The Nature of Music

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Two prevailing ideas:

- music constitutes an autonomous, discrete domain of human experience
- the privileged mode of engagement with music is listening

Both have secure provenances in Western intellectual history, from Aristoxenus in the 4th century BCE to Hanslick in the 1800s

Both are increasingly globalized, having become firmly embedded in "folk theories" of music in most musical *supercultures*, reinforced by socio-economic and, particularly, technological developments over the last two centuries

A musical superculture (after Slobin, 1992) includes "three basic components:

- An industry… justifying the ways of the superculture to man, woman, and child
- The state and its institutionalized rules and venues… [institutional] activity affects subcultures… through erasure and stereotypes
- The superculture provides a set of standardized styles, repertoires, and performance practices anyone can recognize, if not like"

Slobin, M. (1992). Micromusics of the West: A Comparative Approach. *Ethnomusicology, 36*(1), 1-87.

The identity of "music" for the major musical supercultures is increasingly dominated by the Western model, in which music is increasingly a commodity with exchange value

In Georgina Born's (2005) words (after Adorno) there are "…several dimensions in which music's existence is permeated by commodification – be it musical form, performance mode, filmic exposure, radio play, production or reception"

This commodification process is driven, at least in part, through the increasing prevalence of music as recorded sound, which also propels the idea that music is for listening

Born, G. (2005). On Musical Mediation: Ontology, Technology and Creativity. *Twentieth-Century Music, 2*(01), 7-36.

As Eric Clarke notes (2007: 69):

"…recordings—understood as a resource rather than a prescription or dogma—have provided people with an unparalleled opportunity to enter into, and learn from, musical cultures from every part of the world. This access is of a particular kind, of course: acousmatic, de-contextualized, disengaged from the specificity of time and place, and affording no real social interaction between the listener and the virtually present musicians (even if sometimes it may conjure up the impression of it)."

Clarke, E. F. (2007). The Impact of Recording on Listening. *Twentieth-Century Music, 4*(01), 47-70.

Hence, globally, music is increasingly subsumed into a Western (or WEIRD: Western, Educated, Industrialized, Rich, Democratic) "folk theory" of music as complex, humanly-produced, expressive sound, engaged with through listening because of its capacity to elicit emotional responses, produced—composed and performed—by the few and consumed—listened to—by the many

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral & Brain Sciences, 33*(2-3), 61-83.

This folk theory has been cemented into place by the commodification of music as having exchange value through the possibility of "ownership" of IPR (the legacy of the work concept) and of the means, not of production, but of dissemination and distribution, once the preserve of the record company and now that of the technocorporations in the form of distribution platforms such as iTunes, as well as search engines (Google page rank algorithms are key here), and control over access to, or influence over, key 'opinion formers' (highly networked individuals), etc. via social networking tools

see, e.g., Garnham, N. (2005). From cultural to creative industries. *International Journal of Cultural Policy, 11*(1), 15-29.

Taking their cues from the prevailing folk theories, the vast majority of experimental studies of music have tended to investigate it in terms of the auditory perception of complex sonic pattern, and the relationships between auditory processes and the elicitation of emotion

Cross, I. (2012). Cognitive Science and the Cultural Nature of Music. *Topics in Cognitive Science, 4*(4), 668-677.

However:

For many of the world's cultures—including Western cultures and subcultures—while music may be listened to, it is also something that is done; it is **participatory** as much as it is **presentational**

Turino, T. (2008). *Music as social life : the politics of participation*. London: University of Chicago Press.

And in many cultures it is not easy to distinguish clearly between the attributes of music and those of language—or, more properly, speech

Wachsmann (1971: 383) "…there are many African cultures that cannot make such a rigid and final separation between music and speech as the West seems to be able to, and in Ancient Greece the word *mousike* embraced both, the poetry of music and the music of poetry (prose, prosody). For them the ends of the music-speech continuum do not have that extreme, ultimate, and irreconcilable connotation that it has for us in the West today. The Ethiopian practice of dance-speech (the sounds of speech to which people dance) is just as acceptable as *The Art of Fugue* (music that uses sounds that are remote—in terms of the length of the continuum—from speech)."

Wachsmann, K. P. (1971). Universal Perspectives in Music. *Ethnomusicology, 15*(3), 381-384.

