

# Speech and music, effability and ineffability

An extraordinary plenary session for the  
International Conference on Music Perception and Cognition

*Participants: Kristen Butchatsky, Emery Schubert, Stela Solar, Joe Wolfe.*

<Four participants and four seats: all is ready for a structured debate, as advertised in the programme. Obviously there will be demonstrations, because in front of Stela there is a cello and a music stand. Two further music stands and two further instruments are temporarily hidden from view. Joe puts up an overhead and begins speaking.>

Joe: The introduction printed in the proceedings attracted criticism of two different sorts. One is that the observations are unsupported by the evidence, speculative, foolish and wrong. The other is that they are so obvious and self-evident that they have been well known and widely accepted for many years. Encouraged by these criticisms, we shall discuss these and related ideas in this session.

Discussion of the possible utility of music is inevitably speculative, and so of limited scientific value. But it's also fun. In that spirit, the participants have been invited to be speculative and to relax the constraints that they would apply if writing for peer review. Let me introduce them. Kristen Butchatsky is the director of music performance groups at the University of New South Wales. She's also well known as a soprano. Stela Solar is a student at the same univeristy. She's also a fine cellist. Emery Schubert, as well as being a conductor and horn player, has been studying emotional response to music.

Let me start by oversimplifying the acoustical argument: in speech, we perceive timbre categorically, and we use phonemes, which are timbre elements, to create words and thus to generate highly detailed, specific meanings. The 'text' of speech is effectively transmitted digitally via parameters corresponding to timbre in music. In music, we perceive pitch and elements of rhythm categorically. The 'text' of music—most of what is written in music—is conveyed digitally via pitch and rhythm. Music communicates, but in a much less detailed and less specific way.

<Joe puts up another overhead showing the 'cello solo and some explanatory text. The text and music have been written so that, before compression, they have approximately the same explicit information content. Stela begins to play. Kristen joins in with four notes at the end, as though improvising. Her notes are not written on the overhead version.)

Andante

4

Vc.

11

Vc.

18

Vc.

meno mosso

22

S.

Sprechgesang

In - eff - a - ble

Vc.

pizz.

Joe: How precisely have we communicated the meaning of the two 'texts'? Some would say that this is missing the point: music communicates differently and communicates different things. Music doesn't make you know, it makes you feel. Emery has been measuring emotional responses to music, using a two dimensional space, so he can tell us: how effective is emotional communication?

Emery: The two dimensional emotion space is based on a simplified representation of two salient dimensions of emotion - arousal (the excitement versus sleepiness of emotion) and the valence. Subjects broadly agree on the coordinates, and achieve a resolution that divides the space into about 10 by 10. Time changes can be as fast as every second or so.

Joe: And that would theoretically allow emotional communication at several bytes per second—comparable with the text of speech. But that's not how we use it.

Emery: The development over time is much more important in the emotional response, rather than simple decoding of icons. People may weep if you tell a sad story. They are unlikely to weep if you just say the word 'sad'.

Joe: And they won't laugh if you just say the word 'joke'. <pause—for maybe they will>

Stela: There are differences: what we used to call the 'rules' of harmony. In almost all styles of music, the notes that you can use are limited in some way by the context, even over long time scales. There's nothing analogous to that in speech.

Joe: So the choice of pitch is limited by formal or aesthetic considerations...

Kristen: And the possible lengths of the notes are constrained too: in most music, they add up to make whole bars, and they work to establish a rhythm. This 'categorisation of note length' that you were talking about can only work if you have set up a rhythm:

<deliberately rhythmically>

To know if it's quavers or crotchets  
You need to establish a rhythm.



Emery: But those constraints are part of the communication, as well as being part of the ineffability.

Kirsten: Implying that communication may be ... in-eff-a-ble. <melodic/prosodic contour as before, but pitch not categorised.>

28 **recit.**

Sprechgesang, words addressed to cello, not cellist

S. *as baritone* Well if you did - n't a - gree, what do you think a - bout it?

Bsn *(spoken)* Well we asked *(to cello)* Well if you did - n't a - gree, what do you think a - bout it?  
Stela to bring her cello to demonstrate that very ineffability Yes we did

Hn

Vc. *(These notes are 'sung' only by the cello)*  
(no you did - n't) (I

32

S. Of course you can com - mun - i - cate, but in a ra - ther dif - fer - ent way.

Bsn In

Hn

Vc. think I can com - mun - i - cate as well as an - y of you! (what do you mean?)

