>C18D03Q9</b>	39	-1.31	1.62	-3	3
<b>C18D03Q12</b>	39	-0.64	1.84	-3	3
<b>C19D00Q3</b>	39	-1.28	1.41	-3	2
<b>C19D00Q7</b>	39	-0.69	1.94	-3	3
<b>C19D00Q14</b>	39	0.92	1.53	-3	3
<b>C19D00Q26</b>	39	1	1.52	-3	3
<b>C19D00Q28</b>	39	-1.03	1.56	-3	3

## Appendix E Data Standardization Algorithm

```
#####
# A customized algorithm for data standardization
# First data of each item is segmented based on its corresponding agent
# Then the mean and standard deviation of each segment is calculated
# Finally, each record on each item is subtracted by its corresponding mean and
# then divided by its corresponding standard deviation.
#
# Input:
# - a list of the agents' name (case sensitive)
# - result_all.csv (accepted participants' answers)
#
# Output:
# - result_all_pItem_std.csv (standardized data)
#####

##### Library #####
library(dplyr)
library(psych)
library(crayon)
library(CTT)

##### Read data #####
d_results_all=read.csv2("data/result_all.csv", header = TRUE, sep =";")
drop=c("PRID","RID","STARTDATE","ENDDATE","RECORDDATE","CheckScore")
d_results = d_results_all[!(names(d_results_all) %in% drop)]

agents = c("AIBO", "AMY", "CHAPPIE", "DEEPBLUE","DOG","FURBY","HAL
9000","iCAT","NAO", "POPPIE","SIM SENSEI", "SIRI", "SARAH","MARCUS")

##### Standardization function #####
standardize_pItem <- function(a, d_){
  d_M = data.frame(matrix(ncol = 132, nrow = 0))
  d_SD = data.frame(matrix(ncol = 132, nrow = 0))
  row = 1
  for (agent in a){
    d_M[row,1] <- agent
    d_SD[row,1] <- agent
    for(j in 2:132){
      d<-d_[d[,1]==agent,j]
      if (length(d)==0) {
        print(j)
        print(paste("agent ", agent, " is empty", sep=" "))
      }
      M <- mean(d)
      std <- sd(d)
      d_M[row,j] <- M
      d_SD[row,j] <- std
    }
  }
}
```

```

    }
    row = row + 1
  }

  d_standard = data.frame()
  for(col in 2:ncol(d_)){
    newCol = col - 1
    for (row in 1:nrow(d_)){
      M = d_M[d_M[,1]==d_[row,1], col]
      std = d_SD[d_SD[,1]==d_[row,1], col]
      d_standard[row,newCol] <- (d_[row, col] - M)/std
    }
  }
  names(d_standard) <- colnames(d_[c(2:ncol(d_))])
  return(d_standard)
}

##### Create and write standardized data #####
d_results_pItem_std = standardize_pItem(agents, d_results)
write.csv(d_results_pItem_std, "data/result_all_pItem_std.csv" , row.names =
FALSE)

```

## Appendix F The CFA Results of Convergent Validity Analysis

### C01 Agent's Believability

**Definition:** The extent to which a user believes that the artefact is a social agent

#### Initial set:

```

lavaan 0.6-8 ended normally after 49 iterations

  Estimator                      ML
Optimization method              NLMINB
Number of model parameters       55

Number of observations           532

Model Test User Model:

Test statistic                   695.337
Degrees of freedom               270
P-value (Chi-square)            0.000

Model Test Baseline Model:

Test statistic                   5051.376
Degrees of freedom               300
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     0.910
Tucker-Lewis Index (TLI)       0.901

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -16516.519
Loglikelihood unrestricted model (H1) -16168.851

Akaike (AIC)                    33143.038
Bayesian (BIC)                  33378.253
Sample-size adjusted Bayesian (BIC) 33203.667

Root Mean Square Error of Approximation:

```

RMSEA	0.054
90 Percent confidence interval - lower	0.049
90 Percent confidence interval - upper	0.059
P-value RMSEA <= 0.05	0.071

Standardized Root Mean Square Residual:

SRMR	0.058
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 =~						
C01D01Q3	1.000				0.719	0.728
C01D01Q10	1.046	0.064	16.449	0.000	0.752	0.762
C01D01Q13	0.957	0.063	15.079	0.000	0.688	0.697
C01D01Q15	1.014	0.064	15.959	0.000	0.729	0.739
C01D01Q16	0.983	0.063	15.489	0.000	0.707	0.716
C01D02 =~						
C01D02Q7	1.000				0.637	0.646
C01D02Q10	0.942	0.077	12.191	0.000	0.601	0.609
C01D02Q0	1.137	0.080	14.217	0.000	0.725	0.735
C01D02Q1	1.205	0.081	14.856	0.000	0.768	0.778
C01D02Q9	1.231	0.082	15.088	0.000	0.785	0.795
C01D03 =~						
C01D03Q7	1.000				0.536	0.543
C01D03Q9	1.137	0.111	10.212	0.000	0.609	0.618
C01D03Q10	0.823	0.101	8.174	0.000	0.441	0.447
C01D03Q11	1.350	0.120	11.220	0.000	0.723	0.733
C01D03Q12	1.152	0.112	10.293	0.000	0.617	0.626
C01D04 =~						
C01D04Q0	1.000				0.323	0.328
C01D04Q13	2.296	0.332	6.913	0.000	0.742	0.752
C01D04Q15	2.078	0.306	6.786	0.000	0.672	0.681
C01D04Q8	0.247	0.148	1.665	0.096	0.080	0.081
C01D04Q9	0.752	0.175	4.307	0.000	0.243	0.246
C01D05 =~						
C01D05Q2	1.000				0.657	0.666
C01D05Q9	1.109	0.084	13.166	0.000	0.728	0.738
C01D05Q11	0.802	0.078	10.291	0.000	0.527	0.534
C01D05Q12	1.014	0.082	12.426	0.000	0.666	0.675
C01D05Q0	0.956	0.080	11.889	0.000	0.628	0.636
C01 =~						
C01D04	1.000				0.936	0.936
C01D01	1.929	0.293	6.590	0.000	0.812	0.812
C01D02	1.901	0.291	6.528	0.000	0.902	0.902
C01D03	1.514	0.246	6.155	0.000	0.855	0.855
C01D05	0.946	0.176	5.387	0.000	0.436	0.436

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D01Q3	0.457	0.034	13.613	0.000	0.457	0.469
.C01D01Q10	0.408	0.031	12.995	0.000	0.408	0.419
.C01D01Q13	0.501	0.036	14.062	0.000	0.501	0.514
.C01D01Q15	0.443	0.033	13.445	0.000	0.443	0.455
.C01D01Q16	0.474	0.034	13.799	0.000	0.474	0.487
.C01D02Q7	0.567	0.038	14.769	0.000	0.567	0.583
.C01D02Q10	0.613	0.041	15.046	0.000	0.613	0.629
.C01D02Q0	0.448	0.033	13.764	0.000	0.448	0.460
.C01D02Q1	0.384	0.030	12.955	0.000	0.384	0.394
.C01D02Q9	0.358	0.029	12.553	0.000	0.358	0.368
.C01D03Q7	0.686	0.046	14.827	0.000	0.686	0.705
.C01D03Q9	0.602	0.043	14.107	0.000	0.602	0.619

.C01D03Q10	0.779	0.050	15.430	0.000	0.779	0.800
.C01D03Q11	0.450	0.037	12.064	0.000	0.450	0.463
.C01D03Q12	0.593	0.042	14.009	0.000	0.593	0.609
.C01D04Q0	0.869	0.055	15.914	0.000	0.869	0.893
.C01D04Q13	0.423	0.038	11.101	0.000	0.423	0.434
.C01D04Q15	0.522	0.040	13.130	0.000	0.522	0.536
.C01D04Q8	0.967	0.059	16.288	0.000	0.967	0.993
.C01D04Q9	0.915	0.057	16.099	0.000	0.915	0.939
.C01D05Q2	0.542	0.042	13.054	0.000	0.542	0.557
.C01D05Q9	0.443	0.039	11.396	0.000	0.443	0.455
.C01D05Q11	0.696	0.047	14.703	0.000	0.696	0.715
.C01D05Q12	0.530	0.041	12.883	0.000	0.530	0.545
.C01D05Q0	0.580	0.043	13.536	0.000	0.580	0.595
.C01D01	0.176	0.025	7.018	0.000	0.341	0.341
.C01D02	0.075	0.016	4.651	0.000	0.186	0.186
.C01D03	0.078	0.017	4.518	0.000	0.270	0.270
.C01D04	0.013	0.006	2.061	0.039	0.124	0.124
.C01D05	0.349	0.046	7.554	0.000	0.810	0.810
C01	0.092	0.026	3.496	0.000	1.000	1.000

#### SEQUENTIAL ACTION

#### CFI

INITIAL

0.910

REMOVE C01D04Q8 (STD.ALL = .08)

0.938

REMOVE C01D04Q9 (STD.ALL = .24)

0.944

REMOVE C01D01Q16 (C01D02 =~ C01D01Q16; MI=28.033)

0.949

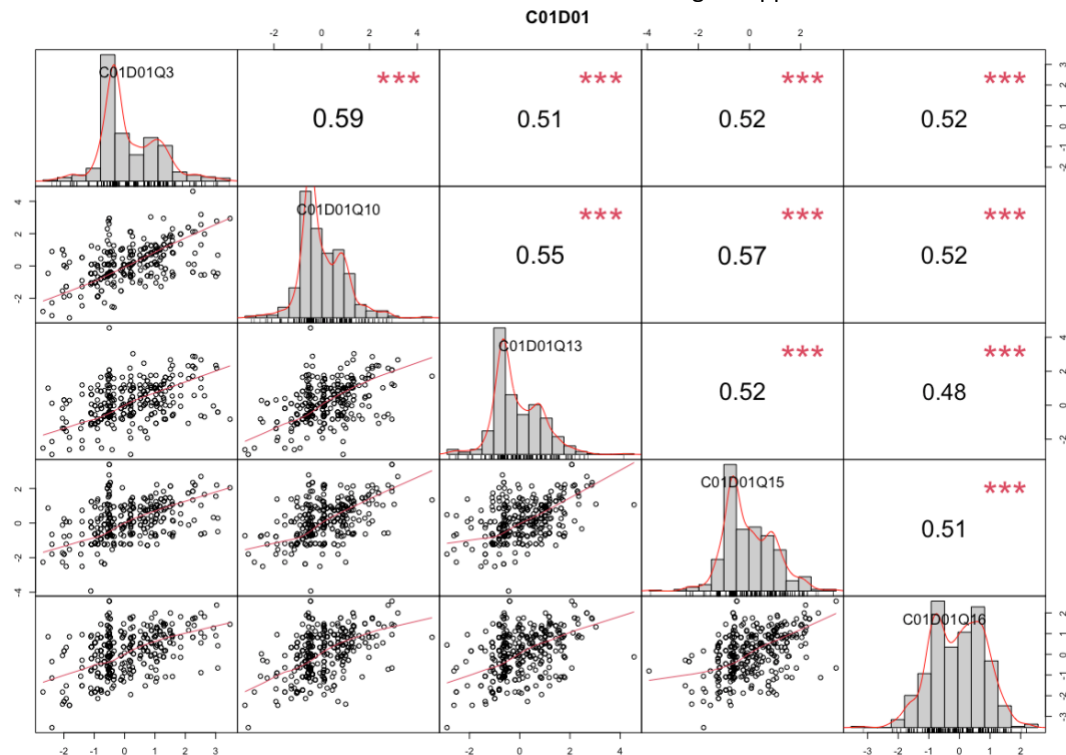
C01D02 ~~ C01D04 (MI = 27.252)

0.956

Removal of items occur in C01D01 and C01D04

#### C01D01 Human-Like Appearance

Definition: The extent to which a user believes that the social agent appears like a human



No.	ITEMID	ITEMQ
1.	C01D01Q3	[The agent]'s appearance is human
2.	C01D01Q10	[The agent] has the appearance of a human
3.	C01D01Q13	[The agent] has a human-like outside
4.	C01D01Q15	[The agent]'s appearance makes me think of a human

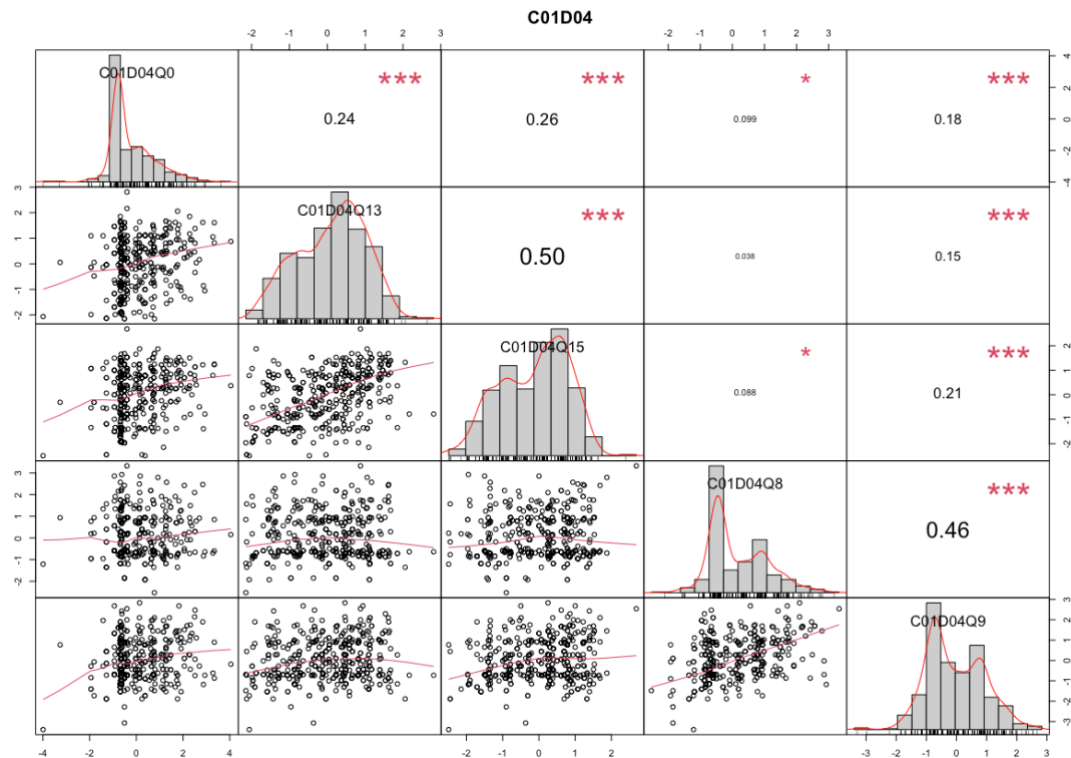
No.	ITEMID	ITEMQ
<del>5.</del>	<del>C01D01Q16</del>	<del>[The agent] has a human likeness</del>

Exclusion reasoning:

Four judges agreed to remove C01D01Q16 as there could be possible confusion with word likeness (similarity to liking)

### C01D04 Natural Behavior

Definition: The extent to which a user believes that the social agent's behavior could exist in or be derived from nature



No.	ITEMID	ITEMQ
1.	C01D04Q0	[The agent] is alive
2.	C01D04Q13	[The agent] acts naturally
3.	C01D04Q15	[The agent] reacts like a living organism
<del>4.</del>	<del>C01D04Q8</del>	<del>[The agent]'s behavior is like an animal</del>
<del>5.</del>	<del>C01D04Q9</del>	<del>There are animals that behave similar to [the agent]</del>

Exclusion reasoning:

Four judges agreed to remove C01D04Q8 and C01D04Q9. It could be that 'animal' represents as a subdimension of a living organism. Further, the analogy of 'animal' could be problematic when the agent represents a human.

### Final Set of C01

Final model:

```

C01D01 =~ C01D01Q3 + C01D01Q10 + C01D01Q13 + C01D01Q15
C01D02 =~ C01D02Q7 + C01D02Q10 + C01D02Q0 + C01D02Q1 + C01D02Q9
C01D03 =~ C01D03Q7 + C01D03Q9 + C01D03Q11 + C01D03Q10 + C01D03Q12
C01D04 =~ C01D04Q0 + C01D04Q13 + C01D04Q15
C01D05 =~ C01D05Q0 + C01D05Q2 + C01D05Q9 + C01D05Q11 + C01D05Q12
C01 =~ C01D04 + C01D01 + C01D02 + C01D03 + C01D05
C01D02 ~~ C01D04

```

CFA result:

```
lavaan 0.6-8 ended normally after 52 iterations
```

Estimator	ML
Optimization method	NLMINB
Number of model parameters	50
Number of observations	532

Model Test User Model:

Test statistic	386.772
Degrees of freedom	203
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	4442.843
Degrees of freedom	231
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.956
Tucker-Lewis Index (TLI)	0.950

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-14423.158
Loglikelihood unrestricted model (H1)	-14229.773
Akaike (AIC)	28946.317
Bayesian (BIC)	29160.149
Sample-size adjusted Bayesian (BIC)	29001.434

Root Mean Square Error of Approximation:

RMSEA	0.041
90 Percent confidence interval - lower	0.035
90 Percent confidence interval - upper	0.047
P-value RMSEA <= 0.05	0.990

Standardized Root Mean Square Residual:

SRMR	0.047
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 =~						
C01D01Q3	1.000				0.722	0.732
C01D01Q10	1.067	0.065	16.499	0.000	0.770	0.781
C01D01Q13	0.965	0.064	15.052	0.000	0.697	0.706
C01D01Q15	1.007	0.064	15.668	0.000	0.727	0.737
C01D02 =~						
C01D02Q7	1.000				0.641	0.649
C01D02Q10	0.934	0.077	12.196	0.000	0.598	0.606
C01D02Q0	1.129	0.079	14.270	0.000	0.723	0.733
C01D02Q1	1.199	0.080	14.952	0.000	0.769	0.779
C01D02Q9	1.225	0.081	15.184	0.000	0.785	0.795



C01D03 =~						
C01D03Q7	1.000				0.527	0.534
C01D03Q9	1.184	0.115	10.268	0.000	0.624	0.632
C01D03Q11	1.373	0.124	11.108	0.000	0.723	0.733
C01D03Q10	0.848	0.103	8.211	0.000	0.447	0.453
C01D03Q12	1.155	0.114	10.120	0.000	0.608	0.617
C01D04 =~						
C01D04Q0	1.000				0.314	0.318
C01D04Q13	2.361	0.349	6.757	0.000	0.740	0.750
C01D04Q15	2.129	0.321	6.633	0.000	0.668	0.677
C01D05 =~						
C01D05Q0	1.000				0.624	0.633
C01D05Q2	1.053	0.089	11.858	0.000	0.657	0.666
C01D05Q9	1.171	0.093	12.651	0.000	0.731	0.741
C01D05Q11	0.838	0.084	9.968	0.000	0.523	0.530
C01D05Q12	1.069	0.089	11.981	0.000	0.668	0.676
C01 =~						
C01D04	1.000				0.837	0.837
C01D01	2.282	0.365	6.255	0.000	0.830	0.830
C01D02	1.952	0.306	6.381	0.000	0.800	0.800
C01D03	1.851	0.315	5.880	0.000	0.922	0.922
C01D05	1.082	0.207	5.218	0.000	0.455	0.455
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D02 ~~						
.C01D04	0.048	0.011	4.313	0.000	0.724	0.724
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D01Q3	0.452	0.034	13.119	0.000	0.452	0.464
.C01D01Q10	0.380	0.032	11.978	0.000	0.380	0.391
.C01D01Q13	0.488	0.036	13.566	0.000	0.488	0.501
.C01D01Q15	0.445	0.034	13.022	0.000	0.445	0.457
.C01D02Q7	0.563	0.038	14.744	0.000	0.563	0.578
.C01D02Q10	0.616	0.041	15.065	0.000	0.616	0.633
.C01D02Q0	0.450	0.033	13.795	0.000	0.450	0.463
.C01D02Q1	0.383	0.030	12.952	0.000	0.383	0.393
.C01D02Q9	0.358	0.029	12.556	0.000	0.358	0.368
.C01D03Q7	0.696	0.047	14.958	0.000	0.696	0.715
.C01D03Q9	0.585	0.042	14.025	0.000	0.585	0.601
.C01D03Q11	0.451	0.037	12.224	0.000	0.451	0.463
.C01D03Q10	0.774	0.050	15.442	0.000	0.774	0.795
.C01D03Q12	0.603	0.042	14.207	0.000	0.603	0.620
.C01D04Q0	0.875	0.055	15.968	0.000	0.875	0.899
.C01D04Q13	0.425	0.038	11.162	0.000	0.425	0.437
.C01D04Q15	0.528	0.040	13.286	0.000	0.528	0.542
.C01D05Q0	0.584	0.043	13.602	0.000	0.584	0.600
.C01D05Q2	0.541	0.041	13.056	0.000	0.541	0.556
.C01D05Q9	0.439	0.039	11.338	0.000	0.439	0.451
.C01D05Q11	0.700	0.047	14.739	0.000	0.700	0.719
.C01D05Q12	0.528	0.041	12.866	0.000	0.528	0.542
.C01D01	0.163	0.027	6.022	0.000	0.312	0.312
.C01D02	0.148	0.024	6.094	0.000	0.360	0.360
.C01D03	0.041	0.015	2.765	0.006	0.149	0.149
.C01D04	0.029	0.010	2.879	0.004	0.299	0.299
.C01D05	0.309	0.044	7.081	0.000	0.793	0.793
C01	0.069	0.021	3.316	0.001	1.000	1.000

## C02 Agent's Usability

Definition: The extent to which a user believes that using an agent will be free from effort (future process)

## Initial set:

lavaan 0.6-8 ended normally after 18 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532

## Model Test User Model:

Test statistic	27.528
Degrees of freedom	5
P-value (Chi-square)	0.000

## Model Test Baseline Model:

Test statistic	496.867
Degrees of freedom	10
P-value	0.000

## User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.954
Tucker-Lewis Index (TLI)	0.907

## Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3504.238
Loglikelihood unrestricted model (H1)	-3490.474
Akaike (AIC)	7028.477
Bayesian (BIC)	7071.243
Sample-size adjusted Bayesian (BIC)	7039.500

## Root Mean Square Error of Approximation:

RMSEA	0.092
90 Percent confidence interval - lower	0.060
90 Percent confidence interval - upper	0.127
P-value RMSEA <= 0.05	0.017

## Standardized Root Mean Square Residual:

SRMR	0.044
------	-------

## Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C02 =~						
C02D00Q1	1.000				0.710	0.720
C02D00Q2	0.944	0.081	11.718	0.000	0.670	0.679
C02D00Q8	0.880	0.078	11.296	0.000	0.625	0.633
R_C02D00Q11	0.400	0.071	5.669	0.000	0.284	0.288
R_C02D00Q15	0.751	0.075	10.042	0.000	0.533	0.541

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C02D00Q1	0.469	0.045	10.330	0.000	0.469	0.482
.C02D00Q2	0.524	0.046	11.522	0.000	0.524	0.538
.C02D00Q8	0.583	0.046	12.611	0.000	0.583	0.599

.R_C02D00Q11	0.893	0.056	15.831	0.000	0.893	0.917
.R_C02D00Q15	0.689	0.049	14.078	0.000	0.689	0.708
C02	0.505	0.063	8.009	0.000	1.000	1.000

#### SEQUENTIAL ACTION

#### CFI

#### INITIAL

0.954

R\_C02D00Q11 (STD.ALL = .29)

1.000

#### Final model:

C02 =~ C02D00Q1 + C02D00Q2 + C02D00Q8 + R\_C02D00Q15

#### CFA result:

lavaan 0.6-8 ended normally after 19 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532

#### Model Test User Model:

Test statistic	0.470
Degrees of freedom	2
P-value (Chi-square)	0.791

#### Model Test Baseline Model:

Test statistic	436.430
Degrees of freedom	6
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.011

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2773.146
Loglikelihood unrestricted model (H1)	-2772.911
Akaike (AIC)	5562.292
Bayesian (BIC)	5596.505
Sample-size adjusted Bayesian (BIC)	5571.111

#### Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.055
P-value RMSEA <= 0.05	0.936

#### Standardized Root Mean Square Residual:

SRMR	0.006
------	-------

#### Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

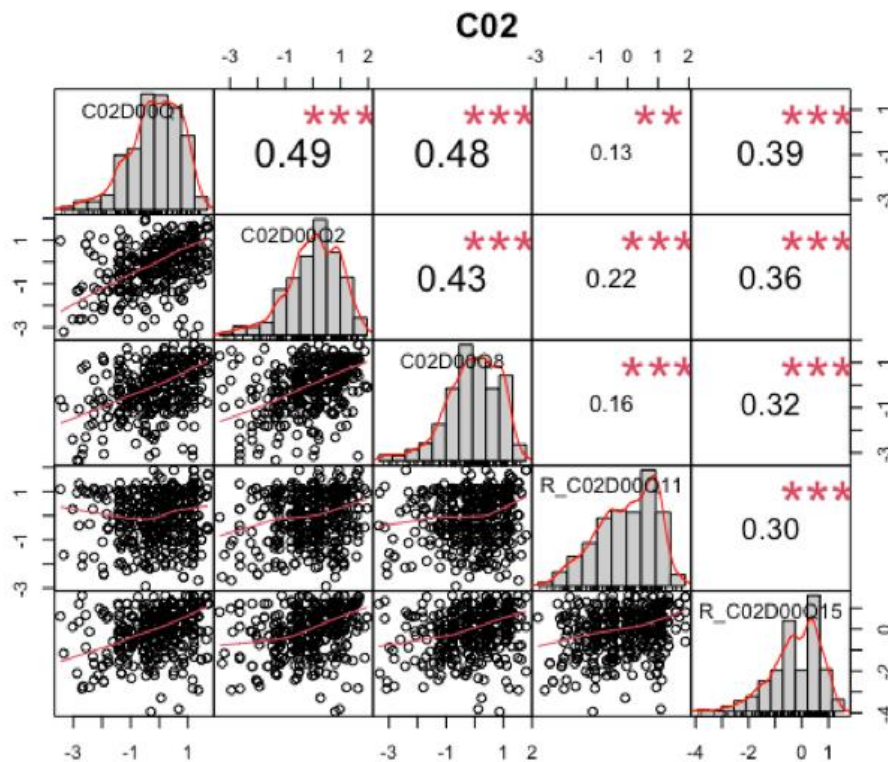
#### Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C02 =~						

C02D00Q1	1.000				0.734	0.743
C02D00Q2	0.899	0.078	11.563	0.000	0.660	0.668
C02D00Q8	0.856	0.076	11.290	0.000	0.628	0.636
R_C02D00Q15	0.697	0.072	9.704	0.000	0.511	0.518

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C02D00Q1	0.435	0.047	9.345	0.000	0.435	0.447
.C02D00Q2	0.539	0.046	11.684	0.000	0.539	0.553
.C02D00Q8	0.580	0.046	12.471	0.000	0.580	0.595
.R_C02D00Q15	0.712	0.050	14.306	0.000	0.712	0.731
C02	0.538	0.066	8.199	0.000	1.000	1.000



No.	ITEMID	ITEMQ
1.	C02D00Q1	[The agent] is easy to use
2.	C02D00Q2	Learning to work with [the agent] is easy
3.	C02D00Q8	Learning how to communicate with [the agent] is quick
4.	<del>C02D00Q11</del>	<del>[R] A manual is needed to communicate with [the agent]</del>
5.	C02D00Q15	[R] [The agent] is difficult to use

Exclusion reasoning:

Four judges agreed to remove C02D00Q11 because it could be that some applications (that are related with/employed ASA) do not provide any manual

### C03 Performance

Definition: The extent to which a task was well performed (past performance)

Model with a C03 construct and two dimensions C03D01 and C03D02 gives a warning message:

Warning messages:

```
1: In lav_model_vcov(lavmodel = lavmodel, lavsamplestats = lavsamplestats,
:

```

lavaan WARNING:

```
Could not compute standard errors! The information matrix could
not be inverted. This may be a symptom that the model is not
```

identified.

2: In lav\_object\_post\_check(object) :

lavaan WARNING: some estimated lv variances are negative

Alternative solutions:

1. Separated: as not one construct with two dimensions, but the dimensions as two separate constructs  
The consideration is that theoretically, although the two dimensions are similar, from a user perspective, they don't necessarily form a construct; In a sense that if an agent performs poorly it doesn't mean that the user is unable to perform well. It might become a question of blame attribution, who was the cause of a poor outcome (of any task or interaction). There might not have been a reason to combine of both parties in one construct, both agent and user performance are independent.
2. Selective combination: focusing on the agent's performance  
The consideration is that it might not be relevant to measure how well a user (individually) did. As IVA researchers, we are more interested in the agent's performance (working together with the user).

Decision:

Four judges agreed to combine C03D01 and C03D02 into one construct and remove the items C03D02Q0, C03D02Q1 and C03D02Q13 because these items only measure the user's performance individually.

Initial set:

```
lavaan 0.6-8 ended normally after 30 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      14

Number of observations          532

Model Test User Model:

Test statistic                   68.634
Degrees of freedom              14
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                   887.952
Degrees of freedom              21
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     0.937
Tucker-Lewis Index (TLI)       0.905

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -4824.812
Loglikelihood unrestricted model (H1) -4790.495

Akaike (AIC)                    9677.624
Bayesian (BIC)                  9737.497
Sample-size adjusted Bayesian (BIC) 9693.057

Root Mean Square Error of Approximation:

RMSEA                           0.086
90 Percent confidence interval - lower 0.066
90 Percent confidence interval - upper 0.106
P-value RMSEA <= 0.05           0.002

Standardized Root Mean Square Residual:
```

SRMR		0.044				
Parameter Estimates:						
Standard errors Information Information saturated (h1) model				Standard Expected Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C03 =~						
C03D01Q1	1.000				0.382	0.387
C03D01Q7	1.836	0.233	7.873	0.000	0.701	0.711
C03D01Q5	1.754	0.226	7.777	0.000	0.670	0.679
C03D01Q6	1.447	0.199	7.286	0.000	0.552	0.560
C03D01Q12	1.433	0.197	7.258	0.000	0.547	0.554
C03D02Q5	1.520	0.205	7.423	0.000	0.580	0.588
C03D02Q10	1.666	0.218	7.657	0.000	0.636	0.644
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C03D01Q1	0.828	0.053	15.621	0.000	0.828	0.850
.C03D01Q7	0.482	0.039	12.248	0.000	0.482	0.495
.C03D01Q5	0.525	0.041	12.909	0.000	0.525	0.539
.C03D01Q6	0.669	0.046	14.511	0.000	0.669	0.687
.C03D01Q12	0.675	0.046	14.561	0.000	0.675	0.693
.C03D02Q5	0.637	0.045	14.219	0.000	0.637	0.654
.C03D02Q10	0.569	0.042	13.489	0.000	0.569	0.585
C03.	0.146	0.035	4.174	0.000	1.000	1.000

<b>SEQUENTIAL ACTION</b>	<b>CFI</b>
<b>INITIAL</b>	<b>0.937</b>
<b>C03D01Q5 ~~ C03D01Q6 (MI = 56.096)</b>	<b>0.997</b>
<b>REMOVE C03D01Q1 (STD.ALL = .39)</b>	<b>1.0</b>

Final model:

C03 =~ C03D01Q7 + C03D01Q5 + C03D01Q6 + C03D01Q12 + C03D02Q5 + C03D02Q10
C03D01Q5 ~~ C03D01Q6

CFA result:

lavaan 0.6-8 ended normally after 20 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	13
Number of observations	532
Model Test User Model:	
Test statistic	6.406
Degrees of freedom	8
P-value (Chi-square)	0.602
Model Test Baseline Model:	
Test statistic	805.457
Degrees of freedom	15
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.004
Loglikelihood and Information Criteria:	

Loglikelihood user model (H0)	-4087.164
Loglikelihood unrestricted model (H1)	-4083.961

Akaike (AIC)	8200.327
Bayesian (BIC)	8255.923
Sample-size adjusted Bayesian (BIC)	8214.657

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.044
P-value RMSEA <= 0.05	0.975

Standardized Root Mean Square Residual:

SRMR	0.014
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

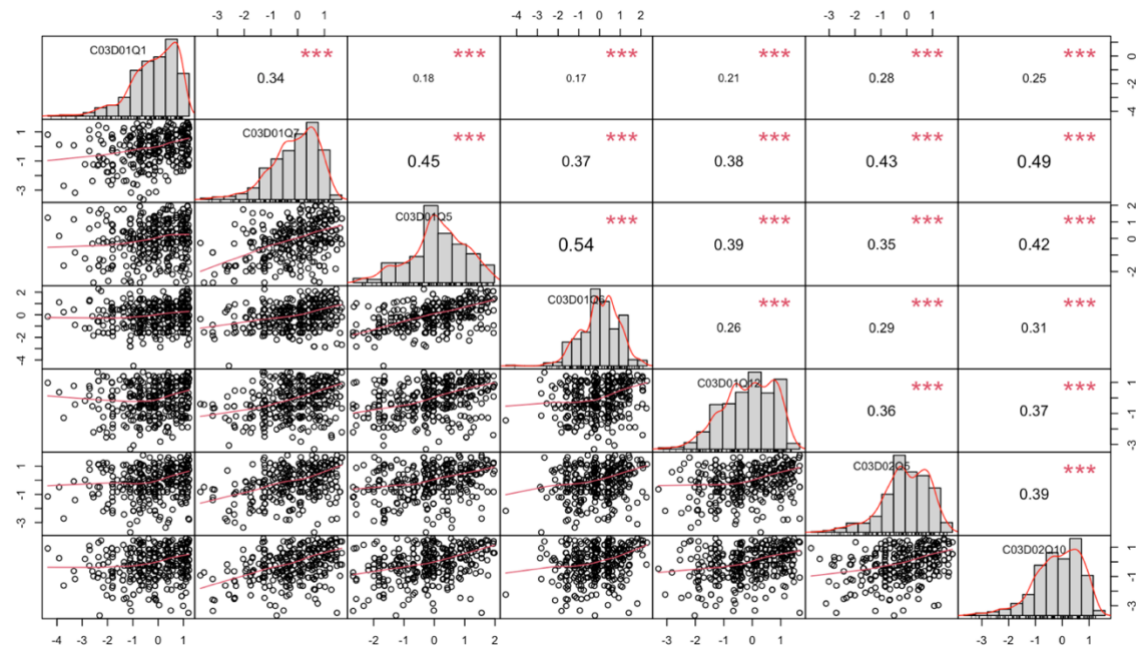
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C03D01 =~						
C03D01Q7	1.000				0.708	0.717
C03D01Q5	0.883	0.074	11.938	0.000	0.625	0.633
C03D01Q6	0.677	0.072	9.344	0.000	0.479	0.485
C03D01Q12	0.790	0.072	10.948	0.000	0.559	0.567
C03D02Q5	0.831	0.073	11.427	0.000	0.588	0.596
C03D02Q10	0.926	0.074	12.434	0.000	0.655	0.664

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C03D01Q5 ~~						
.C03D01Q6	0.224	0.037	6.123	0.000	0.224	0.339

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C03D01Q7	0.473	0.042	11.373	0.000	0.473	0.485
.C03D01Q5	0.583	0.044	13.132	0.000	0.583	0.599
.C03D01Q6	0.744	0.051	14.701	0.000	0.744	0.764
.C03D01Q12	0.661	0.047	14.138	0.000	0.661	0.679
.C03D02Q5	0.628	0.046	13.771	0.000	0.628	0.645
.C03D02Q10	0.544	0.043	12.639	0.000	0.544	0.559
C03D01	0.501	0.060	8.337	0.000	1.000	1.000



No.	ITEMID	ITEMQ
1.	<del>C03D01Q1</del>	<del>The amount time it took to complete the task is acceptable</del>
2.	C03D01Q7	[The agent] does its task well
3.	C03D01Q5	[The agent] enhances [my / the user's] effectiveness on the task
4.	C03D01Q6	[The agent] allows [me / the user] to get [my / the user's] task done more quickly
5.	C03D01Q12	[The agent] does not hinder [me / the user]
6.	C03D02Q5	[I am / The user is] able to carry out the task well
7.	C03D02Q10	[I am / The user is] capable of succeeding with [the agent]

Exclusion reasoning:

Four judges agreed to remove C03D01D1 because it has also a low correlation with other items. Another reason is that the item mentions the “time” element, which is different from other items.

