
Questionnaires & Scoring

APPENDIX A3

A3.1 Scoring

A3.1.1 Contributions

Relative number of subject contributions was estimated in the following way: for each utterance or action of the agent, the number of times a subject repeats the same request or makes a new request is counted.

A3.1.2 Hesitations / Frustration

The following behaviors will be counted as constituting interaction-related hesitations and frustration, on behalf of the subjects:

1. Restarts (related to agent's behavior—no to recalling a command).
2. Subject looks at experimenter while waiting for agent to respond.
3. Subject clearly indicates frustration with agent's response or lack of response, by gesture, facial expression or verbally, for example by asking experimenter what to do.

A3.2 Instructions for Subjects

You are about to test a system that employs the latest advances in artificial intelligence and human-computer interaction. The experiment requires you wearing a suit and gloves to track your body movements, a head-mounted eye tracker that allows the computer to estimate where you are looking, and a microphone that allows the computer to hear your speech. After putting on this tracking system, you will be asked to calibrate it. Follow the spoken instructions of your administrator.

Next, a face will appear on the monitor to your left. This is your solar system expert. You will interact with three different characters. They are all experts on the solar system, but their abilities, intelligence and/or behaviors may vary. After your interaction with each of them, you will evaluate their performance. The estimated total interaction time for all 3 characters is 45 minutes.

On the big display in front of you is a computer model of the solar system. The character understands commands to go certain places in the solar system, and can tell you about the planets.

The characters are programmed to respond to natural multimodal behavior: They can “see” your body, hear your speech, and they can tell where you’re looking. We ask that you try to interact with them as normally as you can. If they don’t understand you, repeat your sentence or say something else. You can ask questions in any sequence you choose.

A3.3 Evaluation Questionnaire

(Notice to the reader: The name appearing in the questions, Gandalf, Bilbo or Roland, depended on which character the subject just interacted with.)

You have just interacted with Gandalf, one of three computer-enacted characters we are developing. Following are questions related to your experience with Gandalf. Please answer them to the best of your ability.

Estimated time: 5 minutes.

Your cooperation is appreciated.

1. Please rate Gandalf on the following issues:

1-a. On a scale from 0 to 10, assuming that a human gets a score of 10, Gandalf’s understanding of your spoken language gets a score of _____.

1-b. On a scale from 0 to 10, assuming that a human gets a score of 10, Gandalf’s use of spoken language gets a score of _____.

When two people interact face-to-face, their interaction is most of the time very smooth, with minimal hesitations and misunderstandings.

1-c. On a scale from 0 to 10, assuming that a human gets a score of 10, the smoothness of the interaction with Gandalf gets a score of _____.

- 1-d. Compared to interacting with a dog, Gandalf's understanding of spoken language is ...
- ...much better.
 - ...somewhat better.
 - ...about equal.
 - ...slightly worse.
 - ...much worse.
- 1-e. Compared to interacting with a dog, Gandalf's use of language is ...
- ...much better.
 - ...somewhat better.
 - ...about equal.
 - ...slightly worse.
 - ...much worse.
- 1-f. Compared to interaction with a dog, the smoothness of the interaction with Gandalf is ...
- ...much better.
 - ...somewhat better.
 - ...about equal.
 - ...slightly worse.
 - ...much worse.
- 1-g. Compared to interacting with a fish in a fishbowl, interacting with Gandalf is ...
- ...much more interesting.
 - ...somewhat more interesting.
 - ...about equal
 - ...somewhat less interesting.
 - ...much less interesting.
- 1-h. Compared to any real animal (excluding humans), Gandalf seems...
- ...incredibly life-like.
 - ...very life-like.
 - ..somewhat life-like.
 - ...not very life-like.
 - ...not life-like at all.
- 1-i. Compared to the most life-like character in any computer game or program you have seen, Gandalf seems...
- ...incredibly life-like.
 - ...very life-like.
 - ..somewhat life-like.
 - ...not very life-like.
 - ...not life-like at all.

2. If the video monitor with Gandalf's face had been turned off for the whole time, do you think your interaction with the computer would have been different?

- Yes
- Yes, perhaps, but not significantly.
- No, probably not.