Two prevailing ideas:

- music constitutes an autonomous domain
- the privileged mode of engagement with music is listening

ALTERNATIVE HYPOTHESIS

Music and speech are components of a general human communicative toolkit, underpinned by similar neural, cognitive, behavioural and affective mechanisms

Hypothesis motivated in part by a growing body of research that indicates common neural and cognitive substrates for music and language or speech:

- speech and music are indissociable in early infancy (Brandt, Gebrian & Slevc, 2012: *Frontiers in Psychology*)
- musical expertise advantageous for aspects of second-language learning (Milovanov et al, 2008: *Brain Research*)
- similar mechanisms underlie emotional inferences from both vocalizations and music (Escoffier, Zhong, Schirmer & Qiu, 2012: *Human Brain Mapping*)
- syntax in language and music processed largely by means of the same brain circuitry (Koelsch, 2012: **Brain & Music**)
- substantial overlap in brain regions involved in processing speech and song (Schön et al, 2010: *NeuroImage*)

Hypothesis also motivated by the realisation that thinking of music as a medium for social interaction that shares many features with speech can provide new and potentially productive ways of exploring music in cognition

Social interaction

Steve Levinson (2006: 39)

“The roots of human sociality lie in a special capacity for social interaction”

“There are quite good *prima facie* grounds for thinking that human interactional abilities are at least partially independent of both language and culture”

Levinson, S. C. (2006). On the human "interaction engine". In N. J. Enfield & S. C. Levinson (Eds.), *Roots of human sociality: culture, cognition and interaction* (pp. 39-69). Oxford: Berg.

Levinson’s “human interaction engine”:

“universal properties of human interaction that have a cognitive-and-ethological foundation, constructed of scraps of motivational tendencies, temporal sensitivities, semi-cooperative instincts, ancient ethological facial displays, and the capacity to analyze other's actions through mental simulation”

Levinson, S. C. (2006). On the human "interaction engine". In N. J. Enfield & S. C. Levinson (Eds.), *Roots of human sociality: culture, cognition and interaction* (pp. 39-69). Oxford: Berg.

From a cross-specific perspective, there is an increasing amount of convergent evidence that points to humans as uniquely and flexibly social

Seed & Tomasello (2010: 414): ”…children and apes perform very similarly on tests dealing with the physical world, but the children—old enough to use some language but still years away from reading, counting, or going to school—outstrip the apes in tests dealing with the social world … Human cultural groups can be distinguished from [types of] cultures seen in nonhuman primates because of their highly cooperative nature”

Seed, A., & Tomasello, M. (2010). Primate Cognition. *Topics in Cognitive Science, 2*(3), 407-419.

Music in social interaction

If music reflects generic human interactive capacities, does it have a generic role in human interaction?

Nettl (2005: 253): "The fundamental function of music in human society, what music ultimately does, is twofold: to **control humanity's relationship to the supernatural**, mediating between humans and other beings, and to **support the integrity of individual social groups**. It does this by expressing the relevant central values of culture in abstracted form"

Nettl, B. (2005). *The study of ethnomusicology: thirty-one issues and concepts* (2nd ed.). Urbana & Chicago: Univ. Illinois Press.

McLeod (1974: 113): "…what music symbolizes is an altered state of consciousness, be it a transition from one status to another, the adoption of a ritual attitude, or the acting out of personal or social importance in the face of tensions implicit in the social structure. **In all cases music is directed at areas regarded as uncertain**…"

Cross (2009: 190): "… music has all the attributes of a communicative system that is highly adapted to facilitate the **management of the uncertainties of social interaction**"

McLeod, N. (1974). Ethnomusicological Research and Anthropology. *Annual Review of Anthropology, 3*, 99-115.

Cross, I. (2009). The evolutionary nature of musical meaning. *Musicae Scientiae, Special Issue: Music and Evolution*, 147-167.

Hypothesis: **Music is an optimal medium for managing situations of social uncertainty, situations where cooperation, reciprocity, commitment and trust cannot be taken for granted**

Appears to be supported by historical, anthropological and ethnomusicological evidence for music's cross-culturally significant role in such situations

Cross, I. (2009). The evolutionary nature of musical meaning. *Musicae Scientiae, Special Issue: Music and Evolution*, 147-167.

How can music manage situations of social uncertainty? And why music rather than speech?

…because a generic function of music as an interactive medium across cultures is *phatic*

Malinowski (1923) suggests that much of what we do when we talk is reaffirm social relationships, and used the term *phatic* to refer to the role of talk in **establishing or reaffirming social bonds**

Malinowski, B. (1923). The problem of meaning in primitive languages. In C. K. Ogden & I. A. Richards (Eds.), *The Meaning of Meaning: A Study of the Influence of Language upon Thought and of the Science of Symbolism*. London: Routledge.