## C04 Agent's Likeability

Definition: The agent's qualities that bring about a favourable regard

Initial set:

```
lavaan 0.6-8 ended normally after 24 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      10

Number of observations          532

Model Test User Model:

Test statistic                   24.827
Degrees of freedom              5
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                   897.181
Degrees of freedom             10
P-value                        0.000

User Model versus Baseline Model:
```



Comparative Fit Index (CFI)	0.978
Tucker-Lewis Index (TLI)	0.955
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-3302.731
Loglikelihood unrestricted model (H1)	-3290.317
Akaike (AIC)	6625.462
Bayesian (BIC)	6668.228
Sample-size adjusted Bayesian (BIC)	6636.485
Root Mean Square Error of Approximation:	
RMSEA	0.086
90 Percent confidence interval - lower	0.054
90 Percent confidence interval - upper	0.122
P-value RMSEA <= 0.05	0.032
Standardized Root Mean Square Residual:	
SRMR	0.034
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured
Latent Variables:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
C04 =~	
C04D00Q1	1.000 0.590 0.598
C04D00Q10	1.490 0.105 14.147 0.000 0.879 0.890
R_C04D00Q11	1.355 0.098 13.811 0.000 0.799 0.810
C04D00Q4	0.704 0.083 8.456 0.000 0.415 0.421
C04D00Q12	1.006 0.089 11.305 0.000 0.593 0.601
Variances:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
.C04D00Q1	0.626 0.042 14.951 0.000 0.626 0.643
.C04D00Q10	0.202 0.030 6.669 0.000 0.202 0.207
.R_C04D00Q11	0.335 0.031 10.715 0.000 0.335 0.344
.C04D00Q4	0.801 0.051 15.802 0.000 0.801 0.823
.C04D00Q12	0.622 0.042 14.923 0.000 0.622 0.638
C04	0.348 0.049 7.143 0.000 1.000 1.000

## SEQUENTIAL ACTION

## CFI

INITIAL

.978

Final model:

C04 =~ C04D00Q1 + C04D00Q10 + R\_C04D00Q11 + C04D00Q4 + C04D00Q12

Note: No item removal

## C05 Agent's Sociability

Initial set:

lavaan 0.6-8 ended normally after 26 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532

Model Test User Model:

Test statistic	7.106
Degrees of freedom	5
P-value (Chi-square)	0.213

Model Test Baseline Model:

Test statistic	503.285
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.996
Tucker-Lewis Index (TLI)	0.991

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3490.818
Loglikelihood unrestricted model (H1)	-3487.265
Akaike (AIC)	7001.636
Bayesian (BIC)	7044.403
Sample-size adjusted Bayesian (BIC)	7012.660

Root Mean Square Error of Approximation:

RMSEA	0.028
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.071
P-value RMSEA <= 0.05	0.756

Standardized Root Mean Square Residual:

SRMR	0.019
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C05 =~						
R_C05D00Q3	1.000				0.399	0.404
C05D00Q6	1.785	0.227	7.854	0.000	0.712	0.721
C05D00Q7	1.758	0.224	7.834	0.000	0.701	0.711
C05D00Q1	1.445	0.196	7.388	0.000	0.576	0.584
C05D00Q18	1.329	0.186	7.145	0.000	0.530	0.537

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C05D00Q3	0.815	0.053	15.308	0.000	0.815	0.837
.C05D00Q6	0.467	0.045	10.464	0.000	0.467	0.480
.C05D00Q7	0.482	0.045	10.793	0.000	0.482	0.495
.C05D00Q1	0.642	0.047	13.594	0.000	0.642	0.659
.C05D00Q18	0.693	0.049	14.199	0.000	0.693	0.712
C05	0.159	0.037	4.241	0.000	1.000	1.000

SEQUENTIAL ACTION

INITIAL

CFI

0.996

Final model:

C05 =~ R\_C05D00Q3 + C05D00Q6 + C05D00Q7 + C05D00Q1 + C05D00Q18

Note: No item removal

## C06 Agent's Personality

Definition: The combination of characteristics or qualities that form an individual's distinctive character

Initial set:

```
lavaan 0.6-8 ended normally after 22 iterations

Estimator                      ML
Optimization method            NLMINB
Number of model parameters      10

Number of observations          532

Model Test User Model:

Test statistic                  27.105
Degrees of freedom              5
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                  530.459
Degrees of freedom              10
P-value                        0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)    0.958
Tucker-Lewis Index (TLI)      0.915

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)   -3487.230
Loglikelihood unrestricted model (H1) -3473.678

Akaike (AIC)                   6994.461
Bayesian (BIC)                 7037.227
Sample-size adjusted Bayesian (BIC) 7005.484

Root Mean Square Error of Approximation:

RMSEA                          0.091
90 Percent confidence interval - lower 0.059
90 Percent confidence interval - upper 0.126
P-value RMSEA <= 0.05          0.018

Standardized Root Mean Square Residual:

SRMR                           0.037

Parameter Estimates:

Standard errors                  Standard
Information                     Expected
Information saturated (h1) model Structured

Latent Variables:
      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
C06D01 =~
  C06D01Q1      1.000
  R_C06D01Q6    1.148    0.102   11.230   0.000   0.701   0.711
  R_C06D01Q13   1.126    0.101   11.154   0.000   0.688   0.698
  C06D01Q8       0.840    0.091    9.246   0.000   0.513   0.520
  C06D01Q11     0.704    0.088    8.032   0.000   0.430   0.436

Variances:
```

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C06D01Q1	0.600	0.046	13.004	0.000	0.600	0.617
.R_C06D01Q6	0.482	0.045	10.811	0.000	0.482	0.495
.R_C06D01Q13	0.500	0.045	11.196	0.000	0.500	0.513
.C06D01Q8	0.710	0.049	14.373	0.000	0.710	0.729
.C06D01Q11	0.789	0.052	15.094	0.000	0.789	0.810
C06D01	0.373	0.055	6.833	0.000	1.000	1.000

#### SEQUENTIAL ACTION

INITIAL

REMOVE R\_C06D01Q13

CFI

0.958

1.0

#### C06D01 Agent's Personality Presence

Definition: To what extent the user believes that the agent has a personality

Final model:

C06D01 =~ C06D01Q1 + R\_C06D01Q6 + C06D01Q8 + C06D01Q11

CFA result:

```
lavaan 0.6-8 ended normally after 22 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      8

Number of observations          532

Model Test User Model:

Test statistic                   1.571
Degrees of freedom              2
P-value (Chi-square)           0.456

Model Test Baseline Model:

Test statistic                   298.790
Degrees of freedom              6
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     1.000
Tucker-Lewis Index (TLI)       1.004

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)   -2842.517
Loglikelihood unrestricted model (H1) -2841.731

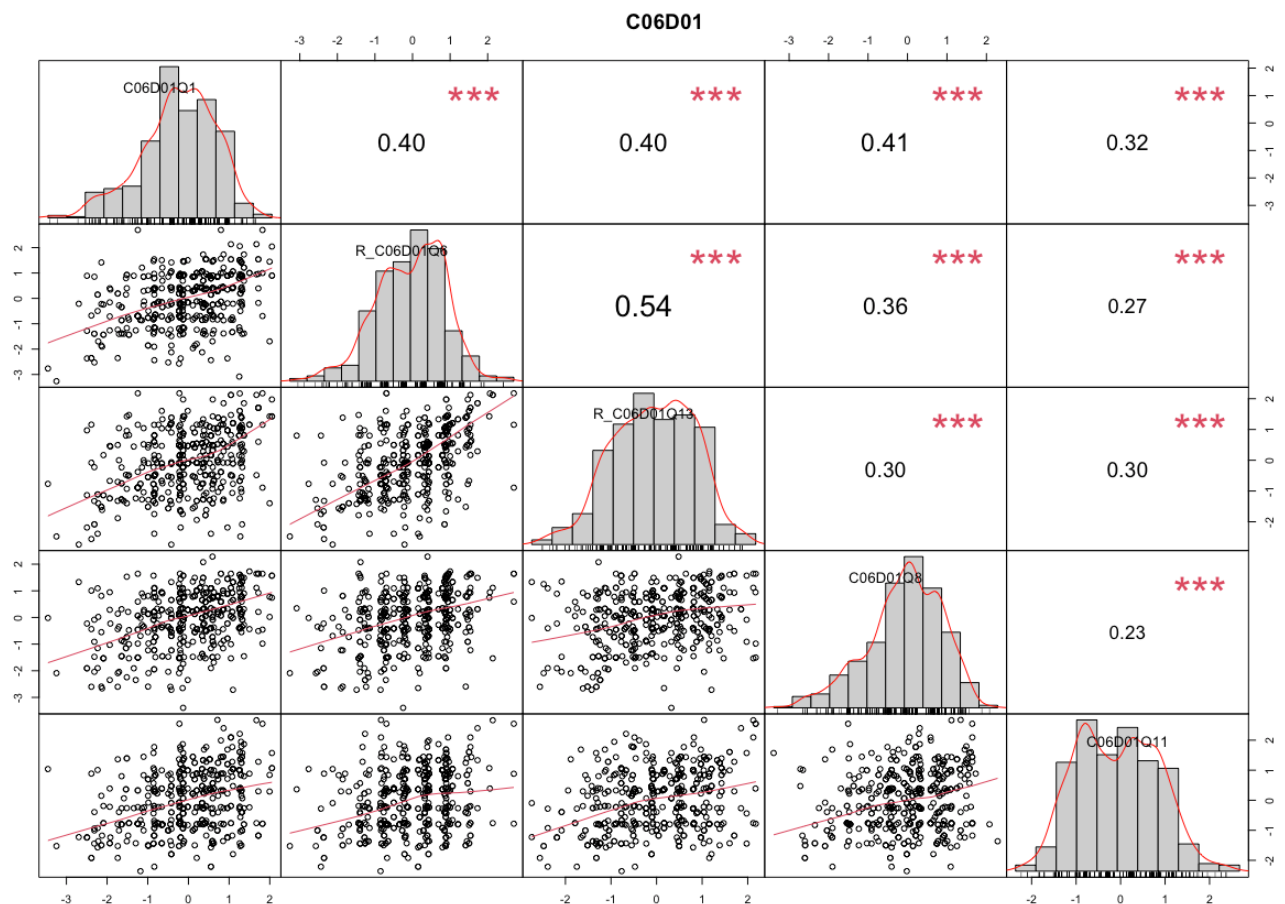
Akaike (AIC)                   5701.034
Bayesian (BIC)                 5735.247
Sample-size adjusted Bayesian (BIC) 5709.852

Root Mean Square Error of Approximation:

RMSEA                          0.000
90 Percent confidence interval - lower 0.000
90 Percent confidence interval - upper 0.080
P-value RMSEA <= 0.05          0.779

Standardized Root Mean Square Residual:
```

SRMR		0.012				
Parameter Estimates:						
Standard errors		Standard				
Information		Expected				
Information saturated (h1) model		Structured				
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C06D01 =~						
C06D01Q1	1.000				0.687	0.696
R_C06D01Q6	0.852	0.095	8.979	0.000	0.585	0.593
C06D01Q8	0.843	0.094	8.950	0.000	0.579	0.587
C06D01Q11	0.637	0.084	7.557	0.000	0.438	0.444
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C06D01Q1	0.501	0.056	9.036	0.000	0.501	0.515
.R_C06D01Q6	0.631	0.052	12.046	0.000	0.631	0.648
.C06D01Q8	0.638	0.052	12.189	0.000	0.638	0.655
.C06D01Q11	0.782	0.054	14.475	0.000	0.782	0.803
C06D01	0.472	0.069	6.849	0.000	1.000	1.000



No.	ITEMID	ITEMQ
1.	C06D01Q1	[The agent] has a distinctive character
2.	C06D01Q6	[R] [The agent] is characterless
3.	<del>C06D01Q13</del>	<del>[R] [The agent] lacks character</del>
4.	C06D01Q8	[The agent] has a coherent identity
5.	C06D01Q11	[The agent] is an individual

Exclusion reasoning:

Four judges agreed to optimize the items in C06D01 towards the word 'character' (in C06D01Q1, C06D01Q6 and C06D01Q13) and decided to remove C06D01Q13. The meaning presented by C06D01Q13 is very similar with C06D01Q06. The two items might be pulling the entire construct together and by removing one of them, we could keep aiming for the definition of the construct.

## C07 User Acceptance of the Agent

Definition: The willingness of the user to interact with the agent

Initial set:

lavaan 0.6-8 ended normally after 18 iterations						
Estimator	ML					
Optimization method	NLMINB					
Number of model parameters	10					
Number of observations	532					
Model Test User Model:						
Test statistic	10.388					
Degrees of freedom	5					
P-value (Chi-square)	0.065					
Model Test Baseline Model:						
Test statistic	593.229					
Degrees of freedom	10					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.991					
Tucker-Lewis Index (TLI)	0.982					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-3447.487					
Loglikelihood unrestricted model (H1)	-3442.293					
Akaike (AIC)	6914.975					
Bayesian (BIC)	6957.741					
Sample-size adjusted Bayesian (BIC)	6925.998					
Root Mean Square Error of Approximation:						
RMSEA	0.045					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.084					
P-value RMSEA <= 0.05	0.524					
Standardized Root Mean Square Residual:						
SRMR	0.022					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C07 =~						
C07D00Q0	1.000				0.728	0.737
C07D00Q11	0.997	0.074	13.435	0.000	0.726	0.735

C07D00Q13	0.769	0.069	11.120	0.000	0.559	0.567
R_C07D00Q15	0.560	0.068	8.280	0.000	0.407	0.413
C07D00Q14	0.856	0.070	12.190	0.000	0.623	0.631
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C07D00Q0	0.444	0.041	10.746	0.000	0.444	0.456
.C07D00Q11	0.447	0.041	10.806	0.000	0.447	0.459
.C07D00Q13	0.661	0.047	14.171	0.000	0.661	0.679
.R_C07D00Q15	0.808	0.052	15.397	0.000	0.808	0.830
.C07D00Q14	0.586	0.044	13.280	0.000	0.586	0.602
C07	0.529	0.062	8.599	0.000	1.000	1.000

## SEQUENTIAL ACTION

## CFI

### INITIAL

0.991

Final model:

C07 =~ C07D00Q0 + C07D00Q11 + C07D00Q13 + R\_C07D00Q15 + C07D00Q14

Note: no item removal

## C08 Agent's Enjoyability

Definition: The extent to which a user finds interacting with the agent enjoyable

Initial set:

lavaan 0.6-8 ended normally after 20 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532
------------------------	-----

Model Test User Model:

Test statistic	30.444
Degrees of freedom	5
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	600.102
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.957
Tucker-Lewis Index (TLI)	0.914

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3454.079
Loglikelihood unrestricted model (H1)	-3438.857
Akaike (AIC)	6928.157
Bayesian (BIC)	6970.924
Sample-size adjusted Bayesian (BIC)	6939.181

Root Mean Square Error of Approximation:

RMSEA	0.098
90 Percent confidence interval - lower	0.066
90 Percent confidence interval - upper	0.133
P-value RMSEA <= 0.05	0.008

Standardized Root Mean Square Residual:

SRMR 0.037

Parameter Estimates:

Standard errors Standard  
Information Expected  
Information saturated (h1) model Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C08 =~						
R_C08D00Q3	1.000				0.670	0.679
C08D00Q4	0.986	0.083	11.885	0.000	0.661	0.670
R_C08D00Q10	1.008	0.084	12.041	0.000	0.676	0.685
C08D00Q0	0.695	0.077	9.011	0.000	0.466	0.472
R_C08D00Q9	0.894	0.081	11.097	0.000	0.599	0.607

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C08D00Q3	0.525	0.043	12.070	0.000	0.525	0.539
.C08D00Q4	0.537	0.044	12.288	0.000	0.537	0.552
.R_C08D00Q10	0.517	0.043	11.940	0.000	0.517	0.531
.C08D00Q0	0.757	0.051	14.926	0.000	0.757	0.777
.R_C08D00Q9	0.615	0.046	13.451	0.000	0.615	0.632
C08	0.449	0.058	7.721	0.000	1.000	1.000

**SEQUENTIAL ACTION**

**CFI**

**INITIAL**

**0.957**

Final model:

C08 =~ R\_C08D00Q3 + C08D00Q4 + R\_C08D00Q10 + C08D00Q0 + R\_C08D00Q9

Note: no item removal.

## C09 User's Engagement

Definition: The extent to which the user feels involved in the interaction with the agent

Initial set:

lavaan 0.6-8 ended normally after 21 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	12
Number of observations	532

Model Test User Model:

Test statistic	34.958
Degrees of freedom	9
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	470.793
Degrees of freedom	15
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.943
Tucker-Lewis Index (TLI)	0.905



Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-4268.771
Loglikelihood unrestricted model (H1)	-4251.293
Akaike (AIC)	8561.543
Bayesian (BIC)	8612.863
Sample-size adjusted Bayesian (BIC)	8574.771

Root Mean Square Error of Approximation:

RMSEA	0.074
90 Percent confidence interval - lower	0.049
90 Percent confidence interval - upper	0.100
P-value RMSEA <= 0.05	0.057

Standardized Root Mean Square Residual:

SRMR	0.045
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C09 =~						
C09D00Q4	1.000				0.644	0.653
C09D00Q5	0.519	0.081	6.398	0.000	0.334	0.338
C09D00Q10	1.088	0.099	10.960	0.000	0.701	0.710
C09D00Q3	0.542	0.081	6.654	0.000	0.349	0.353
C09D00Q1	0.977	0.092	10.565	0.000	0.629	0.637
R_C09D00Q9	0.551	0.082	6.753	0.000	0.355	0.359

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C09D00Q4	0.559	0.047	11.818	0.000	0.559	0.574
.C09D00Q5	0.862	0.055	15.566	0.000	0.862	0.886
.C09D00Q10	0.483	0.047	10.188	0.000	0.483	0.496
.C09D00Q3	0.852	0.055	15.487	0.000	0.852	0.875
.C09D00Q1	0.578	0.047	12.185	0.000	0.578	0.594
.R_C09D00Q9	0.848	0.055	15.455	0.000	0.848	0.871
C09	0.415	0.059	7.056	0.000	1.000	1.000

SEQUENTIAL ACTION

CFI

INITIAL	0.943
REMOVE C09D00Q5 (STD.ALL = .34)	0.974
REMOVE C09D00Q3 (STD.ALL = .35)	0.993

Final model:

C09 =~ C09D00Q4 + C09D00Q10 + C09D00Q1 + R\_C09D00Q9

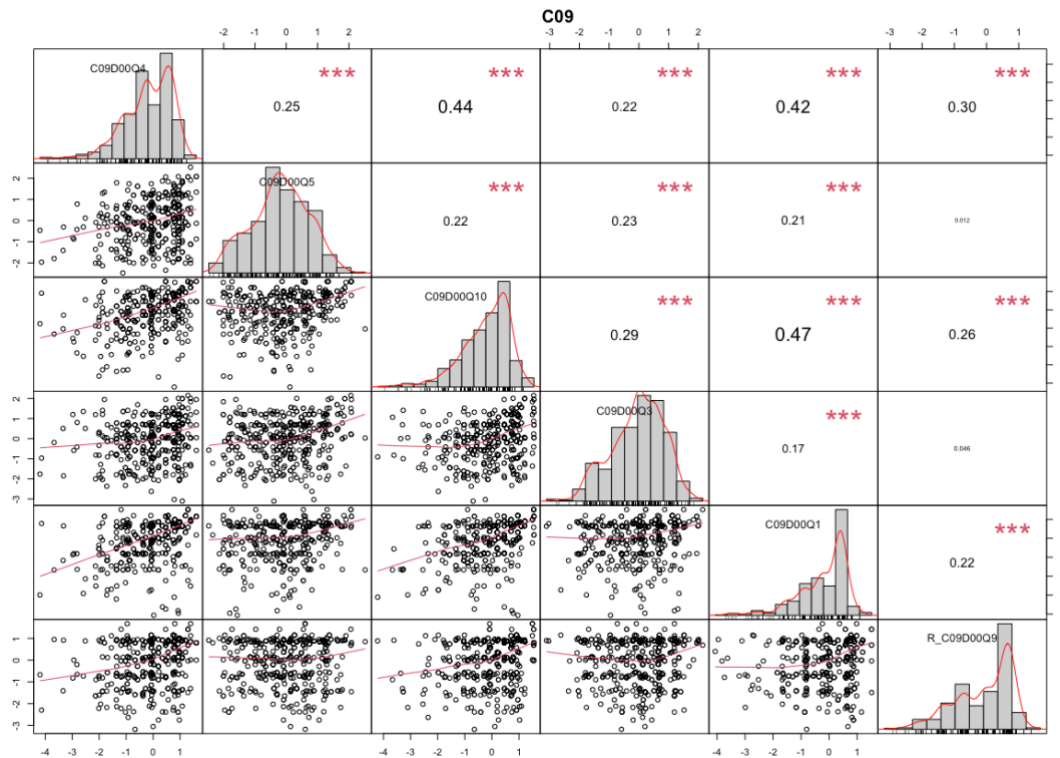
CFA result:

lavaan 0.6-8 ended normally after 22 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532

Model Test User Model:

Test statistic	4.419					
Degrees of freedom	2					
P-value (Chi-square)	0.110					
Model Test Baseline Model:						
Test statistic	349.627					
Degrees of freedom	6					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.993					
Tucker-Lewis Index (TLI)	0.979					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2818.522					
Loglikelihood unrestricted model (H1)	-2816.313					
Akaike (AIC)	5653.044					
Bayesian (BIC)	5687.258					
Sample-size adjusted Bayesian (BIC)	5661.863					
Root Mean Square Error of Approximation:						
RMSEA	0.048					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.109					
P-value RMSEA <= 0.05	0.426					
Standardized Root Mean Square Residual:						
SRMR	0.020					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C09 =~						
C09D00Q4	1.000				0.638	0.647
C09D00Q10	1.074	0.105	10.200	0.000	0.685	0.694
C09D00Q1	1.011	0.100	10.130	0.000	0.645	0.654
R_C09D00Q9	0.604	0.085	7.078	0.000	0.385	0.391
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C09D00Q4	0.566	0.050	11.400	0.000	0.566	0.582
.C09D00Q10	0.504	0.051	9.945	0.000	0.504	0.518
.C09D00Q1	0.557	0.050	11.195	0.000	0.557	0.572
.R_C09D00Q9	0.825	0.054	15.150	0.000	0.825	0.847
C09	0.407	0.060	6.768	0.000	1.000	1.000



No.	ITEMID	ITEMQ
1.	C09D00Q4	[I / The user] was concentrated during the interaction with [the agent]
2.	<del>C09D00Q5</del>	<del>[I / The user] forgot about [my / their] surroundings when interacting with [the agent]</del>
3.	C09D00Q10	The interaction captured [my / the user's] attention
4.	<del>C09D00Q3</del>	<del>Interacting with [the agent] was absorbing</del>
5.	C09D00Q1	[I / The user] was alert during the interaction with [the agent]
6.	C09D00Q9	[R] [I / The user] was looking for distractions during the interaction with [the agent]

Exclusion reasoning:

Four judges agreed to remove C09D00Q5 as the item might be relevant for interaction with agents in a virtual reality environment (i.e. forgetting about the surroundings) and might be problematic when the interaction involves other types of agents and robots. The judges also agreed to remove C09D00Q3 because the word “absorbing” might be confusing. Further the judges agreed not to remove C09D00Q9, although the loading is < .40 and the total number of item is > 3.

## C10 User's Trust

Definition: The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)

Initial set:

lavaan 0.6-8 ended normally after 22 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532

Model Test User Model:

Test statistic	15.485
Degrees of freedom	5
P-value (Chi-square)	0.008

Model Test Baseline Model:

Test statistic	517.843
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.979
Tucker-Lewis Index (TLI)	0.959

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3487.729
Loglikelihood unrestricted model (H1)	-3479.986
Akaike (AIC)	6995.458
Bayesian (BIC)	7038.224
Sample-size adjusted Bayesian (BIC)	7006.481

Root Mean Square Error of Approximation:

RMSEA	0.063
90 Percent confidence interval - lower	0.029
90 Percent confidence interval - upper	0.100
P-value RMSEA <= 0.05	0.234

Standardized Root Mean Square Residual:

SRMR	0.029
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C10 =~						
C10D00Q1	1.000				0.601	0.609
C10D00Q6	0.922	0.096	9.565	0.000	0.554	0.562
C10D00Q10	0.886	0.095	9.299	0.000	0.532	0.540
C10D00Q16	1.035	0.101	10.294	0.000	0.622	0.630
C10D00Q18	1.131	0.105	10.749	0.000	0.680	0.689

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C10D00Q1	0.612	0.047	13.023	0.000	0.612	0.629
.C10D00Q6	0.666	0.048	13.760	0.000	0.666	0.685
.C10D00Q10	0.690	0.049	14.044	0.000	0.690	0.709
.C10D00Q16	0.587	0.046	12.627	0.000	0.587	0.603
.C10D00Q18	0.512	0.045	11.262	0.000	0.512	0.526
C10	0.361	0.054	6.646	0.000	1.000	1.000

SEQUENTIAL ACTION

CFI

INITIAL

0.979

Final model:

C10 =~ C10D00Q1 + C10D00Q6 + C10D00Q10 + C10D00Q16 + C10D00Q18

Note: no item removal

## C11 User-Agent Alliance

Definition: The extent to which a beneficial association is formed

Model with C11 construct and two dimensions C11D01 and C11D02 gives warning messages:

Warning messages:

```
1: In lav_model_vcov(lavmodel = lavmodel, lavsamplestats = lavsamplestats,
:
lavaan WARNING:
  Could not compute standard errors! The information matrix could
  not be inverted. This may be a symptom that the model is not
  identified.
2: In lav_object_post_check(object) :
lavaan WARNING: some estimated lv variances are negative
```

Alternative solutions:

1. Separated: as not one construct with two dimensions, but the dimensions as two separate constructs  
The consideration is that theoretically, although the two dimensions are similar, from a user perspective they don't necessarily form a construct (i.e. in task performing setting and social setting). Both settings are viewed independent.
2. Combination: as to combine 5 items in C11D01 and 5 items in C11D02  
The consideration is that the alliance of user-agent is relevant for any kind of settings.

Decision:

Four judges agreed to combine C11D01 and C11D02 into one construct.

Initial set:

```
lavaan 0.6-8 ended normally after 23 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      20

Number of observations          532

Model Test User Model:

Test statistic                   165.390
Degrees of freedom              35
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                   1418.160
Degrees of freedom              45
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     0.905
Tucker-Lewis Index (TLI)       0.878

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -6851.430
Loglikelihood unrestricted model (H1) -6768.736

Akaike (AIC)                    13742.861
Bayesian (BIC)                  13828.394
Sample-size adjusted Bayesian (BIC) 13764.908

Root Mean Square Error of Approximation:

RMSEA                           0.084
```

90 Percent confidence interval - lower	0.071
90 Percent confidence interval - upper	0.097
P-value RMSEA <= 0.05	0.000
Standardized Root Mean Square Residual:	
SRMR	0.051
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured
Latent Variables:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
C11 =~	
C11D01Q6	1.000
C11D01Q9	0.812 0.074 10.926 0.000 0.538 0.545
C11D01Q10	0.928 0.076 12.288 0.000 0.615 0.623
C11D01Q11	0.856 0.075 11.453 0.000 0.567 0.574
C11D01Q14	0.789 0.074 10.648 0.000 0.522 0.529
C11D02Q1	0.678 0.073 9.269 0.000 0.449 0.455
C11D02Q3	0.919 0.075 12.182 0.000 0.609 0.617
C11D02Q4	0.900 0.075 11.959 0.000 0.596 0.604
C11D02Q7	0.935 0.076 12.366 0.000 0.619 0.628
C11D02Q8	0.817 0.074 10.985 0.000 0.541 0.548
Variances:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
.C11D01Q6	0.535 0.039 13.758 0.000 0.535 0.550
.C11D01Q9	0.685 0.046 15.001 0.000 0.685 0.703
.C11D01Q10	0.596 0.042 14.337 0.000 0.596 0.612
.C11D01Q11	0.652 0.044 14.780 0.000 0.652 0.670
.C11D01Q14	0.701 0.046 15.102 0.000 0.701 0.720
.C11D02Q1	0.772 0.050 15.502 0.000 0.772 0.793
.C11D02Q3	0.603 0.042 14.401 0.000 0.603 0.620
.C11D02Q4	0.619 0.043 14.528 0.000 0.619 0.636
.C11D02Q7	0.590 0.041 14.288 0.000 0.590 0.606
.C11D02Q8	0.681 0.045 14.978 0.000 0.681 0.700
C11.	0.439 0.054 8.110 0.000 1.000 1.000

SEQUENTIAL ACTION	CFI
INITIAL	0.905
C11D01Q6 ~~ C11D02Q3 (MI = 25.619)	0.922
C11D01Q9 ~~ C11D01Q11 (MI = 19.676)	0.934
C11D01Q9 ~~ C11D01Q10 (MI = 9.637)	0.942
C11D02Q3 ~~ C11D02Q8 (MI = 9.882)	0.949
C11D02Q3 ~~ C11D02Q7 (MI = 9.467)	0.956

Final model:

C11 =~ C11D01Q6 + C11D01Q9 + C11D01Q10 + C11D01Q11 + C11D01Q14 + C11D02Q3 + C11D02Q4 + C11D02Q7 + C11D02Q8 + C11D02Q1
C11D01Q6 ~~ C11D02Q3
C11D01Q9 ~~ C11D01Q11
C11D01Q9 ~~ C11D01Q10
C11D02Q3 ~~ C11D02Q8

CFA result:

lavaan 0.6-8 ended normally after 25 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	25

Number of observations	532					
Model Test User Model:						
Test statistic	90.676					
Degrees of freedom	30					
P-value (Chi-square)	0.000					
Model Test Baseline Model:						
Test statistic	1418.160					
Degrees of freedom	45					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.956					
Tucker-Lewis Index (TLI)	0.934					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-6814.074					
Loglikelihood unrestricted model (H1)	-6768.736					
Akaike (AIC)	13678.147					
Bayesian (BIC)	13785.063					
Sample-size adjusted Bayesian (BIC)	13705.706					
Root Mean Square Error of Approximation:						
RMSEA	0.062					
90 Percent confidence interval - lower	0.047					
90 Percent confidence interval - upper	0.076					
P-value RMSEA <= 0.05	0.088					
Standardized Root Mean Square Residual:						
SRMR	0.039					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C11 =~						
C11D01Q6	1.000				0.631	0.639
C11D01Q9	0.799	0.083	9.596	0.000	0.504	0.511
C11D01Q10	0.974	0.085	11.445	0.000	0.614	0.623
C11D01Q11	0.864	0.083	10.417	0.000	0.545	0.553
C11D01Q14	0.867	0.083	10.480	0.000	0.547	0.555
C11D02Q3	0.836	0.073	11.471	0.000	0.528	0.535
C11D02Q4	0.964	0.085	11.389	0.000	0.608	0.616
C11D02Q7	0.992	0.085	11.640	0.000	0.626	0.635
C11D02Q8	0.818	0.082	9.975	0.000	0.516	0.523
C11D02Q1	0.761	0.081	9.389	0.000	0.480	0.486
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C11D01Q6 ~~						
.C11D02Q3	0.166	0.032	5.141	0.000	0.166	0.262
.C11D01Q9 ~~						
.C11D01Q11	0.147	0.034	4.318	0.000	0.147	0.211
.C11D01Q10	0.099	0.032	3.068	0.002	0.099	0.151
.C11D02Q3 ~~						
.C11D02Q8	0.122	0.032	3.811	0.000	0.122	0.174

.C11D02Q7	0.095	0.030	3.120	0.002	0.095	0.149
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C11D01Q6	0.576	0.042	13.650	0.000	0.576	0.591
.C11D01Q9	0.720	0.049	14.743	0.000	0.720	0.739
.C11D01Q10	0.596	0.043	13.831	0.000	0.596	0.612
.C11D01Q11	0.676	0.046	14.596	0.000	0.676	0.695
.C11D01Q14	0.674	0.046	14.624	0.000	0.674	0.692
.C11D02Q3	0.693	0.048	14.409	0.000	0.693	0.713
.C11D02Q4	0.604	0.043	13.980	0.000	0.604	0.620
.C11D02Q7	0.582	0.042	13.718	0.000	0.582	0.597
.C11D02Q8	0.708	0.048	14.872	0.000	0.708	0.727
.C11D02Q1	0.743	0.049	15.137	0.000	0.743	0.763
C11	0.398	0.053	7.456	0.000	1.000	1.000

Note: no item removal

## C12 Agent's Attentiveness

Definition: The extent to which the user believes that the agent is aware of and has attention for the user

Initial set:

lavaan 0.6-8 ended normally after 19 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532
Model Test User Model:	
Test statistic	33.707
Degrees of freedom	5
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	412.801
Degrees of freedom	10
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.929
Tucker-Lewis Index (TLI)	0.857
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-3549.361
Loglikelihood unrestricted model (H1)	-3532.507
Akaike (AIC)	7118.722
Bayesian (BIC)	7161.488
Sample-size adjusted Bayesian (BIC)	7129.745
Root Mean Square Error of Approximation:	
RMSEA	0.104
90 Percent confidence interval - lower	0.072
90 Percent confidence interval - upper	0.138
P-value RMSEA <= 0.05	0.003
Standardized Root Mean Square Residual:	
SRMR	0.055



# Parameter Estimates:

Standard errors  
Information  
Information saturated (h1) model

Standard  
Expected  
Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C12 =~						
C12D00Q0	1.000				0.698	0.708
C12D00Q1	0.932	0.087	10.754	0.000	0.651	0.660
C12D00Q8	0.413	0.074	5.600	0.000	0.288	0.292
R_C12D00Q6	0.431	0.074	5.838	0.000	0.301	0.305
C12D00Q13	0.941	0.087	10.780	0.000	0.657	0.666

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C12D00Q0	0.486	0.049	9.926	0.000	0.486	0.499
.C12D00Q1	0.550	0.048	11.407	0.000	0.550	0.565
.C12D00Q8	0.891	0.057	15.755	0.000	0.891	0.915
.R_C12D00Q6	0.883	0.056	15.698	0.000	0.883	0.907
.C12D00Q13	0.542	0.048	11.231	0.000	0.542	0.557
C12	0.488	0.065	7.537	0.000	1.000	1.000

Removing both R\_C12D00Q8 and C12 D00Q8 resulted:

Warning message:

In lav\_model\_vcov(lavmodel = lavmodel, lavsamplestats = lavsamplestats, :  
lavaan WARNING:

Could not compute standard errors! The information matrix could  
not be inverted. This may be a symptom that the model is not  
identified.

lavaan ERROR: could not compute modification indices; information matrix  
is singular

## SEQUENTIAL ACTION

## CFI

INITIAL

0.929

REMOVE R\_C12D00Q6 (STD.ALL = .29)

0.990

## SEQUENTIAL ACTION

## CFI

INITIAL

0.929

REMOVE C12D00Q8 (STD.ALL = .31)

0.982

R\_C12D00Q6 ~~ C12D00Q13

0.994

Final model

:

C12 =~ C12D00Q0 + C12D00Q1 + R\_C12D00Q6 + C12D00Q13

## CFA result:

lavaan 0.6-8 ended normally after 21 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	9
Number of observations	532

Model Test User Model:

Test statistic	3.220
Degrees of freedom	1
P-value (Chi-square)	0.073

Model Test Baseline Model:

Test statistic	353.868
Degrees of freedom	6
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.994
Tucker-Lewis Index (TLI)	0.962

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2815.802
Loglikelihood unrestricted model (H1)	-2814.192
Akaike (AIC)	5649.605
Bayesian (BIC)	5688.095
Sample-size adjusted Bayesian (BIC)	5659.526

Root Mean Square Error of Approximation:

RMSEA	0.065
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.149
P-value RMSEA <= 0.05	0.262

Standardized Root Mean Square Residual:

SRMR	0.016
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

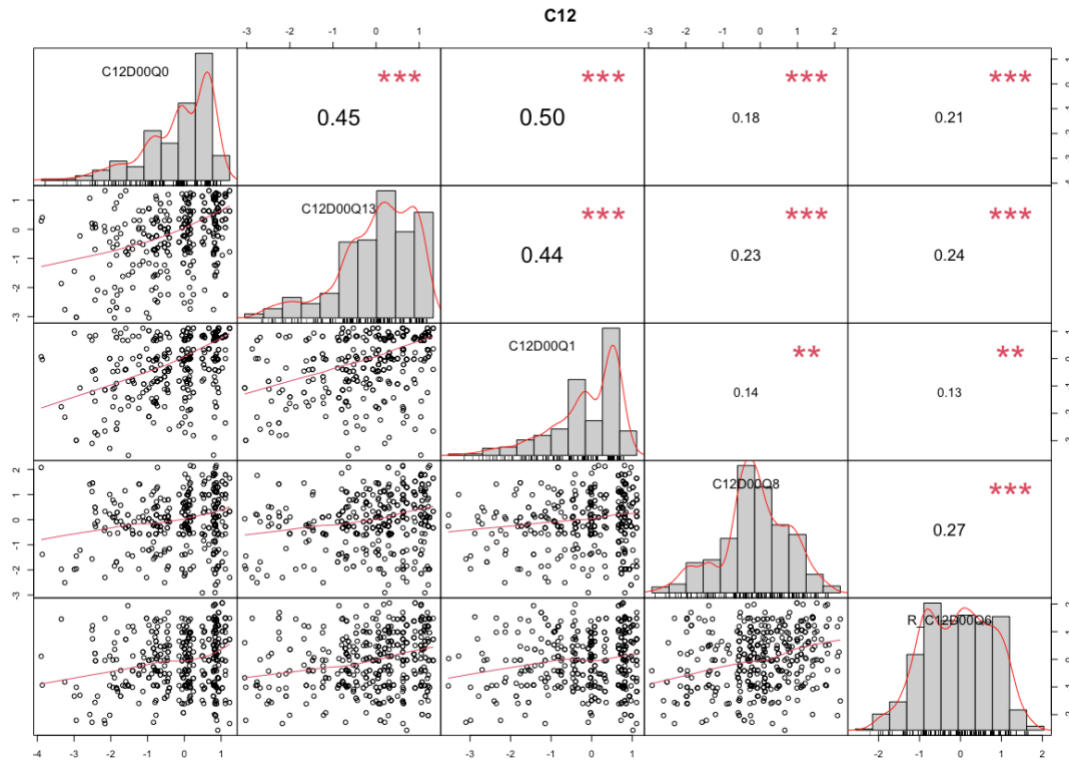
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C12 =~						
C12D00Q0	1.000				0.712	0.722
C12D00Q1	0.950	0.092	10.345	0.000	0.677	0.686
R_C12D00Q6	0.334	0.076	4.414	0.000	0.238	0.241
C12D00Q13	0.879	0.086	10.242	0.000	0.626	0.635

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C12D00Q6 ~~						
.C12D00Q13	0.084	0.038	2.198	0.028	0.084	0.115

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C12D00Q0	0.466	0.052	8.916	0.000	0.466	0.479
.C12D00Q1	0.516	0.051	10.192	0.000	0.516	0.530
.R_C12D00Q6	0.917	0.058	15.809	0.000	0.917	0.942
.C12D00Q13	0.581	0.049	11.753	0.000	0.581	0.597
C12	0.507	0.068	7.431	0.000	1.000	1.000



No.	ITEMID	ITEMQ
1.	C12D00Q0	[The agent] remains focused on [me / the user] throughout the interaction
2.	C12D00Q13	[The agent] is attentive
3.	C12D00Q1	[I / The user] receives [the agent]'s full attention throughout the interaction
4.	C12D00Q8	[The agent] notices if [I leave / the user leaves]
5.	C12D00Q6	[R] [The agent] does not notice what happens around it

Exclusion reasoning:

Four judges agreed to remove C12D00Q8 as perhaps the user might not leave.