36

S. *recit* *muta* So

Bsn speech we use pho - nemes: We vary the spectrum and envelope independently of the pitch: the sounds 'Ba' and 'Do' have dif - frent - mean - ings, e - ven dif - frent gram - ma - tic - al func - tions.

Hn

Vc.

40

S. 'ba ba ba ba ba' is one tim - bre and 'do do do do do' is a - no - ther?

Bsn

Hn

Vc. *muta*

So if

44 **molto rit.** stares at the others<sup>5</sup>  
with a wild surmise

S.

Bsn.

Hn.

Vc.   
ins - tru - ments want - ed to talk to us in our lan - guage They could change the tim - bre on each note: it sounds like Klang - far - ben - mel - o - die!

(to audience)

47   
Per - haps Klang - far - ben - mel - o - die does have some - thing to say to us af - ter all!

Bsn.   
sul *tasto* normale *tasto* normale

Hn.

Vc.

(but ex - cept for

50 (another strange look) **naturale**

S.   
You can show it with

Bsn.

Hn.   
E - spe - cial - ly in ton - al mu - sic: Some notes just don't fit.

Vc.   
is - n't the choice of notes lim - it - ed?)

54 **hold up '10' card**

S.   
probetones

Bsn.   
What are probetones? **muta** Cadenza Can you dem - on - strate?

Hn.   
Well: *<ca*

Vc.   
*no pulse*

61 **tempo di valse**

S. **hold up '8' card** **hold up 'NS (p=0.02)' card** **hold up '1' card** **hold up '1'**

Bsn *pulse*

Hn *split notes, stopped n random notes ad lib.*

Vc. *pulse*

73 **hold up 'outlier' card** **Largo**

S. *and that real ly cuts*

Bsn *p*

Hn *p*

Vc.

83 **muta** **Moderato** **rit**

S. *down the notes you can use* *So if you take a mel - o - dy, with the notes in one ke - ey..*

Bsn

Hn

Vc. *pp pizz*

89 **a tempo**

S. **muta** *That's a prob - lem too: For mus - ic has its*

Bsn *And if the notes don't stretch my range too far, I'd be glad, That's a prob - lem too. For mus - ic*

Hn

Vc.

94

S. own set of rules: ev' - ry note must fit in the rhy - thm: you can't just choose an - y notes that you want: they

Bsn. has rules: e - ven ob - bli - ga - ti have to fit the rhy - thm You choose notes they

Hn.

Vc.

97

S. must fit to - geth - er with - out a clash to make a ton al song. *arco* **muta**

Bsn. must must fit to - geth er with out a clash to make a ton al song.

Hn.

Vc.

102

S. You can use a scale as a mo - tif,

Bsn.

Hn.

Vc.

107

S. then just add the words and then we'll all har - mo - nise you can just close your eyes and lis - ten, sing in

Bsn. and then we'll all har - mo - nise you can just close your eyes and lis - ten, sing in

Hn.

Vc.

111

S. thirds. Then we'll sing mel-is-ma a - a, a a - a a a: that's a mess-age

Bsn thirds. Then we'll sing mel-is-ma a - a, a a - a a a: that's a mess-age

Hn

Vc.

116

S. too, and if you have no-thing left to say, just pause

Bsn *muta*

Hn too, and if you have no-thing left to say, just pause

Vc. solo

121

S. For then you can re-state the theme: I don't know

Bsn

Hn If you do, what's that me-e-e-an? And if the notes go

Vc. pizz *muta*

rit genuinely puzzled a tempo

126

S. high we'll share them a-round That's called har-mo-ny For mus-ic has its

Bsn up too share them a-round That's called har-mo-ny For mus-ic

Hn

Vc.