As many ethnomusicologists—including Lomax (1968) and Turino (2008)—have noted, **music as an interactive process establishes and maintains social bonds**—interactive music seems to have a *phatic* function

Lomax, A. (1968). *Folk song style and culture*. Washington DC: American Association for the Advancement of Science.

Turino, T. (2008). *Music as social life : the politics of participation*. London: University of Chicago Press.

Phatic or *relational* talk contrasts with task-oriented or *transactional* talk, where the function of the communicative interaction is directed towards a goal extrinsic to the interaction (such as organising joint action)

Guerin (2003: 274): "Phatic communication is formal talk between relative strangers that means little beyond remaining in a (possible) relationship with each other.”

… an extremely constrained notion of the phatic dimension, losing a great deal of Malinowski's original notion of the phatic

In his words, (Malinowski, 1923: 285): "…words in Phatic Communion… fulfill a social function and that is their principal aim, but they are neither the result of intellectual reflection, nor do they necessarily arouse reflection in the listener… Each utterance is an act serving the direct aim of binding hearer to speaker by a tie of some social sentiment or other"

Guerin, B. (2003). Language use as social strategy: A review and an analytic framework for the social sciences. *Review of General Psychology, 7*(3), 251-298.

Coupland, Coupland & Robinson (1992: 211): "Goals of talk that relate to building, modifying, or dissolving personal relationships, and, on the other hand, those that have to do with the definition and redefinition of own and others' identities as interacting beings, are no less intrinsic to the enterprise of talking [than is the transmission and reception of factual information]. *Phaticity may be best seen as a constellation of interactional goals that are potentially relevant to all contexts of human interchange*."

Coupland, J., Coupland, N., & Robinson, J. D. (1992). "How Are You?": Negotiating Phatic Communion. *Language in Society, 21*(2), 207-230.

McCarthy (2003: 59-60): "…the concept of good listenership seems to require more than acknowledgment and transactional efficiency in keeping the channel open; listeners may be inferred as working at the creation and maintenance of sociability and affective well-being in their responses… As with other aspects of relational talk, this kind of responsiveness is not something that just surfaces from time to time in the discourse but seems to be a continuous thread in the fabric of talk…"

McCarthy, M. (2003). Talking Back: "Small" Interactional Response Tokens in Everyday Conversation
Research on Language & Social Interaction, 36(1), 33 - 63.

In other words, phatic, relational elements permeate *all* human communicative interactions, serving to keep open channels of communication (in a "conventional" transmission model of communication) or to align attitudes and affects so as to ensure the conditions for mutual and coordinated co-construction of ongoing communicative interaction

Applications of the notion of the "phatic" to music:

Pike (1967: 316) " For the listener the sounds exist as prelinguistic experience. They are immediately given and grasped without interpolated, extramusical meanings. At this level of experience music is its own language, a "phatic communion."

Pike, A. (1967). The Phenomenological Analysis and Description of Musical Experience. *Journal of Research in Music Education, 15*(4), 316-319.

Applications of the notion of the "phatic" to music:

Blum (1975: 212) "In my judgment, … the rich ethnographic data presented in Rouget's essay [on the court songs of the ancient African kingdoms of Porto Novo and Abomey] might suggest greater attention to metalingual and phatic functions"

Blum, S. (1975). Towards a Social History of Musicological Technique. *Ethnomusicology, 19*(2), 207-231.

Applications of the notion of the "phatic" to music:

Vuust & Roepstorff (2008: 140) "The phatic function is especially important to communication in jazz in particular and maybe music as a whole… jazz allows for several communication channels at the same time, implying that new connections between different musicians are established continuously in the musical flow"

Vuust, P., & Roepstorff, A. (2008). Listen up! Polyrhythms in brain and music. *Cognitive Semiotics, 3*(fall), 134-158.

But jazz is a highly skilled suite of musical behaviours; how does participatory music fulfil a phatic function more-or-less independently of participants' expertise?

I suggest that it does this by allowing participants

(a) to coordinate their behaviours in time

ENTRAINMENT

(b) to experience the significance of the musical interaction in wholly personal terms

FLOATING INTENTIONALITY

(c) to feel that all participants' goals and mutual attitudes are in alignment

HONEST SIGNALLING

Entrainment

When people make music together, they coordinate their behaviours in time. Typically, the result is that a regular pulse structure emerges that is experienced as shared, around which each participant organises their contribution to the musical event

When making music together, participants *entrain* their attention, actions and sounds with those of other participants, mutually adapting their behaviours in time

Himberg, T. (2013). *Interaction in Musical Time.* Unpublished Ph.D thesis, University of Cambridge, Cambridge, UK. [see https://www.repository.cam.ac.uk/handle/1810/245212]

Many recent studies show that when people entrain their behaviours with one another, they experience positive effects on their memory for and their attitudes towards each other

- in part because entrained others are perceived as similar to oneself
- in part because sustained entrainment provides a good index of ability and motivation to cooperate

Valdesolo, P., & DeSteno, D. (2011). Synchrony and the social tuning of compassion. *Emotion, 11*(2), 262-266.