### C13 Agent's Coherence

Definition: The extent to which the agent is perceived as being logical and consistent

Initial set:

```
lavaan 0.6-8 ended normally after 20 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      10

Number of observations          532

Model Test User Model:

Test statistic                   6.551
Degrees of freedom              5
P-value (Chi-square)           0.256

Model Test Baseline Model:

Test statistic                   387.864
Degrees of freedom              10
P-value                         0.000

User Model versus Baseline Model:
```

Comparative Fit Index (CFI)	0.996					
Tucker-Lewis Index (TLI)	0.992					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-3548.251					
Loglikelihood unrestricted model (H1)	-3544.976					
Akaike (AIC)	7116.503					
Bayesian (BIC)	7159.269					
Sample-size adjusted Bayesian (BIC)	7127.526					
Root Mean Square Error of Approximation:						
RMSEA	0.024					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.068					
P-value RMSEA <= 0.05	0.793					
Standardized Root Mean Square Residual:						
SRMR	0.020					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C13 =~						
R_C13D00Q3	1.000				0.738	0.748
C13D00Q7	0.542	0.072	7.532	0.000	0.400	0.406
R_C13D00Q11	0.871	0.084	10.386	0.000	0.643	0.652
R_C13D00Q6	0.636	0.074	8.607	0.000	0.470	0.476
R_C13D00Q15	0.606	0.073	8.276	0.000	0.447	0.453
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C13D00Q3	0.428	0.052	8.272	0.000	0.428	0.440
.C13D00Q7	0.813	0.054	15.113	0.000	0.813	0.835
.R_C13D00Q11	0.560	0.049	11.339	0.000	0.560	0.575
.R_C13D00Q6	0.753	0.052	14.504	0.000	0.753	0.774
.R_C13D00Q15	0.773	0.053	14.722	0.000	0.773	0.794
C13	0.545	0.070	7.817	0.000	1.000	1.000

## SEQUENTIAL ACTION

CFI

INITIAL

0.996

Final model:

C13 =~ R\_C13D00Q3 + C13D00Q7 + R\_C13D00Q11 + R\_C13D00Q6 + R\_C13D00Q15

Note: No item removal.

## C14 Agent's Intentionality

Definition: The extent to which the agent is perceived as being deliberate and has deliberations

Initial set:

lavaan 0.6-8 ended normally after 27 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532					
Model Test User Model:						
Test statistic	6.323					
Degrees of freedom	5					
P-value (Chi-square)	0.276					
Model Test Baseline Model:						
Test statistic	439.254					
Degrees of freedom	10					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.997					
Tucker-Lewis Index (TLI)	0.994					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-3522.442					
Loglikelihood unrestricted model (H1)	-3519.281					
Akaike (AIC)	7064.884					
Bayesian (BIC)	7107.651					
Sample-size adjusted Bayesian (BIC)	7075.908					
Root Mean Square Error of Approximation:						
RMSEA	0.022					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.067					
P-value RMSEA <= 0.05	0.807					
Standardized Root Mean Square Residual:						
SRMR	0.020					
Parameter Estimates:						
Standard errors			Standard			
Information			Expected			
Information saturated (h1) model			Structured			
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C14 =~						
C14D00Q0	1.000				0.474	0.481
C14D00Q10	1.708	0.187	9.140	0.000	0.810	0.821
R_C14D00Q13	1.302	0.147	8.882	0.000	0.617	0.626
C14D00Q15	0.930	0.126	7.359	0.000	0.441	0.447
C14D00Q16	0.916	0.126	7.288	0.000	0.434	0.440
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C14D00Q0	0.749	0.051	14.767	0.000	0.749	0.769
.C14D00Q10	0.318	0.051	6.186	0.000	0.318	0.326
.R_C14D00Q13	0.593	0.047	12.582	0.000	0.593	0.609
.C14D00Q15	0.779	0.052	15.050	0.000	0.779	0.800
.C14D00Q16	0.785	0.052	15.099	0.000	0.785	0.806
C14	0.225	0.044	5.133	0.000	1.000	1.000

#### SEQUENTIAL ACTION

INITIAL

#### CFI

0.997

Final model:

$C14 \sim C14D00Q0 + C14D00Q10 + R\ C14D00Q13 + C14D00Q15 + C14D00Q16$
--

Note: no item removal.

## C15 Attitude

Definition: A favourable or unfavourable evaluation toward the interaction with the agent

Initial set:

```
lavaan 0.6-8 ended normally after 17 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      10

Number of observations          532

Model Test User Model:

Test statistic                   52.223
Degrees of freedom              5
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                   814.000
Degrees of freedom              10
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     0.941
Tucker-Lewis Index (TLI)       0.883

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)   -3358.019
Loglikelihood unrestricted model (H1) -3331.908

Akaike (AIC)                    6736.039
Bayesian (BIC)                  6778.805
Sample-size adjusted Bayesian (BIC) 6747.062

Root Mean Square Error of Approximation:

RMSEA                           0.133
90 Percent confidence interval - lower 0.102
90 Percent confidence interval - upper 0.167
P-value RMSEA <= 0.05          0.000

Standardized Root Mean Square Residual:

SRMR                            0.052

Parameter Estimates:

Standard errors                  Standard
Information                     Expected
Information saturated (h1) model Structured

Latent Variables:
      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
C15 =~
  C15D00Q10      1.000
  C15D00Q11      0.978    0.061   16.146   0.000    0.765    0.775
  C15D00Q8       0.708    0.059   12.009   0.000    0.554    0.561
  C15D00Q12      0.746    0.059   12.656   0.000    0.583    0.591
```

R_C15D00Q15	0.776	0.059	13.181	0.000	0.607	0.615
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C15D00Q10	0.362	0.036	10.192	0.000	0.362	0.372
.C15D00Q11	0.389	0.036	10.815	0.000	0.389	0.399
.C15D00Q8	0.667	0.045	14.711	0.000	0.667	0.685
.C15D00Q12	0.634	0.044	14.438	0.000	0.634	0.651
.R_C15D00Q15	0.606	0.043	14.179	0.000	0.606	0.622
C15	0.611	0.062	9.865	0.000	1.000	1.000

#### SEQUENTIAL ACTION

#### CFI

#### INITIAL

0.941

**C15D00Q8 ~~ C15D00Q12 (MI = 48.406)**

0.999

#### Final model:

C15 =~ C15D00Q10 + C15D00Q11 + C15D00Q8 + C15D00Q12 + R\_C15D00Q15  
C15D00Q8 ~~ C15D00Q12

#### CFA result:

lavaan 0.6-8 ended normally after 19 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	11
Number of observations	532

#### Model Test User Model:

Test statistic	5.043
Degrees of freedom	4
P-value (Chi-square)	0.283

#### Model Test Baseline Model:

Test statistic	814.000
Degrees of freedom	10
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.999
Tucker-Lewis Index (TLI)	0.997

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3334.429
Loglikelihood unrestricted model (H1)	-3331.908
Akaike (AIC)	6690.859
Bayesian (BIC)	6737.902
Sample-size adjusted Bayesian (BIC)	6702.984

#### Root Mean Square Error of Approximation:

RMSEA	0.022
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.072
P-value RMSEA <= 0.05	0.771

#### Standardized Root Mean Square Residual:

SRMR	0.014
------	-------

#### Parameter Estimates:

Standard errors Information Information saturated (h1) model				Standard Expected Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C15 =~						
C15D00Q10	1.000				0.797	0.807
C15D00Q11	0.969	0.061	15.856	0.000	0.772	0.782
C15D00Q8	0.634	0.059	10.821	0.000	0.505	0.512
C15D00Q12	0.675	0.058	11.564	0.000	0.538	0.545
R_C15D00Q15	0.773	0.058	13.330	0.000	0.616	0.624
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C15D00Q8 ~~						
.C15D00Q12	0.222	0.036	6.210	0.000	0.222	0.316
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C15D00Q10	0.339	0.037	9.143	0.000	0.339	0.348
.C15D00Q11	0.378	0.037	10.158	0.000	0.378	0.388
.C15D00Q8	0.719	0.048	14.973	0.000	0.719	0.738
.C15D00Q12	0.684	0.046	14.734	0.000	0.684	0.703
.R_C15D00Q15	0.594	0.042	13.988	0.000	0.594	0.610
C15	0.635	0.064	9.946	0.000	1.000	1.000

Note: no item removal

## C16 Social Presence

Definition: The degree to which the user perceives the presence of a social entity in the interaction

Initial set:

lavaan 0.6-8 ended normally after 20 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532
Model Test User Model:	
Test statistic	90.306
Degrees of freedom	5
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	687.963
Degrees of freedom	10
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.874
Tucker-Lewis Index (TLI)	0.748
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-3440.079
Loglikelihood unrestricted model (H1)	-3394.926
Akaike (AIC)	6900.159
Bayesian (BIC)	6942.925



Sample-size adjusted Bayesian (BIC)		6911.182				
Root Mean Square Error of Approximation:						
RMSEA		0.179				
90 Percent confidence interval - lower		0.148				
90 Percent confidence interval - upper		0.212				
P-value RMSEA <= 0.05		0.000				
Standardized Root Mean Square Residual:						
SRMR		0.068				
Parameter Estimates:						
Standard errors		Standard				
Information		Expected				
Information saturated (h1) model		Structured				
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C16 =~						
C16D00Q11	1.000				0.629	0.637
C16D00Q13	1.158	0.094	12.271	0.000	0.728	0.738
C16D00Q12	1.122	0.093	12.102	0.000	0.706	0.715
C16D00Q16	0.896	0.086	10.400	0.000	0.563	0.571
C16D00Q17	0.742	0.083	8.924	0.000	0.466	0.473
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C16D00Q11	0.578	0.044	13.179	0.000	0.578	0.594
.C16D00Q13	0.443	0.041	10.760	0.000	0.443	0.455
.C16D00Q12	0.476	0.042	11.439	0.000	0.476	0.489
.C16D00Q16	0.657	0.046	14.121	0.000	0.657	0.674
.C16D00Q17	0.756	0.050	15.022	0.000	0.756	0.777
C16	0.395	0.055	7.246	0.000	1.000	1.000

#### SEQUENTIAL ACTION

#### CFI

INITIAL

0.874

C16D00Q11 ~~ C16D00Q16 (MI = 93.192)

1.000

Final model:

C16 =~ C16D00Q11 + C16D00Q13 + C16D00Q12 + C16D00Q16 + C16D00Q17  
C16D00Q11 ~~ C16D00Q16

CFA result:

lavaan 0.6-8 ended normally after 29 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	11
Number of observations	532

Model Test User Model:

Test statistic	3.289
Degrees of freedom	4
P-value (Chi-square)	0.511

Model Test Baseline Model:

Test statistic	687.963
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.003

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3396.571
Loglikelihood unrestricted model (H1)	-3394.926
Akaike (AIC)	6815.141
Bayesian (BIC)	6862.185
Sample-size adjusted Bayesian (BIC)	6827.267

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.060
P-value RMSEA <= 0.05	0.895

Standardized Root Mean Square Residual:

SRMR	0.016
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C16 =~						
C16D00Q11	1.000				0.535	0.542
C16D00Q13	1.438	0.136	10.570	0.000	0.769	0.780
C16D00Q12	1.367	0.130	10.542	0.000	0.732	0.741
C16D00Q16	0.851	0.080	10.664	0.000	0.455	0.461
C16D00Q17	0.918	0.108	8.500	0.000	0.491	0.498

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C16D00Q11 ~~						
.C16D00Q16	0.312	0.039	7.975	0.000	0.312	0.429

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C16D00Q11	0.687	0.048	14.292	0.000	0.687	0.706
.C16D00Q13	0.382	0.045	8.470	0.000	0.382	0.392
.C16D00Q12	0.438	0.044	9.894	0.000	0.438	0.450
.C16D00Q16	0.766	0.051	14.959	0.000	0.766	0.787
.C16D00Q17	0.732	0.050	14.763	0.000	0.732	0.752
C16	0.286	0.048	5.939	0.000	1.000	1.000

Note: no item removal.

## C17 Interaction Impact on Self-Image

Definition: How the user believes others perceive the user because of the interaction with the agent

Initial set:

lavaan 0.6-8 ended normally after 19 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532					
Model Test User Model:						
Test statistic	32.857					
Degrees of freedom	5					
P-value (Chi-square)	0.000					
Model Test Baseline Model:						
Test statistic	512.647					
Degrees of freedom	10					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.945					
Tucker-Lewis Index (TLI)	0.889					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-3499.013					
Loglikelihood unrestricted model (H1)	-3482.584					
Akaike (AIC)	7018.025					
Bayesian (BIC)	7060.791					
Sample-size adjusted Bayesian (BIC)	7029.048					
Root Mean Square Error of Approximation:						
RMSEA	0.102					
90 Percent confidence interval - lower	0.071					
90 Percent confidence interval - upper	0.137					
P-value RMSEA <= 0.05	0.004					
Standardized Root Mean Square Residual:						
SRMR	0.043					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C17 =~						
C17D00Q2	1.000				0.670	0.679
C17D00Q3	1.018	0.089	11.425	0.000	0.682	0.691
C17D00Q8	0.654	0.079	8.310	0.000	0.438	0.444
C17D00Q9	0.768	0.081	9.508	0.000	0.515	0.522
C17D00Q10	0.916	0.085	10.824	0.000	0.614	0.622
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C17D00Q2	0.525	0.046	11.460	0.000	0.525	0.539
.C17D00Q3	0.509	0.046	11.126	0.000	0.509	0.522
.C17D00Q8	0.782	0.052	14.963	0.000	0.782	0.803
.C17D00Q9	0.709	0.050	14.243	0.000	0.709	0.728
.C17D00Q10	0.597	0.047	12.765	0.000	0.597	0.613
C17	0.449	0.060	7.487	0.000	1.000	1.000

#### SEQUENTIAL ACTION

INITIAL

C17D00Q2 ~~ C17D00Q3 (MI = 31.429)

CFI

0.945

0.999

**Final model:**

```
C17 =~ C17D00Q2 + C17D00Q3 + C17D00Q8 + C17D00Q9 + C17D00Q10
C17D00Q2 ~~ C17D00Q3
```

**CFA result:**

lavaan 0.6-8 ended normally after 29 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	11
Number of observations	532

**Model Test User Model:**

Test statistic	4.464
Degrees of freedom	4
P-value (Chi-square)	0.347

**Model Test Baseline Model:**

Test statistic	512.647
Degrees of freedom	10
P-value	0.000

**User Model versus Baseline Model:**

Comparative Fit Index (CFI)	0.999
Tucker-Lewis Index (TLI)	0.998

**Loglikelihood and Information Criteria:**

Loglikelihood user model (H0)	-3484.816
Loglikelihood unrestricted model (H1)	-3482.584
Akaike (AIC)	6991.632
Bayesian (BIC)	7038.675
Sample-size adjusted Bayesian (BIC)	7003.758

**Root Mean Square Error of Approximation:**

RMSEA	0.015
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.069
P-value RMSEA <= 0.05	0.815

**Standardized Root Mean Square Residual:**

SRMR	0.015
------	-------

**Parameter Estimates:**

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

**Latent Variables:**

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C17 =~						
C17D00Q2	1.000				0.543	0.550
C17D00Q3	1.030	0.097	10.614	0.000	0.559	0.566
C17D00Q8	0.904	0.117	7.735	0.000	0.491	0.497
C17D00Q9	1.012	0.123	8.242	0.000	0.549	0.556
C17D00Q10	1.276	0.146	8.715	0.000	0.692	0.702

**Covariances:**

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
--	----------	---------	---------	---------	--------	---------

.C17D00Q2 ~~						
.C17D00Q3	0.216	0.042	5.179	0.000	0.216	0.322
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C17D00Q2	0.679	0.053	12.823	0.000	0.679	0.698
.C17D00Q3	0.661	0.053	12.566	0.000	0.661	0.679
.C17D00Q8	0.733	0.052	14.018	0.000	0.733	0.753
.C17D00Q9	0.672	0.051	13.133	0.000	0.672	0.690
.C17D00Q10	0.494	0.053	9.351	0.000	0.494	0.508
C17	0.294	0.054	5.467	0.000	1.000	1.000

Note: no item removal

## C18 Emotional Experience

Definition: A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them

Model with C18 construct and two dimensions C18D01 and C18D03 gives a warning message:

Warning message:

```
In lav_model_vcov(lavmodel = lavmodel, lavsamplestats = lavsamplestats, :
lavaan WARNING:
  Could not compute standard errors! The information matrix could
  not be inverted. This may be a symptom that the model is not
  identified.
```

Decision:

Four judges agreed to separate C18D01 and C18D03 into two individual constructs. This makes theoretically sense as the agent's and user's emotion presence are independent.

Initial set:

lavaan 0.6-8 ended normally after 32 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	21
Number of observations	532
Model Test User Model:	
Test statistic	92.621
Degrees of freedom	34
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	1697.368
Degrees of freedom	45
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.965
Tucker-Lewis Index (TLI)	0.953
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-6675.442
Loglikelihood unrestricted model (H1)	-6629.131
Akaike (AIC)	13392.884
Bayesian (BIC)	13482.693
Sample-size adjusted Bayesian (BIC)	13416.033

Root Mean Square Error of Approximation:

RMSEA	0.057
90 Percent confidence interval - lower	0.043
90 Percent confidence interval - upper	0.071
P-value RMSEA <= 0.05	0.193

Standardized Root Mean Square Residual:

SRMR	0.045
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D01 =~						
C18D01Q2	1.000				0.755	0.765
C18D01Q3	1.006	0.058	17.445	0.000	0.760	0.770
R_C18D01Q5	1.016	0.058	17.611	0.000	0.767	0.777
C18D01Q8	0.955	0.058	16.521	0.000	0.721	0.731
R_C18D01Q14	0.912	0.058	15.729	0.000	0.689	0.698
C18D03 =~						
C18D03Q0	1.000				0.469	0.475
C18D03Q1	1.134	0.146	7.760	0.000	0.532	0.539
C18D03Q2	1.095	0.144	7.620	0.000	0.513	0.520
C18D03Q9	1.290	0.157	8.233	0.000	0.605	0.613
C18D03Q12	1.287	0.156	8.224	0.000	0.603	0.611

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D01 ~~						
C18D03	0.203	0.030	6.894	0.000	0.575	0.575

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C18D01Q2	0.403	0.031	12.828	0.000	0.403	0.414
.C18D01Q3	0.396	0.031	12.719	0.000	0.396	0.407
.R_C18D01Q5	0.385	0.031	12.547	0.000	0.385	0.396
.C18D01Q8	0.453	0.034	13.492	0.000	0.453	0.465
.R_C18D01Q14	0.499	0.036	13.984	0.000	0.499	0.512
.C18D03Q0	0.754	0.052	14.506	0.000	0.754	0.774
.C18D03Q1	0.691	0.050	13.766	0.000	0.691	0.710
.C18D03Q2	0.710	0.051	14.006	0.000	0.710	0.729
.C18D03Q9	0.608	0.048	12.545	0.000	0.608	0.624
.C18D03Q12	0.610	0.048	12.577	0.000	0.610	0.626
C18D01	0.570	0.058	9.884	0.000	1.000	1.000
C18D03	0.220	0.045	4.925	0.000	1.000	1.000

SEQUENTIAL ACTION

INITIAL

REMOVE C18D03Q9 (C18D01 =~ C18D03Q9, MI = 14.315)

CFI

0.965

0.981

Final model:

C18D01 =~ C18D01Q2 + C18D01Q3 + R\_C18D01Q5 + C18D01Q8 + R\_C18D01Q14  
C18D03 =~ C18D03Q0 + C18D03Q1 + C18D03Q2 + C18D03Q12

CFA result:

lavaan 0.6-8 ended normally after 27 iterations

Estimator	ML
Optimization method	NLMINB

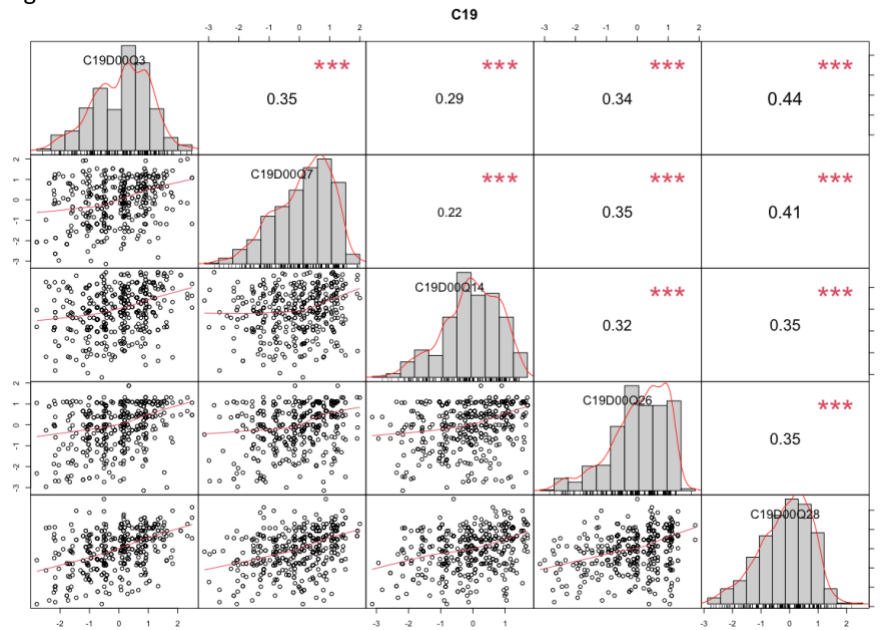
Number of model parameters	19					
Number of observations	532					
Model Test User Model:						
Test statistic	54.537					
Degrees of freedom	26					
P-value (Chi-square)	0.001					
Model Test Baseline Model:						
Test statistic	1510.684					
Degrees of freedom	36					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.981					
Tucker-Lewis Index (TLI)	0.973					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-6001.960					
Loglikelihood unrestricted model (H1)	-5974.692					
Akaike (AIC)	12041.921					
Bayesian (BIC)	12123.177					
Sample-size adjusted Bayesian (BIC)	12062.865					
Root Mean Square Error of Approximation:						
RMSEA	0.045					
90 Percent confidence interval - lower	0.028					
90 Percent confidence interval - upper	0.062					
P-value RMSEA <= 0.05	0.649					
Standardized Root Mean Square Residual:						
SRMR	0.033					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D01 =~						
C18D01Q2	1.000				0.753	0.764
C18D01Q3	1.011	0.058	17.395	0.000	0.761	0.772
R_C18D01Q5	1.019	0.058	17.537	0.000	0.768	0.778
C18D01Q8	0.954	0.058	16.379	0.000	0.719	0.728
R_C18D01Q14	0.918	0.058	15.740	0.000	0.692	0.701
C18D03 =~						
C18D03Q0	1.000				0.530	0.537
C18D03Q1	1.113	0.136	8.162	0.000	0.590	0.598
C18D03Q2	0.976	0.127	7.694	0.000	0.518	0.525
C18D03Q12	1.042	0.131	7.950	0.000	0.553	0.560
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D01 ~~						
C18D03	0.205	0.031	6.662	0.000	0.512	0.512
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all

.C18D01Q2	0.406	0.032	12.815	0.000	0.406	0.417
.C18D01Q3	0.394	0.031	12.628	0.000	0.394	0.405
.R_C18D01Q5	0.384	0.031	12.475	0.000	0.384	0.395
.C18D01Q8	0.457	0.034	13.501	0.000	0.457	0.470
.R_C18D01Q14	0.495	0.036	13.909	0.000	0.495	0.508
.C18D03Q0	0.692	0.053	13.055	0.000	0.692	0.711
.C18D03Q1	0.625	0.053	11.826	0.000	0.625	0.642
.C18D03Q2	0.706	0.053	13.273	0.000	0.706	0.725
.C18D03Q12	0.668	0.053	12.634	0.000	0.668	0.686
C18D01	0.568	0.058	9.840	0.000	1.000	1.000
C18D03	0.281	0.053	5.342	0.000	1.000	1.000

Note: item removal occurs only in C18D03 (see below)

### C18D03 User's Emotion Presence

Definition: To what extent the user believes that his/her emotional state is caused by the interaction or the agent



No.	ITEMID	ITEMQ
1.	C18D03Q0	[The agent]'s attitude influence how [I feel / the user feels]
2.	C18D03Q1	[I am / The user is] influenced by [the agent]'s moods
3.	C18D03Q2	The emotions [I feel / the user feels] during the interaction are caused by [the agent]
4.	<del>C18D03Q9</del>	<del>[My / The user's] interaction with [the agent] is an emotional experience</del>
5.	C18D03Q12	[My / The user's] interaction with [the agent] gives [me / them] an emotional sensation

Removal reasoning:

Four judges agreed to remove C18D03Q9. The modification indices shows that this item is correlated with C18D01. Further the item does not make explicit for whom this is an emotional experience (the user or the agent).

### C19 User-Agent Interplay

Definition: The extent to which the user and the agent have an effect on each other

Initial set:

lavaan 0.6-8 ended normally after 24 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	10



Number of observations	532					
Model Test User Model:						
Test statistic	10.236					
Degrees of freedom	5					
P-value (Chi-square)	0.069					
Model Test Baseline Model:						
Test statistic	459.321					
Degrees of freedom	10					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.988					
Tucker-Lewis Index (TLI)	0.977					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-3514.365					
Loglikelihood unrestricted model (H1)	-3509.247					
Akaike (AIC)	7048.730					
Bayesian (BIC)	7091.496					
Sample-size adjusted Bayesian (BIC)	7059.753					
Root Mean Square Error of Approximation:						
RMSEA	0.044					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.083					
P-value RMSEA <= 0.05	0.534					
Standardized Root Mean Square Residual:						
SRMR	0.024					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C19 =~						
C19D00Q3	1.000				0.613	0.622
C19D00Q7	0.917	0.096	9.563	0.000	0.563	0.570
C19D00Q14	0.778	0.092	8.494	0.000	0.477	0.484
C19D00Q26	0.893	0.095	9.393	0.000	0.548	0.555
C19D00Q28	1.121	0.106	10.564	0.000	0.687	0.697
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C19D00Q3	0.598	0.048	12.485	0.000	0.598	0.614
.C19D00Q7	0.657	0.049	13.414	0.000	0.657	0.675
.C19D00Q14	0.746	0.051	14.497	0.000	0.746	0.766
.C19D00Q26	0.674	0.049	13.638	0.000	0.674	0.692
.C19D00Q28	0.501	0.047	10.603	0.000	0.501	0.515
C19	0.376	0.056	6.681	0.000	1.000	1.000

## SEQUENTIAL ACTION

INITIAL

CFI

0.988

Final model:

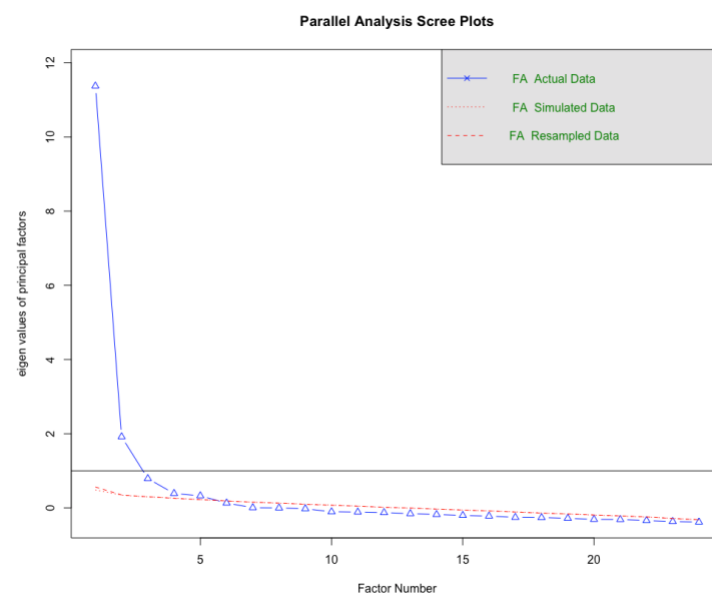
C19 =~ C19D00Q3 + C19D00Q7 + C19D00Q14 + C19D00Q26 + C19D00Q28

Note: no item removal.

## Appendix G The EFA Result of Predicted Latent Scores

Data description of the predicted latent scores:

CONSTRUCT ID	N	M	SD	MIN	MAX
C01D01	532	-2,62E-17	0,67	-2,33	2,36
C01D02	532	2,84E-18	0,60	-1,83	1,66
C01D03	532	1,76E-17	0,48	-1,69	1,46
C01D04	532	-9,65E-18	0,29	-0,90	0,78
C01D05	532	-2,80E-17	0,56	-1,99	1,21
C02	532	-7,25E-18	0,64	-2,36	1,28
C03	532	-4,24E-17	0,63	-2,09	1,29
C04	532	-5,31E-17	0,55	-2,32	1,23
C05	532	-2,85E-18	0,35	-0,96	0,99
C06D01	532	3,09E-18	0,57	-2,16	1,67
C07	532	3,13E-17	0,65	-2,24	1,43
C08	532	-2,69E-17	0,59	-2,00	1,11
C09	532	-6,82E-17	0,54	-1,90	1,06
C10	532	-5,51E-18	0,52	-1,53	1,32
C11	532	1,33E-17	0,57	-2,01	1,27
C12	532	2,04E-18	0,61	-2,34	0,99
C13	532	-4,69E-18	0,63	-2,17	1,24
C14	532	-1,11E-17	0,42	-1,41	0,89
C15	532	-1,74E-17	0,72	-2,37	1,74
C16	532	1,35E-17	0,47	-1,16	1,35
C17	532	1,27E-17	0,46	-1,53	1,40
C18D01	532	-3,27E-17	0,71	-2,17	3,01
C18D03	532	2,24E-17	0,44	-1,32	1,39
C19	532	8,20E-18	0,53	-1,70	1,17



Parallel analysis suggests that the number of factors = 5 and the number of components = NA

EFA results (Number of factors = 5, estimator = maximum likelihood, rotation = promax)

```
Factor Analysis using method = ml
Call: fa(r = data_cor, nfactors = nfactors, rotate = "promax", SMC = FALSE,
      max.iter = 100, fm = "ml")
```

Standardized loadings (pattern matrix) based upon correlation matrix									
	item	ML3	ML4	ML1	ML5	ML2	h2	u2	com
C03	7	0.89	-0.14	0.05	-0.06	0.04	0.69	0.307	1.1
C13	17	0.77	-0.31	-0.01	0.14	0.12	0.52	0.482	1.4
C07	11	0.74	0.04	-0.05	0.23	-0.06	0.69	0.308	1.2
C15	19	0.71	0.03	-0.10	0.27	-0.07	0.64	0.363	1.3
C12	16	0.71	0.07	-0.01	-0.16	-0.03	0.47	0.526	1.1
C09	13	0.65	0.09	-0.19	0.04	-0.04	0.39	0.615	1.2
C10	14	0.64	0.04	0.15	-0.07	0.04	0.56	0.437	1.2
C02	6	0.63	0.01	0.04	0.00	-0.03	0.43	0.573	1.0
C08	12	0.54	0.00	-0.06	0.50	0.06	0.76	0.243	2.0
C01D05	5	0.53	-0.14	0.31	0.16	-0.11	0.48	0.522	2.1
C17	21	0.50	0.23	-0.02	0.16	-0.04	0.52	0.478	1.6
C14	18	0.47	0.22	0.08	-0.09	0.15	0.53	0.468	1.8
C18D01	22	-0.34	0.97	0.02	0.09	-0.03	0.68	0.318	1.3
C18D03	23	0.01	0.82	-0.01	0.01	-0.09	0.59	0.408	1.0
C19	24	0.21	0.68	-0.04	-0.14	-0.04	0.55	0.448	1.3
C16	20	0.01	0.64	0.08	0.07	0.07	0.60	0.402	1.1
C05	9	0.08	0.53	0.18	0.13	0.07	0.67	0.331	1.5
C06D01	10	0.03	0.52	0.04	0.20	0.08	0.52	0.482	1.4
C11	15	0.44	0.46	0.08	-0.08	0.06	0.76	0.240	2.1
C01D03	3	-0.02	0.10	0.97	0.01	-0.07	0.99	0.010	1.0
C01D01	1	-0.06	0.02	0.90	-0.10	0.07	0.78	0.218	1.0
C01D04	4	-0.05	0.12	0.64	0.09	0.41	0.97	0.027	1.8
C01D02	2	-0.03	0.03	0.59	0.03	0.57	1.00	0.005	2.0
C04	8	0.28	0.21	0.02	0.54	0.00	0.72	0.284	1.9
		ML3	ML4	ML1	ML5	ML2			
SS loadings		6.06	4.01	3.21	1.31	0.92			
Proportion Var		0.25	0.17	0.13	0.05	0.04			
Cumulative Var		0.25	0.42	0.55	0.61	0.65			
Proportion Explained		0.39	0.26	0.21	0.08	0.06			
Cumulative Proportion		0.39	0.65	0.86	0.94	1.00			
With factor correlations of									
	ML3	ML4	ML1	ML5	ML2				
ML3	1.00	0.63	0.53	0.42	0.44				
ML4	0.63	1.00	0.61	0.35	0.57				
ML1	0.53	0.61	1.00	0.36	0.43				
ML5	0.42	0.35	0.36	1.00	0.21				
ML2	0.44	0.57	0.43	0.21	1.00				
Mean item complexity = 1.4									
Test of the hypothesis that 5 factors are sufficient.									
The degrees of freedom for the null model are 276 and the objective function was 20.65									
The degrees of freedom for the model are 166 and the objective function was 1.23									
The root mean square of the residuals (RMSR) is 0.03									
The df corrected root mean square of the residuals is 0.04									
Fit based upon off diagonal values = 1									
Measures of factor score adequacy									
		ML3	ML4	ML1	ML5	ML2			
Correlation of (regression) scores with factors		0.97	0.96	1.00	0.87	0.99			
Multiple R square of scores with factors		0.94	0.92	0.99	0.75	0.98			
Minimum correlation of possible factor scores		0.87	0.83	0.98	0.50	0.95			

With the factor loading cut-off .40, based on the EFA result, there are four groups of constructs\*:

1. ML 1 (4 constructs): These constructs are composed with items that describe how believable the agent and its behavior is.  
C01D01, C01D02, C01D03, C01D04
2. ML3 (13 constructs): The constructs are composed with items more related to users (or the rater), how the agent impacts/affects the user (i.e. more of a judgement)

- C01D05, C02, C03, C07, C08, C09, C10, C11, C12, C13, C14, C15, C17
3. ML4 (7 constructs): These constructs are composed with items that describe the socio-emotional of the agent and the interaction with the agent. They measure less about the user or the agent.  
C05, C06D01, C11, C16, C18D01, C18D03, C19
  4. ML5 (2 constructs): These constructs are composed with items that measure the user (or the rater)'s opinion about the agent  
C04, C08

Note: the factor ML2 contains two constructs that are overlapped with the factor ML1

## Appendix H The CFA Results of Discriminant Validity Analysis

### Establishing Convergent and Admissible Models

#### ML1

4 constructs: C01D01, C01D02, C01D03, C01D04

lavaan 0.6-8 ended normally after 57 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	40
Number of observations	532

Model Test User Model:

Test statistic	171.190
Degrees of freedom	113
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	3527.588
Degrees of freedom	136
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.983
Tucker-Lewis Index (TLI)	0.979

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-11034.087
Loglikelihood unrestricted model (H1)	-10948.492
Akaike (AIC)	22148.174
Bayesian (BIC)	22319.240
Sample-size adjusted Bayesian (BIC)	22192.268

Root Mean Square Error of Approximation:

RMSEA	0.031
90 Percent confidence interval - lower	0.021
90 Percent confidence interval - upper	0.040
P-value RMSEA <= 0.05	1.000

Standardized Root Mean Square Residual:

SRMR

0.033

## Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 =~						
C01D01Q3	1.000				0.721	0.730
C01D01Q10	1.067	0.064	16.561	0.000	0.769	0.779
C01D01Q13	0.974	0.064	15.208	0.000	0.702	0.711
C01D01Q15	1.007	0.064	15.707	0.000	0.726	0.736
C01D02 =~						
C01D02Q7	1.000				0.637	0.646
C01D02Q10	0.925	0.077	12.038	0.000	0.590	0.597
C01D02Q0	1.137	0.080	14.270	0.000	0.725	0.734
C01D02Q1	1.209	0.081	14.959	0.000	0.771	0.781
C01D02Q9	1.236	0.081	15.206	0.000	0.788	0.799
C01D03 =~						
C01D03Q7	1.000				0.541	0.548
C01D03Q9	1.153	0.110	10.514	0.000	0.624	0.632
C01D03Q11	1.334	0.117	11.404	0.000	0.722	0.731
C01D03Q10	0.846	0.100	8.496	0.000	0.458	0.464
C01D03Q12	1.096	0.108	10.181	0.000	0.593	0.601
C01D04 =~						
C01D04Q0	1.000				0.310	0.314
C01D04Q13	2.380	0.353	6.735	0.000	0.738	0.747
C01D04Q15	2.168	0.327	6.623	0.000	0.672	0.681

## Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 ~~						
C01D02	0.334	0.035	9.474	0.000	0.728	0.728
C01D03	0.301	0.035	8.700	0.000	0.772	0.772
C01D04	0.139	0.024	5.662	0.000	0.620	0.620
C01D02 ~~						
C01D03	0.236	0.029	8.040	0.000	0.686	0.686
C01D04	0.179	0.030	6.016	0.000	0.908	0.908
C01D03 ~~						
C01D04	0.137	0.024	5.657	0.000	0.815	0.815

