

SUPPLEMENTARY MATERIAL 2

Information and qualitative analysis of patient 'A' (Supplementary Table 1)

When generating voices using simple rhythm and vowels, patient 'A' attempted the change in breathing pattern from the early stage, the time period of exhaling was increased, its voice did not change although the patient 'A' talked a lot, and a response to increase/decrease in voice due to the 5th interval key occurred. From 5th time, however, the movement of eyes and a chin got serious, instead of that of the upper body, so that vocalizing tempo was radically slow. Patient 'A' had liked singing songs, but singing activities had diminished due to its frequent hoarse voice and consequential sense of helplessness. It sang its favorite songs memorizing lyrics and keys through sessions, but was found not tired and to naturally extend its voice to a high pitching sound zone. She said "I feel better that I do not have a husky voice and can breathe easily," moved the upper body to the beat of a touch bell saying "I like the bell sound," and improvised voice melody. In the later session, movement of the upper body was diminished, but its chin was extensively moved so that voice volume was low and the patient 'A' stably sang songs without facial expression.

Supplementary Table 1. Analysis of patient 'A's attitude in the participation to vocalization and singing activities

Activity	Response	Early (1st–2nd session)	Mid (3rd–4th session)	Later (5th–6th session)
Vocalization	Physical	In spite of the sever movement of its upper body, it extends its chest forward to the upward music when inhaling.	When exhaling, it breaths to the downward music, bends its upper body toward exhaling and following in & exhaling pattern.	There is no sever movement of the upper body, but it slowly vocalizes with eyes and chin move severely.
	Musical	It feel the vibration from resonation. When slowly vocalizing in two beats, it has larger mouth and sound.	When leaping up/downward, there was change in tune and the tune extended to A to D. 2nd to 3rd keys did not incur the change in tune of voice.	When humming, it created melody and sang songs to the Q-code accompaniment. The change in tune in accordance with code change turns to be clear.
Singing activity	Physical	Moving the upper body to music, the interviewee sang songs moving it more extensively from side to side.	When singing 'With Lover' and 'Love,' the movement of the upper body was identified.	Eyes and a chin severely moved, while they stopped when the interviewee sang songs.
	Musical	The patient memorized lyrics, tune, and rhythm of its favorite songs. When singing, the musical sound range increases up to D5.	With a touch bell, the interviewee attempted the change in various rhythm and tune when improvising songs.	Due to change in the body, voice got weaker and tempo was slower, but 'Bandal' has low keys so that the interviewee lowered tune and beat singing songs.
	Emotional	The patient said 'the song of one-sided love' is joyous so that it feels good. And the sound of a drum in the song makes it feel better. After singing 'Bandal,' it expressed change in emotion saying it felt like tearing.	The patient said 'no one to love' on the verge of tears. After singing kid's songs, it elaborated its own emotion using some terms like memories with its friends and positive words.	The patient said to feel better when thinking about friends, but its chin moved a lot. It seemed to be less attentive to the session without facial expression.