Global structure, emotion and tension in progressive rock and classical music

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BACKGROUND

Global structure seems to have limited influence on subjects' ratings of emotional profile, coherence and musical flow (Karno & Konecni, 1992; Tillman & Bigand, 1996; Lalitte, Bigand, Kantor-Martynuska, & Delbe, 2009; Granot & Jacoby, 2011, 2012).

RESEARCH QUESTION

Can continuous tension ratings and listeners' open comments regarding their listening experience reveal their sensitivity to the musical global-structure?

METHODS AND RESULTS

Subjects
A total of 80 Western listeners with no musical training, in 4 groups of N =20

Musical Stimuli
Classical (**Mozart** (M) - Piano Sonata in B-flat major, K. 570/I). N subjects = 40
Progressive-rock (**Trespass** (T) – the song "In Haze of Time"). N subjects = 40

In each genre we presented the original piece (O; N = 20) and a reordered version (R; N = 20), created by reordering the musical segments of the piece into a new form inconsistent with tonal and tensional principles of the original musical structure.

Original:

1	2	3	4	5
· Exposition - first theme	· Exposition - second theme	· Development	· Recapitulation - first theme	· Recapitulation - second theme

Reordered:

2	4	1	3	5
· Exposition - second theme	· Recapitulation - first theme	· Exposition - first theme	· Development	· Recapitulation - second theme

MEASURES

1. Open comments
Listen once and "write down what is your general impression from the composition (enjoyment, interest, metaphors that occurred to you, emotions or other thoughts)".
- All four pieces were described as pleasurable
- M. – most comments described emotions such as relaxation and pleasantness (~45%)
- T. – most comments describes expressions of interest such as cognitive evaluation and curiosity (~34%)
- Reordered pieces received longer descriptions

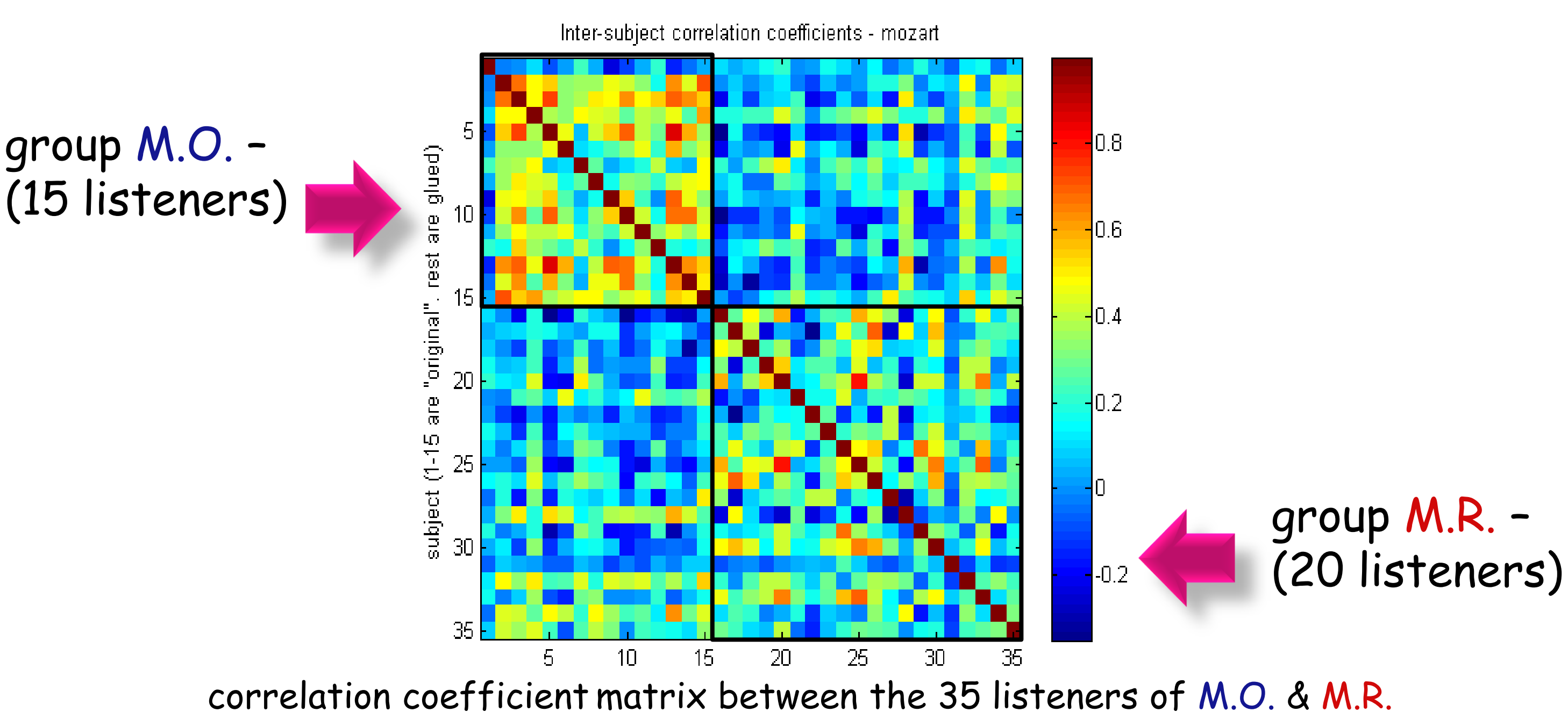|	Average number of words per answer
Mozart-original (M.O.)	15
Mozart-reordered (M.R.)	21
Trespass-original (T.O.)	16.5
Trespass-reordered (T.R.)	18