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D01Q3	0.454	0.034	13.276	0.000	0.454	0.467
.C01D01Q10	0.382	0.031	12.180	0.000	0.382	0.393
.C01D01Q13	0.481	0.035	13.600	0.000	0.481	0.494
.C01D01Q15	0.447	0.034	13.177	0.000	0.447	0.459
.C01D02Q7	0.567	0.038	14.834	0.000	0.567	0.583
.C01D02Q10	0.626	0.041	15.169	0.000	0.626	0.643
.C01D02Q0	0.448	0.032	13.874	0.000	0.448	0.461
.C01D02Q1	0.380	0.029	13.034	0.000	0.380	0.390
.C01D02Q9	0.353	0.028	12.612	0.000	0.353	0.362
.C01D03Q7	0.681	0.046	14.863	0.000	0.681	0.699
.C01D03Q9	0.584	0.042	14.039	0.000	0.584	0.600
.C01D03Q11	0.453	0.037	12.293	0.000	0.453	0.465
.C01D03Q10	0.764	0.050	15.393	0.000	0.764	0.785
.C01D03Q12	0.622	0.043	14.396	0.000	0.622	0.639
.C01D04Q0	0.878	0.055	16.007	0.000	0.878	0.901

.C01D04Q13	0.430	0.037	11.466	0.000	0.430	0.441
.C01D04Q15	0.522	0.039	13.349	0.000	0.522	0.537
C01D01	0.519	0.056	9.203	0.000	1.000	1.000
C01D02	0.406	0.051	7.958	0.000	1.000	1.000
C01D03	0.293	0.047	6.274	0.000	1.000	1.000
C01D04	0.096	0.028	3.440	0.001	1.000	1.000

#### Findings:

Model is convergence with 40 parameters, CFI .983 and the highest correlation between constructs is .908

### ML3

#### Initial

13 constructs: C01D05, C02, C03, C07, C08, C09, C10, C11, C12, C13, C14, C15, C17

Warning message:

```
In lav_object_post_check(object) :
  lavaan WARNING: covariance matrix of latent variables
                    is not positive definite;
                    use lavInspect(fit, "cov.lv") to investigate.
```

#### Correlation Matrix between Predicted-Latent Constructs:

	C01D05	C02	C03	C07	C08	C09	C10	C11	C12	C13	C14	C15	C17
C01D05	1.000												
C02	0.643	1.000											
C03	0.622	0.688	1.000										
C07	0.647	0.703	0.822	1.000									
C08	0.611	0.632	0.763	0.923	1.000								
C09	0.602	0.564	0.621	0.703	0.643	1.000							
C10	0.523	0.591	0.835	0.814	0.658	0.426	1.000						
C11	0.436	0.605	0.787	0.722	0.720	0.513	0.826	1.000					
C12	0.558	0.628	0.672	0.673	0.623	0.718	0.629	0.695	1.000				
C13	0.635	0.607	0.779	0.739	0.811	0.554	0.647	0.573	0.670	1.000			
C14	0.524	0.666	0.714	0.696	0.706	0.466	0.830	0.885	0.745	0.663	1.000		
C15	0.643	0.629	0.808	1.003	0.941	0.697	0.746	0.724	0.695	0.696	0.642	1.000	
C17	0.496	0.588	0.804	0.907	0.808	0.547	0.809	0.784	0.591	0.606	0.672	0.880	1.000

#### Findings:

- Ultra Heywood case: correlation scores between C07 and C15 is > 1.0
- Checking correlation scores between items of C03, C07, C08, C10, C15 and C17 found the correlation scores C07D00Q14 with two items in C15 are the highest. This item also correlates highly with an item in C08.
- Removing items in C15 (that highly correlates with C07) does not reduce the correlation score between the latent construct sC07 and C15

Solution: remove C07D00Q14

#### After Removing C07D00Q14

Warning message:

```
In lav_object_post_check(object) :
  lavaan WARNING: covariance matrix of latent variables
                    is not positive definite;
                    use lavInspect(fit, "cov.lv") to investigate.
```

#### Correlation Matrix between Predicted-Latent Constructs:

	C01D05	C02	C03	C07	C08	C09	C10	C11	C12	C13	C14	C15	C17
C01D05	1.000												
C02	0.644	1.000											
C03	0.622	0.688	1.000										
C07	0.679	0.722	0.833	1.000									
C08	0.611	0.632	0.763	0.925	1.000								
C09	0.602	0.565	0.621	0.692	0.642	1.000							

C10	0.524	0.591	0.835	0.831	0.657	0.426	1.000						
C11	0.436	0.605	0.787	0.722	0.720	0.513	0.826	1.000					
C12	0.558	0.629	0.672	0.686	0.623	0.718	0.629	0.695	1.000				
C13	0.635	0.608	0.779	0.778	0.811	0.554	0.647	0.574	0.670	1.000			
C14	0.524	0.666	0.714	0.723	0.706	0.466	0.830	0.885	0.745	0.663	1.000		
C15	0.646	0.630	0.810	0.981	0.941	0.696	0.749	0.727	0.697	0.697	0.646	1.000	
C17	0.496	0.588	0.804	0.899	0.807	0.547	0.809	0.784	0.591	0.606	0.672	0.882	1.000

#### Findings:

- More than one Heywood cases with correlation scores between latent constructs > .90
- Correlation scores between the latent constructs C07 and C15 is still the highest
- Checking correlation scores between items in C03, C07, C08, C10, C15 and C17 found the correlation score between C07D00Q13 and an item in C15 is the highest.
- Removing an item in C15 (that highly correlates with C07) does not reduce the correlation score between the latent constructs C07 and C15

Solution: remove C07D00Q13

#### After Removing C07D00Q13

Warning message:

```
In lav_object_post_check(object) :
lavaan WARNING: covariance matrix of latent variables
is not positive definite;
use lavInspect(fit, "cov.lv") to investigate.
```

#### Correlation Matrix between Predicted-Latent Constructs:

	C01D05	C02	C03	C07	C08	C09	C10	C11	C12	C13	C14
C15	C17										
C01D05	1.000										
C02	0.643	1.000									
C03	0.622	0.688	1.000								
C07	0.555	0.650	0.748	1.000							
C08	0.610	0.632	0.763	0.813	1.000						
C09	0.601	0.565	0.621	0.641	0.643	1.000					
C10	0.524	0.591	0.836	0.781	0.658	0.426	1.000				
C11	0.435	0.604	0.786	0.630	0.719	0.512	0.826	1.000			
C12	0.558	0.629	0.672	0.660	0.623	0.718	0.630	0.695	1.000		
C13	0.635	0.608	0.780	0.701	0.810	0.554	0.648	0.573	0.670	1.000	
C14	0.524	0.665	0.714	0.654	0.706	0.466	0.830	0.884	0.745	0.663	1.000
C15	0.645	0.629	0.810	0.908	0.942	0.697	0.749	0.726	0.696	0.697	0.645
1.000											
C17	0.496	0.588	0.804	0.849	0.808	0.547	0.809	0.784	0.591	0.606	0.672
0.882	1.000										

#### Findings:

- More than one Heywood cases with correlation scores between latent constructs > .90
- Correlation scores between the latent constructs C08 and C15 is still the highest
- Checking correlation scores between items in C07, C08, C13 and C15 found the correlation scores between C08D00Q0 and two items in C15 is the highest.
- Removing items in C15 (that highly correlates with C08) does not reduce the correlation score between the latent constructs C08 and C15

Solution: remove C08D00Q0

#### After Removing C08D00Q0

lavaan 0.6-8 ended normally after 133 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	208
Number of observations	532

Model Test User Model:

Test statistic	3929.703
Degrees of freedom	1937
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	15127.891
Degrees of freedom	2080
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.847
Tucker-Lewis Index (TLI)	0.836

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-43006.707
Loglikelihood unrestricted model (H1)	-41041.855
Akaike (AIC)	86429.413
Bayesian (BIC)	87318.955
Sample-size adjusted Bayesian (BIC)	86658.700

Root Mean Square Error of Approximation:

RMSEA	0.044
90 Percent confidence interval - lower	0.042
90 Percent confidence interval - upper	0.046
P-value RMSEA <= 0.05	1.000

Standardized Root Mean Square Residual:

SRMR	0.054
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D05 =~						
C01D05Q0	1.000				0.623	0.631
C01D05Q2	1.050	0.086	12.181	0.000	0.654	0.663
C01D05Q9	1.154	0.089	13.012	0.000	0.718	0.728
C01D05Q11	0.920	0.084	10.994	0.000	0.573	0.580
C01D05Q12	1.043	0.086	12.120	0.000	0.649	0.658
C02 =~						
C02D00Q1	1.000				0.760	0.770
C02D00Q2	0.839	0.062	13.432	0.000	0.637	0.646
C02D00Q8	0.818	0.062	13.115	0.000	0.621	0.630
R_C02D00Q15	0.666	0.062	10.733	0.000	0.506	0.513
C03 =~						
C03D01Q7	1.000				0.704	0.713
C03D01Q5	0.935	0.065	14.366	0.000	0.658	0.667
C03D01Q6	0.771	0.065	11.884	0.000	0.543	0.550
C03D01Q12	0.774	0.065	11.927	0.000	0.545	0.552
C03D02Q5	0.797	0.065	12.290	0.000	0.561	0.569
C03D02Q10	0.946	0.065	14.536	0.000	0.666	0.675
C07 =~						
C07D00Q0	1.000				0.726	0.736
C07D00Q11	1.001	0.063	15.958	0.000	0.727	0.737
R_C07D00Q15	0.598	0.063	9.490	0.000	0.434	0.440



C08 =~						
R_C08D00Q3	1.000				0.636	0.645
C08D00Q4	1.074	0.081	13.328	0.000	0.684	0.693
R_C08D00Q10	1.071	0.081	13.295	0.000	0.682	0.691
R_C08D00Q9	0.942	0.079	11.973	0.000	0.599	0.607
C09 =~						
C09D00Q4	1.000				0.637	0.645
C09D00Q10	1.113	0.089	12.530	0.000	0.709	0.718
C09D00Q1	0.986	0.085	11.566	0.000	0.628	0.637
R_C09D00Q9	0.580	0.079	7.385	0.000	0.369	0.374
C10 =~						
C10D00Q1	1.000				0.627	0.636
C10D00Q6	0.878	0.079	11.098	0.000	0.551	0.558
C10D00Q10	0.861	0.079	10.910	0.000	0.540	0.547
C10D00Q16	0.958	0.080	11.935	0.000	0.601	0.609
C10D00Q18	1.070	0.082	13.039	0.000	0.671	0.680
C11 =~						
C11D01Q6	1.000				0.626	0.634
C11D01Q9	0.832	0.077	10.762	0.000	0.521	0.528
C11D01Q10	1.007	0.080	12.645	0.000	0.631	0.639
C11D01Q11	0.818	0.077	10.605	0.000	0.512	0.519
C11D01Q14	0.898	0.078	11.485	0.000	0.562	0.569
C11D02Q3	0.940	0.079	11.944	0.000	0.589	0.596
C11D02Q4	0.967	0.079	12.226	0.000	0.605	0.613
C11D02Q7	1.035	0.080	12.927	0.000	0.648	0.657
C11D02Q8	0.806	0.077	10.460	0.000	0.504	0.511
C11D02Q1	0.818	0.077	10.603	0.000	0.512	0.519
C12 =~						
C12D00Q0	1.000				0.652	0.660
C12D00Q1	0.967	0.080	12.136	0.000	0.630	0.638
R_C12D00Q6	0.450	0.074	6.092	0.000	0.293	0.297
C12D00Q13	1.101	0.082	13.375	0.000	0.717	0.727
C13 =~						
R_C13D00Q3	1.000				0.721	0.731
C13D00Q7	0.658	0.066	10.000	0.000	0.474	0.481
R_C13D00Q11	0.816	0.066	12.316	0.000	0.588	0.596
R_C13D00Q6	0.690	0.066	10.478	0.000	0.498	0.504
R_C13D00Q15	0.613	0.066	9.328	0.000	0.442	0.448
C14 =~						
C14D00Q0	1.000				0.501	0.508
C14D00Q10	1.430	0.131	10.940	0.000	0.717	0.726
R_C14D00Q13	1.213	0.121	10.040	0.000	0.608	0.616
C14D00Q15	1.097	0.116	9.458	0.000	0.550	0.557
C14D00Q16	0.863	0.107	8.047	0.000	0.433	0.439
C15 =~						
C15D00Q10	1.000				0.692	0.701
C15D00Q11	0.979	0.066	14.847	0.000	0.677	0.686
C15D00Q8	0.973	0.066	14.767	0.000	0.673	0.682
C15D00Q12	0.996	0.066	15.100	0.000	0.689	0.698
R_C15D00Q15	0.807	0.066	12.311	0.000	0.558	0.566
C17 =~						
C17D00Q2	1.000				0.684	0.693
C17D00Q3	1.018	0.070	14.539	0.000	0.696	0.705
C17D00Q8	0.673	0.068	9.857	0.000	0.460	0.466
C17D00Q9	0.733	0.069	10.707	0.000	0.501	0.508
C17D00Q10	0.837	0.069	12.141	0.000	0.572	0.580
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D05 ~~						
C02	0.304	0.035	8.625	0.000	0.643	0.643
C03	0.272	0.032	8.414	0.000	0.621	0.621
C07	0.251	0.032	7.758	0.000	0.555	0.555
C08	0.241	0.030	7.960	0.000	0.609	0.609
C09	0.238	0.031	7.749	0.000	0.601	0.601
C10	0.205	0.028	7.268	0.000	0.524	0.524
C11	0.170	0.025	6.658	0.000	0.435	0.435
C12	0.226	0.030	7.523	0.000	0.558	0.558

C13	0.285	0.034	8.377	0.000	0.635	0.635
C14	0.163	0.024	6.712	0.000	0.523	0.523
C15	0.278	0.032	8.568	0.000	0.645	0.645
C17	0.211	0.029	7.181	0.000	0.496	0.496
C02 ~~						
C03	0.368	0.039	9.537	0.000	0.688	0.688
C07	0.359	0.039	9.104	0.000	0.650	0.650
C08	0.293	0.035	8.389	0.000	0.606	0.606
C09	0.273	0.035	7.832	0.000	0.565	0.565
C10	0.282	0.034	8.206	0.000	0.591	0.591
C11	0.287	0.034	8.536	0.000	0.604	0.604
C12	0.311	0.037	8.516	0.000	0.629	0.629
C13	0.333	0.039	8.644	0.000	0.608	0.608
C14	0.253	0.032	7.901	0.000	0.665	0.665
C15	0.331	0.037	9.015	0.000	0.629	0.629
C17	0.305	0.036	8.424	0.000	0.588	0.588
C03 ~~						
C07	0.382	0.039	9.841	0.000	0.748	0.748
C08	0.334	0.036	9.342	0.000	0.746	0.746
C09	0.278	0.034	8.287	0.000	0.621	0.621
C10	0.369	0.038	9.776	0.000	0.836	0.836
C11	0.346	0.036	9.654	0.000	0.786	0.786
C12	0.308	0.035	8.809	0.000	0.672	0.672
C13	0.396	0.040	9.995	0.000	0.780	0.780
C14	0.252	0.031	8.099	0.000	0.714	0.714
C15	0.395	0.039	10.229	0.000	0.810	0.810
C17	0.387	0.039	10.017	0.000	0.804	0.804
C07 ~~						
C08	0.353	0.037	9.412	0.000	0.763	0.763
C09	0.296	0.036	8.334	0.000	0.641	0.641
C10	0.356	0.038	9.462	0.000	0.781	0.781
C11	0.286	0.033	8.603	0.000	0.630	0.630
C12	0.312	0.036	8.621	0.000	0.660	0.660
C13	0.367	0.039	9.323	0.000	0.701	0.701
C14	0.238	0.031	7.725	0.000	0.654	0.654
C15	0.456	0.042	10.823	0.000	0.908	0.908
C17	0.421	0.041	10.289	0.000	0.848	0.848
C08 ~~						
C09	0.241	0.031	7.744	0.000	0.596	0.596
C10	0.258	0.031	8.234	0.000	0.647	0.647
C11	0.280	0.032	8.746	0.000	0.702	0.702
C12	0.255	0.032	8.004	0.000	0.616	0.616
C13	0.376	0.039	9.683	0.000	0.819	0.819
C14	0.230	0.029	7.826	0.000	0.722	0.722
C15	0.382	0.038	9.962	0.000	0.868	0.868
C17	0.330	0.036	9.231	0.000	0.759	0.759
C09 ~~						
C10	0.170	0.028	6.181	0.000	0.426	0.426
C11	0.204	0.028	7.232	0.000	0.512	0.512
C12	0.298	0.035	8.508	0.000	0.718	0.718
C13	0.255	0.034	7.561	0.000	0.555	0.555
C14	0.149	0.024	6.157	0.000	0.466	0.466
C15	0.307	0.035	8.809	0.000	0.697	0.697
C17	0.238	0.032	7.493	0.000	0.547	0.547
C10 ~~						
C11	0.324	0.035	9.305	0.000	0.825	0.825
C12	0.257	0.032	8.061	0.000	0.630	0.630
C13	0.293	0.035	8.485	0.000	0.648	0.648
C14	0.261	0.032	8.193	0.000	0.829	0.829
C15	0.325	0.035	9.280	0.000	0.750	0.750
C17	0.347	0.037	9.453	0.000	0.809	0.809
C11 ~~						
C12	0.283	0.033	8.666	0.000	0.695	0.695
C13	0.258	0.032	8.080	0.000	0.572	0.572
C14	0.277	0.033	8.434	0.000	0.884	0.884
C15	0.315	0.034	9.298	0.000	0.727	0.727
C17	0.335	0.035	9.461	0.000	0.784	0.784
C12 ~~						

C13	0.315	0.036	8.651	0.000	0.670	0.670
C14	0.243	0.031	7.893	0.000	0.745	0.745
C15	0.314	0.035	8.962	0.000	0.697	0.697
C17	0.263	0.033	7.982	0.000	0.591	0.591
C13 ~~						
C14	0.240	0.031	7.743	0.000	0.663	0.663
C15	0.347	0.037	9.355	0.000	0.696	0.696
C17	0.299	0.036	8.389	0.000	0.606	0.606
C14 ~~						
C15	0.224	0.029	7.740	0.000	0.646	0.646
C17	0.230	0.030	7.754	0.000	0.672	0.672
C15 ~~						
C17	0.417	0.040	10.410	0.000	0.882	0.882
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D05Q0	0.586	0.042	14.093	0.000	0.586	0.602
.C01D05Q2	0.546	0.040	13.681	0.000	0.546	0.561
.C01D05Q9	0.458	0.037	12.500	0.000	0.458	0.470
.C01D05Q11	0.646	0.044	14.615	0.000	0.646	0.663
.C01D05Q12	0.552	0.040	13.744	0.000	0.552	0.567
.C02D00Q1	0.396	0.037	10.726	0.000	0.396	0.407
.C02D00Q2	0.568	0.042	13.619	0.000	0.568	0.583
.C02D00Q8	0.588	0.042	13.846	0.000	0.588	0.603
.R_C02D00Q15	0.717	0.048	14.988	0.000	0.717	0.737
.C03D01Q7	0.478	0.034	14.010	0.000	0.478	0.491
.C03D01Q5	0.540	0.037	14.561	0.000	0.540	0.555
.C03D01Q6	0.679	0.044	15.387	0.000	0.679	0.698
.C03D01Q12	0.677	0.044	15.376	0.000	0.677	0.695
.C03D02Q5	0.658	0.043	15.287	0.000	0.658	0.676
.C03D02Q10	0.530	0.037	14.478	0.000	0.530	0.544
.C07D00Q0	0.446	0.035	12.577	0.000	0.446	0.458
.C07D00Q11	0.445	0.035	12.549	0.000	0.445	0.457
.R_C07D00Q15	0.785	0.050	15.685	0.000	0.785	0.807
.R_C08D00Q3	0.569	0.039	14.401	0.000	0.569	0.584
.C08D00Q4	0.506	0.037	13.776	0.000	0.506	0.520
.R_C08D00Q10	0.509	0.037	13.809	0.000	0.509	0.523
.R_C08D00Q9	0.615	0.042	14.764	0.000	0.615	0.631
.C09D00Q4	0.568	0.043	13.266	0.000	0.568	0.583
.C09D00Q10	0.471	0.040	11.688	0.000	0.471	0.484
.C09D00Q1	0.579	0.043	13.410	0.000	0.579	0.595
.R_C09D00Q9	0.837	0.054	15.636	0.000	0.837	0.860
.C10D00Q1	0.580	0.040	14.560	0.000	0.580	0.596
.C10D00Q6	0.670	0.044	15.176	0.000	0.670	0.688
.C10D00Q10	0.682	0.045	15.243	0.000	0.682	0.701
.C10D00Q16	0.613	0.041	14.806	0.000	0.613	0.629
.C10D00Q18	0.524	0.037	14.031	0.000	0.524	0.538
.C11D01Q6	0.582	0.039	15.042	0.000	0.582	0.598
.C11D01Q9	0.702	0.045	15.588	0.000	0.702	0.721
.C11D01Q10	0.576	0.038	15.009	0.000	0.576	0.592
.C11D01Q11	0.711	0.046	15.622	0.000	0.711	0.731
.C11D01Q14	0.658	0.043	15.412	0.000	0.658	0.676
.C11D02Q3	0.627	0.041	15.274	0.000	0.627	0.644
.C11D02Q4	0.607	0.040	15.176	0.000	0.607	0.624
.C11D02Q7	0.554	0.037	14.878	0.000	0.554	0.569
.C11D02Q8	0.719	0.046	15.651	0.000	0.719	0.739
.C11D02Q1	0.711	0.046	15.622	0.000	0.711	0.731
.C12D00Q0	0.549	0.041	13.437	0.000	0.549	0.564
.C12D00Q1	0.577	0.042	13.774	0.000	0.577	0.593
.R_C12D00Q6	0.888	0.056	15.966	0.000	0.888	0.912
.C12D00Q13	0.459	0.038	12.018	0.000	0.459	0.471
.R_C13D00Q3	0.454	0.038	11.998	0.000	0.454	0.466
.C13D00Q7	0.749	0.049	15.275	0.000	0.749	0.769
.R_C13D00Q11	0.628	0.044	14.367	0.000	0.628	0.645
.R_C13D00Q6	0.726	0.048	15.132	0.000	0.726	0.746
.R_C13D00Q15	0.779	0.050	15.451	0.000	0.779	0.800
.C14D00Q0	0.723	0.047	15.423	0.000	0.723	0.742
.C14D00Q10	0.460	0.035	13.046	0.000	0.460	0.473

.R_C14D00Q13	0.604	0.041	14.675	0.000	0.604	0.620
.C14D00Q15	0.671	0.044	15.140	0.000	0.671	0.689
.C14D00Q16	0.786	0.050	15.713	0.000	0.786	0.808
.C15D00Q10	0.495	0.034	14.605	0.000	0.495	0.509
.C15D00Q11	0.515	0.035	14.755	0.000	0.515	0.529
.C15D00Q8	0.520	0.035	14.791	0.000	0.520	0.534
.C15D00Q12	0.499	0.034	14.634	0.000	0.499	0.512
.R_C15D00Q15	0.662	0.043	15.527	0.000	0.662	0.680
.C17D00Q2	0.507	0.037	13.846	0.000	0.507	0.520
.C17D00Q3	0.489	0.036	13.640	0.000	0.489	0.503
.C17D00Q8	0.762	0.049	15.628	0.000	0.762	0.783
.C17D00Q9	0.722	0.047	15.448	0.000	0.722	0.742
.C17D00Q10	0.646	0.043	15.028	0.000	0.646	0.663
C01D05	0.388	0.052	7.444	0.000	1.000	1.000
C02	0.578	0.061	9.434	0.000	1.000	1.000
C03	0.496	0.055	9.034	0.000	1.000	1.000
C07	0.528	0.058	9.147	0.000	1.000	1.000
C08	0.405	0.052	7.805	0.000	1.000	1.000
C09	0.406	0.055	7.442	0.000	1.000	1.000
C10	0.393	0.051	7.683	0.000	1.000	1.000
C11	0.392	0.050	7.812	0.000	1.000	1.000
C12	0.425	0.054	7.795	0.000	1.000	1.000
C13	0.520	0.059	8.857	0.000	1.000	1.000
C14	0.251	0.043	5.865	0.000	1.000	1.000
C15	0.478	0.054	8.932	0.000	1.000	1.000
C17	0.467	0.055	8.568	0.000	1.000	1.000

#### Finding:

- The model is convergence with 208 parameters, CFI is .847 and the highest correlation between latent constructs is .904
- The factor loading of two items are below the cut-off .40

#### ML4

7 constructs: C05, C06D01, C11, C16, C18D01, C18D03 and C19

lavaan 0.6-8 ended normally after 83 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	97
Number of observations	532
Model Test User Model:	
Test statistic	1442.427
Degrees of freedom	644
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	7899.616
Degrees of freedom	703
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.889
Tucker-Lewis Index (TLI)	0.879
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-25187.104
Loglikelihood unrestricted model (H1)	-24465.891
Akaike (AIC)	50568.208
Bayesian (BIC)	50983.042

Sample-size adjusted Bayesian (BIC) 50675.135

Root Mean Square Error of Approximation:

RMSEA	0.048
90 Percent confidence interval - lower	0.045
90 Percent confidence interval - upper	0.052
P-value RMSEA <= 0.05	0.800

Standardized Root Mean Square Residual:

SRMR	0.051
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C05 =~						
R_C05D00Q3	1.000				0.408	0.414
C05D00Q6	1.621	0.183	8.877	0.000	0.662	0.670
C05D00Q7	1.544	0.177	8.716	0.000	0.630	0.638
C05D00Q1	1.565	0.179	8.761	0.000	0.639	0.647
C05D00Q18	1.442	0.170	8.478	0.000	0.588	0.596
C06D01 =~						
C06D01Q1	1.000				0.620	0.629
R_C06D01Q6	0.992	0.087	11.451	0.000	0.615	0.623
C06D01Q8	0.826	0.083	9.908	0.000	0.513	0.520
C06D01Q11	0.868	0.084	10.319	0.000	0.539	0.546
C11 =~						
C11D01Q6	1.000				0.674	0.683
C11D01Q9	0.729	0.069	10.574	0.000	0.491	0.498
C11D01Q10	0.887	0.070	12.718	0.000	0.598	0.606
C11D01Q11	0.800	0.069	11.549	0.000	0.539	0.546
C11D01Q14	0.760	0.069	10.998	0.000	0.512	0.519
C11D02Q3	0.967	0.070	13.767	0.000	0.652	0.660
C11D02Q4	0.887	0.070	12.717	0.000	0.598	0.606
C11D02Q7	0.920	0.070	13.153	0.000	0.620	0.628
C11D02Q8	0.842	0.069	12.119	0.000	0.568	0.575
C11D02Q1	0.643	0.069	9.377	0.000	0.433	0.439
C16 =~						
C16D00Q11	1.000				0.596	0.604
C16D00Q13	1.201	0.093	12.973	0.000	0.716	0.725
C16D00Q12	1.198	0.093	12.951	0.000	0.714	0.723
C16D00Q16	0.959	0.087	11.009	0.000	0.571	0.579
C16D00Q17	0.848	0.085	9.979	0.000	0.505	0.512
C18D01 =~						
C18D01Q2	1.000				0.749	0.760
C18D01Q3	1.014	0.058	17.599	0.000	0.760	0.770
R_C18D01Q5	1.029	0.058	17.873	0.000	0.771	0.781
C18D01Q8	0.966	0.058	16.708	0.000	0.724	0.734
R_C18D01Q14	0.918	0.058	15.813	0.000	0.688	0.697
C18D03 =~						
C18D03Q0	1.000				0.574	0.582
C18D03Q1	1.024	0.099	10.330	0.000	0.588	0.596
C18D03Q2	0.798	0.093	8.584	0.000	0.458	0.465
C18D03Q12	0.966	0.097	9.918	0.000	0.555	0.563
C19 =~						
C19D00Q3	1.000				0.603	0.611
C19D00Q7	0.907	0.086	10.493	0.000	0.547	0.554
C19D00Q14	0.825	0.085	9.720	0.000	0.497	0.504
C19D00Q26	0.966	0.088	11.028	0.000	0.582	0.590
C19D00Q28	1.105	0.091	12.175	0.000	0.666	0.675

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C05 ~~						
C06D01	0.210	0.029	7.209	0.000	0.831	0.831
C11	0.251	0.033	7.686	0.000	0.914	0.914
C16	0.225	0.030	7.391	0.000	0.924	0.924
C18D01	0.221	0.030	7.419	0.000	0.721	0.721
C18D03	0.160	0.024	6.574	0.000	0.682	0.682
C19	0.181	0.026	6.951	0.000	0.734	0.734
C06D01 ~~						
C11	0.308	0.035	8.902	0.000	0.736	0.736
C16	0.296	0.034	8.693	0.000	0.802	0.802
C18D01	0.347	0.037	9.310	0.000	0.746	0.746
C18D03	0.253	0.032	7.780	0.000	0.708	0.708
C19	0.236	0.031	7.657	0.000	0.630	0.630
C11 ~~						
C16	0.317	0.034	9.214	0.000	0.790	0.790
C18D01	0.333	0.035	9.453	0.000	0.659	0.659
C18D03	0.252	0.031	8.011	0.000	0.652	0.652
C19	0.322	0.035	9.181	0.000	0.792	0.792
C16 ~~						
C18D01	0.289	0.033	8.745	0.000	0.647	0.647
C18D03	0.253	0.031	8.057	0.000	0.740	0.740
C19	0.259	0.031	8.309	0.000	0.722	0.722
C18D01 ~~						
C18D03	0.221	0.031	7.175	0.000	0.514	0.514
C19	0.268	0.032	8.268	0.000	0.594	0.594
C18D03 ~~						
C19	0.312	0.036	8.673	0.000	0.902	0.902
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C05D00Q3	0.807	0.051	15.940	0.000	0.807	0.829
.C05D00Q6	0.536	0.037	14.586	0.000	0.536	0.550
.C05D00Q7	0.577	0.039	14.905	0.000	0.577	0.592
.C05D00Q1	0.566	0.038	14.827	0.000	0.566	0.581
.C05D00Q18	0.628	0.041	15.224	0.000	0.628	0.645
.C06D01Q1	0.589	0.043	13.683	0.000	0.589	0.605
.R_C06D01Q6	0.595	0.043	13.763	0.000	0.595	0.611
.C06D01Q8	0.711	0.048	14.898	0.000	0.711	0.730
.C06D01Q11	0.683	0.047	14.673	0.000	0.683	0.702
.C11D01Q6	0.519	0.036	14.539	0.000	0.519	0.533
.C11D01Q9	0.732	0.047	15.651	0.000	0.732	0.752
.C11D01Q10	0.616	0.041	15.144	0.000	0.616	0.633
.C11D01Q11	0.683	0.044	15.456	0.000	0.683	0.701
.C11D01Q14	0.712	0.046	15.572	0.000	0.712	0.731
.C11D02Q3	0.549	0.037	14.747	0.000	0.549	0.564
.C11D02Q4	0.616	0.041	15.144	0.000	0.616	0.633
.C11D02Q7	0.589	0.039	14.996	0.000	0.589	0.605
.C11D02Q8	0.652	0.043	15.317	0.000	0.652	0.669
.C11D02Q1	0.786	0.050	15.833	0.000	0.786	0.807
.C16D00Q11	0.619	0.042	14.864	0.000	0.619	0.636
.C16D00Q13	0.462	0.034	13.413	0.000	0.462	0.474
.C16D00Q12	0.464	0.035	13.446	0.000	0.464	0.477
.C16D00Q16	0.647	0.043	15.044	0.000	0.647	0.665
.C16D00Q17	0.718	0.047	15.426	0.000	0.718	0.738
.C18D01Q2	0.412	0.031	13.318	0.000	0.412	0.423
.C18D01Q3	0.396	0.030	13.109	0.000	0.396	0.407
.R_C18D01Q5	0.379	0.029	12.863	0.000	0.379	0.389
.C18D01Q8	0.450	0.033	13.758	0.000	0.450	0.462
.R_C18D01Q14	0.500	0.035	14.246	0.000	0.500	0.514
.C18D03Q0	0.644	0.046	14.045	0.000	0.644	0.661
.C18D03Q1	0.628	0.045	13.851	0.000	0.628	0.645
.C18D03Q2	0.763	0.050	15.159	0.000	0.763	0.784
.C18D03Q12	0.666	0.047	14.290	0.000	0.666	0.684
.C19D00Q3	0.610	0.042	14.418	0.000	0.610	0.627
.C19D00Q7	0.675	0.045	14.925	0.000	0.675	0.693
.C19D00Q14	0.726	0.048	15.255	0.000	0.726	0.746
.C19D00Q26	0.634	0.043	14.622	0.000	0.634	0.652

.C19D00Q28	0.530	0.039	13.580	0.000	0.530	0.544
C05	0.166	0.035	4.748	0.000	1.000	1.000
C06D01	0.385	0.053	7.262	0.000	1.000	1.000
C11	0.454	0.053	8.567	0.000	1.000	1.000
C16	0.355	0.049	7.217	0.000	1.000	1.000
C18D01	0.562	0.057	9.861	0.000	1.000	1.000
C18D03	0.330	0.050	6.537	0.000	1.000	1.000
C19	0.363	0.051	7.188	0.000	1.000	1.000

#### Findings:

- Model convergence with 97 parameters, CFI = .889 and the highest correlation between latent constructs is .924

#### ML5

2 constructs: C04 and C08

Note: Initially the model has been convergence with 21 parameters, CFI 949 and the correlation between latent constructs is .914, C08 is also one of constructs in ML3

#### After Removing C08D00Q0 (based on ML3):

lavaan 0.6-8 ended normally after 28 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	19
Number of observations	532
Model Test User Model:	
Test statistic	122.792
Degrees of freedom	26
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	1878.374
Degrees of freedom	36
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.947
Tucker-Lewis Index (TLI)	0.927
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-5852.243
Loglikelihood unrestricted model (H1)	-5790.847
Akaike (AIC)	11742.486
Bayesian (BIC)	11823.742
Sample-size adjusted Bayesian (BIC)	11763.430
Root Mean Square Error of Approximation:	
RMSEA	0.084
90 Percent confidence interval - lower	0.069
90 Percent confidence interval - upper	0.099
P-value RMSEA <= 0.05	0.000
Standardized Root Mean Square Residual:	
SRMR	0.044

# Parameter Estimates:

Standard errors  
Information  
Information saturated (hl) model

Standard  
Expected  
Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C04 =~						
C04D00Q1	1.000				0.596	0.604
C04D00Q10	1.421	0.097	14.635	0.000	0.846	0.858
R_C04D00Q11	1.359	0.095	14.291	0.000	0.810	0.820
C04D00Q4	0.759	0.082	9.216	0.000	0.452	0.458
C04D00Q12	1.024	0.087	11.751	0.000	0.610	0.618
C08 =~						
R_C08D00Q3	1.000				0.708	0.717
C08D00Q4	0.933	0.067	13.928	0.000	0.660	0.669
R_C08D00Q9	0.834	0.067	12.525	0.000	0.590	0.598
R_C08D00Q10	0.903	0.067	13.507	0.000	0.639	0.648

## Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C04 ~~						
C08	0.385	0.039	9.874	0.000	0.913	0.913

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C04D00Q1	0.619	0.041	15.127	0.000	0.619	0.636
.C04D00Q10	0.258	0.025	10.373	0.000	0.258	0.265
.R_C04D00Q11	0.318	0.027	11.882	0.000	0.318	0.327
.C04D00Q4	0.769	0.049	15.765	0.000	0.769	0.790
.C04D00Q12	0.601	0.040	15.031	0.000	0.601	0.618
.R_C08D00Q3	0.473	0.036	13.053	0.000	0.473	0.486
.C08D00Q4	0.538	0.039	13.867	0.000	0.538	0.552
.R_C08D00Q9	0.625	0.043	14.661	0.000	0.625	0.642
.R_C08D00Q10	0.565	0.040	14.147	0.000	0.565	0.581
C04	0.355	0.049	7.305	0.000	1.000	1.000
C08	0.501	0.057	8.860	0.000	1.000	1.000

## Refinement of Models's CFI

Sequential Action	Reasoning	CFI			
		ML1	ML3	ML4	ML5
<b>Initial</b>		.983	.847	.889	.947
<b>Remove R_C12D00Q6</b>	Std.all = .30		.852		
<b>Remove R_C09D00Q9</b>	Std.all = .37 Note: C09 left with 3 items		.856		
<b>Remove C11 from ML3</b>	C13 =~ C11D02Q1, MI = 63.807		.875	.895	
<b>Remove C11D02Q1</b>	After removing C11D02Q1, the EFA result of predicted latent scores shows that C11 doesn't belong to ML3 anymore (cut-off .40) and appears only in ML4. Removing C11 from ML3 makes its CFI higher than removing only C11D02Q1 from ML3.				
<b>Add C03D01Q5 ~~ C03D01Q6</b>	MI = 50.811		.880		
<b>Remove C14D00Q15</b>	C13 =~ C14D00Q15, MI = 32.517		.884		
<b>Remove C08 from ML3</b>	C13 =~ R_C08D00Q10, MI 31.208		.898		.957
<b>Remove R_C08D00Q10</b>	After removal R_C08D00Q10, the EFA result of predicted latent scores shows that C08 doesn't				



belong to ML3 anymore (cut-off .40) and appears only in ML5.

Removing C08 from ML3 makes its CFI higher than removing only R\_C08D00Q10 from ML3.

