Eloquent silences: A musical and lexical analysis of conversation between oncologists and their patients

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A B S T R A C T

Objective: Silences in doctor-patient communication can be "connectional" and communicative, in contrast to silences that indicate awkwardness or distraction. Musical and lexical analyses can identify and characterize connectional silences in consultations between oncologists and patients.
Methods: Two medical students and a professor of voice screened all 1211 silences over 2 s in length from 124 oncology office visits. We developed a "strength of connection" taxonomy and examined ten connectional silences for lexical and musical features including pitch, volume, and speaker turn-taking rhythm.
Results: We identified connectional silences with good reliability. Typical dialog rhythms surrounding connectional silences are characterized by relatively equal turn lengths and frequent short vocalizations. We found no pattern of volume and pitch variability around these silences. Connectional silences occurred in a wide variety of lexical contexts.
Conclusion: Particular patterns of dialog rhythm mark connectional silences. Exploring structures of connectional silence extends our understanding of the audio-linguistic conditions that mark patient-clinician connection.
Practice implications: Communicating with an awareness of pitch, rhythm, and silence – in addition to lexical content – can facilitate shared understanding and emotional connection.

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1. Introduction

Silence is a communicative act, yet clinicians are rarely trained or sensitized to its importance and potential meanings. Silence in clinical settings has been studied since the 1970s in order to classify and understand its functions and etiologies [1–4]. Silence in clinical contexts is defined as an absence of verbal audio signal, lasting appreciably longer than the average time between speaking turns [5–7]. The meaning and function of silence is defined by context including ambient sounds, utterances before and after the silence, and visual cues such as facial expression and body position [3,5,7–10]. The literature from psychotherapy and linguistics suggests that silence within medical visits can be divided broadly into communicatory silences that are intentionally left silent and non-communicatory or interrupted communication, such as when a physician enters data on a computer [7,11].

Previous research on silence in patient-physician communication has identified a particular type of silence – which we call "connectional silence" – associated with emotional exchange [8,12]. Descriptions of these moments, presumed to build relationships and be therapeutic for patients, often contain elements of resonance, presence, and attentiveness [13]. These connectional silences may contribute to improved communication by facilitating shared understanding and emotions [14].

Silence in general – and connectional silences in particular – have been regarded either as intangible, part of the art of medicine, or as part of the lexical structure [15]. Yet, detailed attention to both the lexicon and musicality of language, including rhythm,

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pitch, volume, and tempo, may shed light on this phenomenon [16]. In this exploratory study, we build on previous work to examine the lexical and musical landscape around these silences in detail, and to identify common elements among connectional silences [17]. Given that this was an exploratory study, we did not know from the outset whether those elements would pertain to the words that preceded and followed the silence (the lexical elements) and/or the musical elements such as pitch and rhythm of the speakers' voices. We sought to illuminate the co-occurrence of silence and connection to determine if there might be performative elements that could be taught to clinicians, thus enriching the patient-physician relationship [8,17,18].

2. Methods

We created a taxonomy of silence, and then analyzed both the lexical and musical contents for those silences that we identified as connectional. We used audio data from the observational stage of a multi-site randomized trial of an intervention to improve communication in oncology settings [19]. Audio-recorded encounters occurred between November 2011 and August 2012 in outpatient oncology clinics near Rochester, NY, and Sacramento, CA. Out of 53 oncologists contacted, 41 solid tumor oncologists in private and university practice settings each completed three audio-recordings of outpatient office visits with patients who had stage III or IV cancer (and an accompanying caregiver if available); these recordings were used in this secondary analysis (Table 1). Oncologists and study personnel at the time were unaware that conversational silences would be examined in a secondary analysis. Detailed recruitment, inclusion, exclusion, and human subject review board approval can be found in a previously published protocol [19].

Initially, we set out to create a typology of moments where silence occurs in conversations in the context of advanced cancer. Analysis was conducted by a multidisciplinary team consisting of a medical student with a background in public health (JB), a medical student with a background in literature (RR), and a professor of voice (KC). All three analysts are trained musicians though RR is not currently practicing. Working from audio with parallel transcripts, we identified all silences greater than 2 s in length.

Silence identification was completed by JB and RR by scanning the waveform in detail for areas of low intensity to ensure that silences as short as one second were conspicuous. Length was measured using an Atlas Ti waveform display by zooming to a scale where one second stretches almost two inches across the screen, highlighting the section of interest, and listening to see if there was any low volume vocal activity. The endpoints of the silence were then adjusted manually to the nearest 0.1 s. Sensitivity was achieved by listening to the entire recording in case there were times with high intensity waveform being created by nonverbal sources such as exam room tables or a ringing cell phone. Ten complete visits were coded by both JB and RR to check accuracy in silence identification and length measurement. A 6% disagreement on borderline-length silences (1.9–2.1 s) was resolved through consensus and we refined the criteria and technique for silence length measurement.

Using a modified grounded approach sensitized by the empirical literature on conversational silences and in consultation with a linguist, we developed descriptive codes [20,21]. Through an iterative process, we eventually defined 10 broad dimensions – 5 lexical and 5 musical – within which a priori and emergent codes were developed to describe distinct patterns of communication 30 s before and after each silence [22,23]. We used musical notation to capture overlapping verbal and non-verbal sounds and to compare speakers' pitch, tempo, and volume even when they overlapped. Our 10 dimensions allowed for axial coding of lexical

Table 1
(a) Patient demographics. (b) Physician demographics.

(a)

	N	%
All	124	100
Race		
White	112	90
Other	12	10
Site		
URMC	78	65
UCD	42	35
Patient Education		
Some college or more	85	68
HS or less	39	33
Aggressive cancer		
Non-aggressive	66	53
Aggressive	58	47
Patient Gender		
Female	70	56
Male	54	44

(b)

	N	%
All	41	100
Physician gender		
Male	29	71
Female	12	29
Physician Race		
Asian	16	39
Black/AA	1	2
White	18	44
Other	1	2
Missing	5	12
Breast cancer physician		
No	33	80
Yes	8	20
Physician age		
Mean	Median	std
44.7	44	9.8

and musical characteristics around each silence (See Tables 2a and 2b for a list and definitions of these dimensions).

As coding progressed, the team noted one kind of silence that marked emotionally intense moments. We sought descriptions of similar phenomena in the medical literature and developed a "strength of connection" taxonomy with subcodes of "connectional," "invitational," "neutral," and "disengaged" silences (Table 3) [12,24–26]. We defined a connectional silence as one in which there was an implicit or explicit patient emotional cue, doctor recognition of that emotion, and an indication of emotional resonance between doctor and patient. We defined connectional silences narrowly; for example, in one case, the patient recognized a doctor's emotion, but not vice versa, and the segment was not coded as connectional because it lacked reciprocity. Invitational silences were those that opened up a conversation, whereas disengaged silences were activities that distanced patient and doctor, such as entering data on a computer. In order to validate the "strength of connection" taxonomy, 10 conversation segments with one silence each were reviewed by 3 expert physicians who were not study participants and not involved in the coding process. The