Music provides a medium for entrained interaction that helps sustain a sense of collective convergence

Floating intentionality & honest signalling

Swain (1996): "…music seems full of meaning to ordinary and often extraordinary listeners, yet no community of listeners can agree among themselves with any precision that comes close to natural language about the nature of that meaning":

floating intentionality

Swain, J. P. (1996). The Range of Musical Semantics. *The Journal of Aesthetics and Art Criticism, 54*(2), 135-152.

Cross, I. (1999). Is music the most important thing we ever did ? Music, development and evolution. In S. W. Yi (Ed.), *Music, mind and science* (pp. 10-39). Seoul: Seoul National University Press.

Music's meanings are individually variable, but also experienced as immediate and direct; while a participant may experience the music as embodying a meaning wholly personal to them, it may also seem to be intrinsic to the music

The music "means like it sounds"—arising from a tendency to experience the acoustical signals entailed by the music *as though* there were a necessary causal connection between the signals' structure and the motivational states of their producers—*as though the music were an honest signal*

For discussion of the concept of “honest signal”, see Owren, M. J., Rendall, D., & Ryan, M. J. (2010). Redefining animal signaling: influence versus information in communication. *Biology & Philosophy, 25*(5), 755-780.

A paradox: music appears to embody unmediated, direct meaning, but what any particular instance of music may mean seems different in the experience of different individuals

…*BUT* unlike interaction in speech, the meanings elicited by music are *not* required to be made mutually explicit by individuals interacting in music

In speech interaction, successful communication requires the existence of common ground: shared knowledge, joint assumptions, and, most likely, common ways of understanding an interlocutor's verbal and gestural behaviours

Common ground is both static and dynamic: in Kecskes and Zhang's' words (2013: 379) " there are two sides of assumed common ground: core common ground … the relatively static, generalized, common knowledge that belongs to a certain speech community as a result of prior interaction and experience, [and] emergent common ground …the relatively dynamic, actualized and particularized knowledge co-constructed in the course of communication that belongs to and is privatized by the individual(s)."

Kecskes, I., & Zhang, F. (2013). On the Dynamic Relations Between Common Ground and Presupposition. In A. Capone, F. Lo Piparo & M. Carapezza (Eds.), *Perspectives on Linguistic Pragmatics* (Vol. 2, pp. 375-395): Springer International Publishing.

But both types of common ground are susceptible to violation: as Kecskes also notes (2010: 70) "…as a consequence of the differences in speaker and hearer processing, the communicative process is rough, rather than smooth. Communication is a trial-and-error process that is co-constructed by the participants [involving] …break-downs, misunderstandings, struggles, and linguistic aggression as properties which are in no way unique, but rather represent common features of communication"

Kecskes, I. (2010). The paradox of communication - Socio-cognitive approach to pragmatics. *Pragmatics and Society, 1*(1), 50-73.

In phatic speech interaction, this may arise when the function of the interaction is misinterpreted and speech acts become understood as having referential value, as being informative and as requiring informative responses; the phatic status of the interaction can dissolve in misunderstanding

But: as noted, in musical interaction whatever constitutes "common ground" need never be assayed; the meanings that are elicited by music are *not* required to be made mutually explicit by individuals interacting in music

Hence music can be thought of as a preternaturally phatic mode of interaction, as an optimal medium for managing situations of social uncertainty, by enhancing a sense of mutual affiliation between participants and by allowing them to experience the significance of a joint event as both deeply personal yet shared

Some empirical support for positive effects of music on sociality:

- there are positive effects of repeated engagement in participatory music for school-age children on the development of a capacity for empathy
- active musical experience leads to enhanced development of prelinguistic communicative gestures and social behaviour for infants between 6 and 12 months of age

Rabinowitch, T.-C., Cross, I., & Burnard, P. (2013). Long-term musical group interaction has a positive influence on empathy in children. *Psychology of Music, 41*(4), 484-498.

Gerry, D., Unrau, A., & Trainor, L. J. (2012). Active music classes in infancy enhance musical, communicative and social development. *Developmental Science, 15*(3), 398-407.