130

S. own <sup>set</sup> of rules: ev' - ry note must fit in the rhy - thm: You have to make sure the notes will all fit, just

Bsn has rules: e - ven ob - bli - ga - ti have to fit the rhy - thm You choose notes just

Hn

Vc.

133 **rit**

S. like in a can-on, or in a fugue to make a ton al song!

Bsn like like in a can-on or in a fugue to make a-a to-o-o - na-a-a-al song!

Hn

Vc. **muta**

137 **recit** **3** **3**

S. Ton-al pre-dic-ta-bi-li-ty: is that what makes writ-ten mu-sic ea-sy to com-press? That's

Bsn

Hn

Vc. **arco**

142

S. right! You can re-peat a phrase in mu-sic mu-sic mu-sic


Bsn right! You can re-peat a phrase in mu-sic **muta** mu-sic


Hn **muta** mu-sic mu sic - mu-sic and it's all part of

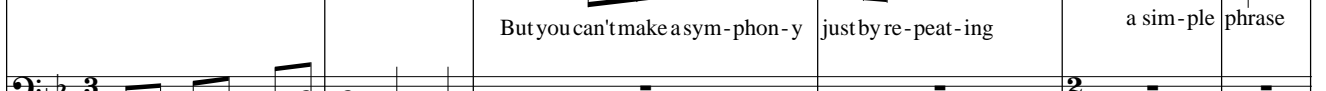
Vc.

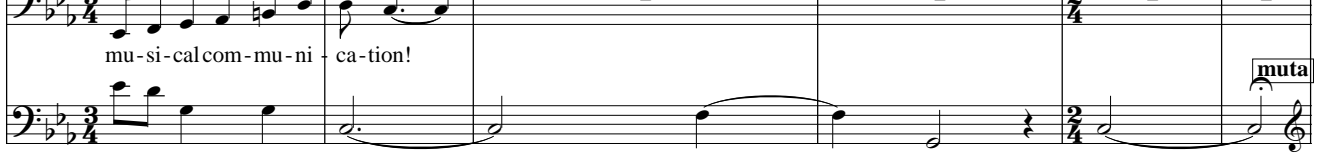
146

Lento

S. 

Bsn. 

Hn. 


Vc. 


mu-si-cal com-mu-ni ca-tion!  
But you can't make a sym-phon-y just by re-peat-ing a sim-ple phrase


*muta*


152

Poco vivace

S. 

Bsn. 


Hn. 

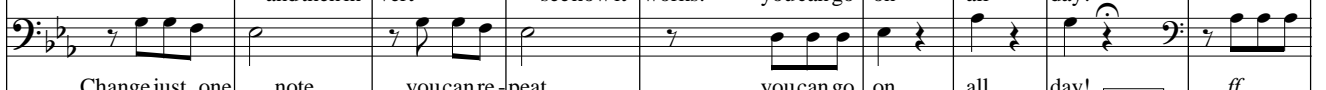
Vc. 

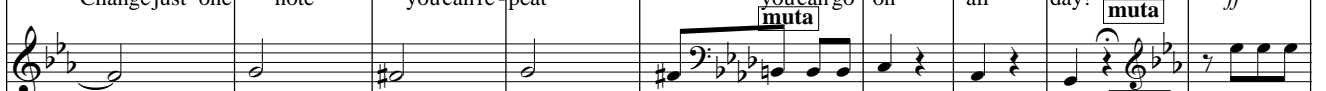
Oh yes you can!  
Oh yes you can Oh yes you can  
ad lib *muta* Oh no you can't Oh no you can't  
Oh yes you can!  
Oh yes you can! Oh yes you can Oh yes you can


163

seriously long!

S. 

Bsn. 


Hn. 


Vc. 

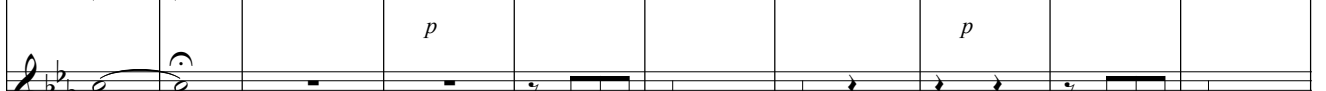
and then in-vert see how it works: you can go on all day!  
Change just one note you can re-peat you can go on all day!  
Change just one note you can re-peat you can go on all day!  
and then in-vert see how it works: on all day!