<b>Remove C01D05Q11</b>	C09 =~ C01D05Q11, MI=29.598	.901	
<b>Remove C10D00Q1</b>	C07 =~ C10D00Q1, MI = 29.451 Note: C07 left with 3 items	.905	
<b>Remove C13D00Q7</b>	C10 =~ C13D00Q7, MI = 31.650	.908	
<b>Remove C15D00Q12</b>	C10 =~ C15D00Q12, MI = 26.284	.915	
<b>Remove C15D00Q8</b>	C17 =~ C15D00Q8, MI = 62.157 Note: C15 left with 3 items	.921	
<b>Remove C03D01Q6</b>	C10 =~ C03D01Q6, MI = 21.121 Due to this removal, C03D01Q5 ~~ C03D01Q6 has to be removed too.	.925	
<b>Remove C03D01Q5</b>	C10 =~ C03D01Q5, MI = 23.916	.926	
<b>Remove R_C02D00Q15</b>	C13 =~ R_C02D00Q15, MI = 16.582 Note: C02 left with 3 items	.929	
<b>Remove R_C13D00Q3</b>	C02D00Q8 ~~ R_C13D00Q3 MI = 15.857 Note: C13 left with 3 items	.932	
<b>Remove C03D02Q5</b>	C10 =~ C03D02Q5, MI = 15.509 Note: C03 left with 3 items	.937	
<b>Remove C17D00Q8</b>	C15 =~ C17D00Q8, MI = 13.989	.940	
<b>Add C17D00Q9 ~~ C17D00Q10</b>	MI = 12.818	.942	
<b>Add C12D00Q0 ~~ C12D00Q1</b>	MI = 12.249	.944	
<b>Remove R_C14D00Q13</b>	C13 =~ R_C14D00Q13, MI = 11.597 Note: C14 left with 3 items	.947	
<b>Remove C01D05Q12</b>	C01D05Q12 ~~ C03D01Q7, MI = 10.797	.948	
<b>Remove C10D00Q10</b>	C10D00Q10 ~~ R_C15D00Q15, MI = 10.698	.953	
<b>Add C16D00Q11 ~~ C16D00Q16</b>	MI = 75.460	.906	
<b>Remove C05D00Q18</b>	C18D01 =~ C05D00Q18, MI 34.048	.910	
<b>Remove C11D02Q3</b>	C18D01 =~ C11D02Q3, MI = 43.704	.914	
<b>Remove C11 from ML4</b>	C18D01 =~ C11D02Q8, MI 27.450	.944	.927
<b>Move back C11 to ML3 and Remove C11D02Q8</b>	After removal C11D02Q8 from ML4, the EFA result of predicted latent scores shows that C11 doesn't belong to ML4 anymore (cut-off .40) and appears only in ML3. Removing C11 from ML4 makes its CFI higher than removing only C11D02Q8 from ML4.		
<b>Add C11D01Q9 ~~ C11D01Q11</b>	MI = 25.676	.948	
<b>Remove C11D01Q6</b>	C03 =~ C11D01Q6, MI=19.682 Note: C11 is combination of dimensions C11D01 (left with 4 items) and C11D02 (left with 2 items). For the sake of item variation, no more removal from C11D02	.950	
<b>Add C11D01Q9 ~~ C11D01Q10</b>	MI = 13.502 Note: Although C15 =~ C11D01Q11 MI = 14.517, but removing C11D01Q11 yields a non-positive covariance matrix error	.951	
<b>Remove C06D01Q8</b>	C06D01Q8 ~~ C19D00Q26 22.453 Note: Removing C06D01Q8 yields higher CFI than removing C19D00Q26 Note: C06 left with 3 items	.935	

<b>Remove C19D00Q3</b>	C18D01 =~ C19D00Q3, MI = 19.249	.939
<b>Remove C16D00Q16</b>	C18D03 =~ C16D00Q16, MI = 21.067	.944
<b>Remove C16D00Q11</b>	C18D03 =~ C16D00Q11, MI = 17.239 Note: C16 left with 3 items	.947
<b>Remove R_C05D00Q3</b>	R_C05D00Q3 ~~ R_C06D01Q6, MI = 17.433	.959
<b>Add R_C14D00Q13 and R_C13D00Q3</b>	This has to be done because the cronbach's alpha score for C13 and C14 with 3 items are < .60 (unacceptable)	.946
<b>C14D00Q10 ~~ C14D00Q16</b>		.947
<b>C07D00Q11 ~~ R_C07D00Q15</b>	MI = 5.457	.947
<b>C11D01Q9 ~~ C11D02Q7</b>	MI = 5.325	.947
<b>C11D01Q11 ~~ C11D02Q7</b>	MI = 4.690	.948
<b>C07D00Q0 ~~ R_C07D00Q15</b>	MI = 4.648	.948
<b>C11D01Q10 ~~ C11D02Q7</b>	MI = 4.500	.949
<b>R_C13D00Q15 ~~ R_C13D00Q3</b>	MI = 3.649	.949
<b>C14D00Q10 ~~ R_C14D00Q13</b>	MI = 3.903	.950
<b>C11D01Q10 ~~ C11D02Q4</b>	MI = 3.534	.950
<b>C11D01Q10 ~~ C11D01Q11</b>	MI = 3.044	.951

Note: MI = modification indices; operations in MI: “=~” (i.e. this item should be assigned to this construct) and “~~” (i.e. their residual errors should be correlate with), std.all = standardized factor loading score

## Four Judges Decisions

### ML1

#### *C01D01 Human-Like Appearance*

Definition: The extent to which a user believes that the social agent appears like a human

No.	ITEMID	ITEMQ
1.	C01D01Q3	[The agent]'s appearance is human
2.	C01D01Q10	[The agent] has the appearance of a human
3.	C01D01Q13	[The agent] has a human-like outside
4.	C01D01Q15	[The agent]'s appearance makes me think of a human

Decision:

Four judges decided to keep the remaining items.

#### *C01D02 Human-Like Behavior*

Definition: The extent to which a user believes that the social agent behaves like a human

No.	ITEMID	ITEMQ
1.	C01D02Q7	A human would behave like [the agent]
2.	C01D02Q10	[The agent]'s manners are consistent with that of people
3.	C01D02Q0	[The agent] behavior makes me think of human behavior
4.	C01D02Q1	[The agent] behaves like a real person

5.	C01D02Q9	[The agent] has a human-like manner
----	----------	-------------------------------------

Decision:

Four judges decided to keep the remaining items.

### *C01D03 Natural Appearance*

Definition: The extent to which a user believes that the social agent's appearance could exist in or be derived from nature

No.	ITEMID	ITEMQ
1.	C01D03Q7	[The agent] appears like something that could exist in nature
2.	C01D03Q9	[The agent] has a natural physique
3.	C01D03Q10	[The agent]'s resemblance has an organic origin
4.	C01D03Q11	[The agent] seems natural from its outward appearance
5.	C01D03Q12	How [the agent] is represented is realistic

Decision:

Four judges decided to keep the remaining items.

### *C01D04 Natural Behavior*

Definition: The extent to which a user believes that the social agent's behaviour could exist in or be derived from nature

No.	ITEMID	ITEMQ
1.	C01D04Q0	[The agent] is alive
2.	C01D04Q13	[The agent] acts naturally
3.	C01D04Q15	[The agent] reacts like a living organism

Decision:

Four judges decided to keep the remaining items.

### *ML3*

### *C01D05 Agent's Appearance Suitability*

Definition: The extent to which the agent's appearance is suitable for its role

No.	ITEMID	ITEMQ
1.	C01D05Q2	[The agent]'s appearance is appropriate
2.	C01D05Q9	[The agent]'s physique is suitable for its role
<del>3.</del>	<del>C01D05Q11</del>	<del>[The agent]'s appearance is functional</del>
<del>4.</del>	<del>C01D05Q12</del>	<del>[The agent]'s physique is fit for purpose</del>
5.	C01D05Q0	[The agent]'s appearance was suitable

Decision:

Four judges agreed to remove C01D05Q11 because the term of 'functional' referring to an appearance might be problematic. The judges also agreed to remove C01D05Q12 because the meaning of the item has been represented by (or it has a similar meaning with) C01D05Q09.

### *C02 Agent's Usability*

Definition: The extent to which a user believes that using an agent will be free from effort (future process)

No.	ITEMID	ITEMQ
1.	C02D00Q1	[The agent] is easy to use
2.	C02D00Q2	Learning to work with [the agent] is easy
3.	C02D00Q8	Learning how to communicate with [the agent] is quick

<del>4.</del>	<del>C02D00Q15</del>	<del>[R] [The agent] is difficult to use</del>
---------------	----------------------	--

Decision:

Four judges agreed to remove C02D00Q15 as its meaning (in reverse) has been represented by C02D00Q1.

### *C03 Performance*

Definition: The extent to which a task was well performed (past performance)

No.	ITEMID	ITEMQ
1.	C03D01Q7	[The agent] does its task well
<del>2.</del>	<del>C03D01Q5</del>	<del>[The agent] enhances [my / the user's] effectiveness on the task</del>
<del>3.</del>	<del>C03D01Q6</del>	<del>[The agent] allows [me / the user] to get [my / the user's] task done more quickly</del>
4.	C03D01Q12	[The agent] does not hinder [me / the user]
<del>5.</del>	<del>C03D02Q5</del>	<del>[I am / The user is] able to carry out the task well</del>
6.	C03D02Q10	[I am / The user is] capable of succeeding with [the agent]

Decision:

Four judges agreed to remove C03D01Q5 and C03D01Q6, because it might be difficult to measure the effectiveness and the time to do a certain task. The judges also agreed to remove C02D01Q5 because (as mentioned before) it might not be relevant to measure how well a user did. As IVA researchers, we are interested in the agent's performance (in combination with the user) but not only the user.

### *C07 User Acceptance of the Agent*

Definition: The willingness of the user to interact with the agent

No.	ITEMID	ITEMQ
1.	C07D00Q0	[I / The user] will use [the agent] again in the future
2.	C07D00Q11	[I / The user] can see [myself / themselves] using [the agent] in the future
<del>3.</del>	<del>C07D00Q13</del>	<del>[The agent] is acceptable</del>
4.	C07D00Q15	[R] [I oppose / The user opposes] further interaction with [the agent]
<del>5.</del>	<del>C07D00Q14</del>	<del>[I am / The user is] positive about future interactions with [the agent]</del>

Decision:

Four judges agreed to remove C07D00Q13 as the term 'acceptable' might be ambiguous and it doesn't show the willingness of the user to interact with the agent. The judges also agreed to remove C07D00Q13 as the meaning has been represented by C07D00Q11.

### *C09 User's Engagement*

Definition: The extent to which the user feels involved in the interaction with the agent

No.	ITEMID	ITEMQ
1.	C09D00Q4	[I / The user] was concentrated during the interaction with [the agent]
2.	C09D00Q10	The interaction captured [my / the user's] attention
3.	C09D00Q1	[I / The user] was alert during the interaction with [the agent]
<del>4.</del>	<del>C09D00Q9</del>	<del>[R] [I / The user] was looking for distractions during the interaction with [the agent]</del>

Decision:

Four judges agreed to remove C09D00Q9 because the item seems implicitly blaming the fault of the user during the interaction.

### *C10 User's Trust*

Definition: The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)

No.	ITEMID	ITEMQ
<del>1.</del>	<del>C10D00Q1</del>	<del>[I am / The user is] confident that the information provided by [the agent] is trustworthy</del>
2.	C10D00Q6	[The agent] always gives good advice
<del>3.</del>	<del>C10D00Q10</del>	<del>[The agent] is an expert in the topic discussed</del>
4.	C10D00Q16	[The agent] acts truthfully
5.	C10D00Q18	[I / The user] can rely on [the agent]

Decision:

Four judges agreed to remove C10D00Q1 and C10D00Q10 because the agent's domain or task might not include providing an information or discussing any topic.

### *C11 User-Agent Alliance*

Definition: The extent to which a beneficial association is formed

No.	ITEMID	ITEMQ
<del>1.</del>	<del>C11D01Q6</del>	<del>[The agent] appreciates [my / the user's] efforts</del>
2.	C11D01Q9	[The agent] and [I / the user] have a strategic alliance
3.	C11D01Q10	Collaborating with [the agent] is like a joint venture
4.	C11D01Q11	[The agent] joins [me / the user] for mutual benefit
5.	C11D01Q14	[The agent] can collaborate in a productive way
<del>6.</del>	<del>C11D02Q1</del>	<del>[I / The user] can understand [the agent]</del>
<del>7.</del>	<del>C11D02Q3</del>	<del>[The agent] cares about [me / the user]</del>
8.	C11D02Q4	[The agent] and [I / the user] are in sync with each other
9.	C11D02Q7	[The agent] understands [me / the user]
<del>10.</del>	<del>C11D02Q8</del>	<del>[The agent] and [I / the user] are close</del>

Decision:

Four judges agreed to C11D01Q6 and C11D01Q3 because the items measure the interaction in one direction: from the agent to the user, which might not appropriate with the construct's definition. The judges also agreed to remove C11D02Q8 as the term 'close' might be confusing: is it measuring the distance literary or emotionally? Further, the judges also agree to remove C11D02Q1 as the user might see it as an evaluation of themselves, while the other items are an evaluation about the agent and/or the interaction.

### *C12 Agent's Attentiveness*

Definition: The extent to which the user believes that the agent is aware of and has attention for the user

No.	ITEMID	ITEMQ
1.	C12D00Q0	[The agent] remains focused on [me / the user] throughout the interaction
2.	C12D00Q13	[The agent] is attentive
3.	C12D00Q1	[I / The user] receives [the agent]'s full attention throughout the interaction
<del>4.</del>	<del>C12D00Q6</del>	<del>[R] [The agent] does not notice what happens around it</del>

Decision:

Four judges agreed to remove C12D00Q6 because the item doesn't measure the agent's attentiveness for the user.

### *C13 Agent's Coherence*

Definition: The extent to which the agent is perceived as being logical and consistent

No.	ITEMID	ITEMQ
1.	C13D00Q3	[R] [The agent]'s behavior does not make sense
<del>2.</del>	<del>C13D00Q7</del>	<del>[The agent] is logical</del>
3.	C13D00Q11	[R] [The agent]'s behavior is irrational
4.	C13D00Q6	[R] [The agent] is inconsistent
5.	C13D00Q15	[R] [The agent] appears confused

Decision:

Four judges agreed to remove C13D00Q7 because the item doesn't mention specifically in what way the agent is logical. It might be not related to its behavior.

#### *C14 Agent's Intentionality*

Definition: The extent to which the agent is perceived as being deliberate and has deliberations

No.	ITEMID	ITEMQ
1.	C14D00Q0	[The agent] acts intentionally
2.	C14D00Q10	[The agent] knows what it is doing
3.	C14D00Q13	[R] [The agent] has no clue of what it is doing
<del>4.</del>	<del>C14D00Q15</del>	<del>I can understand [the agent]'s reasoning</del>
5.	C14D00Q16	[The agent] can make its own decision

Decision:

Four judges agreed to remove C14D00Q15 because as the user might see it as an evaluation of themselves, while the other items are an evaluation about the agent. The judges agreed to keep C14D00Q13 because the item can represent the definition of the construct.

#### *C15 Attitude*

Definition: A favourable or unfavourable evaluation toward the interaction with the agent

No.	ITEMID	ITEMQ
1.	C15D00Q10	[I see / The user sees] the interaction with [the agent] as something positive
2.	C15D00Q11	[I view / The user views] the interaction as something favorable
<del>3.</del>	<del>C15D00Q8</del>	<del>Interacting with [the agent] is rewarding</del>
<del>4.</del>	<del>C15D00Q12</del>	<del>Engaging with [the agent] is a good thing</del>
5.	C15D00Q15	[R] [I think / The user thinks] negatively of the interaction with [the agent]

Decision:

Four judges agreed to remove C15D00Q8 because it might be difficult to measure whether or not the interaction is rewarding or what kind reward the user receives from the interaction with the agent. The judges also agreed to remove C15D00Q12 because its meaning has been represented by C15D00Q10 and C15D00Q11.

#### *C17 Interaction Impact on Self-Image*

Definition: How the user believes others perceive the user because of the interaction with the agent

No.	ITEMID	ITEMQ
1.	C17D00Q2	[My / The user's] friends would recommend [me / them] to use [the agent]
2.	C17D00Q3	Others would encourage [me / the user] to use [the agent]
<del>3.</del>	<del>C17D00Q8</del>	<del>[I feel / The user feels] cool when others see [me / them] interacting with [the agent]</del>
4.	C17D00Q9	[The agent] makes [me / the user] look good
5.	C17D00Q10	People would look favorably at [me / the user] because of [my / their] interaction with [the agent]

Decision:

Four judges agreed to remove C17D00Q8 because using the word 'cool' in the item might be not appropriate for some users.

#### *ML4*

#### *C05 Agent's Sociability*

Definition: The agent's quality or state of being sociable

No.	ITEMID	ITEMQ
<del>1.</del>	<del>C05D00Q3</del>	<del>[R] interacting with [the agent] is awkward</del>
2.	C05D00Q6	[The agent] can easily mix socially
3.	C05D00Q7	It is easy to mingle with [the agent]
4.	C05D00Q1	[The agent] interacts socially with [me / the user]
<del>5.</del>	<del>C05D00Q18</del>	<del>[The agent] is empathic</del>

Decision:

Four judges agreed to remove C05D00Q3 and C05D0018 because perhaps being 'awkward' or 'empathic' does not mean 'sociable' to some users.

### *C06 Agent's Personality*

Definition: The combination of characteristics or qualities that form an individual's distinctive character

#### *C06D01 Agent's Personality Presence*

Definition: To what extent the user believes that the agent has a personality

No.	ITEMID	ITEMQ
1.	C06D01Q1	[The agent] has a distinctive character
2.	C06D01Q6	[R] [The agent] is characterless
<del>3.</del>	<del>C06D01Q8</del>	<del>[The agent] has a coherent identity</del>
4.	C06D01Q11	[The agent] is an individual

Decision:

Four judges agreed to remove C06D01Q8 because the words 'coherent identity' might be hard to understand.

### *C16 Social Presence*

Definition: The degree to which the user perceives the presence of a social entity in the interaction

No.	ITEMID	ITEMQ
<del>1.</del>	<del>C16D00Q11</del>	<del>During the interaction [I perceive / the user perceives] [the agent] as a social entity</del>
2.	C16D00Q12	[The agent] has a social presence
3.	C16D00Q13	[The agent] is a social entity
<del>4.</del>	<del>C16D00Q16</del>	<del>[I behave / The user behaves] as if [the agent] is a social entity</del>
5.	C16D00Q17	[I have / The user has] the same social presence as [the agent]

Decision:

Four judges agreed to remove C16D00Q11 and C16D00Q16 because as the user might see it as an evaluation of themselves, while the other items are an evaluation about the agent.

### *C18D01 Agent's Emotional Intelligence Presence*

Definition: To what extent the user believes that the agent has an emotional experience and can convey its emotions

No.	ITEMID	ITEMQ
1.	C18D01Q2	[The agent] is emotional
2.	C18D01Q3	[The agent] experiences emotions
3.	C18D01Q5	[R] [The agent] is emotionless
4.	C18D01Q8	[The agent] can express its feelings
5.	C18D01Q14	[R] [The agent] cannot experience emotions

Decision:

Four judges decided to keep the remaining items.

### C18D03 User's Emotion Presence

Definition: To what extent the user believes that his/her emotional state is caused by the interaction or the agent

No.	ITEMID	ITEMQ
1.	C18D03Q0	[The agent]'s attitude influence how [I feel / the user feels]
2.	C18D03Q1	[I am / The user is] influenced by [the agent]'s moods
3.	C18D03Q2	The emotions [I feel / the user feels] during the interaction are caused by [the agent]
4.	C18D03Q12	[My / The user's] interaction with [the agent] gives [me / them] an emotional sensation

Decision:

Four judges decided to keep the remaining items.

### C19 User-Agent Interplay

Definition: The extent to which the user and the agent have an effect on each other

No.	ITEMID	ITEMQ
<del>1.</del>	<del>C19D00Q3</del>	<del>[The agent]'s emotions change to what [I do / the user does]</del>
2.	C19D00Q7	[My / The user's] emotions influence the mood of the interaction
3.	C19D00Q14	[The agent] reciprocates [my / the user's] actions
4.	C19D00Q26	[The agent]'s and [my / the user's] behaviors are in direct response to each other's behavior
5.	C19D00Q28	[The agent]'s and [my / the user's] emotions change to what [we / they] do to each other

Decision:

Four judges agreed to remove C19D00Q3 as the meaning has been represented by C19D00Q28 and C19D00Q28 can better represent the definition of the construct than C19D00Q3

### ML5

#### C04 Agent's Likeability

Definition: The agent's qualities that bring about a favourable regard

No.	ITEMID	ITEMQ
1.	C04D00Q1	[The agent]'s appearance is pleasing
2.	C04D00Q10	I like [the agent]
3.	C04D00Q11	[R] I dislike [the agent]
4.	C04D00Q4	[The agent] is cooperative
5.	C04D00Q12	I want to hang out with [the agent]

Decision:

Four judges decided to keep the remaining items.

#### C08 Agent's Enjoyability

Definition: The extent to which a user finds interacting with the agent enjoyable

Sequential Action	Reasoning	CFI			
		ML1	ML3	ML4	ML5
Initial		.983	.951	.959	.957
Include C08D00Q0	Previously C08D00Q0 was removed (see Appendix H section Establishing Convergent Models subsection ML3).				.958



No.	ITEMID	ITEMQ
1.	C08D00Q3	[R] [The agent] is boring
2.	C08D00Q4	It is interesting to interact with [the agent]
3.	<del>C08D00Q10</del>	<del>[R] [The agent] is terrible to cope with</del>
4.	C08D00Q0	[I enjoy / The user enjoys] interacting with [the agent]
5.	C08D00Q9	[R] [The agent] is unpleasant to deal with

Decision:

Four judges decided to keep C08D00Q0 because it seems the item is the only item that can represent the definition of the construct fully. On the other hands, the four judges agreed to remove C08D00Q10 as the words 'terrible to cope with' might difficult to understand and measure.

## CFA Results of Four EFA-based Models

EFA result of the predicted latent constructs (Final Models):

```
Factor Analysis using method = ml
Call: fa(r = data_cor, nfactors = nfactors, rotate = "Promax", SMC = FALSE,
max.iter = 100, fm = "ml")
Standardized loadings (pattern matrix) based upon correlation matrix
      item  ML3  ML2  ML4  ML1  h2  u2  com
C03      7  0.99 -0.06  0.04 -0.01 0.94 0.0621 1.0
C13     13  0.93 -0.26  0.04  0.05 0.71 0.2876 1.2
C12     12  0.91  0.06 -0.01 -0.09 0.80 0.1981 1.0
C07      8  0.88 -0.03 -0.08  0.10 0.79 0.2107 1.0
C02      6  0.85  0.01  0.01 -0.04 0.70 0.2969 1.0
C09      9  0.84  0.09 -0.17 -0.02 0.63 0.3657 1.1
C15     15  0.83  0.00 -0.14  0.14 0.72 0.2839 1.1
C17     16  0.83  0.07  0.00  0.08 0.84 0.1582 1.0
C11     11  0.82  0.15  0.12 -0.09 0.88 0.1187 1.1
C10     10  0.81  0.03  0.15 -0.03 0.81 0.1874 1.1
C14     14  0.75  0.12  0.19 -0.09 0.81 0.1945 1.2
C01D05    5  0.68 -0.13  0.03  0.16 0.53 0.4737 1.2
C16     19 -0.03  0.99  0.01  0.02 0.97 0.0313 1.0
C05     17  0.03  0.96  0.02  0.00 0.98 0.0179 1.0
C06D01   18 -0.09  0.92  0.05  0.08 0.89 0.1114 1.0
C18D01   20 -0.20  0.79  0.10  0.09 0.63 0.3673 1.2
C18D03   21  0.25  0.71 -0.03 -0.06 0.69 0.3114 1.3
C19     22  0.26  0.70 -0.03 -0.09 0.68 0.3234 1.3
C01D02    2  0.04  0.05  0.91  0.00 0.94 0.0617 1.0
C01D04    4  0.02  0.09  0.87  0.08 0.96 0.0352 1.0
C01D01    1  0.02 -0.02  0.84 -0.08 0.65 0.3525 1.0
C01D03    3  0.00  0.05  0.82  0.05 0.76 0.2354 1.0
C04     23  0.17  0.08  0.05  0.81 0.98 0.0202 1.1
C08     24  0.22  0.07  0.03  0.80 0.99 0.0061 1.2

      ML3  ML2  ML4  ML1
SS loadings      9.25 4.89 3.42 1.73
Proportion Var    0.39 0.20 0.14 0.07
Cumulative Var    0.39 0.59 0.73 0.80
Proportion Explained 0.48 0.25 0.18 0.09
Cumulative Proportion 0.48 0.73 0.91 1.00

With factor correlations of
      ML3  ML2  ML4  ML1
ML3 1.00 0.60 0.54 0.59
ML2 0.60 1.00 0.69 0.47
ML4 0.54 0.69 1.00 0.40
ML1 0.59 0.47 0.40 1.00

Mean item complexity = 1.1
Test of the hypothesis that 4 factors are sufficient.
```

The degrees of freedom for the null model are 276 and the objective function was 57.26  
The degrees of freedom for the model are 186 and the objective function was 23.59

The root mean square of the residuals (RMSR) is 0.04  
The df corrected root mean square of the residuals is 0.05

Fit based upon off diagonal values = 1

Measures of factor score adequacy

	ML3	ML2	ML4	ML1
Correlation of (regression) scores with factors	0.99	0.99	0.99	1.00
Multiple R square of scores with factors	0.98	0.99	0.98	0.99
Minimum correlation of possible factor scores	0.96	0.98	0.95	0.98

## ML1

### Final Model:

```

C01D01 =~ C01D01Q10 + C01D01Q13 + C01D01Q15 + C01D01Q3
C01D02 =~ C01D02Q10 + C01D02Q0 + C01D02Q1 + C01D02Q9 + C01D02Q7
C01D03 =~ C01D03Q9 + C01D03Q11 + C01D03Q10 + C01D03Q12 + C01D03Q7
C01D04 =~ C01D04Q13 + C01D04Q15 + C01D04Q0

```

### CFA result:

lavaan 0.6-8 ended normally after 44 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	40
Number of observations	532

#### Model Test User Model:

Test statistic	171.190
Degrees of freedom	113
P-value (Chi-square)	0.000

#### Model Test Baseline Model:

Test statistic	3527.588
Degrees of freedom	136
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.983
Tucker-Lewis Index (TLI)	0.979

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-11034.087
Loglikelihood unrestricted model (H1)	-10948.492
Akaike (AIC)	22148.174
Bayesian (BIC)	22319.240
Sample-size adjusted Bayesian (BIC)	22192.268

#### Root Mean Square Error of Approximation:

RMSEA	0.031
90 Percent confidence interval - lower	0.021
90 Percent confidence interval - upper	0.040
P-value RMSEA <= 0.05	1.000

#### Standardized Root Mean Square Residual:

SRMR	0.033
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 =~						
C01D01Q10	1.000				0.769	0.779
C01D01Q13	0.912	0.057	16.097	0.000	0.702	0.711
C01D01Q15	0.944	0.057	16.689	0.000	0.726	0.736
C01D01Q3	0.937	0.057	16.561	0.000	0.721	0.730
C01D02 =~						
C01D02Q10	1.000				0.590	0.597
C01D02Q0	1.229	0.093	13.172	0.000	0.725	0.734
C01D02Q1	1.307	0.095	13.708	0.000	0.771	0.781
C01D02Q9	1.337	0.096	13.898	0.000	0.788	0.799
C01D02Q7	1.081	0.090	12.038	0.000	0.637	0.646
C01D03 =~						
C01D03Q9	1.000				0.624	0.632
C01D03Q11	1.156	0.088	13.075	0.000	0.722	0.731
C01D03Q10	0.734	0.080	9.125	0.000	0.458	0.464
C01D03Q12	0.950	0.084	11.320	0.000	0.593	0.601
C01D03Q7	0.867	0.082	10.514	0.000	0.541	0.548
C01D04 =~						
C01D04Q13	1.000				0.738	0.747
C01D04Q15	0.911	0.062	14.766	0.000	0.672	0.681
C01D04Q0	0.420	0.062	6.735	0.000	0.310	0.314

Covariances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 ~~						
C01D02	0.330	0.035	9.330	0.000	0.728	0.728
C01D03	0.370	0.039	9.613	0.000	0.772	0.772
C01D04	0.352	0.039	9.029	0.000	0.620	0.620
C01D02 ~~						
C01D03	0.252	0.030	8.320	0.000	0.686	0.686
C01D04	0.395	0.040	9.961	0.000	0.908	0.908
C01D03 ~~						
C01D04	0.375	0.039	9.555	0.000	0.815	0.815

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D01Q10	0.382	0.031	12.180	0.000	0.382	0.393
.C01D01Q13	0.481	0.035	13.600	0.000	0.481	0.494
.C01D01Q15	0.447	0.034	13.177	0.000	0.447	0.459
.C01D01Q3	0.454	0.034	13.276	0.000	0.454	0.467
.C01D02Q10	0.626	0.041	15.169	0.000	0.626	0.643
.C01D02Q0	0.448	0.032	13.874	0.000	0.448	0.461
.C01D02Q1	0.380	0.029	13.034	0.000	0.380	0.390
.C01D02Q9	0.353	0.028	12.612	0.000	0.353	0.362
.C01D02Q7	0.567	0.038	14.834	0.000	0.567	0.583
.C01D03Q9	0.584	0.042	14.039	0.000	0.584	0.600
.C01D03Q11	0.453	0.037	12.293	0.000	0.453	0.465
.C01D03Q10	0.764	0.050	15.393	0.000	0.764	0.785
.C01D03Q12	0.622	0.043	14.396	0.000	0.622	0.639
.C01D03Q7	0.681	0.046	14.863	0.000	0.681	0.699
.C01D04Q13	0.430	0.037	11.466	0.000	0.430	0.441
.C01D04Q15	0.522	0.039	13.349	0.000	0.522	0.537
.C01D04Q0	0.878	0.055	16.007	0.000	0.878	0.901
C01D01	0.591	0.059	10.068	0.000	1.000	1.000
C01D02	0.348	0.048	7.215	0.000	1.000	1.000
C01D03	0.389	0.052	7.454	0.000	1.000	1.000
C01D04	0.544	0.060	9.092	0.000	1.000	1.000

C01D01 C01D02 C01D03 C01D04

C01D01	1.000			
C01D02	0.728	1.000		
C01D03	0.772	0.686	1.000	
C01D04	0.620	0.908	0.815	1.000

### ML3

#### Final Model:

```

C01D05 =~ C01D05Q0 + C01D05Q2 + C01D05Q9
C02 =~ C02D00Q1 + C02D00Q2 + C02D00Q8
C03 =~ C03D01Q7 + C03D01Q12 + C03D02Q10
C07 =~ C07D00Q0 + C07D00Q11 + R_C07D00Q15
C09 =~ C09D00Q4 + C09D00Q10 + C09D00Q1
C10 =~ C10D00Q6 + C10D00Q16 + C10D00Q18
C11 =~ C11D01Q9 + C11D01Q10 + C11D01Q14 + C11D01Q11 + C11D02Q4 + C11D02Q7
C12 =~ C12D00Q0 + C12D00Q1 + C12D00Q13
C13 =~ R_C13D00Q11 + R_C13D00Q6 + R_C13D00Q15 + R_C13D00Q3
C14 =~ C14D00Q0 + C14D00Q10 + C14D00Q16 + R_C14D00Q13
C15 =~ C15D00Q10 + C15D00Q11 + R_C15D00Q15
C17 =~ C17D00Q2 + C17D00Q3 + C17D00Q9 + C17D00Q10
C17D00Q9 ~~ C17D00Q10
C12D00Q0 ~~ C12D00Q1
C11D01Q9 ~~ C11D01Q11
C11D01Q9 ~~ C11D01Q10
C14D00Q10 ~~ C14D00Q16
C07D00Q11 ~~ R_C07D00Q15
C11D01Q9 ~~ C11D02Q7
C11D01Q11 ~~ C11D02Q7
C07D00Q0 ~~ R_C07D00Q15
C11D01Q10 ~~ C11D02Q7
C14D00Q10 ~~ R_C14D00Q13
R_C13D00Q15 ~~ R_C13D00Q3
C11D01Q10 ~~ C11D02Q4
C11D01Q10 ~~ C11D01Q11

```

#### CFA result:

```

lavaan 0.6-8 ended normally after 117 iterations

Estimator ML
Optimization method NLMINB
Number of model parameters 164

Number of observations 532

Model Test User Model:

Test statistic 1111.491
Degrees of freedom 739
P-value (Chi-square) 0.000

Model Test Baseline Model:

Test statistic 8401.871
Degrees of freedom 861
P-value 0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.951
Tucker-Lewis Index (TLI) 0.942

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -27761.635
Loglikelihood unrestricted model (H1) -27205.889

```

Akaike (AIC)	55851.270
Bayesian (BIC)	56552.639
Sample-size adjusted Bayesian (BIC)	56032.054

Root Mean Square Error of Approximation:

RMSEA	0.031
90 Percent confidence interval - lower	0.027
90 Percent confidence interval - upper	0.034
P-value RMSEA <= 0.05	1.000

Standardized Root Mean Square Residual:

SRMR	0.038
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D05 =~						
C01D05Q0	1.000				0.634	0.643
C01D05Q2	1.089	0.092	11.812	0.000	0.691	0.700
C01D05Q9	1.105	0.093	11.894	0.000	0.701	0.710
C02 =~						
C02D00Q1	1.000				0.764	0.774
C02D00Q2	0.833	0.064	13.085	0.000	0.636	0.645
C02D00Q8	0.807	0.063	12.718	0.000	0.616	0.625
C03 =~						
C03D01Q7	1.000				0.695	0.704
C03D01Q12	0.771	0.067	11.558	0.000	0.536	0.543
C03D02Q10	0.974	0.067	14.446	0.000	0.677	0.686
C07 =~						
C07D00Q0	1.000				0.752	0.762
C07D00Q11	0.979	0.062	15.893	0.000	0.736	0.746
R_C07D00Q15	0.668	0.068	9.775	0.000	0.502	0.509
C09 =~						
C09D00Q4	1.000				0.617	0.626
C09D00Q10	1.157	0.095	12.140	0.000	0.714	0.724
C09D00Q1	1.029	0.091	11.313	0.000	0.635	0.644
C10 =~						
C10D00Q6	1.000				0.550	0.558
C10D00Q16	1.137	0.108	10.550	0.000	0.625	0.634
C10D00Q18	1.277	0.113	11.270	0.000	0.703	0.712
C11 =~						
C11D01Q9	1.000				0.495	0.502
C11D01Q10	1.276	0.118	10.819	0.000	0.632	0.639
C11D01Q14	1.200	0.124	9.706	0.000	0.594	0.602
C11D01Q11	0.886	0.095	9.309	0.000	0.438	0.444
C11D02Q4	1.208	0.124	9.727	0.000	0.598	0.606
C11D02Q7	1.337	0.133	10.038	0.000	0.662	0.671
C12 =~						
C12D00Q0	1.000				0.611	0.619
C12D00Q1	0.974	0.079	12.310	0.000	0.595	0.603
C12D00Q13	1.182	0.096	12.328	0.000	0.722	0.732
C13 =~						
R_C13D00Q11	1.000				0.611	0.620
R_C13D00Q6	0.793	0.085	9.281	0.000	0.485	0.491
R_C13D00Q15	0.806	0.093	8.703	0.000	0.493	0.499
R_C13D00Q3	1.246	0.103	12.127	0.000	0.762	0.772
C14 =~						
C14D00Q0	1.000				0.515	0.522
C14D00Q10	1.370	0.129	10.634	0.000	0.705	0.715
C14D00Q16	0.790	0.105	7.504	0.000	0.407	0.412
R_C14D00Q13	1.156	0.119	9.691	0.000	0.595	0.603

C15 =~						
C15D00Q10	1.000				0.782	0.792
C15D00Q11	0.990	0.056	17.575	0.000	0.774	0.784
R_C15D00Q15	0.811	0.057	14.328	0.000	0.634	0.642
C17 =~						
C17D00Q2	1.000				0.696	0.705
C17D00Q3	1.054	0.071	14.847	0.000	0.733	0.743
C17D00Q9	0.663	0.069	9.662	0.000	0.462	0.468
C17D00Q10	0.772	0.069	11.187	0.000	0.537	0.544
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C17D00Q9 ~~						
.C17D00Q10	0.115	0.035	3.337	0.001	0.115	0.160
.C12D00Q0 ~~						
.C12D00Q1	0.118	0.034	3.492	0.000	0.118	0.194
.C11D01Q9 ~~						
.C11D01Q11	0.203	0.037	5.569	0.000	0.203	0.269
.C11D01Q10	0.098	0.033	2.941	0.003	0.098	0.151
.C14D00Q10 ~~						
.C14D00Q16	0.077	0.033	2.370	0.018	0.077	0.125
.C07D00Q11 ~~						
.R_C07D00Q15	-0.108	0.035	-3.068	0.002	-0.108	-0.194
.C11D01Q9 ~~						
.C11D02Q7	-0.040	0.031	-1.292	0.196	-0.040	-0.064
.C11D01Q11 ~~						
.C11D02Q7	0.052	0.032	1.623	0.105	0.052	0.080
.C07D00Q0 ~~						
.R_C07D00Q15	-0.083	0.036	-2.319	0.020	-0.083	-0.152
.C11D01Q10 ~~						
.C11D02Q7	-0.074	0.031	-2.418	0.016	-0.074	-0.133
.C14D00Q10 ~~						
.R_C14D00Q13	0.089	0.036	2.493	0.013	0.089	0.164
.R_C13D00Q15 ~~						
.R_C13D00Q3	-0.067	0.034	-1.953	0.051	-0.067	-0.124
.C11D01Q10 ~~						
.C11D02Q4	-0.058	0.030	-1.942	0.052	-0.058	-0.098
.C11D01Q11	0.053	0.033	1.592	0.111	0.053	0.079
C01D05 ~~						
C02	0.299	0.037	8.165	0.000	0.616	0.616
C03	0.266	0.034	7.810	0.000	0.602	0.602
C07	0.254	0.034	7.522	0.000	0.532	0.532
C09	0.223	0.031	7.222	0.000	0.569	0.569
C10	0.155	0.026	5.956	0.000	0.445	0.445
C11	0.136	0.023	5.887	0.000	0.432	0.432
C12	0.206	0.030	6.863	0.000	0.531	0.531
C13	0.215	0.030	7.112	0.000	0.555	0.555
C14	0.148	0.025	5.843	0.000	0.453	0.453
C15	0.254	0.034	7.428	0.000	0.511	0.511
C17	0.208	0.031	6.699	0.000	0.470	0.470
C02 ~~						
C03	0.374	0.040	9.346	0.000	0.705	0.705
C07	0.358	0.040	9.018	0.000	0.623	0.623
C09	0.279	0.035	7.876	0.000	0.591	0.591
C10	0.236	0.032	7.274	0.000	0.561	0.561
C11	0.244	0.032	7.737	0.000	0.646	0.646
C12	0.314	0.037	8.459	0.000	0.673	0.673
C13	0.252	0.034	7.424	0.000	0.540	0.540
C14	0.253	0.033	7.594	0.000	0.645	0.645
C15	0.333	0.039	8.469	0.000	0.557	0.557
C17	0.326	0.038	8.586	0.000	0.613	0.613
C03 ~~						
C07	0.381	0.040	9.616	0.000	0.729	0.729
C09	0.285	0.035	8.202	0.000	0.664	0.664
C10	0.303	0.035	8.529	0.000	0.791	0.791
C11	0.287	0.034	8.385	0.000	0.833	0.833
C12	0.295	0.035	8.357	0.000	0.694	0.694
C13	0.336	0.038	8.908	0.000	0.791	0.791

