Linguistic Features During Speech Utterances in the Context of Social Skills Training

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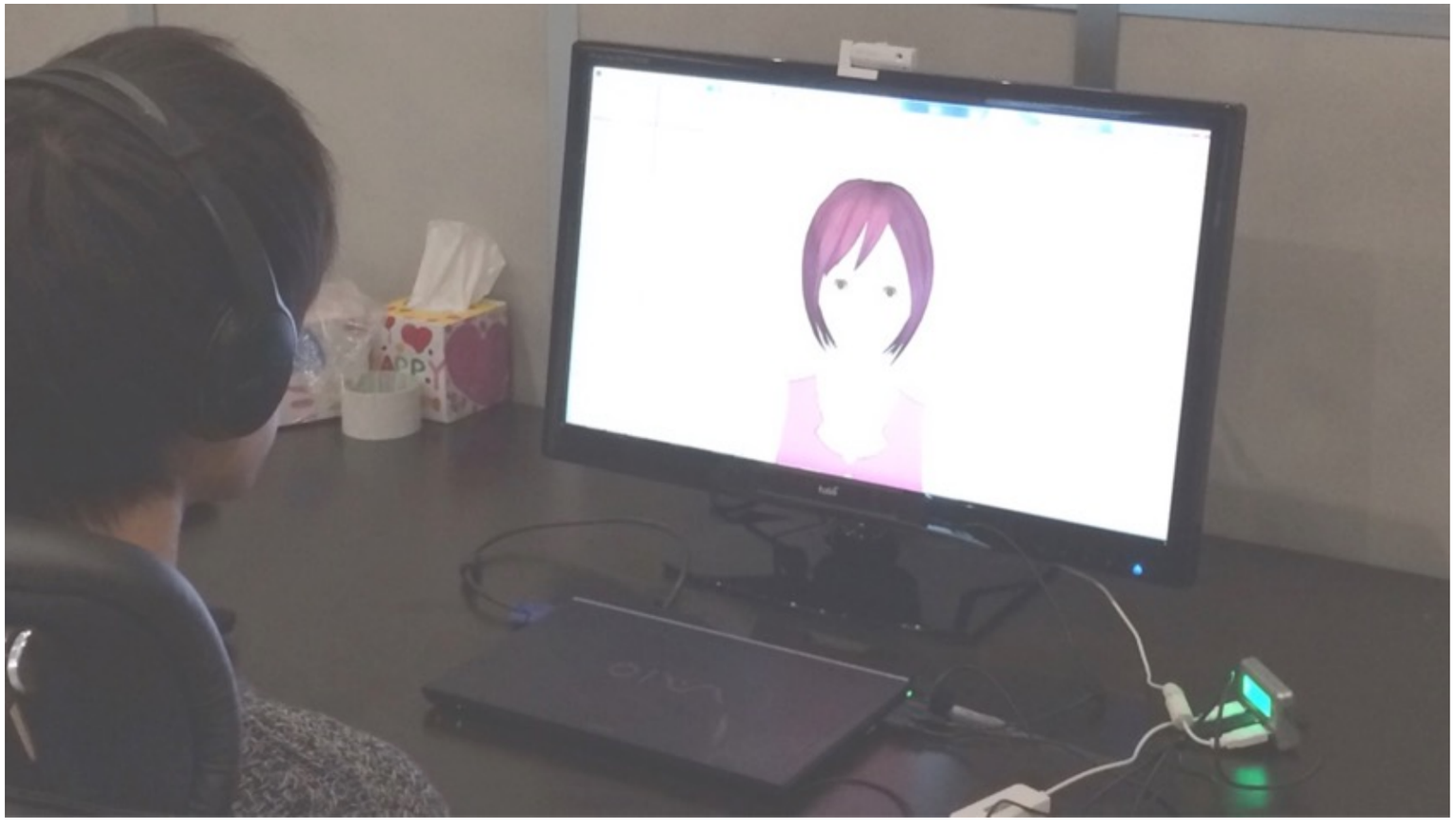
Social Skills Training (SST)

- Psychosocial treatment
- For people with autism, schizophrenia [Bellack, 2013]
- To obtain appropriate social skills through
  - Instruction
  - Modeling
  - Role-play
  - Feedback
  - Homework