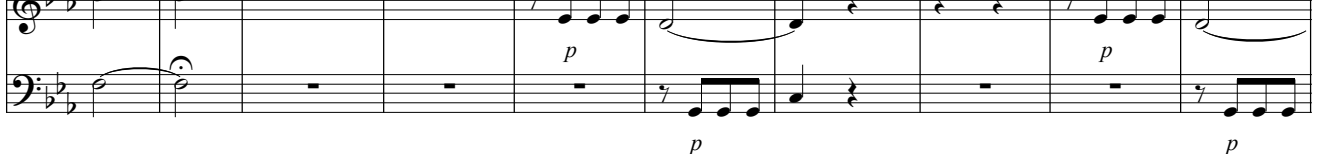
*muta* *muta* *muta* *ff* *ff* *ff*

172

S. 

Bsn. 

Hn. 

Vc. 

You can re-peat A sim-ple phrase

*p* *p* *p* *p*

S. You can re - pe - at, you can re - peat! With just four notes you can go o - on on and o - on, on and o - on, on and

Bsn

Hn

Vc.

S. o - on on and o - on, on and on: with just four notes you can cre - ate a lit - tle mo - tif or a theme. Don't have to work, don't have to

Bsn

Hn

Vc.

S. think, Don't have to sweat don't have to dream! And if we change the co - lour and we make the leap a per - fect fifth

Bsn *mufa*

Hn

Vc.

**Giocoso**

S. Watch! Sim - pler than that,

Bsn Watch! It sounds com - plete - ly new! Horn appears bored, then begins some other activity (eg reading) while playing the pedal n

Hn *solo*

Vc. *mufa*

220

S. you can re-peat just the one note o-ver a-gain o-ver a-gain

Bsn

Hn

Vc.

You can o-ver a-gain, o-ver a-gain o-ver and

233

S. o-ver and o-ver and o-ver and o-ver a-gain

Bsn

Hn

Vc. o-ver and o-ver and o-ver and o-ver a-gain

repeat and fade

Wake up horn, stage business.

Recit

But what if the mu-si-cian does-n't have a

240

S. Im-pro-vise some-thing? You mean make it up?

Bsn

Hn (to soprano) gesture to sop.

Vc. muta

score?

Easy swing

We could ne-ver do that.

Easy swing pizz.

245

S. I'm not sing-ing with-out an-y mu-sic!


Bsn

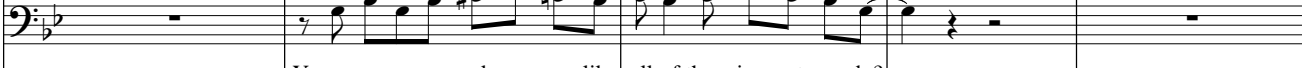
Hn 8bsa ad lib sempre She's not swinging with-out an-y mu-sic!

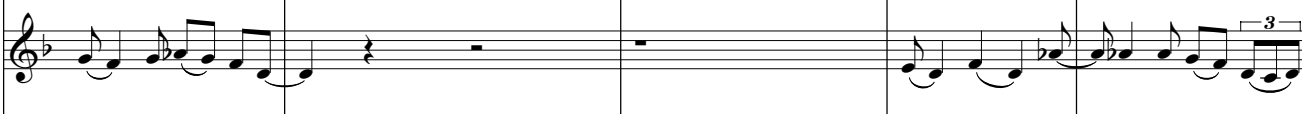
Vc.


Completely straight, no swing

251

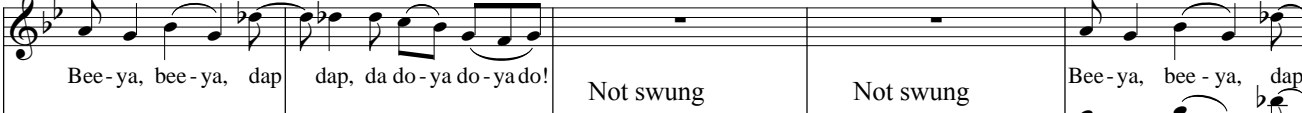
S. 