C14	0.246	0.032	7.644	0.000	0.687	0.687
C15	0.388	0.040	9.667	0.000	0.714	0.714
C17	0.381	0.039	9.682	0.000	0.788	0.788
C07 ~~						
C09	0.291	0.035	8.255	0.000	0.628	0.628
C10	0.283	0.034	8.218	0.000	0.684	0.684
C11	0.230	0.030	7.628	0.000	0.618	0.618
C12	0.305	0.036	8.475	0.000	0.665	0.665
C13	0.299	0.036	8.369	0.000	0.651	0.651
C14	0.229	0.031	7.310	0.000	0.591	0.591
C15	0.468	0.044	10.746	0.000	0.797	0.797
C17	0.421	0.041	10.174	0.000	0.805	0.805
C09 ~~						
C10	0.130	0.025	5.291	0.000	0.382	0.382
C11	0.176	0.026	6.842	0.000	0.575	0.575
C12	0.278	0.034	8.156	0.000	0.737	0.737
C13	0.185	0.028	6.534	0.000	0.489	0.489
C14	0.142	0.025	5.741	0.000	0.448	0.448
C15	0.316	0.037	8.584	0.000	0.655	0.655
C17	0.244	0.032	7.526	0.000	0.568	0.568
C10 ~~						
C11	0.224	0.030	7.580	0.000	0.824	0.824
C12	0.211	0.029	7.187	0.000	0.626	0.626
C13	0.183	0.027	6.710	0.000	0.545	0.545
C14	0.227	0.030	7.472	0.000	0.800	0.800
C15	0.236	0.032	7.363	0.000	0.549	0.549
C17	0.287	0.034	8.331	0.000	0.748	0.748
C11 ~~						
C12	0.228	0.030	7.640	0.000	0.752	0.752
C13	0.165	0.025	6.660	0.000	0.545	0.545
C14	0.234	0.031	7.562	0.000	0.918	0.918
C15	0.235	0.031	7.651	0.000	0.606	0.606
C17	0.266	0.033	8.161	0.000	0.774	0.774
C12 ~~						
C13	0.232	0.031	7.453	0.000	0.622	0.622
C14	0.235	0.031	7.541	0.000	0.746	0.746
C15	0.302	0.036	8.359	0.000	0.633	0.633
C17	0.259	0.033	7.788	0.000	0.609	0.609
C13 ~~						
C14	0.174	0.027	6.551	0.000	0.553	0.553
C15	0.278	0.035	7.967	0.000	0.581	0.581
C17	0.239	0.032	7.462	0.000	0.561	0.561
C14 ~~						
C15	0.185	0.029	6.323	0.000	0.459	0.459
C17	0.239	0.032	7.573	0.000	0.667	0.667
C15 ~~						
C17	0.383	0.040	9.618	0.000	0.704	0.704
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D05Q0	0.571	0.044	12.864	0.000	0.571	0.587
.C01D05Q2	0.496	0.043	11.555	0.000	0.496	0.510
.C01D05Q9	0.482	0.043	11.269	0.000	0.482	0.495
.C02D00Q1	0.390	0.039	9.976	0.000	0.390	0.401
.C02D00Q2	0.569	0.043	13.372	0.000	0.569	0.584
.C02D00Q8	0.594	0.043	13.682	0.000	0.594	0.610
.C03D01Q7	0.490	0.037	13.162	0.000	0.490	0.504
.C03D01Q12	0.686	0.045	15.194	0.000	0.686	0.705
.C03D02Q10	0.516	0.038	13.552	0.000	0.516	0.529
.C07D00Q0	0.408	0.036	11.219	0.000	0.408	0.419
.C07D00Q11	0.432	0.037	11.786	0.000	0.432	0.444
.R_C07D00Q15	0.721	0.052	13.913	0.000	0.721	0.741
.C09D00Q4	0.593	0.044	13.471	0.000	0.593	0.609
.C09D00Q10	0.464	0.041	11.303	0.000	0.464	0.476
.C09D00Q1	0.570	0.043	13.172	0.000	0.570	0.586
.C10D00Q6	0.671	0.046	14.578	0.000	0.671	0.689
.C10D00Q16	0.583	0.043	13.638	0.000	0.583	0.598
.C10D00Q18	0.480	0.040	11.925	0.000	0.480	0.493

.C11D01Q9	0.729	0.048	15.208	0.000	0.729	0.748
.C11D01Q10	0.577	0.042	13.584	0.000	0.577	0.591
.C11D01Q14	0.621	0.041	14.987	0.000	0.621	0.638
.C11D01Q11	0.781	0.050	15.513	0.000	0.781	0.803
.C11D02Q4	0.616	0.042	14.680	0.000	0.616	0.632
.C11D02Q7	0.536	0.039	13.568	0.000	0.536	0.550
.C12D00Q0	0.600	0.045	13.449	0.000	0.600	0.617
.C12D00Q1	0.620	0.045	13.663	0.000	0.620	0.636
.C12D00Q13	0.452	0.041	11.151	0.000	0.452	0.464
.R_C13D00Q11	0.600	0.044	13.706	0.000	0.600	0.616
.R_C13D00Q6	0.739	0.049	15.029	0.000	0.739	0.759
.R_C13D00Q15	0.731	0.052	14.046	0.000	0.731	0.751
.R_C13D00Q3	0.393	0.043	9.087	0.000	0.393	0.404
.C14D00Q0	0.709	0.047	14.930	0.000	0.709	0.728
.C14D00Q10	0.476	0.046	10.421	0.000	0.476	0.489
.C14D00Q16	0.808	0.052	15.417	0.000	0.808	0.830
.R_C14D00Q13	0.620	0.047	13.163	0.000	0.620	0.637
.C15D00Q10	0.363	0.032	11.182	0.000	0.363	0.372
.C15D00Q11	0.375	0.033	11.450	0.000	0.375	0.385
.R_C15D00Q15	0.572	0.040	14.247	0.000	0.572	0.587
.C17D00Q2	0.490	0.038	12.990	0.000	0.490	0.503
.C17D00Q3	0.436	0.036	12.055	0.000	0.436	0.448
.C17D00Q9	0.761	0.050	15.364	0.000	0.761	0.781
.C17D00Q10	0.685	0.046	14.914	0.000	0.685	0.704
C01D05	0.402	0.056	7.247	0.000	1.000	1.000
C02	0.584	0.063	9.286	0.000	1.000	1.000
C03	0.483	0.056	8.617	0.000	1.000	1.000
C07	0.565	0.060	9.375	0.000	1.000	1.000
C09	0.381	0.053	7.125	0.000	1.000	1.000
C10	0.303	0.048	6.316	0.000	1.000	1.000
C11	0.245	0.043	5.671	0.000	1.000	1.000
C12	0.373	0.053	6.997	0.000	1.000	1.000
C13	0.374	0.053	7.095	0.000	1.000	1.000
C14	0.265	0.045	5.866	0.000	1.000	1.000
C15	0.611	0.060	10.148	0.000	1.000	1.000
C17	0.484	0.056	8.582	0.000	1.000	1.000

	C01D05	C02	C03	C07	C09	C10	C11	C12	C13	C14	C15	C17
C01D05	1.000											
C02	0.616	1.000										
C03	0.602	0.705	1.000									
C07	0.532	0.623	0.729	1.000								
C09	0.569	0.591	0.664	0.628	1.000							
C10	0.445	0.561	0.791	0.684	0.382	1.000						
C11	0.432	0.646	0.833	0.618	0.575	0.824	1.000					
C12	0.531	0.673	0.694	0.665	0.737	0.626	0.752	1.000				
C13	0.555	0.540	0.791	0.651	0.489	0.545	0.545	0.622	1.000			
C14	0.453	0.645	0.687	0.591	0.448	0.800	0.918	0.746	0.553	1.000		
C15	0.511	0.557	0.714	0.797	0.655	0.549	0.606	0.633	0.581	0.459	1.000	
C17	0.470	0.613	0.788	0.805	0.568	0.748	0.774	0.609	0.561	0.667	0.704	1.000

## ML4

### Final Model:

```

C05 =~ C05D00Q6 + C05D00Q7 + C05D00Q1
C06D01 =~ C06D01Q1 + C06D01Q11 + R_C06D01Q6
C16 =~ C16D00Q12 + C16D00Q17 + C16D00Q13
C18D01 =~ C18D01Q2 + C18D01Q3 + R_C18D01Q5 + C18D01Q8 + R_C18D01Q14
C18D03 =~ C18D03Q0 + C18D03Q1 + C18D03Q2 + C18D03Q12
C19 =~ C19D00Q14 + C19D00Q28 + C19D00Q7 + C19D00Q26

```

### CFA result:

lavaan 0.6-8 ended normally after 60 iterations

Estimator	ML
Optimization method	NLMINB



Number of model parameters	59					
Number of observations	532					
Model Test User Model:						
Test statistic	355.702					
Degrees of freedom	194					
P-value (Chi-square)	0.000					
Model Test Baseline Model:						
Test statistic	4147.024					
Degrees of freedom	231					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.959					
Tucker-Lewis Index (TLI)	0.951					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-14555.533					
Loglikelihood unrestricted model (H1)	-14377.682					
Akaike (AIC)	29229.066					
Bayesian (BIC)	29481.388					
Sample-size adjusted Bayesian (BIC)	29294.105					
Root Mean Square Error of Approximation:						
RMSEA	0.040					
90 Percent confidence interval - lower	0.033					
90 Percent confidence interval - upper	0.046					
P-value RMSEA <= 0.05	0.997					
Standardized Root Mean Square Residual:						
SRMR	0.037					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C05 =~						
C05D00Q6	1.000				0.702	0.712
C05D00Q7	0.897	0.068	13.110	0.000	0.630	0.639
C05D00Q1	0.935	0.069	13.621	0.000	0.657	0.666
C06D01 =~						
C06D01Q1	1.000				0.573	0.580
C06D01Q11	0.961	0.095	10.170	0.000	0.550	0.558
R_C06D01Q6	1.025	0.096	10.655	0.000	0.587	0.595
C16 =~						
C16D00Q12	1.000				0.734	0.744
C16D00Q17	0.730	0.063	11.509	0.000	0.536	0.543
C16D00Q13	1.005	0.064	15.676	0.000	0.738	0.748
C18D01 =~						
C18D01Q2	1.000				0.750	0.760
C18D01Q3	1.013	0.057	17.614	0.000	0.760	0.770
R_C18D01Q5	1.026	0.057	17.862	0.000	0.770	0.780
C18D01Q8	0.961	0.058	16.657	0.000	0.721	0.731
R_C18D01Q14	0.922	0.058	15.917	0.000	0.692	0.701
C18D03 =~						

C18D03Q0	1.000				0.574	0.582
C18D03Q1	1.015	0.099	10.239	0.000	0.582	0.590
C18D03Q2	0.823	0.094	8.772	0.000	0.472	0.479
C18D03Q12	0.963	0.098	9.869	0.000	0.553	0.560
C19 =~						
C19D00Q14	1.000				0.476	0.483
C19D00Q28	1.420	0.149	9.530	0.000	0.676	0.685
C19D00Q7	1.177	0.135	8.710	0.000	0.561	0.568
C19D00Q26	1.183	0.135	8.736	0.000	0.564	0.571
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C05 ~~						
C06D01	0.337	0.038	8.938	0.000	0.839	0.839
C16	0.470	0.044	10.729	0.000	0.912	0.912
C18D01	0.345	0.037	9.267	0.000	0.655	0.655
C18D03	0.280	0.035	8.099	0.000	0.694	0.694
C19	0.229	0.031	7.378	0.000	0.686	0.686
C06D01 ~~						
C16	0.346	0.038	9.024	0.000	0.823	0.823
C18D01	0.357	0.038	9.356	0.000	0.832	0.832
C18D03	0.238	0.032	7.531	0.000	0.725	0.725
C19	0.170	0.026	6.510	0.000	0.624	0.624
C16 ~~						
C18D01	0.372	0.039	9.647	0.000	0.675	0.675
C18D03	0.270	0.034	7.891	0.000	0.642	0.642
C19	0.225	0.031	7.270	0.000	0.642	0.642
C18D01 ~~						
C18D03	0.221	0.031	7.160	0.000	0.512	0.512
C19	0.193	0.028	6.910	0.000	0.541	0.541
C18D03 ~~						
C19	0.256	0.034	7.638	0.000	0.937	0.937
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C05D00Q6	0.480	0.038	12.674	0.000	0.480	0.493
.C05D00Q7	0.577	0.041	13.995	0.000	0.577	0.592
.C05D00Q1	0.542	0.040	13.591	0.000	0.542	0.557
.C06D01Q1	0.646	0.046	14.156	0.000	0.646	0.663
.C06D01Q11	0.671	0.046	14.452	0.000	0.671	0.689
.R_C06D01Q6	0.629	0.045	13.934	0.000	0.629	0.646
.C16D00Q12	0.435	0.036	12.118	0.000	0.435	0.447
.C16D00Q17	0.687	0.046	14.990	0.000	0.687	0.705
.C16D00Q13	0.429	0.036	12.001	0.000	0.429	0.441
.C18D01Q2	0.411	0.031	13.291	0.000	0.411	0.422
.C18D01Q3	0.396	0.030	13.101	0.000	0.396	0.407
.R_C18D01Q5	0.381	0.030	12.880	0.000	0.381	0.391
.C18D01Q8	0.453	0.033	13.792	0.000	0.453	0.466
.R_C18D01Q14	0.495	0.035	14.196	0.000	0.495	0.509
.C18D03Q0	0.644	0.046	14.036	0.000	0.644	0.662
.C18D03Q1	0.634	0.046	13.919	0.000	0.634	0.652
.C18D03Q2	0.751	0.050	15.052	0.000	0.751	0.771
.C18D03Q12	0.668	0.047	14.304	0.000	0.668	0.686
.C19D00Q14	0.747	0.050	15.052	0.000	0.747	0.767
.C19D00Q28	0.516	0.042	12.358	0.000	0.516	0.530
.C19D00Q7	0.659	0.046	14.299	0.000	0.659	0.677
.C19D00Q26	0.656	0.046	14.264	0.000	0.656	0.674
C05	0.493	0.057	8.633	0.000	1.000	1.000
C06D01	0.328	0.050	6.544	0.000	1.000	1.000
C16	0.538	0.059	9.193	0.000	1.000	1.000
C18D01	0.563	0.057	9.877	0.000	1.000	1.000
C18D03	0.330	0.051	6.525	0.000	1.000	1.000
C19	0.227	0.043	5.302	0.000	1.000	1.000

	C05	C06D01	C16	C18D01	C18D03	C19
C05	1.000					
C06D01	0.839	1.000				
C16	0.912	0.823	1.000			

C18D01	0.655	0.832	0.675	1.000		
C18D03	0.694	0.725	0.642	0.512	1.000	
C19	0.686	0.624	0.642	0.541	0.937	1.000

## ML5

### Final Model:

C04 =~	C04D00Q1 +	C04D00Q10 +	R_C04D00Q11 +	C04D00Q4 +	C04D00Q12
C08 =~	R_C08D00Q3 +	C08D00Q4	+ R_C08D00Q9 +	C08D00Q0	

### CFA result:

```
lavaan 0.6-8 ended normally after 27 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      19

Number of observations          532

Model Test User Model:

Test statistic                   97.847
Degrees of freedom              26
P-value (Chi-square)           0.000

Model Test Baseline Model:

Test statistic                   1740.810
Degrees of freedom              36
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     0.958
Tucker-Lewis Index (TLI)       0.942

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -5908.552
Loglikelihood unrestricted model (H1) -5859.629

Akaike (AIC)                    11855.104
Bayesian (BIC)                  11936.361
Sample-size adjusted Bayesian (BIC) 11876.049

Root Mean Square Error of Approximation:

RMSEA                           0.072
90 Percent confidence interval - lower 0.057
90 Percent confidence interval - upper 0.088
P-value RMSEA <= 0.05           0.008

Standardized Root Mean Square Residual:

SRMR                            0.038

Parameter Estimates:

Standard errors                  Standard
Information                     Expected
Information saturated (h1) model Structured

Latent Variables:
      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
C04 =~
  C04D00Q1      1.000                0.597  0.605
```

C04D00Q10	1.413	0.096	14.660	0.000	0.844	0.856
R_C04D00Q11	1.350	0.094	14.295	0.000	0.806	0.817
C04D00Q4	0.757	0.082	9.227	0.000	0.452	0.458
C04D00Q12	1.034	0.087	11.884	0.000	0.618	0.626
C08 =~						
R_C08D00Q3	1.000				0.701	0.711
C08D00Q4	0.943	0.068	13.852	0.000	0.661	0.670
R_C08D00Q9	0.803	0.067	11.907	0.000	0.563	0.571
C08D00Q0	0.670	0.067	10.000	0.000	0.470	0.476
Covariances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C04 ~~						
C08	0.392	0.040	9.932	0.000	0.937	0.937
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C04D00Q1	0.617	0.041	15.108	0.000	0.617	0.634
.C04D00Q10	0.261	0.025	10.443	0.000	0.261	0.268
.R_C04D00Q11	0.324	0.027	11.974	0.000	0.324	0.332
.C04D00Q4	0.769	0.049	15.761	0.000	0.769	0.790
.C04D00Q12	0.592	0.040	14.968	0.000	0.592	0.608
.R_C08D00Q3	0.482	0.037	12.941	0.000	0.482	0.495
.C08D00Q4	0.536	0.039	13.704	0.000	0.536	0.551
.R_C08D00Q9	0.656	0.044	14.840	0.000	0.656	0.674
.C08D00Q0	0.753	0.049	15.440	0.000	0.753	0.773
C04	0.357	0.049	7.329	0.000	1.000	1.000
C08	0.492	0.057	8.688	0.000	1.000	1.000

C04	C08
C04	1.000
C08	0.937 1.000

## Appendix I CFA and Reliability Analysis Results of Individual Measurement

### C01 Agent's Believability

Definition: The extent to which a user believes that the artefact is a social agent

#### *C01D01 Human-Like Appearance*

Definition: The extent to which a user believes that the social agent appears like a human

lavaan 0.6-8 ended normally after 19 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532
Model Test User Model:	
Test statistic	1.317
Degrees of freedom	2
P-value (Chi-square)	0.518
Model Test Baseline Model:	
Test statistic	750.615
Degrees of freedom	6
P-value	0.000
User Model versus Baseline Model:	

Comparative Fit Index (CFI)	1.000					
Tucker-Lewis Index (TLI)	1.003					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2616.477					
Loglikelihood unrestricted model (H1)	-2615.819					
Akaike (AIC)	5248.954					
Bayesian (BIC)	5283.167					
Sample-size adjusted Bayesian (BIC)	5257.773					
Root Mean Square Error of Approximation:						
RMSEA	0.000					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.076					
P-value RMSEA <= 0.05	0.815					
Standardized Root Mean Square Residual:						
SRMR	0.007					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D01 =~						
C01D01Q3	1.000				0.726	0.736
C01D01Q10	1.081	0.068	15.852	0.000	0.785	0.795
C01D01Q13	0.952	0.066	14.423	0.000	0.691	0.700
C01D01Q15	0.983	0.066	14.834	0.000	0.713	0.723
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D01Q3	0.447	0.037	12.215	0.000	0.447	0.459
.C01D01Q10	0.358	0.035	10.336	0.000	0.358	0.368
.C01D01Q13	0.496	0.038	13.004	0.000	0.496	0.510
.C01D01Q15	0.465	0.037	12.518	0.000	0.465	0.477
C01D01	0.527	0.058	9.033	0.000	1.000	1.000

```
Reliability analysis
Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
0.83 0.83 0.78 0.55 4.8 0.012 -5.5e-17 0.8 0.54

lower alpha upper 95% confidence boundaries
0.8 0.83 0.85

Reliability if an item is dropped:
raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
C01D01Q3 0.78 0.78 0.71 0.55 3.6 0.016 5.7e-04 0.55
C01D01Q10 0.76 0.76 0.68 0.52 3.2 0.018 7.8e-05 0.52
C01D01Q13 0.79 0.79 0.72 0.56 3.9 0.015 1.3e-03 0.57
C01D01Q15 0.79 0.79 0.71 0.55 3.7 0.016 1.9e-03 0.55

Item statistics
n raw.r std.r r.cor r.drop mean sd
C01D01Q3 532 0.81 0.81 0.72 0.65 6.3e-17 0.99
C01D01Q10 532 0.84 0.84 0.77 0.69 1.2e-17 0.99
C01D01Q13 532 0.79 0.79 0.69 0.63 -1.1e-16 0.99
C01D01Q15 532 0.81 0.81 0.71 0.64 -1.8e-16 0.99
```

### C01D02 Human-Like Behavior

Definition: The extent to which a user believes that the social agent behaves like a human

lavaan 0.6-8 ended normally after 23 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532
------------------------	-----

Model Test User Model:

Test statistic	4.026
Degrees of freedom	5
P-value (Chi-square)	0.546

Model Test Baseline Model:

Test statistic	964.722
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.002

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3258.560
Loglikelihood unrestricted model (H1)	-3256.547
Akaike (AIC)	6537.120
Bayesian (BIC)	6579.886
Sample-size adjusted Bayesian (BIC)	6548.143

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.054
P-value RMSEA <= 0.05	0.930

Standardized Root Mean Square Residual:

SRMR	0.011
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D02 =~						
C01D02Q7	1.000				0.639	0.648
C01D02Q10	0.945	0.079	11.913	0.000	0.604	0.612
C01D02Q0	1.163	0.083	13.999	0.000	0.743	0.753
C01D02Q1	1.180	0.083	14.139	0.000	0.754	0.765
C01D02Q9	1.219	0.084	14.436	0.000	0.779	0.790

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D02Q7	0.565	0.040	14.195	0.000	0.565	0.580
.C01D02Q10	0.609	0.042	14.565	0.000	0.609	0.625

.C01D02Q0	0.421	0.034	12.403	0.000	0.421	0.432
.C01D02Q1	0.405	0.033	12.117	0.000	0.405	0.415
.C01D02Q9	0.366	0.032	11.367	0.000	0.366	0.376
C01D02	0.409	0.052	7.794	0.000	1.000	1.000

#### Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.84	0.84	0.81	0.51	5.2	0.011	1.5e-16	0.77	0.5

lower alpha upper      95% confidence boundaries  
0.82 0.84 0.86

#### Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C01D02Q7	0.82	0.82	0.78	0.53	4.5	0.013	0.0049	0.55	
C01D02Q10	0.83	0.83	0.79	0.55	4.8	0.012	0.0027	0.55	
C01D02Q0	0.80	0.80	0.75	0.49	3.9	0.014	0.0046	0.50	
C01D02Q1	0.79	0.79	0.75	0.49	3.8	0.015	0.0044	0.50	
C01D02Q9	0.79	0.79	0.74	0.48	3.7	0.015	0.0046	0.47	

#### Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C01D02Q7	532	0.74	0.74	0.64	0.59	-1.9e-17	0.99
C01D02Q10	532	0.72	0.72	0.61	0.56	2.3e-16	0.99
C01D02Q0	532	0.80	0.80	0.74	0.67	1.4e-16	0.99
C01D02Q1	532	0.81	0.81	0.75	0.68	4.8e-16	0.99
C01D02Q9	532	0.82	0.82	0.77	0.71	-5.9e-17	0.99

### C01D03 Natural Appearance

**Definition:** The extent to which a user believes that the social agent's appearance could exist in or be derived from nature

lavaan 0.6-8 ended normally after 24 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532
------------------------	-----

#### Model Test User Model:

Test statistic	6.699
Degrees of freedom	5
P-value (Chi-square)	0.244

#### Model Test Baseline Model:

Test statistic	495.152
Degrees of freedom	10
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.996
Tucker-Lewis Index (TLI)	0.993

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3494.681
Loglikelihood unrestricted model (H1)	-3491.332
Akaike (AIC)	7009.363
Bayesian (BIC)	7052.129

Sample-size adjusted Bayesian (BIC)		7020.386				
Root Mean Square Error of Approximation:						
RMSEA		0.025				
90 Percent confidence interval - lower		0.000				
90 Percent confidence interval - upper		0.069				
P-value RMSEA <= 0.05		0.783				
Standardized Root Mean Square Residual:						
SRMR		0.019				
Parameter Estimates:						
Standard errors		Standard				
Information		Expected				
Information saturated (h1) model		Structured				
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D03 =~						
C01D03Q7	1.000				0.557	0.565
C01D03Q9	1.110	0.113	9.835	0.000	0.619	0.627
C01D03Q11	1.316	0.126	10.464	0.000	0.733	0.743
C01D03Q10	0.830	0.102	8.131	0.000	0.463	0.469
C01D03Q12	1.016	0.109	9.338	0.000	0.566	0.574
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D03Q7	0.663	0.048	13.762	0.000	0.663	0.681
.C01D03Q9	0.591	0.046	12.726	0.000	0.591	0.607
.C01D03Q11	0.436	0.045	9.584	0.000	0.436	0.448
.C01D03Q10	0.760	0.051	14.803	0.000	0.760	0.780
.C01D03Q12	0.653	0.048	13.635	0.000	0.653	0.671
C01D03	0.311	0.051	6.115	0.000	1.000	1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.73	0.73	0.69	0.35	2.7	0.018	7.7e-19	0.69	0.35

lower alpha upper 95% confidence boundaries

0.69 0.73 0.77

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C01D03Q7	0.69	0.69	0.64	0.36	2.3	0.022	0.0072	0.37	
C01D03Q9	0.67	0.67	0.61	0.34	2.0	0.023	0.0081	0.34	
C01D03Q10	0.72	0.72	0.66	0.39	2.6	0.020	0.0027	0.40	
C01D03Q11	0.64	0.64	0.58	0.31	1.8	0.025	0.0037	0.33	
C01D03Q12	0.69	0.69	0.64	0.36	2.3	0.022	0.0046	0.35	

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C01D03Q7	532	0.68	0.68	0.55	0.47	-1.1e-16	0.99
C01D03Q9	532	0.72	0.72	0.62	0.53	-4.5e-16	0.99
C01D03Q10	532	0.62	0.62	0.46	0.39	1.6e-16	0.99
C01D03Q11	532	0.77	0.77	0.70	0.60	9.1e-17	0.99
C01D03Q12	532	0.68	0.68	0.55	0.47	3.0e-16	0.99

### C01D04 Natural Behavior

Definition: The extent to which a user believes that the social agent's behaviour could exist in or be derived from nature



lavaan 0.6-8 ended normally after 22 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532
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Model Test User Model:

Test statistic	0.000
Degrees of freedom	0

Model Test Baseline Model:

Test statistic	198.316
Degrees of freedom	3
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2144.187
Loglikelihood unrestricted model (H1)	-2144.187
Akaike (AIC)	4300.374
Bayesian (BIC)	4326.033
Sample-size adjusted Bayesian (BIC)	4306.988

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA

Standardized Root Mean Square Residual:

SRMR	0.000
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D04 =~						
C01D04Q0	1.000				0.352	0.356
C01D04Q13	1.896	0.317	5.976	0.000	0.667	0.676
C01D04Q15	2.064	0.368	5.610	0.000	0.726	0.736

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D04Q0	0.850	0.056	15.151	0.000	0.850	0.873
.C01D04Q13	0.529	0.081	6.494	0.000	0.529	0.543
.C01D04Q15	0.447	0.093	4.822	0.000	0.447	0.459
C01D04	0.124	0.036	3.458	0.001	1.000	1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median	r
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	0.6	0.6	0.52	0.33	1.5	0.03	1.1e-17	0.74	0.26
lower alpha upper 95% confidence boundaries									
	0.54	0.6	0.66						
Reliability if an item is dropped:									
	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C01D04Q0	0.66	0.66	0.50	0.50	1.98	0.029	NA	0.50	
C01D04Q13	0.42	0.42	0.26	0.26	0.71	0.051	NA	0.26	
C01D04Q15	0.39	0.39	0.24	0.24	0.63	0.053	NA	0.24	
Item statistics									
	n	raw.r	std.r	r.cor	r.drop	mean	sd		
C01D04Q0	532	0.67	0.67	0.36	0.29	1.2e-16	0.99		
C01D04Q13	532	0.78	0.78	0.62	0.46	-8.8e-17	0.99		
C01D04Q15	532	0.79	0.79	0.64	0.48	1.0e-17	0.99		

### C01D05 Agent's Appearance Suitability

Definition: The extent to which the agent's appearance is suitable for its role

lavaan 0.6-8 ended normally after 22 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	6
Number of observations	532
Model Test User Model:	
Test statistic	0.000
Degrees of freedom	0
Model Test Baseline Model:	
Test statistic	322.357
Degrees of freedom	3
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-2082.166
Loglikelihood unrestricted model (H1)	-2082.166
Akaike (AIC)	4176.332
Bayesian (BIC)	4201.992
Sample-size adjusted Bayesian (BIC)	4182.946
Root Mean Square Error of Approximation:	
RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA
Standardized Root Mean Square Residual:	
SRMR	0.000
Parameter Estimates:	
Standard errors	Standard

Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C01D05 =~						
C01D05Q0	1.000				0.630	0.639
C01D05Q2	1.129	0.109	10.382	0.000	0.711	0.721
C01D05Q9	1.086	0.104	10.456	0.000	0.685	0.694
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C01D05Q0	0.577	0.049	11.754	0.000	0.577	0.592
.C01D05Q2	0.468	0.052	8.998	0.000	0.468	0.480
.C01D05Q9	0.505	0.051	9.963	0.000	0.505	0.519
C01D05	0.397	0.059	6.741	0.000	1.000	1.000

#### Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.73	0.73	0.64	0.47	2.6	0.021	2.2e-16	0.79	0.46

lower alpha upper      95% confidence boundaries  
0.68 0.73 0.77

#### Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C01D05Q2	0.61	0.61	0.44	0.44	1.6	0.033	NA	0.44	
C01D05Q9	0.63	0.63	0.46	0.46	1.7	0.032	NA	0.46	
C01D05Q0	0.67	0.67	0.50	0.50	2.0	0.029	NA	0.50	

#### Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C01D05Q2	532	0.81	0.81	0.67	0.57	1.5e-16	0.99
C01D05Q9	532	0.81	0.81	0.65	0.55	4.2e-16	0.99
C01D05Q0	532	0.79	0.79	0.61	0.52	8.7e-17	0.99

## C02 Agent's Usability

Definition: The extent to which a user believes that using an agent will be free from effort (future process)

lavaan 0.6-8 ended normally after 19 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532
------------------------	-----

#### Model Test User Model:

Test statistic	0.000
Degrees of freedom	0

#### Model Test Baseline Model:

Test statistic	319.693
Degrees of freedom	3
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2083.498
Loglikelihood unrestricted model (H1)	-2083.498
Akaike (AIC)	4178.996
Bayesian (BIC)	4204.656
Sample-size adjusted Bayesian (BIC)	4185.610
Root Mean Square Error of Approximation:	
RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA
Standardized Root Mean Square Residual:	
SRMR	0.000
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured
Latent Variables:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
C02 =~	
C02D00Q1	1.000 0.734 0.744
C02D00Q2	0.889 0.087 10.255 0.000 0.653 0.662
C02D00Q8	0.864 0.085 10.229 0.000 0.635 0.643
Variances:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
.C02D00Q1	0.435 0.054 8.082 0.000 0.435 0.447
.C02D00Q2	0.547 0.050 10.963 0.000 0.547 0.562
.C02D00Q8	0.571 0.049 11.547 0.000 0.571 0.587
C02	0.539 0.071 7.591 0.000 1.000 1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.72	0.72	0.64	0.47	2.6	0.021	-1.3e-16	0.79	0.48

lower alpha upper 95% confidence boundaries

0.68 0.72 0.76

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C02D00Q1	0.60	0.60	0.43	0.43	1.5	0.035		NA	0.43
C02D00Q2	0.65	0.65	0.48	0.48	1.8	0.031		NA	0.48
C02D00Q8	0.66	0.66	0.49	0.49	1.9	0.030		NA	0.49

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C02D00Q1	532	0.82	0.82	0.68	0.57	5.7e-17	0.99
C02D00Q2	532	0.80	0.80	0.63	0.53	-1.6e-16	0.99
C02D00Q8	532	0.79	0.79	0.61	0.52	-2.9e-16	0.99

### C03 Performance

Definition: The extent to which a task was well performed (past performance)

lavaan 0.6-8 ended normally after 20 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532					
Model Test User Model:						
Test statistic	0.000					
Degrees of freedom	0					
Model Test Baseline Model:						
Test statistic	255.247					
Degrees of freedom	3					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	1.000					
Tucker-Lewis Index (TLI)	1.000					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2115.721					
Loglikelihood unrestricted model (H1)	-2115.721					
Akaike (AIC)	4243.442					
Bayesian (BIC)	4269.102					
Sample-size adjusted Bayesian (BIC)	4250.056					
Root Mean Square Error of Approximation:						
RMSEA	0.000					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.000					
P-value RMSEA <= 0.05	NA					
Standardized Root Mean Square Residual:						
SRMR	0.000					
Parameter Estimates:						
Standard errors				Standard		
Information				Expected		
Information saturated (h1) model				Structured		
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C03 =~						
C03D01Q7	1.000				0.699	0.708
C03D01Q12	0.763	0.089	8.539	0.000	0.533	0.540
C03D02Q10	0.968	0.113	8.543	0.000	0.676	0.685
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C03D01Q7	0.486	0.061	7.980	0.000	0.486	0.499
.C03D01Q12	0.690	0.052	13.174	0.000	0.690	0.708
.C03D02Q10	0.517	0.059	8.767	0.000	0.517	0.531
C03	0.488	0.074	6.585	0.000	1.000	1.000

Reliability analysis									
Call: psych::alpha(x = data, check.keys = TRUE)									
raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r	
0.68	0.68	0.59	0.41	2.1	0.024	-4.1e-17	0.77	0.38	
lower alpha upper 95% confidence boundaries									
0.63	0.68	0.73							

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha se	var.r	med.r
C03D01Q7	0.54	0.54	0.37	0.37	1.2	0.040	NA	0.37
C03D01Q12	0.65	0.65	0.49	0.49	1.9	0.030	NA	0.49
C03D02Q10	0.55	0.55	0.38	0.38	1.2	0.039	NA	0.38

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C03D01Q7	532	0.80	0.80	0.64	0.52	1.3e-18	0.99
C03D01Q12	532	0.75	0.75	0.53	0.44	5.7e-17	0.99
C03D02Q10	532	0.79	0.79	0.63	0.51	-1.8e-16	0.99

## C04 Agent's Likeability

**Definition:** The agent's qualities that bring about a favourable regard

lavaan 0.6-8 ended normally after 24 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	10

Number of observations	532
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Model Test User Model:

Test statistic	24.827
Degrees of freedom	5
P-value (Chi-square)	0.000

Model Test Baseline Model:

Test statistic	897.181
Degrees of freedom	10
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.978
Tucker-Lewis Index (TLI)	0.955

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-3302.731
Loglikelihood unrestricted model (H1)	-3290.317
Akaike (AIC)	6625.462
Bayesian (BIC)	6668.228
Sample-size adjusted Bayesian (BIC)	6636.485

Root Mean Square Error of Approximation:

RMSEA	0.086
90 Percent confidence interval - lower	0.054
90 Percent confidence interval - upper	0.122
P-value RMSEA <= 0.05	0.032

Standardized Root Mean Square Residual:

SRMR	0.034
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C04 =~						
C04D00Q1	1.000				0.590	0.598
C04D00Q10	1.490	0.105	14.147	0.000	0.879	0.890
R_C04D00Q11	1.355	0.098	13.811	0.000	0.799	0.810
C04D00Q4	0.704	0.083	8.456	0.000	0.415	0.421
C04D00Q12	1.006	0.089	11.305	0.000	0.593	0.601
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C04D00Q1	0.626	0.042	14.951	0.000	0.626	0.643
.C04D00Q10	0.202	0.030	6.669	0.000	0.202	0.207
.R_C04D00Q11	0.335	0.031	10.715	0.000	0.335	0.344
.C04D00Q4	0.801	0.051	15.802	0.000	0.801	0.823
.C04D00Q12	0.622	0.042	14.923	0.000	0.622	0.638
C04	0.348	0.049	7.143	0.000	1.000	1.000

#### Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.8	0.8	0.78	0.44	4	0.014	9e-17	0.73	0.47

lower alpha upper      95% confidence boundaries  
0.77 0.8 0.83

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C04D00Q1	0.76	0.76	0.74	0.45	3.2	0.017	0.029	0.43	
C04D00Q10	0.71	0.71	0.66	0.38	2.4	0.021	0.010	0.38	
R_C04D00Q11	0.73	0.73	0.69	0.41	2.7	0.019	0.012	0.43	
C04D00Q4	0.82	0.82	0.79	0.53	4.5	0.013	0.011	0.49	
C04D00Q12	0.77	0.77	0.74	0.45	3.3	0.017	0.027	0.42	