Music & speech as interactive media: periodicity as a common mechanism

Two prospective functions for periodicity in communicative behaviour

(i) increase predictability

(ii) affiliation enhancement

Speech registers that are intended to enhance predictability (capture attention) should be more regular than those that are not

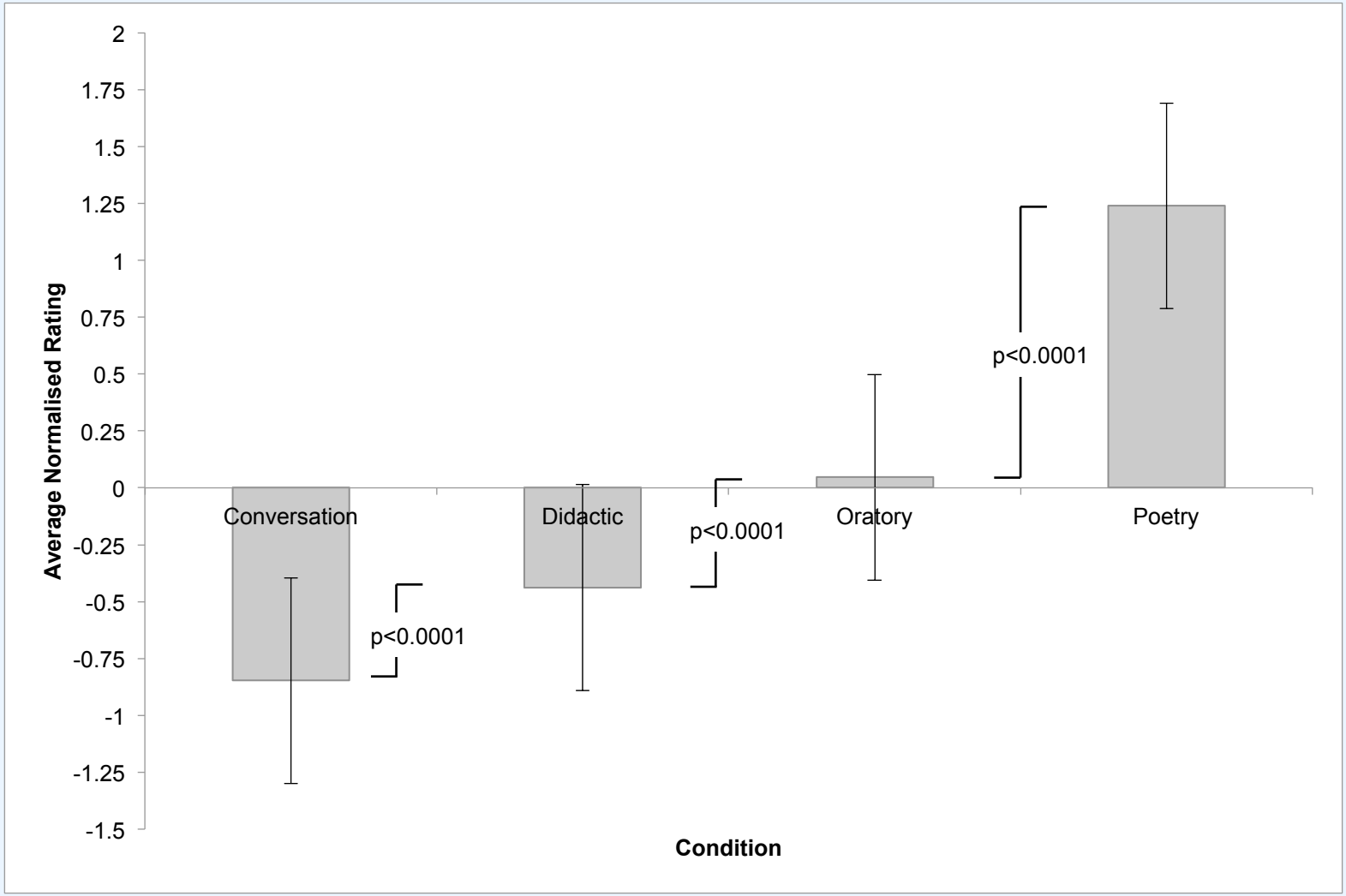
Speech registers intended to capture attention and enhance affiliation between listeners and speaker should be even more regular

Used instances of conversational speech, didactic speech (lectures: attentional predictability), oratory (party political speeches: attentional predictability and affiliation enhancement) and metrical poetry in two tasks:

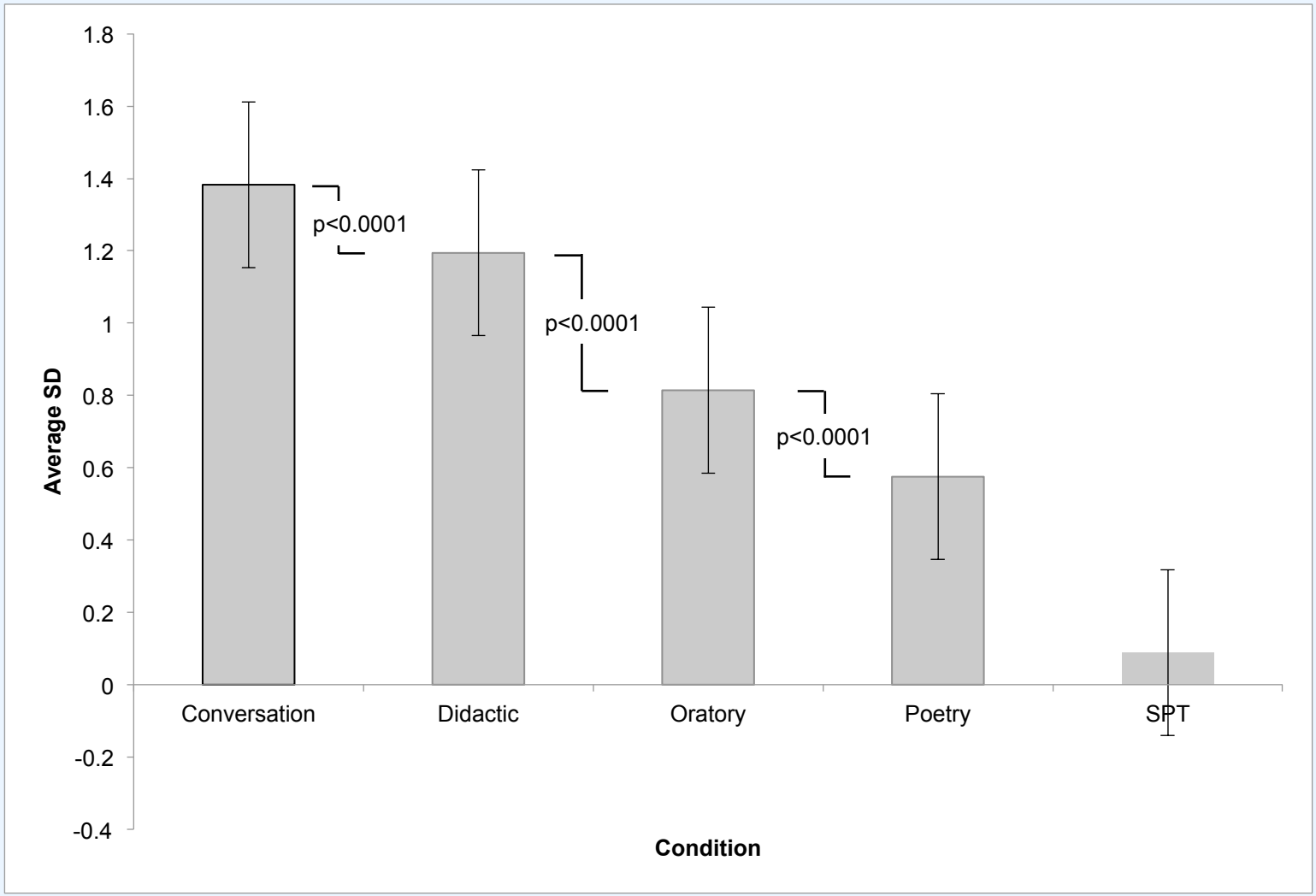
(a) rating rhythmicity of examples, and:

(b) tapping along to the "beat" of the examples (SD of the mean of each pair of inter-tap intervals—meta-ITI—was the measure of beat variability)

Knight, S. L. & Cross, I. (2015, under revision). Sociolinguistic functions of periodicity in speech. *Cognition*.