- M.R. – some answers included contrastive descriptions such as "Sometimes calm and sometimes bouncy"
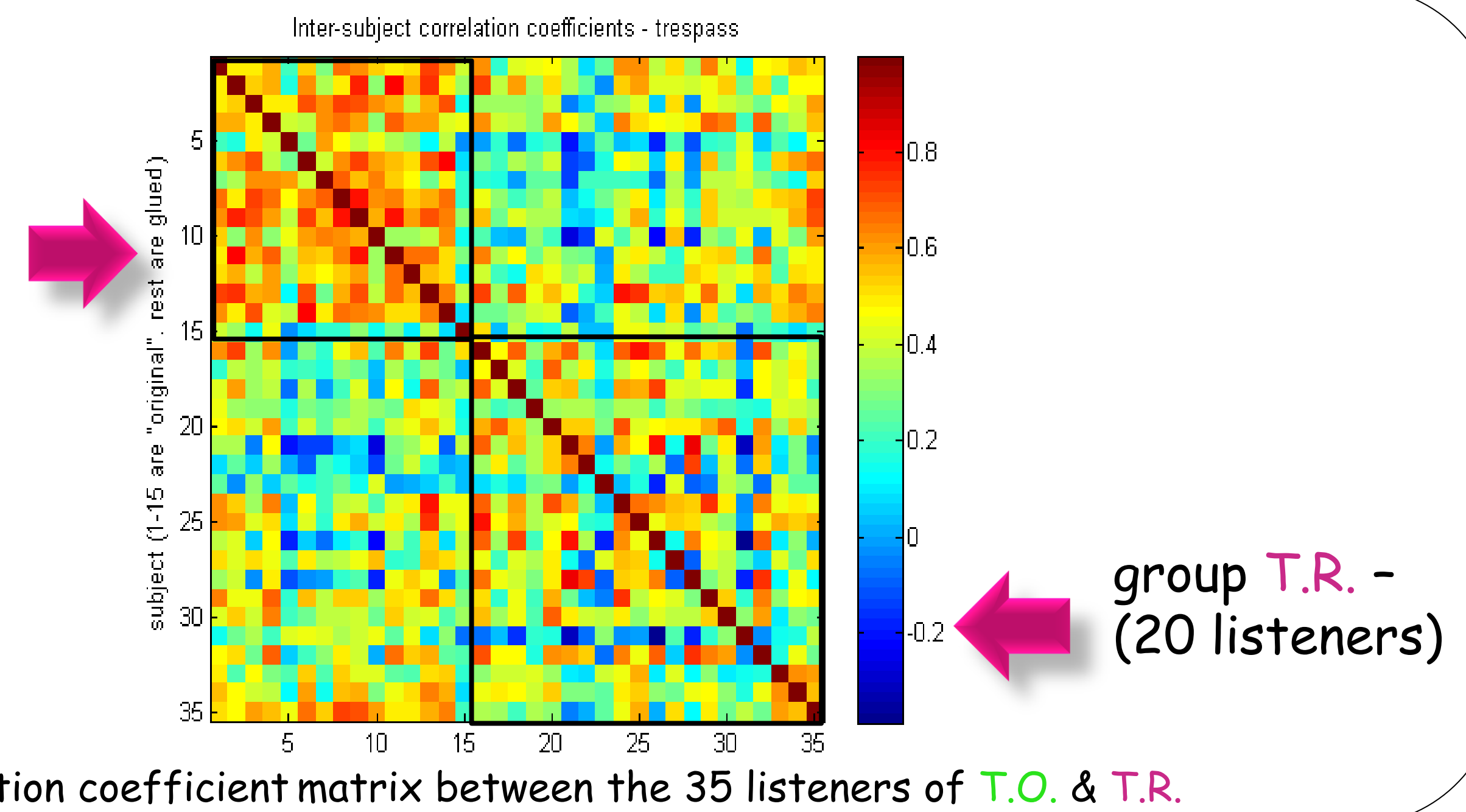
2. Continuous Tension Measurements
While listening to the composition for the 2nd time, listeners were asked to continuously rate the degree of tension using the wheel of a MIDI keyboard.