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C04D00Q1	532	0.74	0.74	0.63	0.57	1.7e-16	0.99
C04D00Q10	532	0.85	0.85	0.84	0.74	1.9e-16	0.99
R_C04D00Q11	532	0.80	0.80	0.77	0.66	-1.0e-17	0.99
C04D00Q4	532	0.60	0.60	0.43	0.39	1.4e-16	0.99
C04D00Q12	532	0.73	0.73	0.63	0.56	-4.5e-17	0.99

## C05 Agent's Sociability

Definition: The agent's quality or state of being sociable

lavaan 0.6-8 ended normally after 18 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532
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Model Test User Model:

Test statistic	0.000
Degrees of freedom	0

Model Test Baseline Model:

Test statistic	305.884
Degrees of freedom	3
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
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Tucker-Lewis Index (TLI)	1.000
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-2090.403
Loglikelihood unrestricted model (H1)	-2090.403
Akaike (AIC)	4192.805
Bayesian (BIC)	4218.465
Sample-size adjusted Bayesian (BIC)	4199.419
Root Mean Square Error of Approximation:	
RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA
Standardized Root Mean Square Residual:	
SRMR	0.000
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured
Latent Variables:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
C05 =~	
C05D00Q6	1.000 0.090 9.646 0.000 0.762 0.772
C05D00Q7	0.865 0.090 9.646 0.000 0.659 0.668
C05D00Q1	0.750 0.079 9.451 0.000 0.572 0.579
Variances:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
.C05D00Q6	0.393 0.059 6.622 0.000 0.393 0.404
.C05D00Q7	0.540 0.052 10.311 0.000 0.540 0.554
.C05D00Q1	0.647 0.050 12.925 0.000 0.647 0.664
C05	0.581 0.077 7.545 0.000 1.000 1.000

```
Reliability analysis
Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
0.71 0.71 0.63 0.45 2.5 0.022 4.7e-17 0.79 0.45

lower alpha upper 95% confidence boundaries
0.67 0.71 0.75

Reliability if an item is dropped:
raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
C05D00Q6 0.56 0.56 0.39 0.39 1.3 0.038 NA 0.39
C05D00Q7 0.62 0.62 0.45 0.45 1.6 0.033 NA 0.45
C05D00Q1 0.68 0.68 0.52 0.52 2.1 0.028 NA 0.52

Item statistics
n raw.r std.r r.cor r.drop mean sd
C05D00Q6 532 0.82 0.82 0.69 0.58 8.9e-17 0.99
C05D00Q7 532 0.80 0.80 0.63 0.53 -2.3e-17 0.99
C05D00Q1 532 0.77 0.77 0.57 0.48 8.3e-17 0.99
```

## C06 Agent's Personality

Definition: The combination of characteristics or qualities that form an individual's distinctive character



### C06D01 Agent's Personality Presence

Definition: To what extent the user believes that the agent has a personality

lavaan 0.6-8 ended normally after 22 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532
------------------------	-----

Model Test User Model:

Test statistic	0.000
Degrees of freedom	0

Model Test Baseline Model:

Test statistic	166.434
Degrees of freedom	3
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2160.128
Loglikelihood unrestricted model (H1)	-2160.128
Akaike (AIC)	4332.255
Bayesian (BIC)	4357.915
Sample-size adjusted Bayesian (BIC)	4338.869

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA

Standardized Root Mean Square Residual:

SRMR	0.000
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C06D01 =~						
C06D01Q1	1.000				0.679	0.688
R_C06D01Q6	0.848	0.137	6.177	0.000	0.576	0.584
C06D01Q11	0.680	0.109	6.218	0.000	0.461	0.468

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C06D01Q1	0.513	0.079	6.516	0.000	0.513	0.527
.R_C06D01Q6	0.642	0.065	9.852	0.000	0.642	0.659
.C06D01Q11	0.761	0.057	13.267	0.000	0.761	0.781
C06D01	0.461	0.088	5.223	0.000	1.000	1.000

```

Reliability analysis
Call: psych::alpha(x = data, check.keys = TRUE)

      raw_alpha std.alpha G6(smc) average_r S/N ase      mean  sd median_r
      0.6      0.6      0.5      0.33 1.5 0.03 -1.2e-16 0.74      0.32

lower alpha upper      95% confidence boundaries
0.54 0.6 0.66

Reliability if an item is dropped:
      raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
C06D01Q1      0.43      0.43      0.27      0.27 0.75      0.050      NA 0.27
R_C06D01Q6      0.49      0.49      0.32      0.32 0.95      0.045      NA 0.32
C06D01Q11      0.57      0.57      0.40      0.40 1.34      0.037      NA 0.40

Item statistics
      n raw.r std.r r.cor r.drop      mean  sd
C06D01Q1  532 0.77 0.77 0.59 0.45 1.2e-16 0.99
R_C06D01Q6 532 0.75 0.75 0.54 0.41 -2.6e-16 0.99
C06D01Q11 532 0.71 0.71 0.46 0.36 -2.1e-16 0.99

```

## C07 User Acceptance of the Agent

**Definition:** The willingness of the user to interact with the agent

```

lavaan 0.6-8 ended normally after 19 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      6

Number of observations          532

Model Test User Model:

Test statistic                   0.000
Degrees of freedom              0

Model Test Baseline Model:

Test statistic                   266.900
Degrees of freedom              3
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     1.000
Tucker-Lewis Index (TLI)       1.000

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -2109.894
Loglikelihood unrestricted model (H1) -2109.894

Akaike (AIC)                    4231.789
Bayesian (BIC)                  4257.449
Sample-size adjusted Bayesian (BIC) 4238.403

Root Mean Square Error of Approximation:

RMSEA                           0.000
90 Percent confidence interval - lower 0.000
90 Percent confidence interval - upper 0.000
P-value RMSEA <= 0.05          NA

Standardized Root Mean Square Residual:

SRMR                            0.000

```

# Parameter Estimates:

Standard errors  
Information  
Information saturated (h1) model

Standard  
Expected  
Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C07 =~						
C07D00Q0	1.000				0.790	0.801
C07D00Q11	0.887	0.126	7.025	0.000	0.701	0.710
R_C07D00Q15	0.473	0.074	6.403	0.000	0.373	0.379

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C07D00Q0	0.350	0.087	4.006	0.000	0.350	0.359
.C07D00Q11	0.483	0.073	6.628	0.000	0.483	0.496
.R_C07D00Q15	0.834	0.055	15.297	0.000	0.834	0.857
C07	0.624	0.101	6.158	0.000	1.000	1.000

## Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.65	0.65	0.58	0.38	1.8	0.027	-1.7e-16	0.76	0.3

lower alpha upper      95% confidence boundaries  
0.6 0.65 0.7

## Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C07D00Q0	0.42	0.42	0.27	0.27	0.73	0.050	NA	0.27	
C07D00Q11	0.47	0.47	0.30	0.30	0.87	0.046	NA	0.30	
R_C07D00Q15	0.72	0.72	0.57	0.57	2.63	0.024	NA	0.57	

## Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C07D00Q0	532	0.81	0.81	0.70	0.55	-4.3e-16	0.99
C07D00Q11	532	0.80	0.80	0.67	0.52	5.7e-17	0.99
R_C07D00Q15	532	0.68	0.68	0.39	0.32	-1.5e-16	0.99

## C08 Agent's Enjoyability

Definition: The extent to which a user finds interacting with the agent enjoyable

lavaan 0.6-8 ended normally after 21 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	8

Number of observations	532
------------------------	-----

## Model Test User Model:

Test statistic	4.267
Degrees of freedom	2
P-value (Chi-square)	0.118

## Model Test Baseline Model:

Test statistic	362.171
Degrees of freedom	6
P-value	0.000

## User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.994					
Tucker-Lewis Index (TLI)	0.981					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2812.174					
Loglikelihood unrestricted model (H1)	-2810.041					
Akaike (AIC)	5640.348					
Bayesian (BIC)	5674.561					
Sample-size adjusted Bayesian (BIC)	5649.167					
Root Mean Square Error of Approximation:						
RMSEA	0.046					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.108					
P-value RMSEA <= 0.05	0.442					
Standardized Root Mean Square Residual:						
SRMR	0.019					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C08 =~						
R_C08D00Q3	1.000				0.680	0.689
C08D00Q4	1.038	0.100	10.386	0.000	0.706	0.716
R_C08D00Q9	0.765	0.083	9.225	0.000	0.521	0.528
C08D00Q0	0.721	0.082	8.815	0.000	0.490	0.497
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C08D00Q3	0.511	0.050	10.139	0.000	0.511	0.525
.C08D00Q4	0.475	0.051	9.270	0.000	0.475	0.488
.R_C08D00Q9	0.703	0.051	13.848	0.000	0.703	0.722
.C08D00Q0	0.733	0.052	14.231	0.000	0.733	0.753
C08	0.463	0.064	7.191	0.000	1.000	1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.7	0.7	0.64	0.37	2.3	0.021	8.5e-17	0.72	0.36

lower alpha upper 95% confidence boundaries

0.66 0.7 0.74

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
R_C08D00Q3	0.61	0.61	0.51	0.34	1.6	0.029	0.00067	0.36	
C08D00Q4	0.60	0.60	0.50	0.33	1.5	0.030	0.00082	0.32	
C08D00Q0	0.67	0.67	0.59	0.41	2.1	0.025	0.00711	0.36	
R_C08D00Q9	0.66	0.66	0.58	0.39	1.9	0.026	0.01001	0.36	

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
R_C08D00Q3	532	0.75	0.75	0.64	0.53	1.5e-16	0.99
C08D00Q4	532	0.76	0.76	0.66	0.55	-1.1e-17	0.99
C08D00Q0	532	0.68	0.68	0.50	0.42	1.2e-16	0.99
R_C08D00Q9	532	0.70	0.70	0.53	0.45	6.2e-17	0.99

## C09 User's Engagement

Definition: The extent to which the user feels involved in the interaction with the agent

lavaan 0.6-8 ended normally after 21 iterations						
Estimator	ML					
Optimization method	NLMINB					
Number of model parameters	6					
Number of observations	532					
Model Test User Model:						
Test statistic	0.000					
Degrees of freedom	0					
Model Test Baseline Model:						
Test statistic	285.118					
Degrees of freedom	3					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	1.000					
Tucker-Lewis Index (TLI)	1.000					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2100.785					
Loglikelihood unrestricted model (H1)	-2100.785					
Akaike (AIC)	4213.571					
Bayesian (BIC)	4239.231					
Sample-size adjusted Bayesian (BIC)	4220.185					
Root Mean Square Error of Approximation:						
RMSEA	0.000					
90 Percent confidence interval - lower	0.000					
90 Percent confidence interval - upper	0.000					
P-value RMSEA <= 0.05	NA					
Standardized Root Mean Square Residual:						
SRMR	0.000					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C09 =~						
C09D00Q4	1.000				0.615	0.623
C09D00Q10	1.126	0.118	9.572	0.000	0.693	0.702
C09D00Q1	1.074	0.111	9.668	0.000	0.661	0.670
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C09D00Q4	0.595	0.051	11.608	0.000	0.595	0.611
.C09D00Q10	0.494	0.055	9.010	0.000	0.494	0.507
.C09D00Q1	0.537	0.053	10.131	0.000	0.537	0.552
C09	0.378	0.059	6.368	0.000	1.000	1.000

```

Reliability analysis
Call: psych::alpha(x = data, check.keys = TRUE)

      raw_alpha std.alpha G6(smc) average_r S/N ase      mean      sd median_r
      0.7      0.7      0.61      0.44 2.4 0.022 -8.7e-17 0.78      0.44

lower alpha upper      95% confidence boundaries
0.66 0.7 0.75

Reliability if an item is dropped:
      raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
C09D00Q4      0.64      0.64      0.47      0.47 1.8      0.031      NA      0.47
C09D00Q10      0.59      0.59      0.42      0.42 1.4      0.036      NA      0.42
C09D00Q1      0.61      0.61      0.44      0.44 1.6      0.034      NA      0.44

Item statistics
      n raw.r std.r r.cor r.drop      mean      sd
C09D00Q4 532 0.78 0.78 0.59 0.50 1.8e-16 0.99
C09D00Q10 532 0.80 0.80 0.64 0.54 -6.5e-17 0.99
C09D00Q1 532 0.79 0.79 0.62 0.52 -3.8e-16 0.99

```

## C10 User's Trust

**Definition:** The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)

```

lavaan 0.6-8 ended normally after 24 iterations

Estimator                      ML
Optimization method             NLMINB
Number of model parameters      6

Number of observations          532

Model Test User Model:

Test statistic                   0.000
Degrees of freedom              0

Model Test Baseline Model:

Test statistic                   238.367
Degrees of freedom              3
P-value                         0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)     1.000
Tucker-Lewis Index (TLI)       1.000

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)    -2124.161
Loglikelihood unrestricted model (H1) -2124.161

Akaike (AIC)                    4260.322
Bayesian (BIC)                  4285.982
Sample-size adjusted Bayesian (BIC) 4266.936

Root Mean Square Error of Approximation:

RMSEA                           0.000
90 Percent confidence interval - lower 0.000
90 Percent confidence interval - upper 0.000
P-value RMSEA <= 0.05          NA

Standardized Root Mean Square Residual:

```

SRMR	0.000					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C10 =~						
C10D00Q6	1.000				0.513	0.520
C10D00Q16	1.256	0.151	8.328	0.000	0.644	0.653
C10D00Q18	1.398	0.176	7.940	0.000	0.717	0.727
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C10D00Q6	0.711	0.053	13.330	0.000	0.711	0.730
.C10D00Q16	0.559	0.059	9.411	0.000	0.559	0.574
.C10D00Q18	0.460	0.066	6.931	0.000	0.460	0.472
C10	0.263	0.051	5.148	0.000	1.000	1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.66	0.66	0.57	0.4	2	0.025	9.5e-17	0.76	0.38

lower	alpha	upper	95% confidence boundaries					
0.61	0.66	0.71						

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C10D00Q6	0.64	0.64	0.47	0.47	1.8	0.031		NA	0.47
C10D00Q16	0.55	0.55	0.38	0.38	1.2	0.039		NA	0.38
C10D00Q18	0.51	0.51	0.34	0.34	1.0	0.043		NA	0.34

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C10D00Q6	532	0.74	0.74	0.51	0.42	7.6e-17	0.99
C10D00Q16	532	0.78	0.78	0.61	0.49	3.9e-18	0.99
C10D00Q18	532	0.80	0.80	0.64	0.52	2.1e-16	0.99

## C11 User-Agent Alliance

**Definition:** The extent to which a beneficial association is formed

lavaan 0.6-8 ended normally after 22 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	12
Number of observations	532
Model Test User Model:	
Test statistic	33.475
Degrees of freedom	9
P-value (Chi-square)	0.000
Model Test Baseline Model:	
Test statistic	650.302
Degrees of freedom	15
P-value	0.000
User Model versus Baseline Model:	

Comparative Fit Index (CFI)	0.961
Tucker-Lewis Index (TLI)	0.936

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-4178.276
Loglikelihood unrestricted model (H1)	-4161.538
Akaike (AIC)	8380.552
Bayesian (BIC)	8431.872
Sample-size adjusted Bayesian (BIC)	8393.780

Root Mean Square Error of Approximation:

RMSEA	0.071
90 Percent confidence interval - lower	0.047
90 Percent confidence interval - upper	0.098
P-value RMSEA <= 0.05	0.075

Standardized Root Mean Square Residual:

SRMR	0.036
------	-------

Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C11 =~						
C11D01Q9	1.000				0.598	0.606
C11D01Q10	1.031	0.099	10.449	0.000	0.617	0.625
C11D01Q11	0.944	0.096	9.858	0.000	0.565	0.572
C11D01Q14	0.948	0.096	9.888	0.000	0.567	0.575
C11D02Q4	0.963	0.096	9.992	0.000	0.576	0.584
C11D02Q7	0.989	0.097	10.169	0.000	0.591	0.599

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C11D01Q9	0.616	0.046	13.369	0.000	0.616	0.633
.C11D01Q10	0.593	0.045	13.058	0.000	0.593	0.609
.C11D01Q11	0.655	0.047	13.847	0.000	0.655	0.672
.C11D01Q14	0.652	0.047	13.815	0.000	0.652	0.669
.C11D02Q4	0.642	0.047	13.696	0.000	0.642	0.659
.C11D02Q7	0.624	0.046	13.474	0.000	0.624	0.641
C11	0.358	0.053	6.720	0.000	1.000	1.000

Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.77	0.77	0.74	0.35	3.3	0.016	-4.2e-17	0.67	0.35

lower alpha upper      95% confidence boundaries  
0.73 0.77 0.8

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C11D01Q9	0.73	0.73	0.69	0.35	2.7	0.019	0.0014	0.35	
C11D01Q10	0.72	0.72	0.69	0.35	2.6	0.019	0.0026	0.35	
C11D01Q11	0.74	0.74	0.69	0.36	2.8	0.018	0.0017	0.35	
C11D01Q14	0.74	0.74	0.69	0.36	2.8	0.018	0.0018	0.35	
C11D02Q4	0.73	0.73	0.70	0.35	2.7	0.018	0.0031	0.35	
C11D02Q7	0.73	0.73	0.69	0.35	2.7	0.019	0.0026	0.35	



Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
C11D01Q9	532	0.69	0.69	0.60	0.52	-2.1e-16	0.99
C11D01Q10	532	0.70	0.70	0.61	0.53	1.7e-17	0.99
C11D01Q11	532	0.66	0.66	0.56	0.49	2.4e-16	0.99
C11D01Q14	532	0.67	0.67	0.56	0.49	-2.1e-16	0.99
C11D02Q4	532	0.67	0.67	0.57	0.50	-1.1e-16	0.99
C11D02Q7	532	0.68	0.68	0.59	0.52	2.9e-17	0.99

## C12 Agent's Attentiveness

**Definition:** The extent to which the user believes that the agent is aware of and has attention for the user

lavaan 0.6-8 ended normally after 20 iterations							
Estimator				ML			
Optimization method				NLMINB			
Number of model parameters				6			
Number of observations				532			
Model Test User Model:							
Test statistic				0.000			
Degrees of freedom				0			
Model Test Baseline Model:							
Test statistic				315.358			
Degrees of freedom				3			
P-value				0.000			
User Model versus Baseline Model:							
Comparative Fit Index (CFI)				1.000			
Tucker-Lewis Index (TLI)				1.000			
Loglikelihood and Information Criteria:							
Loglikelihood user model (H0)				-2085.666			
Loglikelihood unrestricted model (H1)				-2085.666			
Akaike (AIC)				4183.331			
Bayesian (BIC)				4208.991			
Sample-size adjusted Bayesian (BIC)				4189.945			
Root Mean Square Error of Approximation:							
RMSEA				0.000			
90 Percent confidence interval - lower				0.000			
90 Percent confidence interval - upper				0.000			
P-value RMSEA <= 0.05				NA			
Standardized Root Mean Square Residual:							
SRMR				0.000			
Parameter Estimates:							
Standard errors				Standard			
Information				Expected			
Information saturated (h1) model				Structured			
Latent Variables:							
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all	
C12 =~							
C12D00Q0	1.000				0.704	0.713	
C12D00Q1	0.974	0.095	10.261	0.000	0.685	0.694	

C12D00Q13	0.891	0.087	10.248	0.000	0.627	0.636
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C12D00Q0	0.479	0.052	9.168	0.000	0.479	0.492
.C12D00Q1	0.504	0.051	9.824	0.000	0.504	0.518
.C12D00Q13	0.580	0.049	11.739	0.000	0.580	0.596
C12	0.495	0.068	7.323	0.000	1.000	1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.72	0.72	0.63	0.46	2.6	0.021	-9.4e-17	0.79	0.45

lower alpha upper 95% confidence boundaries

0.68 0.72 0.76

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C12D00Q0	0.61	0.61	0.44	0.44	1.6	0.034		NA	0.44
C12D00Q13	0.66	0.66	0.50	0.50	2.0	0.029		NA	0.50
C12D00Q1	0.62	0.62	0.45	0.45	1.7	0.033		NA	0.45

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C12D00Q0	532	0.81	0.81	0.66	0.56	-1.7e-16	0.99
C12D00Q13	532	0.79	0.79	0.61	0.52	-3.2e-16	0.99
C12D00Q1	532	0.81	0.81	0.65	0.55	2.2e-16	0.99

### C13 Agent's Coherence

**Definition:** The extent to which the agent is perceived as being logical and consistent

lavaan 0.6-8 ended normally after 22 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532
Model Test User Model:	
Test statistic	2.222
Degrees of freedom	2
P-value (Chi-square)	0.329
Model Test Baseline Model:	
Test statistic	317.338
Degrees of freedom	6
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.999
Tucker-Lewis Index (TLI)	0.998
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-2833.568
Loglikelihood unrestricted model (H1)	-2832.457
Akaike (AIC)	5683.136
Bayesian (BIC)	5717.350
Sample-size adjusted Bayesian (BIC)	5691.955

#### Root Mean Square Error of Approximation:

RMSEA	0.014
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.089
P-value RMSEA <= 0.05	0.689

#### Standardized Root Mean Square Residual:

SRMR	0.013
------	-------

#### Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

#### Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C13 =~						
R_C13D00Q11	1.000				0.665	0.674
R_C13D00Q6	0.707	0.086	8.263	0.000	0.471	0.477
R_C13D00Q15	0.698	0.085	8.175	0.000	0.464	0.470
R_C13D00Q3	1.063	0.111	9.548	0.000	0.707	0.717

#### Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.R_C13D00Q11	0.531	0.053	9.976	0.000	0.531	0.545
.R_C13D00Q6	0.752	0.053	14.282	0.000	0.752	0.772
.R_C13D00Q15	0.758	0.053	14.357	0.000	0.758	0.779
.R_C13D00Q3	0.473	0.055	8.569	0.000	0.473	0.486
C13	0.443	0.065	6.772	0.000	1.000	1.000

#### Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.67	0.67	0.62	0.34	2.1	0.023	-1.7e-16	0.7	0.32

lower alpha upper 95% confidence boundaries  
0.63 0.67 0.72

#### Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
R_C13D00Q3	0.55	0.55	0.45	0.29	1.2	0.034	0.0018	0.30	
R_C13D00Q11	0.57	0.57	0.47	0.31	1.3	0.032	0.0029	0.32	
R_C13D00Q6	0.65	0.65	0.56	0.38	1.8	0.027	0.0090	0.33	
R_C13D00Q15	0.65	0.65	0.56	0.38	1.8	0.027	0.0096	0.35	

#### Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
R_C13D00Q3	532	0.76	0.76	0.66	0.53	-1.7e-16	0.99
R_C13D00Q11	532	0.75	0.75	0.63	0.51	-1.4e-16	0.99
R_C13D00Q6	532	0.67	0.67	0.47	0.39	-4.6e-17	0.99
R_C13D00Q15	532	0.67	0.67	0.47	0.39	-2.9e-16	0.99

## C14 Agent's Intentionality

Definition: The extent to which the agent is perceived as being deliberate and has deliberations

lavaan 0.6-8 ended normally after 27 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532

Model Test User Model:

Test statistic	2.644
Degrees of freedom	2
P-value (Chi-square)	0.267

Model Test Baseline Model:

Test statistic	347.610
Degrees of freedom	6
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.998
Tucker-Lewis Index (TLI)	0.994

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2818.643
Loglikelihood unrestricted model (H1)	-2817.321
Akaike (AIC)	5653.287
Bayesian (BIC)	5687.500
Sample-size adjusted Bayesian (BIC)	5662.105

Root Mean Square Error of Approximation:

RMSEA	0.025
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.093
P-value RMSEA <= 0.05	0.632

Standardized Root Mean Square Residual:

SRMR	0.015
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C14 =~						
C14D00Q0	1.000				0.460	0.466
C14D00Q10	1.777	0.213	8.328	0.000	0.817	0.828
C14D00Q16	0.946	0.133	7.128	0.000	0.435	0.441
R_C14D00Q13	1.344	0.157	8.589	0.000	0.618	0.627

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C14D00Q0	0.762	0.052	14.711	0.000	0.762	0.783
.C14D00Q10	0.306	0.062	4.933	0.000	0.306	0.314
.C14D00Q16	0.784	0.052	14.948	0.000	0.784	0.805
.R_C14D00Q13	0.591	0.050	11.725	0.000	0.591	0.607
C14	0.212	0.043	4.879	0.000	1.000	1.000

Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.68	0.68	0.63	0.34	2.1	0.023	-1.3e-16	0.7	0.34

lower	alpha	upper	95% confidence boundaries
0.63	0.68	0.72	

Reliability if an item is dropped:									
	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C14D00Q0	0.65	0.65	0.57	0.38	1.8	0.027	0.0195	0.37	
C14D00Q10	0.51	0.51	0.42	0.26	1.1	0.036	0.0019	0.24	
R_C14D00Q13	0.59	0.59	0.50	0.33	1.4	0.031	0.0070	0.37	
C14D00Q16	0.67	0.67	0.59	0.40	2.0	0.025	0.0117	0.37	
Item statistics									
	n	raw.r	std.r	r.cor	r.drop	mean	sd		
C14D00Q0	532	0.67	0.67	0.48	0.40	1.5e-16	0.99		
C14D00Q10	532	0.80	0.80	0.73	0.59	-1.9e-16	0.99		
R_C14D00Q13	532	0.73	0.73	0.61	0.48	-1.2e-16	0.99		
C14D00Q16	532	0.65	0.65	0.44	0.36	-3.4e-16	0.99		

## C15 Attitude

Definition: A favourable or unfavourable evaluation toward the interaction with the agent

lavaan 0.6-8 ended normally after 17 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	6
Number of observations	532
Model Test User Model:	
Test statistic	0.000
Degrees of freedom	0
Model Test Baseline Model:	
Test statistic	462.358
Degrees of freedom	3
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-2012.166
Loglikelihood unrestricted model (H1)	-2012.166
Akaike (AIC)	4036.331
Bayesian (BIC)	4061.991
Sample-size adjusted Bayesian (BIC)	4042.945
Root Mean Square Error of Approximation:	
RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA
Standardized Root Mean Square Residual:	
SRMR	0.000
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

#### Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C15 =~						
C15D00Q10	1.000				0.799	0.810
C15D00Q11	0.955	0.071	13.359	0.000	0.763	0.773
R_C15D00Q15	0.783	0.062	12.566	0.000	0.625	0.634

#### Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C15D00Q10	0.335	0.045	7.387	0.000	0.335	0.344
.C15D00Q11	0.391	0.044	8.894	0.000	0.391	0.402
.R_C15D00Q15	0.583	0.043	13.399	0.000	0.583	0.598
C15	0.638	0.069	9.236	0.000	1.000	1.000

#### Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.78	0.78	0.71	0.54	3.6	0.017	-1.3e-16	0.82	0.51

lower alpha upper 95% confidence boundaries  
0.75 0.78 0.81

#### Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C15D00Q10	0.66	0.66	0.49	0.49	1.9	0.030	NA	0.49	
C15D00Q11	0.68	0.68	0.51	0.51	2.1	0.028	NA	0.51	
R_C15D00Q15	0.77	0.77	0.63	0.63	3.3	0.020	NA	0.63	

#### Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C15D00Q10	532	0.86	0.86	0.75	0.66	-2.1e-16	0.99
C15D00Q11	532	0.85	0.85	0.73	0.64	2.6e-17	0.99
R_C15D00Q15	532	0.80	0.80	0.62	0.56	-2.2e-16	0.99

### C16 Social Presence

Definition: The degree to which the user perceives the presence of a social entity in the interaction

lavaan 0.6-8 ended normally after 19 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	6

Number of observations	532
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#### Model Test User Model:

Test statistic	0.000
Degrees of freedom	0

#### Model Test Baseline Model:

Test statistic	323.780
Degrees of freedom	3
P-value	0.000

#### User Model versus Baseline Model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000

#### Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2081.455
Loglikelihood unrestricted model (H1)	-2081.455

Akaike (AIC)	4174.910
Bayesian (BIC)	4200.569
Sample-size adjusted Bayesian (BIC)	4181.524
Root Mean Square Error of Approximation:	
RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.000
P-value RMSEA <= 0.05	NA
Standardized Root Mean Square Residual:	
SRMR	0.000
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured
Latent Variables:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
C16 =~	
C16D00Q13	1.000 0.000 0.771 0.782
C16D00Q12	0.933 0.097 9.647 0.000 0.720 0.730
C16D00Q17	0.659 0.072 9.113 0.000 0.508 0.515
Variances:	
	Estimate Std.Err z-value P(> z ) Std.lv Std.all
.C16D00Q13	0.379 0.061 6.221 0.000 0.379 0.389
.C16D00Q12	0.455 0.056 8.069 0.000 0.455 0.468
.C16D00Q17	0.716 0.050 14.253 0.000 0.716 0.735
C16	0.595 0.079 7.560 0.000 1.000 1.000

Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.71	0.71	0.63	0.45	2.4	0.022	1.1e-16	0.79	0.4

lower	alpha	upper	95% confidence boundaries					
0.67	0.71	0.75						

Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C16D00Q12	0.57	0.57	0.40	0.40	1.3	0.037		NA	0.40
C16D00Q13	0.55	0.55	0.38	0.38	1.2	0.039		NA	0.38
C16D00Q17	0.73	0.73	0.57	0.57	2.7	0.024		NA	0.57

Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C16D00Q12	532	0.82	0.82	0.68	0.56	2.3e-16	0.99
C16D00Q13	532	0.83	0.83	0.71	0.59	8.7e-18	0.99
C16D00Q17	532	0.74	0.74	0.51	0.44	9.3e-17	0.99

## C17 Interaction Impact on Self-Image

Definition: How the user believes others perceive the user because of the interaction with the agent

lavaan 0.6-8 ended normally after 20 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	8
Number of observations	532

Model Test User Model:

Test statistic	12.356
Degrees of freedom	2
P-value (Chi-square)	0.002

Model Test Baseline Model:

Test statistic	411.769
Degrees of freedom	6
P-value	0.000

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.974
Tucker-Lewis Index (TLI)	0.923

Loglikelihood and Information Criteria:

Loglikelihood user model (H0)	-2791.420
Loglikelihood unrestricted model (H1)	-2785.242
Akaike (AIC)	5598.839
Bayesian (BIC)	5633.053
Sample-size adjusted Bayesian (BIC)	5607.658

Root Mean Square Error of Approximation:

RMSEA	0.099
90 Percent confidence interval - lower	0.051
90 Percent confidence interval - upper	0.155
P-value RMSEA <= 0.05	0.047

Standardized Root Mean Square Residual:

SRMR	0.032
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Parameter Estimates:

Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C17 =~						
C17D00Q2	1.000				0.687	0.696
C17D00Q3	1.051	0.094	11.169	0.000	0.722	0.732
C17D00Q9	0.710	0.078	9.063	0.000	0.488	0.494
C17D00Q10	0.830	0.081	10.235	0.000	0.570	0.578

Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C17D00Q2	0.502	0.048	10.481	0.000	0.502	0.515
.C17D00Q3	0.452	0.049	9.295	0.000	0.452	0.464
.C17D00Q9	0.736	0.051	14.445	0.000	0.736	0.756
.C17D00Q10	0.649	0.049	13.361	0.000	0.649	0.666
C17	0.472	0.063	7.497	0.000	1.000	1.000

Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.72	0.72	0.67	0.39	2.6	0.02	-4.1e-17	0.73	0.37

lower	alpha	upper	95% confidence boundaries
0.68	0.72	0.76	



Reliability if an item is dropped:									
	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C17D00Q2	0.64	0.64	0.54	0.37	1.8	0.027	0.00152	0.37	
C17D00Q3	0.63	0.63	0.53	0.36	1.7	0.028	0.00087	0.37	
C17D00Q9	0.70	0.70	0.62	0.44	2.4	0.022	0.00686	0.41	
C17D00Q10	0.66	0.66	0.58	0.40	2.0	0.025	0.01410	0.33	
Item statistics									
	n	raw.r	std.r	r.cor	r.drop	mean	sd		
C17D00Q2	532	0.76	0.76	0.65	0.54	7.9e-17	0.99		
C17D00Q3	532	0.77	0.77	0.67	0.56	-1.2e-16	0.99		
C17D00Q9	532	0.69	0.69	0.51	0.43	-2.2e-16	0.99		
C17D00Q10	532	0.73	0.73	0.58	0.50	8.7e-17	0.99		

## C18 Emotional Experience

**Definition:** A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them

### *C18D01 Agent's Emotional Intelligence Presence*

**Definition:** To what extent the user believes that the agent has an emotional experience and can convey its emotions

lavaan 0.6-8 ended normally after 19 iterations	
Estimator	ML
Optimization method	NLMINB
Number of model parameters	10
Number of observations	532
Model Test User Model:	
Test statistic	15.675
Degrees of freedom	5
P-value (Chi-square)	0.008
Model Test Baseline Model:	
Test statistic	1147.365
Degrees of freedom	10
P-value	0.000
User Model versus Baseline Model:	
Comparative Fit Index (CFI)	0.991
Tucker-Lewis Index (TLI)	0.981
Loglikelihood and Information Criteria:	
Loglikelihood user model (H0)	-3173.063
Loglikelihood unrestricted model (H1)	-3165.225
Akaike (AIC)	6366.125
Bayesian (BIC)	6408.892
Sample-size adjusted Bayesian (BIC)	6377.149
Root Mean Square Error of Approximation:	
RMSEA	0.063
90 Percent confidence interval - lower	0.030
90 Percent confidence interval - upper	0.100
P-value RMSEA <= 0.05	0.226
Standardized Root Mean Square Residual:	
SRMR	0.020

# Parameter Estimates:

Standard errors  
Information  
Information saturated (h1) model

Standard  
Expected  
Structured

## Latent Variables:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D01 =~						
C18D01Q2	1.000				0.748	0.758
C18D01Q3	1.024	0.059	17.279	0.000	0.766	0.776
R_C18D01Q5	1.026	0.059	17.311	0.000	0.768	0.778
C18D01Q8	0.950	0.059	16.029	0.000	0.711	0.721
R_C18D01Q14	0.936	0.059	15.768	0.000	0.700	0.710

## Variances:

	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C18D01Q2	0.414	0.032	12.813	0.000	0.414	0.425
.C18D01Q3	0.387	0.031	12.382	0.000	0.387	0.397
.R_C18D01Q5	0.384	0.031	12.343	0.000	0.384	0.395
.C18D01Q8	0.468	0.035	13.530	0.000	0.468	0.480
.R_C18D01Q14	0.484	0.035	13.708	0.000	0.484	0.497
C18D01	0.560	0.058	9.720	0.000	1.000	1.000

## Reliability analysis

Call: psych:::alpha(x = data, check.keys = TRUE)

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.86	0.86	0.84	0.56	6.4	0.0093	-1.4e-16	0.8	0.57

lower alpha upper      95% confidence boundaries  
0.85 0.86 0.88

## Reliability if an item is dropped:

	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C18D01Q2	0.83	0.83	0.79	0.56	5.0	0.012	0.00156	0.56	
C18D01Q3	0.83	0.83	0.79	0.55	4.9	0.012	0.00186	0.56	
R_C18D01Q5	0.83	0.83	0.79	0.55	4.9	0.012	0.00202	0.56	
C18D01Q8	0.84	0.84	0.80	0.57	5.3	0.011	0.00154	0.59	
R_C18D01Q14	0.84	0.84	0.80	0.58	5.4	0.011	0.00047	0.58	

## Item statistics

	n	raw.r	std.r	r.cor	r.drop	mean	sd
C18D01Q2	532	0.81	0.81	0.75	0.69	-1.6e-17	0.99
C18D01Q3	532	0.82	0.82	0.77	0.71	-1.4e-16	0.99
R_C18D01Q5	532	0.82	0.82	0.76	0.71	-6.2e-17	0.99
C18D01Q8	532	0.79	0.79	0.71	0.66	-1.7e-16	0.99
R_C18D01Q14	532	0.78	0.78	0.70	0.65	-3.0e-16	0.99

## C18D03 User's Emotion Presence

Definition: To what extent the user believes that his/her emotional state is caused by the interaction or the agent

lavaan 0.6-8 ended normally after 26 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	8

Number of observations	532
------------------------	-----

## Model Test User Model:

Test statistic	7.827
Degrees of freedom	2

P-value (Chi-square)	0.020					
Model Test Baseline Model:						
Test statistic	249.152					
Degrees of freedom	6					
P-value	0.000					
User Model versus Baseline Model:						
Comparative Fit Index (CFI)	0.976					
Tucker-Lewis Index (TLI)	0.928					
Loglikelihood and Information Criteria:						
Loglikelihood user model (H0)	-2870.463					
Loglikelihood unrestricted model (H1)	-2866.550					
Akaike (AIC)	5756.927					
Bayesian (BIC)	5791.140					
Sample-size adjusted Bayesian (BIC)	5765.745					
Root Mean Square Error of Approximation:						
RMSEA	0.074					
90 Percent confidence interval - lower	0.025					
90 Percent confidence interval - upper	0.132					
P-value RMSEA <= 0.05	0.177					
Standardized Root Mean Square Residual:						
SRMR	0.026					
Parameter Estimates:						
Standard errors	Standard					
Information	Expected					
Information saturated (h1) model	Structured					
Latent Variables:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
C18D03 =~						
C18D03Q0	1.000				0.534	0.541
C18D03Q1	1.067	0.142	7.515	0.000	0.570	0.577
C18D03Q2	1.015	0.137	7.397	0.000	0.542	0.549
C18D03Q12	1.028	0.138	7.433	0.000	0.549	0.556
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C18D03Q0	0.689	0.056	12.380	0.000	0.689	0.707
.C18D03Q1	0.649	0.056	11.545	0.000	0.649	0.667
.C18D03Q2	0.680	0.056	12.205	0.000	0.680	0.698
.C18D03Q12	0.672	0.056	12.040	0.000	0.672	0.690
C18D03	0.285	0.056	5.126	0.000	1.000	1.000

Reliability analysis									
Call: psych::alpha(x = data, check.keys = TRUE)									
raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r	
0.64	0.64	0.58	0.31	1.8	0.025	-3.3e-17	0.69	0.33	
lower alpha upper 95% confidence boundaries									
0.59	0.64	0.69							
Reliability if an item is dropped:									
	raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C18D03Q0	0.58	0.58	0.48	0.32	1.4	0.032	0.00108	0.33	
C18D03Q1	0.56	0.56	0.47	0.30	1.3	0.033	0.00221	0.32	

C18D03Q2	0.58	0.58	0.48	0.31	1.4	0.032	0.00099	0.32
C18D03Q12	0.57	0.57	0.47	0.31	1.3	0.032	0.00274	0.34
Item statistics								
	n	raw.r	std.r	r.cor	r.drop	mean	sd	
C18D03Q0	532	0.69	0.69	0.51	0.41	-1.5e-16	0.99	
C18D03Q1	532	0.70	0.70	0.54	0.43	5.1e-19	0.99	
C18D03Q2	532	0.69	0.69	0.52	0.41	-6.2e-17	0.99	
C18D03Q12	532	0.70	0.70	0.53	0.42	9.5e-17	0.99	

## C19 User-Agent Interplay

**Definition:** The extent to which the user and the agent have an effect on each other

lavaan 0.6-8 ended normally after 25 iterations					
Estimator	ML				
Optimization method	NLMINB				
Number of model parameters	8				
Number of observations	532				
Model Test User Model:					
Test statistic	9.655				
Degrees of freedom	2				
P-value (Chi-square)	0.008				
Model Test Baseline Model:					
Test statistic	295.413				
Degrees of freedom	6				
P-value	0.000				
User Model versus Baseline Model:					
Comparative Fit Index (CFI)	0.974				
Tucker-Lewis Index (TLI)	0.921				
Loglikelihood and Information Criteria:					
Loglikelihood user model (H0)	-2848.247				
Loglikelihood unrestricted model (H1)	-2843.419				
Akaike (AIC)	5712.494				
Bayesian (BIC)	5746.707				
Sample-size adjusted Bayesian (BIC)	5721.313				
Root Mean Square Error of Approximation:					
RMSEA	0.085				
90 Percent confidence interval - lower	0.037				
90 Percent confidence interval - upper	0.142				
P-value RMSEA <= 0.05	0.106				
Standardized Root Mean Square Residual:					
SRMR	0.028				
Parameter Estimates:					
Standard errors	Standard				
Information	Expected				
Information saturated (h1) model	Structured				
Latent Variables:					
	Estimate	Std.Err	z-value	P(> z )	Std.lv Std.all
C19 =~					

C19D00Q7	1.000				0.569	0.577
C19D00Q14	0.848	0.111	7.674	0.000	0.483	0.489
C19D00Q28	1.177	0.136	8.630	0.000	0.670	0.679
C19D00Q26	0.979	0.118	8.322	0.000	0.557	0.564
Variances:						
	Estimate	Std.Err	z-value	P(> z )	Std.lv	Std.all
.C19D00Q7	0.650	0.053	12.223	0.000	0.650	0.667
.C19D00Q14	0.740	0.054	13.802	0.000	0.740	0.760
.C19D00Q28	0.525	0.056	9.380	0.000	0.525	0.539
.C19D00Q26	0.663	0.053	12.496	0.000	0.663	0.681
C19	0.324	0.057	5.714	0.000	1.000	1.000

#### Reliability analysis

Call: psych::alpha(x = data, check.keys = TRUE)

```
raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
0.67      0.67      0.61      0.33  2 0.024 2.4e-17 0.7 0.35
```

```
lower alpha upper      95% confidence boundaries
0.62 0.67 0.71
```

#### Reliability if an item is dropped:

```
raw_alpha std.alpha G6(smc) average_r S/N alpha se var.r med.r
C19D00Q7      0.61      0.61      0.51      0.34 1.5 0.030 0.00035 0.35
C19D00Q14      0.64      0.64      0.54      0.37 1.8 0.027 0.00139 0.35
C19D00Q26      0.59      0.59      0.50      0.33 1.5 0.031 0.00978 0.35
C19D00Q28      0.55      0.55      0.46      0.29 1.2 0.033 0.00447 0.32
```

#### Item statistics

```
n raw.r std.r r.cor r.drop mean sd
C19D00Q7 532 0.70 0.70 0.54 0.43 -1.6e-17 0.99
C19D00Q14 532 0.67 0.67 0.48 0.39 1.7e-17 0.99
C19D00Q26 532 0.71 0.71 0.55 0.45 2.8e-16 0.99
C19D00Q28 532 0.75 0.75 0.63 0.51 -1.8e-16 0.99
```

## Appendix J Four Judges Decision on the Highest Loading Items

Note: Individual column shows the factor loading score of items based on the CFA result of the individual construct (in Appendix I CFA and Reliability Analysis Result of Individual Construct); ML[1..4] column shows the factor loading score of items based on the CFA result of the construct's corresponding EFA-result-based model (in Appendix H The CFA Result based on the EFA-based Models section CFA Results of Four EFA-based-Models).

