Seniors' Sensing of Agents' Personality from Facial Expressions

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Motivation

- **Emotions** and facial emotional expressions are **important** [4, 3, 5]

- They are indispensable for **starting, maintaining, modifying, strengthening or breaking relationships** with others [2]

- *Semaine* project [6]: *"emotionally colored interactions between a person and a machine"* [1]

- *Empathic* project [7]: *"developing causal models of [agent] coach-user interactional exchanges that engage elders in emotionally believable interactions"*

Source: https://pixabay.com/en/emotions-man-happy-sad-face-adult-371238/, by RyanMcGuire | CC0 Creative Commons

References:
[1] Bevacqua, E., Pammi, S., Hyniewska, S. J., Schröder, M., Pelachaud, C.: Multimodal backchannels for embodied conversational agents. In: Allbeck, J., Badler, N., Bickmore, T., Pelachaud, C., Safonova, A. (eds) IVA 2010, Lecture Notes in Artificial Intelligence 6356, pp. 194-200. Springer, Berlin, Germany (2010).
[2] Campos, J. J., Barrett, K. C.: Toward a new understanding of emotions and their development. In: Izard, C., Kagan, J, Zajonc, R. (eds.) Emotions, cognition, and behavior, pp. 229–263. Cambridge University Press, New York, NY, USA (1984).
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[4] Seibt, B., Mühlberger, A., Likowski, K. U., Weyers, P.: Facial mimicry in its social setting. Frontiers in Psychology, 6:1122 (2015).
[5] Seidela, E. V., Habela, U., Kirschnerc, M., Gurd, R. C., Derntla, B.: The impact of facial emotional expressions on behavioral tendencies in females and males. Journal of Experimental Psychology Human Perception & Perform, 36(2), 500–507 (2010).
[6] https://cordis.europa.eu/project/rcn/85389_en.html
[7] https://cordis.europa.eu/project/rcn/212371_en.html

Pilot Study

Goals

- assess **seniors' preferences in initiating conversations** with an **agent visually expressing emotional behavior**
- **summon elder's emotional responses** arising from such non-verbal agent behavior
- measure their **interest in these interactions**

Sample

- n=**45 healthy seniors** (20 females)
- aged **65+ years** (AVG=70.28 years; SD=±5.52)
- from **Campania**, a region in the south of Italy

Stimuli

- **4 conversational agents** possessing **different personality features** [1]
- **1 video clip per agent**, **10 seconds** long showing an agent's half torso while speaking (note: audio was muted)

Agents

- **Serena**, female, based on Semaine's Poppy, committed to expressing **optimism**
- **Gerardo**, male, based on Semaine's Obadiah, deputed to express **pessimism**
- **Pasquale**, male, based on Semaine's Spike, deputed to express **aggression**
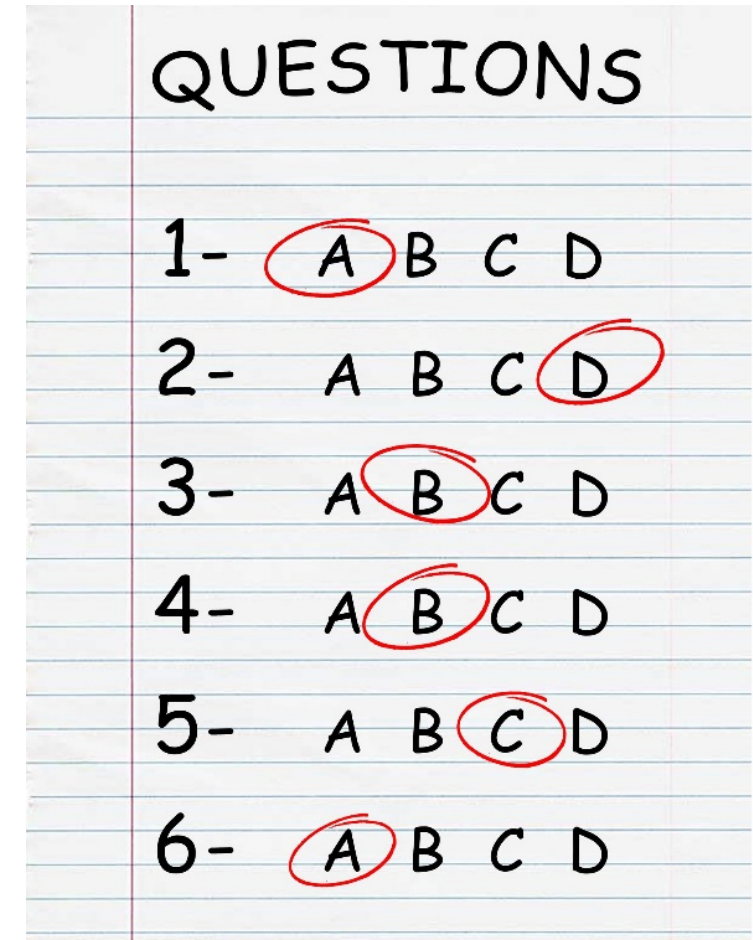- **Francesca**, female, based on Semaine's Prudence, aimed at expressing **pragmatism**