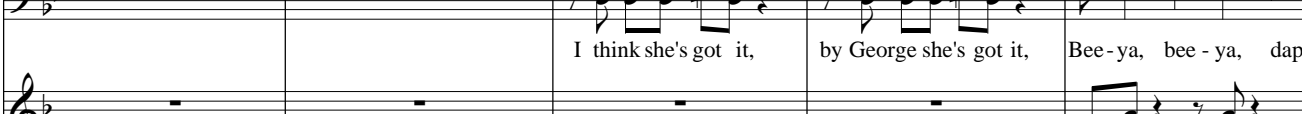
Bsn 

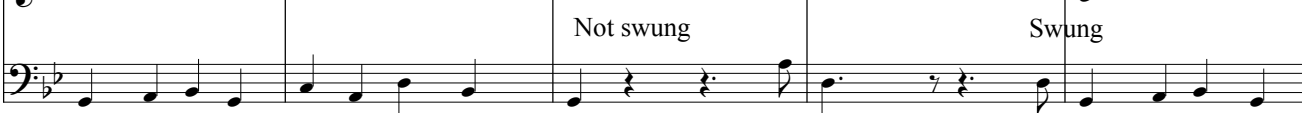
Hn 

Vc. 

256

S. 

Bsn 

Hn 

Vc. 

261


S. 


Bsn 


Hn 


Vc. 

265

S. 

Bsn 

Hn 

Vc. 

8bsa ad lib

270

S. Do - ya, do - ya Di - yap da do - ya do - ya - do! Ba - da da - ya - da do - yap, do - yap di - ya dow,

Bsn Do - ya, do - ya Di - yap da do - ya do - ya - do! Ba - da da - ya - da do - yap, do - yap di - ya dow,

Hn

Vc.

274

S. ba - ya da - yap, Dap! Dado - ya do - ya - do. Ba do - ya, do - ya di - ya dow. Ba do - ya

Bsn ba - ya da - yap, Dap! Dado - ya do - ya - do. Ba do - ya, do - ya di - ya dow. Ba do - ya

Hn

Vc.

279

S. Ba - ya - do wow wow, Ba - ya do wow wow, Bo - ya do - y do - ya? Ba - ya, da - ya do wow. snap fingers

Bsn Ba - ya - do wow wow, Ba - ya do wow wow, Bo - ya do - y do - ya? Ba - ya, da - ya do wow. snap fingers

Hn

Vc.

284

S. We could ne-verdo that. Dowah. Recit

Bsn We could ne-verdo that. Dowah. What did that mean?

Hn snap fingers

Vc. arco

290

S. Who cares? How did it make you feel? Per - haps...

Bsn. If I could put it in - to word I would - n't need mu - sic. Per haps it is

Hn. muta

Vc. muta

296

S. in - eff - a - ble... in - eff - a - ble... And if it is in -

Bsn.

Hn.

Vc. pizz. arco

Moderato

305

S. eff - a - ble To take the in - ex - press - a - ble

Bsn.

Hn. con luce Just what that means we can't be sure of yet

Vc.

310

S. If mus - ic is in - eff - a - ble We'll see if we can eff it a - ny

Bsn.

Hn. Whate - ver that is we want more of that. If mus - ic is in - F If it's in D, We'll see if we can eff it a - ny

Vc.

316 **A piacere** **Andante**

S. how. And if it is in - eff - a - ble, in - eff - a - ble, in - eff - a - ble... But if

Bsn how. In - eff - a - ble, in - eff - a - ble, in - eff - a - ble...

Hn *p*

Vc. **Andante**

322

S. words were all we had... There would be no more phil - os - o - phy, No trips to

Bsn. But if words were all we had... be no more phil - o - so - phy, No trips to

Hn *p*

Vc. *p*

329

S. Syd - ney: we'd have to find a - no - ther job: What could we do with - out mus - ic? No Shepherd tones, no

Bsn. Syd - ney we'd Have to find a job, we would have to find a job, There'd be no Shepherd tones, no

Hn

Vc.

