

Artificial Social Agent Questionnaire Instrument

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The *Artificial Social Agent Questionnaire* is an instrument for evaluating human interaction with an artificial social agent (ASA), resulting from multi-year efforts involving more than 100 Intelligent Virtual Agent (IVA) researchers worldwide at Open Source Framework work-group of Artificial Social Agent Evaluation Instrument (<https://osf.io/6duf7/>). This document presents the long version (of the ASA Questionnaire), which consists of 90 questionnaire items in 19 constructs, and the short version, which consists of 24 items. To support reporting ASA questionnaire results, we also put forward an ASA chart. The chart provides a quick overview of agent profile.

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4TU.ResearchData.

Note:

- [R] refers to reverse-scoring questionnaire item,
- [The agent] can be replaced with the ASA's name, and
- [.. / ..], e.g. [I am / The user is], means to use either one.

Rating Scale:

7-point rating scale [-3 .. +3]

- -3 label: disagree
- 0 label: neither agree nor disagree
- 3 label: agree

I. The ASA Questionnaire

1 Agent's Believability

The extent to which a user believes that the artifact is a social agent.

1.1 Human-Like Appearance

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

(HLA1) [The agent]'s appearance is human

(HLA2) [The agent] has the appearance of a human

(HLA3) [The agent] has a human-like outside

(HLA4) [The agent]'s appearance makes me think of a human

1.2 Human-Like Behaviour

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

(HLB1) A human would behave like [the agent]

- (HLB2) [The agent]'s manners are consistent with those of people
- (HLB3) [The agent]'s behavior makes me think of human behavior
- (HLB4) [The agent] behaves like a real person
- (HLB5) [The agent] has a human-like manner

1.3 Natural Appearance

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

- (NA1) [The agent] appears like something that could exist in nature
- (NA2) [The agent] has a natural physique
- (NA3) [The agent]'s resemblance has an organic origin
- (NA4) [The agent] seems natural from its outward appearance
- (NA5) How [the agent] is represented is realistic

1.4 Natural Behaviour

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

- (NB1) [The agent] is alive
- (NB2) [The agent] acts naturally
- (NB3) [The agent] reacts like a living organism

1.5 Agent's Appearance Suitability

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

- (AAS1) [The agent]'s appearance is appropriate
- (AAS2) [The agent]'s physique is suitable for its role
- (AAS3) [The agent]'s appearance was suitable

2 Agent's Usability

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

- (AU1) [The agent] is easy to use
- (AU2) Learning to work with [the agent] is easy
- (AU3) Learning how to communicate with [the agent] is quick

3 Performance

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

- (PF1) [The agent] does its task well
- (PF2) [The agent] does not hinder [me / the user]
- (PF3) [I am / The user is] capable of succeeding with [the agent]

4 Agent's Likeability

The agent's qualities that bring about a favourable regard.

- (AL1) [The agent]'s appearance is pleasing
- (AL2) I like [the agent]
- (AL3) [R] I dislike [the agent]
- (AL4) [The agent] is cooperative
- (AL5) I want to hang out with [the agent]

5 Agent's Sociability

The agent's quality or state of being sociable.

- (AS1) [The agent] can easily mix socially
- (AS2) It is easy to mingle with [the agent]
- (AS3) [The agent] interacts socially with [me / the user]

6 Agent's Personality

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

6.1 Agent's Personality Presence

To what extent the user believes that the agent has a personality.

(APP1) [The agent] has a distinctive character

(APP2) [R] [The agent] is characterless

(APP3) [The agent] is an individual

6.2 Agent's Personality Type

The particular personality of the agent.

7 User Acceptance of the Agent

The willingness of the user to interact with the agent.