### C01 Agent's Believability

Definition: The extent to which a user believes that the artefact is a social agent

#### C01D01 Human-Like Appearance

Definition: The extent to which a user believes that the social agent appears like a human

No.	ITEMID	ITEMQ	Individual	ML1
<del>1.</del>	<del>C01D01Q3</del>	<del>[The agent]'s appearance is human</del>	<del>.74</del>	<del>.73</del>
2.	C01D01Q10	[The agent] has the appearance of a human	.79	.78
<del>3.</del>	<del>C01D01Q13</del>	<del>[The agent] has a human-like outside</del>	<del>.70</del>	<del>.71</del>
<del>4.</del>	<del>C01D01Q15</del>	<del>[The agent]'s appearance makes me think of a human</del>	<del>.72</del>	<del>.74</del>

Selection reasoning:

Four judges agreed to select C01D01Q10 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

#### C01D02 Human-Like Behavior

Definition: The extent to which a user believes that the social agent behaves like a human

No.	ITEMID	ITEMQ	Individual	ML1
<del>1.</del>	<del>C01D02Q7</del>	<del>A human would behave like [the agent]</del>	<del>.65</del>	<del>.65</del>
<del>2.</del>	<del>C01D02Q10</del>	<del>[The agent]'s manners are consistent with that of people</del>	<del>.61</del>	<del>.60</del>
<del>3.</del>	<del>C01D02Q0</del>	<del>[The agent] behavior makes me think of human behavior</del>	<del>.75</del>	<del>.73</del>
<del>4.</del>	<del>C01D02Q1</del>	<del>[The agent] behaves like a real person</del>	<del>.77</del>	<del>.78</del>
5.	C01D02Q9	[The agent] has a human-like manner	.79	.80

Selection reasoning:

Four judges doubted between C01D02Q1 and C01D02Q9, because both items can represent the definition of the construct. Finally, the judges agreed to select C10D02Q9 because the item has slightly higher factor loading for both measures.

### C01D03 Natural Appearance

Definition: The extent to which a user believes that the social agent's appearance could exist in or be derived from nature

No.	ITEMID	ITEMQ	Individual	ML1
<del>1.</del>	<del>C01D03Q7</del>	<del>[The agent] appears like something that could exist in nature</del>	<del>.57</del>	<del>.55</del>
<del>2.</del>	<del>C01D03Q9</del>	<del>[The agent] has a natural physique</del>	<del>.63</del>	<del>.63</del>
<del>3.</del>	<del>C01D03Q10</del>	<del>[The agent]'s resemblance has an organic origin</del>	<del>.47</del>	<del>.46</del>
4.	C01D03Q11	[The agent] seems natural from its outward appearance	.74	.73
<del>5.</del>	<del>C01D03Q12</del>	<del>How [the agent] is represented is realistic</del>	<del>.57</del>	<del>.60</del>

Selection reasoning:

Four judges agreed to select C01D03Q11 because the item has the highest factor loading for both measures.

### C01D04 Natural Behavior

Definition: The extent to which a user believes that the social agent's behaviour could exist in or be derived from nature

No.	ITEMID	ITEMQ	Individual	ML1
<del>1.</del>	<del>C01D04Q0</del>	<del>[The agent] is alive</del>	<del>.36</del>	<del>.31</del>
<del>2.</del>	<del>C01D04Q13</del>	<del>[The agent] acts naturally</del>	<del>.68</del>	<del>.68</del>
3.	C01D04Q15	[The agent] reacts like a living organism	.74	.75

Selection reasoning:

Four judges agreed to select C01D04Q15 because the item has the highest factor loading for both measures although the judges realized that it might be difficult to translate in some languages.

### C01D05 Agent's Appearance Suitability

Definition: The extent to which the agent's appearance is suitable for its role

No.	ITEMID	ITEMQ	Individual	ML3
1.	C01D05Q2	[The agent]'s appearance is appropriate	.72	.70
<del>2.</del>	<del>C01D05Q9</del>	<del>[The agent]'s physique is suitable for its role</del>	<del>.69</del>	<del>.71</del>
<del>3.</del>	<del>C01D05Q0</del>	<del>[The agent]'s appearance was suitable</del>	<del>.64</del>	<del>.64</del>

Selection reasoning:

Four judges agreed to select C01D05Q2 because the item can still represent the definition of the construct although it doesn't contain the word 'suitable' and has the highest factor loading for one of measures.

### C02 Agent's Usability

Definition: The extent to which a user believes that using an agent will be free from effort (future process)

No.	ITEMID	ITEMQ	Individual	ML3
1.	C02D00Q1	[The agent] is easy to use	.74	.77
<del>2.</del>	<del>C02D00Q2</del>	<del>Learning to work with [the agent] is easy</del>	<del>.66</del>	<del>.65</del>
<del>3.</del>	<del>C02D00Q8</del>	<del>Learning how to communicate with [the agent] is quick</del>	<del>.64</del>	<del>.63</del>

Selection reasoning:

Four judges agreed to select C02D00Q1 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

### C03 Performance

Definition: The extent to which a task was well performed (past performance)

No.	ITEMID	ITEMQ	Individual	ML3
1.	C03D01Q7	[The agent] does its task well	.71	.70
<del>2.</del>	<del>C03D01Q12</del>	<del>[The agent] does not hinder [me / the user]</del>	<del>.54</del>	<del>.54</del>
<del>3.</del>	<del>C03D02Q10</del>	<del>[I am / The user is] capable of succeeding with [the agent]</del>	<del>.67</del>	<del>.69</del>

Selection reasoning:

Four judges agreed to select C03D01Q7 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

### C04 Agent's Likeability

Definition: The agent's qualities that bring about a favourable regard

No.	ITEMID	ITEMQ	Individual	ML5
<del>1.</del>	<del>C04D00Q1</del>	<del>[The agent]'s appearance is pleasing</del>	<del>.60</del>	<del>.61</del>
2.	C04D00Q10	I like [the agent]	.89	.86
<del>3.</del>	<del>C04D00Q11</del>	<del>[R] I dislike [the agent]</del>	<del>.81</del>	<del>.82</del>
<del>4.</del>	<del>C04D00Q4</del>	<del>[The agent] is cooperative</del>	<del>.42</del>	<del>.46</del>
<del>5.</del>	<del>C04D00Q12</del>	<del>I want to hang out with [the agent]</del>	<del>.60</del>	<del>.63</del>

Selection reasoning:

Four judges agreed to select C04D00Q10 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

### C05 Agent's Sociability

Definition: The agent's quality or state of being sociable

No.	ITEMID	ITEMQ	Individual	ML4
1.	C05D00Q6	[The agent] can easily mix socially	.77	.71
<del>2.</del>	<del>C05D00Q7</del>	<del>It is easy to mingle with [the agent]</del>	<del>.67</del>	<del>.64</del>
<del>3.</del>	<del>C05D00Q1</del>	<del>[The agent] interacts socially with [me / the user]</del>	<del>.58</del>	<del>.67</del>

Selection reasoning:

Four judges agreed to select C05D00Q6 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

### C06 Agent's Personality

Definition: The combination of characteristics or qualities that form an individual's distinctive character

#### C06D01 Agent's Personality Presence

Definition: To what extent the user believes that the agent has a personality

No.	ITEMID	ITEMQ	Individual	ML4
1.	C06D01Q1	[The agent] has a distinctive character	.69	.58
<del>2.</del>	<del>C06D01Q6</del>	<del>[R] [The agent] is characterless</del>	<del>.58</del>	<del>.60</del>

No.	ITEMID	ITEMQ	Individual	ML4
<del>3.</del>	<del>C06D01Q11</del>	<del>[The agent] is an individual</del>	<del>.47</del>	<del>.56</del>

Selection reasoning:

Four judges agreed to select C06D01Q1 because the item closely represents the definition of the construct despite it might be hard to translate in some languages.

### C07 User Acceptance of the Agent

Definition: The willingness of the user to interact with the agent

No.	ITEMID	ITEMQ	Individual	ML3
1.	C07D00Q0	[I / The user] will use [the agent] again in the future	.80	.76
<del>2.</del>	<del>C07D00Q11</del>	<del>[I / The user] can see [myself / themselves] using [the agent] in the future</del>	<del>.71</del>	<del>.75</del>
<del>3.</del>	<del>C07D00Q15</del>	<del>[R] [I oppose / The user opposes] further interaction with [the agent]</del>	<del>.38</del>	<del>.51</del>

Selection reasoning:

Four judges agreed to select C07D00Q0 because the item is easier formulated and has the highest factor loading for both measures.

### C08 Agent's Enjoyability

Definition: The extent to which a user finds interacting with the agent enjoyable

No.	ITEMID	ITEMQ	Individual	ML5
1.	C08D00Q3	[R] [The agent] is boring	.69	.71
<del>2.</del>	<del>C08D00Q4</del>	<del>It is interesting to interact with [the agent]</del>	<del>.72</del>	<del>.67</del>
<del>3.</del>	<del>C08D00Q0</del>	<del>[I enjoy / The user enjoys] interacting with [the agent]</del>	<del>.50</del>	<del>.48</del>
<del>4.</del>	<del>C08D00Q9</del>	<del>[R] [The agent] is unpleasant to deal with</del>	<del>.53</del>	<del>.57</del>

Selection reasoning:

Four judges agreed to select C08D00Q3 because the item is a good predictor of the construct based on both measures despite that it might be a bit further from the definition of the construct.

### C09 User's Engagement

Definition: The extent to which the user feels involved in the interaction with the agent

No.	ITEMID	ITEMQ	Individual	ML3
<del>1.</del>	<del>C09D00Q4</del>	<del>[I / The user] was concentrated during the interaction with [the agent]</del>	<del>.62</del>	<del>.62</del>
2.	C09D00Q10	The interaction captured [my / the user's] attention	.70	.72
<del>3.</del>	<del>C09D00Q1</del>	<del>[I / The user] was alert during the interaction with [the agent]</del>	<del>.67</del>	<del>.64</del>

Selection reasoning:

Four judges agreed to select C09D00Q10 because the item has a simple statement to represent the definition of the construct and has the highest factor loading for both measures.

### C10 User's Trust

Definition: The extent to which a user believes in the reliability, truthfulness, and ability of the agent (for future interactions)

No.	ITEMID	ITEMQ	Individual	ML3
<del>1.</del>	<del>C10D00Q6</del>	<del>[The agent] always gives good advice</del>	<del>.52</del>	<del>.56</del>
<del>2.</del>	<del>C10D00Q16</del>	<del>[The agent] acts truthfully</del>	<del>.65</del>	<del>.63</del>



No.	ITEMID	ITEMQ	Individual	ML3
3.	C10D00Q18	[I / The user] can rely on [the agent]	.73	.71

Selection reasoning:

Four judges agreed to select C10D00Q18 because the item closely represents the definition of the construct and has the highest factor loading for both measures.

### C11 User-Agent Alliance

Definition: The extent to which a beneficial association is formed

No.	ITEMID	ITEMQ	Individual	ML3
1.	C11D01Q9	[The agent] and [I / the user] have a strategic alliance	.61	.50
<del>2.</del>	<del>C11D01Q10</del>	<del>Collaborating with [the agent] is like a joint venture</del>	<del>.63</del>	<del>.64</del>
<del>3.</del>	<del>C11D01Q11</del>	<del>[The agent] joins [me / the user] for mutual benefit</del>	<del>.57</del>	<del>.44</del>
<del>4.</del>	<del>C11D01Q14</del>	<del>[The agent] can collaborate in a productive way</del>	<del>.58</del>	<del>.60</del>
<del>5.</del>	<del>C11D02Q4</del>	<del>[The agent] and [I / the user] are in sync with each other</del>	<del>.58</del>	<del>.61</del>
<del>6.</del>	<del>C11D02Q7</del>	<del>[The agent] understands [me / the user]</del>	<del>.60</del>	<del>.67</del>

Selection reasoning:

Four judges agreed to select C11D01Q9 because the item closely represents the definition of the construct, relatively easy to translate in other languages and has a decent factor loading score for both measures.

### C12 Agent's Attentiveness

Definition: The extent to which the user believes that the agent is aware of and has attention for the user

No.	ITEMID	ITEMQ	Individual	ML3
<del>1.</del>	<del>C12D00Q9</del>	<del>[The agent] remains focused on [me / the user] throughout the interaction</del>	<del>.71</del>	<del>.62</del>
2.	C12D00Q13	[The agent] is attentive	.64	.73
<del>3.</del>	<del>C12D00Q1</del>	<del>[I / The user] receives [the agent]'s full attention throughout the interaction</del>	<del>.69</del>	<del>.60</del>

Selection reasoning:

Four judges agreed to select C12D00Q13 because the item closely represents the definition of the construct, is simple and has the highest factor loading for one of the measures.

### C13 Agent's Coherence

Definition: The extent to which the agent is perceived as being logical and consistent

No.	ITEMID	ITEMQ	Individual	ML3
1.	C13D00Q3	[R] [The agent]'s behavior does not make sense	.72	.77
<del>2.</del>	<del>C13D00Q11</del>	<del>[R] [The agent]'s behavior is irrational</del>	<del>.63</del>	<del>.62</del>
<del>3.</del>	<del>C13D00Q6</del>	<del>[R] [The agent] is inconsistent</del>	<del>.47</del>	<del>.49</del>
<del>4.</del>	<del>C13D00Q15</del>	<del>[R] [The agent] appears confused</del>	<del>.52</del>	<del>.50</del>

Selection reasoning:

Four judges agreed to select C13D00Q3 because the item closely represents the definition of the construct, makes sense and has the highest factor loading for both measures.

### C14 Agent's Intentionality

Definition: The extent to which the agent is perceived as being deliberate and has deliberations

No.	ITEMID	ITEMQ	Individual	ML3
<del>1.</del>	<del>C14D00Q0</del>	<del>[The agent] acts intentionally</del>	<del>.48</del>	<del>.52</del>

<del>2.</del>	<del>C14D00Q10</del>	<del>[The agent] knows what it is doing</del>	<del>.78</del>	<del>.72</del>
3.	C14D00Q13	[R] [The agent] has no clue of what it is doing	.63	.60
<del>4.</del>	<del>C14D00Q16</del>	<del>[The agent] can make its own decision</del>	<del>.48</del>	<del>.41</del>

Selection reasoning:

Although the factor loading of C14D00Q13 for both measures is not the highest, four judges agreed to select this item because the item is easier to translate to other languages.

### C15 Attitude

Definition: A favourable or unfavourable evaluation toward the interaction with the agent

No.	ITEMID	ITEMQ	Individual	ML3
1.	C15D00Q10	[I see / The user sees] the interaction with [the agent] as something positive	.81	.79
<del>2.</del>	<del>C15D00Q11</del>	<del>[I view / The user views] the interaction as something favorable</del>	<del>.77</del>	<del>.79</del>
<del>3.</del>	<del>C15D00Q15</del>	<del>[R] [I think / The user thinks] negatively of the interaction with [the agent]</del>	<del>.63</del>	<del>.64</del>

Selection reasoning:

Four judges agreed to select C15D00Q10 because the item closely represents the definition of the construct , is easy to translate in other languages, and has the highest factor loading for both measures.

### C16 Social Presence

Definition: The degree to which the user perceives the presence of a social entity in the interaction

No.	ITEMID	ITEMQ	Individual	ML4
<del>1.</del>	<del>C16D00Q12</del>	<del>[The agent] has a social presence</del>	<del>.73</del>	<del>.74</del>
2.	C16D00Q13	[The agent] is a social entity	.78	.75
<del>3.</del>	<del>C16D00Q17</del>	<del>[I have / The user has] the same social presence as [the agent]</del>	<del>.52</del>	<del>.54</del>

Selection reasoning:

Four judges agreed to select C16D00Q13 because the item closely represents the definition of the construct, is easier to translate in other languages, and has the highest factor loading for both measures.

### C17 Interaction Impact on Self-Image

Definition: How the user believes others perceive the user because of the interaction with the agent

No.	ITEMID	ITEMQ	Individual	ML3
<del>1.</del>	<del>C17D00Q2</del>	<del>[My / The user's] friends would recommend [me / them] to use [the agent]</del>	<del>.70</del>	<del>.71</del>
2.	C17D00Q3	Others would encourage [me / the user] to use [the agent]	.73	.74
<del>3.</del>	<del>C17D00Q9</del>	<del>[The agent] makes [me / the user] look good</del>	<del>.49</del>	<del>.47</del>
<del>4.</del>	<del>C17D00Q10</del>	<del>People would look favorably at [me / the user] because of [my / their] interaction with [the agent]</del>	<del>.58</del>	<del>.54</del>

Selection reasoning:

Four judges agreed to select C17D00Q3 because the item can represent the definition of the construct and has the highest factor loading for both measures.

### C18 Emotional Experience

Definition: A self-contained phenomenal experience. They are subjective, evaluative, and independent of the sensations, thoughts, or images evoking them

### C18D01 Agent's Emotional Intelligence Presence

Definition: To what extent the user believes that the agent has an emotional experience and can convey its emotions

No.	ITEMID	ITEMQ	Individual	ML4
<del>1.</del>	<del>C18D01Q2</del>	<del>[The agent] is emotional</del>	<del>.76</del>	<del>.76</del>
<del>2.</del>	<del>C18D01Q3</del>	<del>[The agent] experiences emotions</del>	<del>.78</del>	<del>.77</del>
3.	C18D01Q5	[R] [The agent] is emotionless	.79	.78
<del>4.</del>	<del>C18D01Q8</del>	<del>[The agent] can express its feelings</del>	<del>.72</del>	<del>.73</del>
<del>5.</del>	<del>C18D01Q14</del>	<del>[R] [The agent] cannot experience emotions</del>	<del>.71</del>	<del>.70</del>

Selection reasoning:

Four judges agreed to select C18D01Q5 because the item can represent the definition of the construct and has the highest factor loading for both measures.

### C18D03 User's Emotion Presence

Definition: To what extent the user believes that his/her emotional state is caused by the interaction or the agent

No.	ITEMID	ITEMQ	Individual	ML4
<del>1.</del>	<del>C18D03Q0</del>	<del>[The agent]'s attitude influence how [I feel / the user feels]</del>	<del>.54</del>	<del>.58</del>
<del>2.</del>	<del>C18D03Q1</del>	<del>[I am / The user is] influenced by [the agent]'s moods</del>	<del>.58</del>	<del>.59</del>
3.	C18D03Q2	The emotions [I feel / the user feels] during the interaction are caused by [the agent]	.55	.48
<del>4.</del>	<del>C18D03Q12</del>	<del>[My / The user's] interaction with [the agent] gives [me / them] an emotional sensation</del>	<del>.57</del>	<del>.56</del>

Selection reasoning:

Four judges agreed to select C18D03Q2 because the item closely represents the definition of the construct and has a decent factor loading for both measures.

### C19 User-Agent Interplay

Definition: The extent to which the user and the agent have an effect on each other

No.	ITEMID	ITEMQ	Individual	ML4
<del>1.</del>	<del>C19D00Q7</del>	<del>[My / The user's] emotions influence the mood of the interaction</del>	<del>.58</del>	<del>.57</del>
<del>2.</del>	<del>C19D00Q14</del>	<del>[The agent] reciprocates [my / the user's] actions</del>	<del>.49</del>	<del>.48</del>
<del>3.</del>	<del>C19D00Q26</del>	<del>[The agent]'s and [my / the user's] behaviors are in direct response to each other's behavior</del>	<del>.56</del>	<del>.57</del>
4.	C19D00Q28	[The agent]'s and [my / the user's] emotions change to what [we / they] do to each other	.68	.69

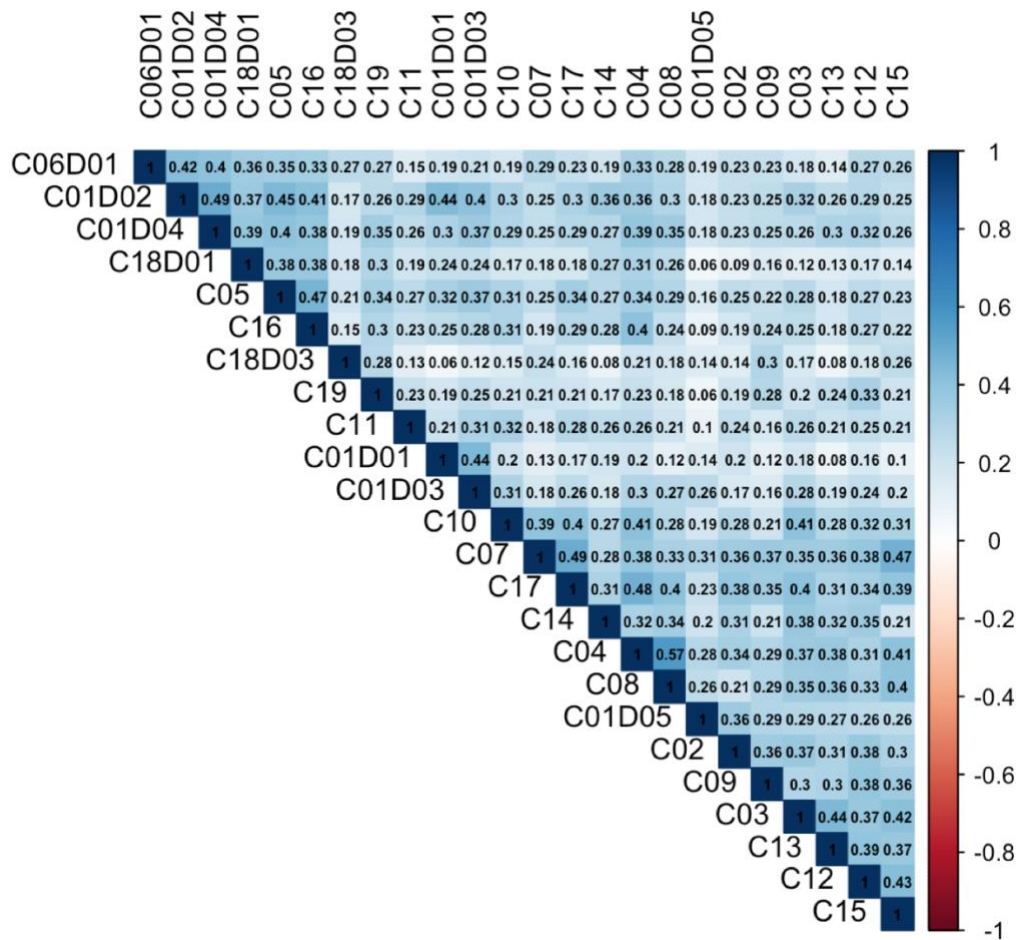
Selection reasoning:

Four judges agreed to select C19D00Q28 because the item can represent the definition of the construct and has the highest factor loading for both measures.

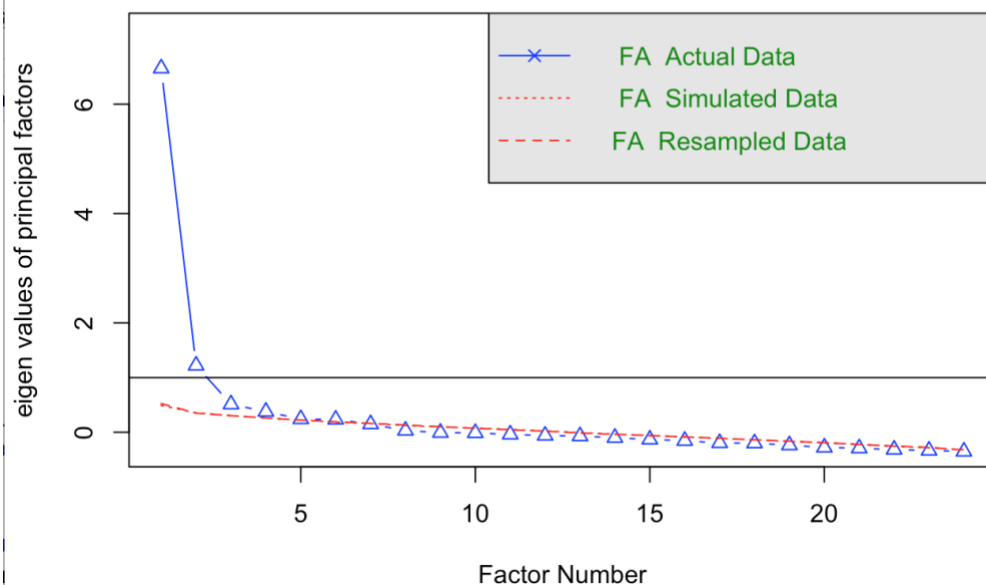
## Appendix K Correlation and EFA Result based on 24 Highest Loading Items

Note: Corresponding construct-IDs are used to represent the 24 items

Correlation between items:



Parallel Analysis Scree Plots



Parallel analysis suggests that the number of factors = 4 and the number of components = NA

EFA result:

```
Factor Analysis using method = ml
Call: fa(r = data_cor, nfactors = nfactors, rotate = "promax", SMC = FALSE,
max.iter = 100, fm = "ml")
```

Standardized loadings (pattern matrix) based upon correlation matrix								
	item	ML1	ML2	ML4	ML3	h2	u2	com
C02	6	0.59	0.12	0.03	-0.14	0.36	0.64	1.2
C07	11	0.59	-0.14	0.15	0.09	0.44	0.56	1.3
C03	7	0.59	0.18	-0.14	0.06	0.44	0.56	1.3
C12	16	0.55	0.06	0.21	-0.12	0.42	0.58	1.4
C15	19	0.55	-0.19	0.15	0.18	0.43	0.57	1.6
C13	17	0.52	-0.02	-0.05	0.16	0.35	0.65	1.2
C09	13	0.50	-0.11	0.35	-0.10	0.38	0.62	2.0
C17	21	0.47	0.02	-0.02	0.27	0.43	0.57	1.6
C01D05	5	0.46	0.05	-0.04	-0.01	0.22	0.78	1.0
C10	14	0.37	0.24	-0.11	0.16	0.34	0.66	2.4
C14	18	0.28	0.22	-0.03	0.13	0.27	0.73	2.4
C01D01	1	-0.02	0.77	-0.05	-0.21	0.39	0.61	1.2
C01D03	3	0.08	0.64	-0.08	-0.03	0.39	0.61	1.1
C01D02	2	0.00	0.60	0.19	0.00	0.52	0.48	1.2
C05	9	-0.02	0.44	0.28	0.04	0.43	0.57	1.7
C11	15	0.20	0.36	-0.04	0.00	0.22	0.78	1.6
C01D04	4	-0.01	0.35	0.31	0.13	0.44	0.56	2.3
C16	20	-0.08	0.32	0.28	0.18	0.38	0.62	2.7
C06D01	10	-0.03	0.09	0.51	0.09	0.38	0.62	1.1
C18D03	23	0.15	-0.14	0.48	-0.03	0.22	0.78	1.4
C19	24	0.11	0.17	0.47	-0.15	0.30	0.70	1.6
C18D01	22	-0.27	0.23	0.41	0.23	0.39	0.61	3.0
C04	8	0.19	-0.06	-0.02	0.71	0.62	0.38	1.2
C08	12	0.20	-0.15	0.00	0.67	0.51	0.49	1.3
		ML1	ML2	ML4	ML3			
SS loadings		3.48	2.44	1.77	1.58			
Proportion Var		0.14	0.10	0.07	0.07			
Cumulative Var		0.14	0.25	0.32	0.39			
Proportion Explained		0.38	0.26	0.19	0.17			
Cumulative Proportion		0.38	0.64	0.83	1.00			
With factor correlations of								
		ML1	ML2	ML4	ML3			
ML1		1.00	0.48	0.46	0.55			
ML2		0.48	1.00	0.54	0.64			
ML4		0.46	0.54	1.00	0.55			
ML3		0.55	0.64	0.55	1.00			
Mean item complexity = 1.6								
Test of the hypothesis that 4 factors are sufficient.								
The degrees of freedom for the null model are 276 and the objective function was 7.59								
The degrees of freedom for the model are 186 and the objective function was 0.72								
The root mean square of the residuals (RMSR) is 0.03								
The df corrected root mean square of the residuals is 0.04								
Fit based upon off diagonal values = 0.99								
Measures of factor score adequacy								
						ML1	ML2	ML4 ML3
Correlation of (regression) scores with factors						0.92	0.90	0.86 0.89
Multiple R square of scores with factors						0.85	0.82	0.74 0.79
Minimum correlation of possible factor scores						0.70	0.64	0.48 0.58

## Appendix L WEB-ASA of 14 ASAs used in the Study

ASA	MEAN VALUE OF CONSTRUCTS/DIMENSIONS IN THE ASA QUESTIONNAIRE
AIBO	-2.54, -1.59, 0.04, 0.3, 2.06, 1.78, 1.56, 1.48, 0.93, 0.32, 1.82, 1.96, 2.19, -0.09, 0.36, 1.85, 1.76, 0.13, 2.37, 0.03, 1.06, -0.69, 1.51, 1.3

<b>AMY</b>	0.88, 0.09, -0.25, -0.85, 1.21, 1.28, 0.87, 0.08, -0.28, -0.44, 0.63, 0.31, 1.31, 0.61, 0.1, 1.66, 1.5, 0.33, 0.36, -0.46, -0.1, -0.92, 0.3, 0.69
<b>CHAPPIE</b>	-1.09, 0.31, -0.92, 0.16, 0.95, 0.75, 1.13, 1.27, 0.63, 0.77, 1.39, 1.82, 2.04, 0.07, 0.65, 1.15, 1.05, 0.18, 1.86, 0.25, 0.88, 0.26, 1.18, 1.02
<b>DEEPBLUE</b>	-1.96, -0.55, -1.1, -1.14, 1.09, 0.8, 1.92, 0.33, -1.23, -1.31, 1.34, 1.18, 1.8, 1.18, 0.63, 1.32, 2.11, 1.54, 1.47, -1.21, 0.83, -2.17, -0.4, 0.17
<b>DOG</b>	-1.91, -0.62, 1.7, 1.89, 1.85, 0.42, 1.28, 2.31, 1.48, 1.47, 1.99, 2.29, 2.33, 0.21, 1.03, 1.91, 1.07, 0.21, 2.5, 0.48, 1.41, 1.1, 1.51, 1.58
<b>FURBY</b>	-2.14, -0.14, -0.85, -0.61, 1.8, 1.92, 1.16, 0.91, 0.73, 0.74, 1.02, 1.44, 1.5, -0.46, -0.06, 1.14, 1.41, -0.49, 1.56, -0.12, 0.63, -0.15, 1.03, 1.03
<b>HAL 9000</b>	-2.08, 0.23, -1.2, -0.36, 1.39, 1.39, 1.18, 0.36, 0.05, 0.29, 1.36, 0.86, 2.12, 0.41, 0.84, 2.1, 1.61, 1.8, 0.41, -0.26, 0.75, -1.06, 0.8, 0.68
<b>ICAT</b>	-2.21, -1.28, -1.5, -1.88, 0.49, 1.19, 0.94, -0.57, -0.35, -0.52, 0.66, 0.47, 1.67, -0.03, -0.26, 1.38, 1.68, 0.07, 1.1, -1.12, -0.08, -1.84, 0.26, 0.06
<b>NAO</b>	-0.93, 0.74, -0.57, -0.36, 1.74, 1, 1.31, 1.74, 0.97, 1.06, 1.57, 1.91, 2.11, 0.51, 0.94, 1.59, 1.61, 0.82, 1.9, 0.4, 1.12, 0.07, 0.99, 1.14
<b>POPPY</b>	0.64, 0.51, -0.31, -0.38, 0.7, 0.84, 0.94, 0.22, 0.75, -0.04, 1.35, 1.03, 1.99, 0.32, 0.22, 1.5, 1.22, 0.44, 1.68, 0.04, 0.21, -0.73, 0.49, 0.68
<b>SIM</b>	1.28, 0.92, 0.61, -0.36, 1.55, 1.25, 1.04, 0.61, 0.13, 0.01, 0.74, 0.86, 1.04, 0.48, 0.32, 1.76, 1.58, 0.85, 0.92, -0.06, 0.36, -0.65, 0.36, 0.95
<b>SENSEI</b>	
<b>SIRI</b>	-1.76, -0.28, -0.7, -0.81, 0.8, 2.21, 2.07, 0.77, -0.14, -0.64, 2.13, 1.53, 1.56, 1.17, 0.57, 1.79, 2.08, 0.79, 2.03, -0.99, 0.93, -1.91, -0.62, 0.05
<b>SARAH</b>	1.66, 0.71, 0.87, -0.32, 1.74, 1.71, 1.72, 0.77, 0.04, -0.17, 1.51, 1.11, 1.67, 1.3, 0.79, 2.04, 1.92, 1.36, 1.73, 0.06, 0.78, -1.36, 0.15, 0.4
<b>MARCUS</b>	1.69, 1.7, 0.67, 1.21, 1.41, 0.65, 1.09, 0.41, 0.75, 1.35, 0.76, 0.71, 2.08, 0.31, 1.07, 1.96, 1.04, 1.63, -0.01, 0.75, 0.24, 0.78, 1.24, 1.4