MIDI keyboard　　MAX

- O. pieces of both genres elicited higher mean inter-subject correlations:
  - M.O. M=0.42 (MAX=0.917, MIN=(-0.217))
  - M.R. M=0.276 (MAX=0.886, MIN=(-0.342))
  - T.O. M=0.607 (MAX=0.946, MIN=0.033)
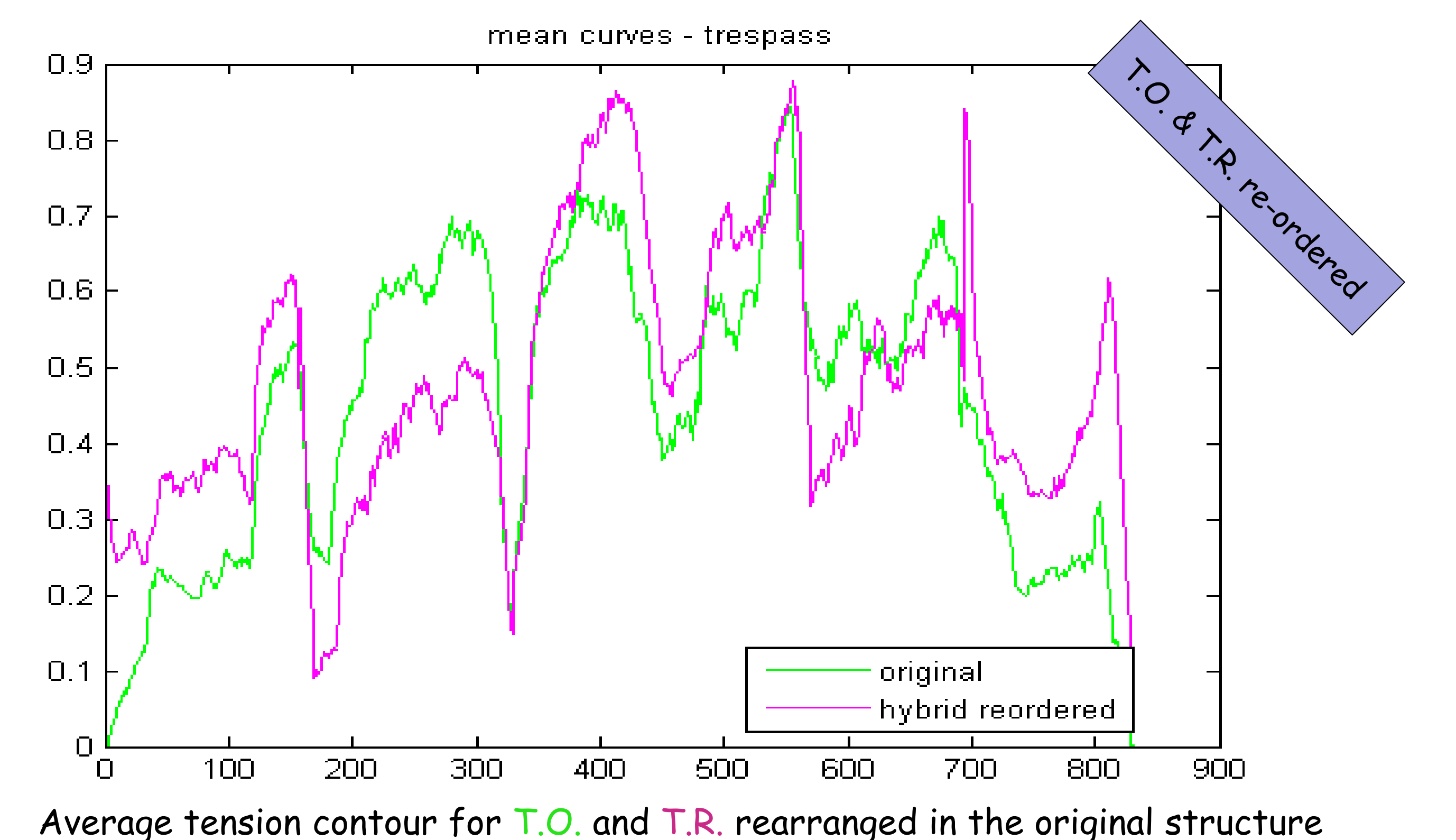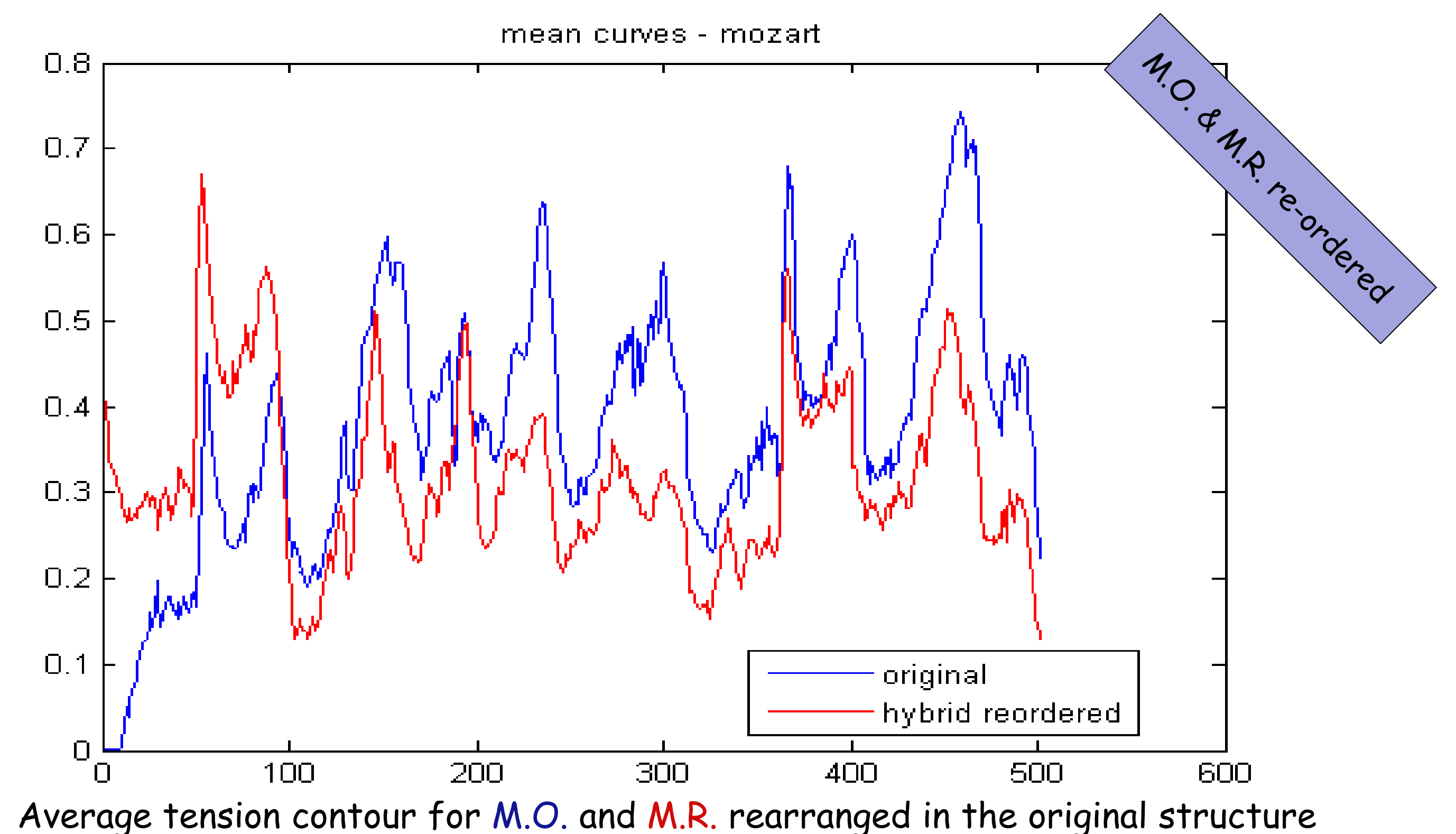 - T.R. M=0.412 (MAX=0.931, MIN=(-0.492))