(UAA1) [I / The user] will use [the agent] again in the future

(UAA2) [I / The user] can see [myself / themselves] using [the agent] in the future

(UAA3) [R] [I oppose / The user opposes] further interaction with [the agent]

8 Agent's Enjoyability

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

(AE1) [R] [The agent] is boring

(AE2) It is interesting to interact with [the agent]

(AE3) [I enjoy / The user enjoys] interacting with [the agent]

(AE4) [R] [The agent] is unpleasant to deal with

9 User's Engagement

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

(UE1) [I / The user] was concentrated during the interaction with [the agent]

(UE2) The interaction captured [my / the user's] attention

(UE3) [I / The user] was alert during the interaction with [the agent]

10 User's Trust

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

(UT1) [The agent] always gives good advice

(UT2) [The agent] acts truthfully

(UT3) [I / The user] can rely on [the agent]

11 User-Agent Alliance

The extent to which a beneficial association is formed.

(UAL1) [The agent] and [I / the user] have a strategic alliance

(UAL2) Collaborating with [the agent] is like a joint venture

(UAL3) [The agent] joins [me / the user] for mutual benefit

(UAL4) [The agent] can collaborate in a productive way

(UAL5) [The agent] and [I / the user] are in sync with each other

(UAL6) [The agent] understands [me / the user]

12 Agent's Attentiveness

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

(AA1) [The agent] remains focused on [me / the user] throughout the interaction

(AA2) [The agent] is attentive

(AA3) [I / The user] receives [the agent]'s full attention throughout the interaction

13 Agent's Coherence

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

- (AC1) [R] [The agent]'s behavior does not make sense
- (AC2) [R] [The agent]'s behavior is irrational
- (AC3) [R] [The agent] is inconsistent
- (AC4) [R] [The agent] appears confused

14 Agent's Intentionality

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

- (AI1) [The agent] acts intentionally
- (AI2) [The agent] knows what it is doing
- (AI3) [R] [The agent] has no clue of what it is doing
- (AI4) [The agent] can make its own decision

15 Attitude

A favourable or unfavourable evaluation toward the interaction with the agent.

- (AT1) [I see / The user sees] the interaction with [the agent] as something positive
- (AT2) [I view / The user views] the interaction as something favorable
- (AT3) [R] [I think / The user thinks] negatively of the interaction with [the agent]

16 Social Presence

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

- (SP1) [The agent] has a social presence
- (SP2) [The agent] is a social entity
- (SP3) [I have / The user has] the same social presence as [the agent]

17 Interaction Impact on Self-Image

How the user believes others perceive the user because of the interaction with the agent.

- (IIS1) [My / The user's] friends would recommend [me / them] to use [the agent]
- (IIS2) Others would encourage [me / the user] to use [the agent]
- (IIS3) [The agent] makes [me / the user] look good
- (IIS4) People would look favorably at [me / the user] because of [my / their] interaction with [the agent]

18 Emotional Experience

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

18.1 Agent's Emotional Intelligence Presence

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

- (AEI1) [The agent] is emotional
- (AEI2) [The agent] experiences emotions
- (AEI3) [R] [The agent] is emotionless
- (AEI4) [The agent] can express its feelings
- (AEI5) [R] [The agent] cannot experience emotions

18.2 Agent's Emotional Intelligence Type

The particular emotional state of the agent.

18.3 User's Emotion Presence

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

- (UEP1) [The agent]'s attitude influences how [I feel / the user feels]
- (UEP2) [I am / The user is] influenced by [the agent]'s moods
- (UEP3) The emotions [I feel / the user feels] during the interaction are caused by [the agent]
- (UEP4) [My / The user's] interaction with [the agent] gives [me / them] an emotional sensation

18.4 User's Emotion Type

The particular emotional state of the user during or after the interaction with the agent.