Mean rhythmicity ratings for each experimental condition



Mean meta-ITI SD for each experimental condition and a self-paced tapping task (SPT)

Rating data significantly negatively correlates with the tapping data
(Pearson's r = -0.43, p < 0.0001; one-tailed)

Here, the presence of an listener is assumed. But these ***presentational*** modes of engagement in speech are much less common than the truly interactive mode manifested in everyday conversation, where an interlocutor is not just a listener but actively participates so as to co-construct the ongoing conversational interaction, often making non-verbal interjections such as *uh-huh*, and nodding, gesturing, reshaping body position relative to speaker, etc

Preliminary results from ongoing research at Cambridge on interaction in spontaneous speech and in music—suggest that both domains are underpinned by common temporal processes

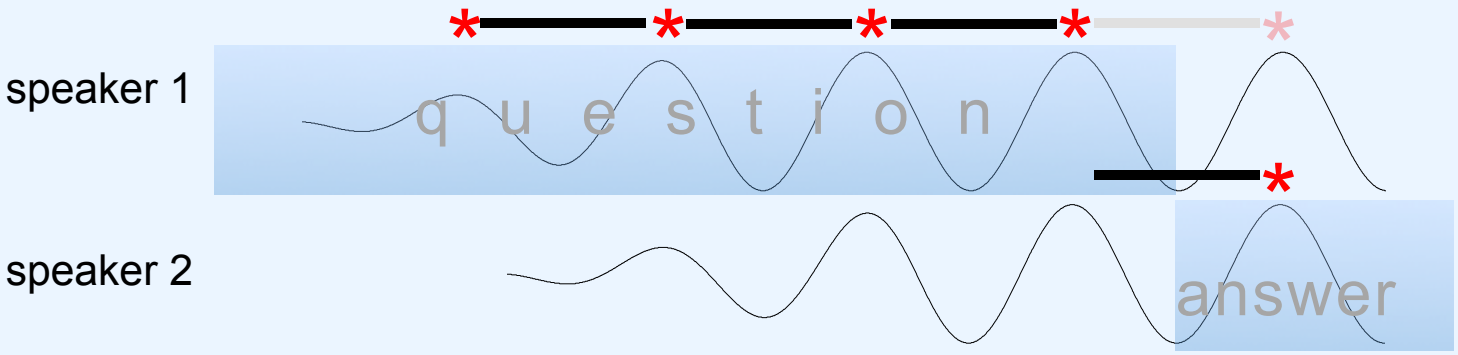
We recorded 8 pairs of same-sex friends aged 18-31 (pairs either both musically trained or not) for about 1 hour each, talking, doing simple non-musical tasks, and making music together

We now have an extremely rich and unique corpus of data on naturalistic interaction in speech and music (in a specific cultural context—southern England)

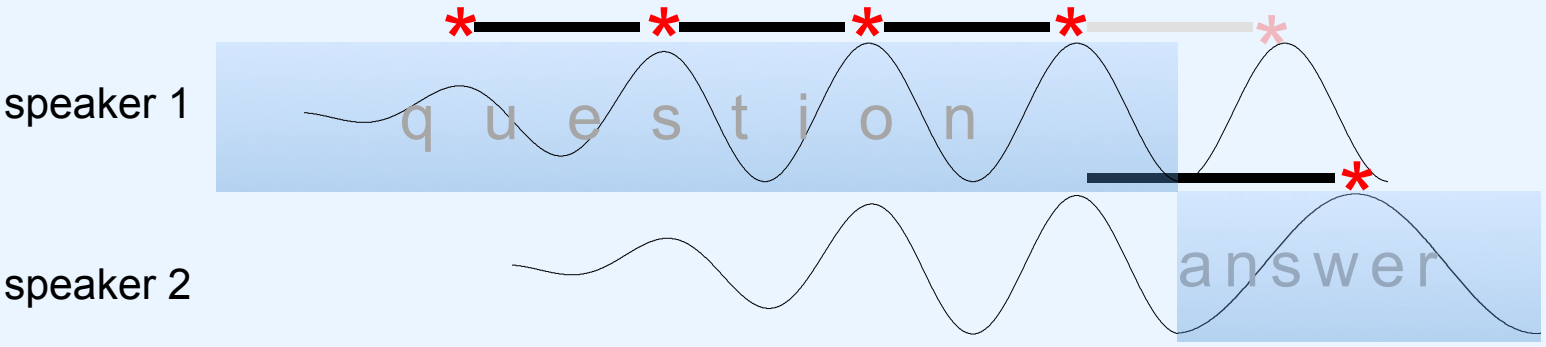
Speech interaction results

Analyses by Richard Ogden show that:

- in instances of conversation involving a question by speaker 1 and an answer from speaker 2, the temporal location of the initial stressed syllables of speaker 2's answer is predictable from the last two or three stressed syllables of speaker 1's assertion when the response is "preferred" (i.e., indicates attitudinal alignment with speaker);
- in cases of "dispreference" or attitudinal **dis**alignment, there can be explicit **temporal** disalignment