group M.O. – (15 listeners)

group M.R. – (20 listeners)

correlation coefficient matrix between the 35 listeners of M.O. & M.R.

group T.O. – (15 listeners)

group T.R. – (20 listeners)

correlation coefficient matrix between the 35 listeners of T.O. & T.R.

Average Tension curves
- M. – average tension contours differ from the inverted U shape typical of Sonata form (development = highest tension) in both the O. and R. pieces

M.O. & M.R. re-ordered

Average tension contour for M.O. and M.R. rearranged in the original structure

T.O. & T.R. re-ordered

Average tension contour for T.O. and T.R. rearranged in the original structure

- Global contours of O. and R. are very similar
- Local differences in tension level and in PCA behavior
- Tension ratings can be partially explained by acoustic measures only in T. such that: ↑ volume= ↑ tension (T.O. P<.0001, r = 0.575; T.R. P<.0001, r=0.248), low register= ↑ tension (T.O. P<.0001, r = -0.616; T.R. P<.0001, r = -0.444)

SUMMARY & CONCLUSIONS

- Tension contour was more affected by musical content than by structural form
- Although direct ratings of coherence and flow do not show any differences between O. and R. pieces, more implicit measures do show that subjects are sensitive at some level to the global-structure. R. pieces arouse:
  - longer open comments and/or more contrastive descriptions
  - lower inter-subject correlations in tension ratings
  - different tension levels as compared to the original pieces, although with similar overall shape
- **Musical genre** had an effect on the typical category of descriptors in the open comments, with higher inter-subject correlations in tension ratings and higher memory scores in the more familiar progressive rock genre

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