Source: https://pixabay.com/en/despaired-businessman-business-2261021/, by www_slon_pics | CC0 Creative Commons

References:
[1] Ochs, M., Niewiadomski, R., Pelachaud, C.: How a Virtual Agent Should Smile? – Morphological and Dynamic Characteristics of Virtual Agent's Smiles. In: Allbeck, J., Badler, N., Bickmore, T., Pelachaud, C., Safonova, A. (eds) IVA 2010, Lecture Notes in Artificial Intelligence 6356, pp. 427-440. Springer, Berlin, Germany (2010).

Tripartite Questionnaire

- **Part 1:** participants' **socio-demographic information**, **degree of technology experience**, and their **used technological devices** with respective **ratings on perceived usage difficulty**

- **Part 2:** participants' **preferences regarding the interaction** with each of the proposed agents
    - Sub-sections: **Pragmatic Qualities** (PQ), **Hedonic Qualities of Identification** (HQI) and **Stimulation** (HQS) and **Attractiveness** (ATT) [1]

- **Part 3:** feedback on **agent characteristics**

References:
[1] Hassenzahl, M. The interplay of beauty, goodness, and usability in interactive products. Human-Computer Interaction, 19, 319–349 (2004).

Results

Devices usage

- **57.8%** of the participants regularly **use at least one device**
- the **most popular** device seems to be the **smartphone** (68.9% regular usage)

Agent Interaction Preference

- **71.1% liked Francesca** (66.7% Serena, 46.7% Gerardo and only 22.2% Pasquale)

Agent Perception

- **64.4%** considered **Francesca moderately pragmatic (PQ)** (Serena=53.3%, Gerardo=42.2%, Pasquale=24.5%)
- **66.5%** consider her to be **moderately mind-pleasing (HQI)** (Serena=51.1%, Gerardo=35.6%, Pasquale=22.2%),
- **75.5% moderately stimulating (HQS)** (Serena=66.6%, Gerardo=40.0%, Pasquale=20.0%),
- **64.5% moderately attractive (ATT)** (Serena=55.6%, Gerardo=44.4%,Pasquale=31.1%)

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7 items à 5 points (++ to --)
- Strong = 7-13 points
- Moderate = 14-20 points
- Mild = 21-27 points
- None = 28-35 points

Conclusion

Summary

- seniors use at **least one technological device**
(the smartphone seems to be preferred)
- seniors show a **positive attitude** towards interactions with an artificial agent, and that they **favor agents which express a positive personality**
- Although participants were not informed about an agent's personality, they were able to perceive relevant facial expressions

Future Outlook

- **deeper investigation** of this capability as those avatars showing positive facial dynamics were females
(potential gender effect [1])
- similar **studies in Spain, Norway, France and Austria**
(starting next week)
- Investigations on the **effect of voice**
(i.e. using a agent that is not muted)
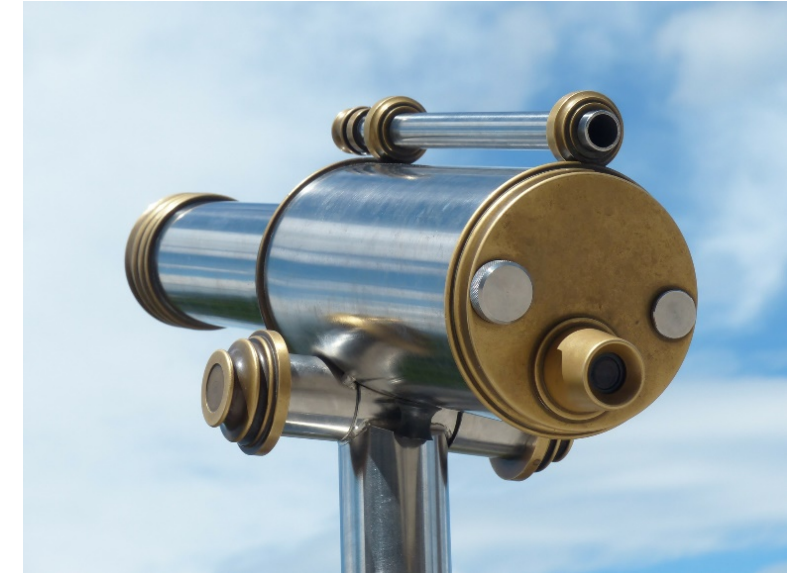
Source: https://pixabay.com/en/telescope-by-looking-view-122960/ by Hans | CC0 Creative Commons

References:
[1] Marsh, A. A., Ambady, N., Kleck, R. E.: The effects of fear and anger facial expressions on approach- and avoidance-related behaviors. Emotion, 5(1):119–24 (2005).

Thank you for your attention!

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