A talking teddy bear for encouraging the elderly to talk with giving response
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Purpose The elderly people who live alone is continuing to increase in Japan. The population exceeded 590 million in 2015 (Cabinet Office Japan, 2019). The purpose of this study is to find a way to offer such people opportunities to make conversations. **Method (1) Talking Teddy bear** The authors produced a talking Teddy bear who responds in a local dialect to encourage the speaker to continue. A coordinated response works as the social bond between the speaker and the listener rather than the content of the conversation (Kita & Ide, 2007). The authors implemented the response by using HEARTalk™ (Yamaha, Corp., Japan), which does not analyze the contents, but the rhythm or prosody of the speech in real time and choose a message for natural response (Yamaha, 2017). All messages were the recorded voice of a native male speaker in Hiroshima dialects who was around 60 years old. The responses were given by the Teddy bear, Himitsu no Kuma-chan (Mysterious Teddy bear) (T-ARTS Company, Ltd., Japan) who waggles his head during the speech. Nineteen responses were all spoken by a man in his 60s in local dialect in Hiroshima. The functions of the responses were approval, applause, simple response, sympathy, surprise, urging to go on, reactions, and asking to repeat for small voices. Recorded audio files were stored in the memory on board. A response was chosen in real time from the recorded messages and then sent to the speaker of the teddy bear. **(2) Trial by an elderly woman** A woman who was in the 70s of age living alone in a Hiroshima prefecture participated in the trial. She had been talkative among family members up to the point of losing her partner three months prior. Since that time, she had spent most of her days in silence. The researches asked her to continue the conversations with the talking Teddy bear as long as she could, although it would or not give responses in the expected way. **Results and Discussion** The participant welcomed the Teddy bear. She was glad to hear the bear's voice in a familiar dialect and interested in managing the conversation by coping with Teddy's responses in both expected and unexpected way. The participant spoke 148 sentences in the first three days. The content in the sentences was events on the day, her impression, and her opinion as a reaction to the response of the bear, or questions to the bear, and so on. She continued the talk coping with the bear's responses in both expected and unexpected ways. The participant showed the robot to every visitor, such as the visiting nurse, repair persons and gardeners. She enjoyed seeing the visitor speak to the robot and had a good time with the visitors. She used the robot after the research session and did again go out to participate in social activities. The method proposed here is a different approach in that the robot encouraging the user has a leading role in management of the conversation.

References
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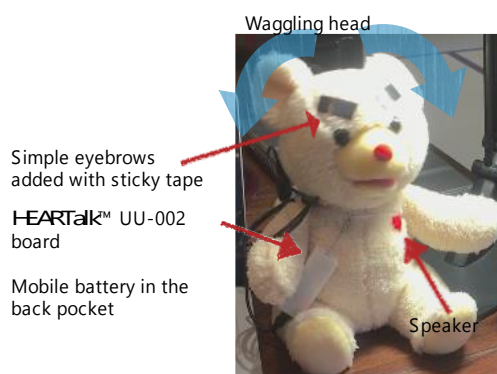
Figure 1. Talking teddy bear for giving responses.