Preferred answer:
answer latency=period of speech accents of speaker 1



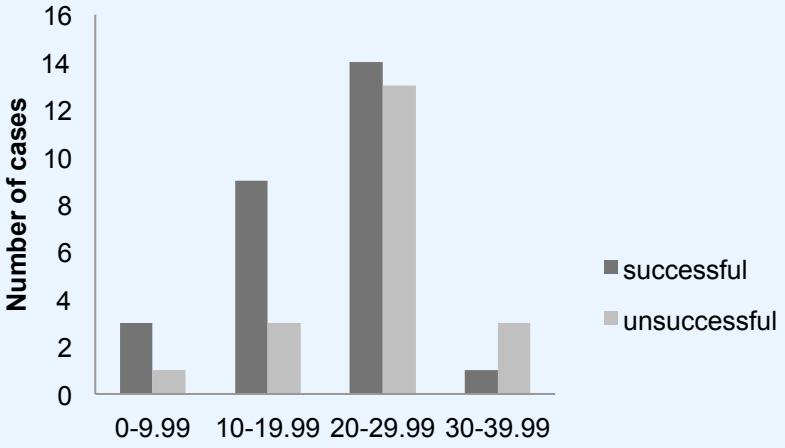
Dispreferred answer:
answer latency≠period of speech accents of speaker 1

Music & speech interaction results

To date, we have analysed pulse or tactus in the "successful" and "unsuccessful" musical bouts of five pairs, evaluating whether intonation peaks in speech ("speech accent") align with the musical pulse **during**, **after** and **before** the musical bout

Bouts	n	mean of mean IOI for each bout (ms)	s.d. of mean IOI	mean of the s.d.s
successful	27	730.52	250.28	63.76
unsuccessful	15	663.91	266.61	112.36

Mean IOIs (ms) and various measures of standard deviation for the pulses of **successful** and **unsucccessful** musical bouts



Mean deviation of intonation peaks in speech from nearest musical pulse onset (% of IOI) before, during and after musical bouts

We find that in and around successful musical bouts, intonation peaks were statistically significantly more likely to be aligned with the musical pulse than in unsuccessful bouts

Note that we have identified several instances where intonation peaks in speech prior to a successful musical bout *across participants* exhibit a periodicity that is **then** taken up in the musical interaction

Hawkins, S., Cross, I., & Ogden, R. (2013). Communicative interaction in spontaneous music and speech. In M. Orwin, C. Howes & R. Kempson (Eds.), *Music, language and interaction* (pp. 285-329). London: College Publications.

These experimental results are narrowly focused and mono-cultural, but derive from real-world, naturalistic situations

These and other studies are adding weight to the hypothesis that in social contexts foregrounding the relational—phatic—dimension of communication, the same processes can underpin interaction in both music and speech

Conclusions

If music and language are so intertwined, why do we appear to need both?

Language, because of its capacity to be unambiguously referential, can never be quite as effective as can music in leading interactants' affective and motivational states into alignment

Music has the advantage over language of being able to integrate the simultaneous experience of multiple participants into a collective communicative interaction

Rather than thinking of speech and music as separate domains, it's probably better to construe them as overlapping categories of interactive, communicative behaviour

Most "everyday" speech interaction is more than a little musical in the ways in which it serves social ends

Most "musical" interactions—particularly in traditional societies and musical micro-cultures—are embedded in specific social processes that direct joint action towards particular goals

There are many instances in different cultures where it is not easy—nor even desirable—to draw a distinction between music and speech (see, e.g., Seeger, *Why Suyá sing*)

Seeger, A. (1987). *Why Suyá sing: a musical anthropology of an Amazonian people*. Cambridge: Cambridge University Press.

This view of music and speech has several implications:

It suggests that in the analysis of culture, it would be most fruitful to investigate language and music as an integrated communicative complex

It suggests that scientific and ethnographic studies of music and language need to take close account of each other's findings, particularly when music and language are being explored as interactive media

It suggests that the roots of several human capacities—such as entrainment—might best be investigated and analysed in terms of their role in communicative interaction

It suggests that, from an evolutionary perspective, music and language may best be explained not as discrete domains of behaviour but as culturally reconfigurable manifestations of an underlying set of communicative resources

Some References…

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Hawkins, S., Cross, I., & Ogden, R. (2013). Communicative interaction in spontaneous music and speech. In M. Orwin, C. Howes & R. Kempson (Eds.), *Music, language and interaction* (pp. 285-329). London: College Publications.

thank you for listening...