2-b. If Yes, how would it be different? (Mark A or B or leave blank.)

A

- 1. More fun. OR
- 2. More difficult. OR
- 3. More efficient. OR
- 4. Smoother. OR
- Other:

B

- Less fun.
- Less difficult.
- Less efficient.
- Less smooth.

3. How helpful to the interaction did you find ...

3-a. ...the content of Gandalf's speech?

- Very helpful.
- Somewhat helpful.
- Neither helpful nor unhelpful.
- Unhelpful.
- Counterproductive.

3-b. ...Gandalf's head motions?

- Very helpful.
- Somewhat helpful.
- Neither helpful nor unhelpful.
- Unhelpful.
- Counterproductive.

3-c. ...Gandalf's expressions?

- Very helpful.
- Somewhat helpful.
- Neither helpful nor unhelpful.
- Unhelpful.
- Counterproductive.

3-d. ...Gandalf's gaze?

- Very helpful.
- Somewhat helpful.
- Neither helpful nor unhelpful.
- Unhelpful.
- Counterproductive.

- 3-e. ...Gandalf's hand gestures?
 - o Very helpful.
 - o Somewhat helpful.
 - o Neither helpful nor unhelpful.
 - o Unhelpful.
 - o Counterproductive.

A3.4 Prior Beliefs Questionnaire

1. The following questions relate to your preconceived notions of interacting with computers.
 - 1-a. Did interacting with these computer controlled characters confirm or disconfirm any of your pre-conceived notions about the difficulty / ease of interacting multimodally with a computer?
 - o I had no preconceived notions of that.
 - o Yes, I thought it would be...
 - o ...much easier than it was.
 - o ...somewhat easier than it was.
 - o ...somewhat smoother than it was.
 - o ...much smoother than it was.
 - o ...very much like this.
 - o ...somewhat more difficult than it was.
 - o ...much more difficult than it was.
 - o No.
 - 1-b. Did interacting with these computer controlled characters confirm or disconfirm any of your pre-conceived notions about your willingness to interact with a computer system that acts as a human?
 - o I had no preconceived notions of that.
 - o Yes, I am now ...
 - o ...much more willing to interact with such systems.
 - o ...somewhat more willing to interact with such systems.
 - o ...somewhat less willing to interact with such systems.
 - o ...much less willing to interact with such systems.
 - o No, I am equally willing as I was before.

- 1-c. Did interacting with these computer controlled characters confirm or disconfirm any of your pre-conceived notions about what future intelligent machines might look like?
- o No.
 - o Yes. Please explain:
- 1-d. Did interacting with these computer controlled characters confirm or disconfirm any of your pre-conceived notions about when/if machines will ever become intelligent?
- o I had no preconceived notions of that.
 - o Yes, I am now ...
 - o ...much more certain they will become intelligent.
 - o ...somewhat more certain they will become intelligent.
 - o ...somewhat less certain they will become intelligent.
 - o ...much less certain they will become intelligent.
 - o No, I hold the exact same belief as before.
- 1-e. Did interacting with these computer controlled characters confirm or disconfirm any other pre-conceived notions you had before about computers, intelligent machines or humanoid computer assistants?
- o No.
 - o Yes. Please explain:
2. Would you use an assistant like Gandalf, Bilbo or Roland in your home to help you with various tasks?
- 2-a. o Yes, even in its current form.
- 2-b. o No, not in its current form; ONLY if (mark all that apply:)
- o I didn't have to "dress up" to communicate with it.
 - o it were a little bit smarter.
 - o it were much smarter.
 - o the interaction were smoother.
 - o it had more knowledge (about various topics).
 - o it was easier to interact with.
 - o it were mobile and had a physical body like a robot.
 - o it had knowledge about my favorite topic.
- 2-c. o No.

3. It took approximately 3 person-years to make these prototype characters (a person-year is the amount of work a person can do in one year). How many years do you think it would take a dedicated research team (10-20 researchers) to create a character such as these that works perfectly?
- more than 100 years
 - between 5 & 10 years
 - between 50 & 100 years
 - between 2 & 5 years
 - between 25 & 50 years
 - between 1 & 2 years
 - between 10 & 25 years
 - less than 1 year