19 User-Agent Interplay

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

- (UAI1) [My / The user's] emotions influence the mood of the interaction
- (UAI2) [The agent] reciprocates [my / the user's] actions
- (UAI3) [The agent]'s and [my / the user's] behaviors are in direct response to each other's behavior
- (UAI4) [The agent]'s and [my / the user's] emotions change to what [we / they] do to each other

II. The Short Version of the ASA Questionnaire

ID	Item
1	HLA [The agent] has the appearance of a human
2	HLB [The agent] has a human-like manner
3	NA [The agent] seems natural from its outward appearance
4	NB [The agent] reacts like a living organism
5	AAS [The agent]'s appearance is appropriate
6	AU [The agent] is easy to use
7	PF [The agent] does its task well
8	AL I like [the agent]
9	AS [The agent] can easily mix socially
10	APP [The agent] has a distinctive character
11	UAA [I / The user] will use [the agent] again in the future
12	AE [R] [The agent] is boring
13	UE The interaction captured [my / the user's] attention
14	UT [I / The user] can rely on [the agent]
15	UAL [The agent] and [I / the user] have a strategic alliance
16	AA [The agent] is attentive
17	AC [R] [The agent]'s behavior does not make sense
18	AI [R] [The agent] has no clue of what it is doing
19	AT [I see / The user sees] the interaction with [the agent] as something positive
20	SP [The agent] is a social entity
21	IIS Others would encourage [me / the user] to use [the agent]
22	AEI [R] [The agent] is emotionless
23	UEP The emotions [I feel / the user feels] during the interaction are caused by [the agent]
24	UAI [The agent]'s and [my / the user's] emotions change to what [we / they] do to each other

III. ASA Chart

The ASA Chart is an informative visual tool to display the scores of an artificial social agent (ASA) on the 24 constructs/dimensions on a two-dimensional plane (see Figure 1). The scores are normalised 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. The constructs/dimensions of the ASA Question-

naire are arranged on the ASA chart based on their distance in the factor analyses and theoretical similarities. The total score (rounded up), of all the constructs/dimensions is displayed in the middle of the chart, which is called the ASA-score. ASA chart allows us for easy comparison between different ASAs: the chart shows the profile of an ASA with regards to users' view about the ASA and their interaction.

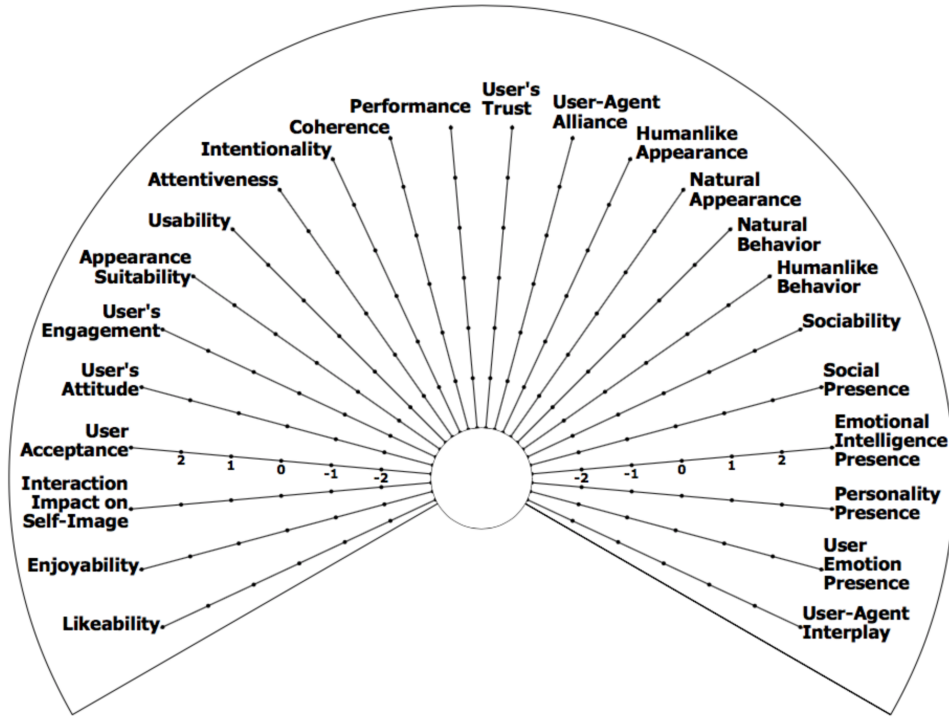


Figure 1: ASA Chart