336

S. ring tones on phones Oh what a world! What a world, with -

Bsn. ring tones on phones: hey that seems to be a good i - dea: i - mag - ine such a world!

Hn

Vc.



341

S. out a song to sing! Mu-sic has it all! you can say it all,

Bsn. Buttell me where would we be with-out words? Where would we find the pre-cis-ion to say with con-cis-ion what -

Hn.

Vc.

348

S. you can feel it all

Bsn. ev - er we think? In a world with - out speech, all our friends would be out of

Hn.

Vc.

354

S. Words and words; what can they do for you? But if words were all we had, there would be

Bsn. reach - no way. You can say what you like but that's just my point!

Hn. muta

Vc. pizz arco

360

S. no songs to make you, no mu-sic to take you a - way from the world There would be no songs to

Bsn. muta

Hn. p

Vc. muta p

367

S. sing you And no har-mo-nies to bring you There'd just be words and words and words and words and words and words and

Bsn And no har-mo-nies to bring you, Just be words and words and words and

Hn Just be

Vc. *muta*

372

S. words and words and words and words and words and words and words and words and words and words and

Bsn words and words and words and words words and words and words and words:

Hn words, words, words, words, words, words, words words words

Vc. Just be words and words and words and words words and words and words and

376

S. words and words there'd just be words

Bsn There'd just be words *muta*

Hn There'd just be words *muta*

Vc. ad lib, lower preferred *arco* *pizz* *arco* *f*

words and words there'd just be words

382

S. But if words were all we had (vocalise)

Bsn

Hn

Vc.

389

S. *There would be no songs to sing you la-la-a-a-a-a-la There'd just be words la-a-a*

Bsn

Hn *(8va ad lib) solo loco tutti*

Vc.

396 *e sempre*

S. *la-a-a*

Bsn

Hn

Vc.

403

S. *What are words for?*

Bsn

Hn *ad lib*

Vc.

410 **Moderato**

S. *Fivemin-utesleft we must con-clude Torun a-way would*

Bsn

Hn

Vc.

*No! If westopnow they'll all askques-tions so...*

416

S. just seem rude We need some mus - ic all can sing

Bsn

Hn con luce Per haps we'll get them all to sing a - long

Vc.

421 **accelerando**

S.

Bsn I think we'll man - age it's not hard to sing an os - tin - a - to, it's not ver - y hard to sing an

Hn muta

Vc.

428

S. invites audience

Bsn os - tin - a - to: Gen - tle - men please join us: La la la la la la la la la la la la

Hn

Vc.

435 Repeat until male chorus is confident invites audience Last time only:

S. La - dies join us La la la la la, La la la la la, La la la la la,

Bsn La la la la la la la la la la la la

Hn La la la la la la la la la la la la

Vc.

Repeat only if necessary for confidence

442

S. La la la. La la la la la, La la la la la, La la la la la, La la la. La la la la la,

Bsn. Gen - tle - men sing: La la

Hn. Repeat only if necessary for confidence La la

Vc.

448

S. La la la la la, La la la la la, La la la. And if it is in - eff - a - ble Just what that means we

Bsn. la la la la la la la la la la And if it is in - eff - a - ble Just what that means we

Hn. la la la la la La la la la la la la

Vc. *muta* 8va ad lib La la la la la, La la la la la, La la la la la,

454

S. can't be sure of To take the in - ex - press: the in - ex - press - a - ble: that is we want more of

Bsn. can't be sure of To take the in - ex - press - a - ble What e - ver that is we want more of

Hn. la La la la la la la la la la

Vc. La la la. La la la la la, La la la la la, La la la la la, La la la.

459

S. that. If mus - ic is in - eff - in - eff - in - eff - a - ble We'll see if we can eff it a - ny - how

Bsn. that. If mus - ic is in - eff - a - ble We'll see if we can eff it a - ny - how

Hn. La la la la la la la la la la

Vc. La la la la la, La la la la la, La la la la la, La la la. La.

**Rit** **Fine**