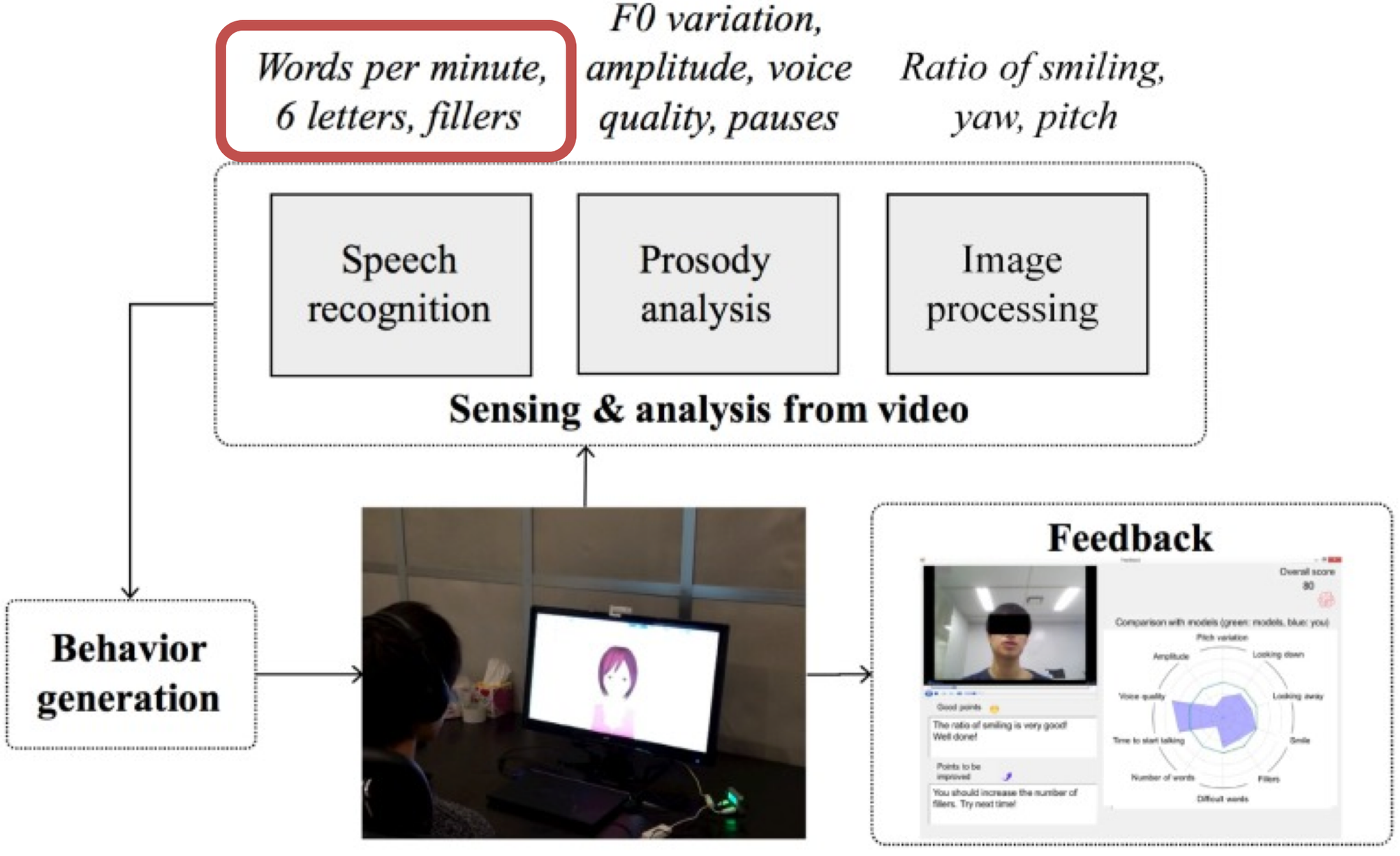
Automated social skills trainer

- People with autism have good systemizing skills
- Embodied conversational agents
- Speaking skills [Tanaka, et al., 2015] and listening skills [Tanaka, et al., 2020]



Role-play and feedback

Speech contents



Online feedback

Summary feedback

Speech contents analysis

- 36 data of adults and 18 data of children/adolescents with autism spectrum disorders
- Speak about a recent fun story for one minute to a person
- Human social skills trainer rated the score (1 to 7)
- Extracted linguistic features:
  - # of Tokens
  - Type-token ratio (TTR)
  - # of conjunction
  - # of fillers
  - Similarity of word embedding
    *sequentially shifting ten words
  - Parse tree depth (depth)

Correlations (*r*) to overall speaking skills

* represents $p < 0.05$, and † represents $p < 0.1$ compared to no correlation

- Adults

	Tokens	TTR	Conj.	Fillers	Similarity	Depth
Adults	0.50*	-0.09	0.03	0	0.10	0.38*

- Children/adolescents

	Tokens	TTR	Conj.	Fillers	Similarity	Depth
Children	0.57*	0	0.53*	0.29	-0.07	0.43†

Conclusions

- We have proposed automated social skills trainer
- This study analyzed speech contents
- Adults: # of tokens, the tree depth are significantly correlated to overall speaking skills
- Children/adolescents: # of tokens, the tree depth, # of conjunctions are correlated to overall speaking skills
- These features can be used for feedback in future automated SSTs