Lectorate Lifelong Learning in Music & the Arts

A Measure of Non Score-dependency: the Groningen Test Battery of Audiation in Instrumental Performance

GTBAIP

definitions

Non score-dependency can be defined as the mastery of all stages of *audiation* at the instrument of choice while listening to, recalling from memory and performing familiar or unfamiliar music as well as creating and improvising (Gordon 1989a).

audiation

Audiation is the process of mentally hearing and comprehending music.

Audiation includes the necessary understanding of music to enable the conscious prediction of patterns in unfamiliar music (Gordon 1989b).

stages of audiation

- Stage 1 Momentary retention
- Stage 2 Initiating and audiating tonal patterns and rhythm patterns AND recognizing and identifying a tonal center and macrobeats
- Stage 3 Establishing objective or subjective tonality and meter
- Stage 4 Consciously retaining in audiation tonal and rhythmic patterns
- Stage 5 Consciously recalling patterns organized and audiated in other pieces of music
- Stage 6 Conscious prediction of patterns

Are audiation and non score-dependency unique to the musical domain or is there an equivalent in the language domain?

music-language tradition

- long tradition of thinkers contemplating language-music relation: Plato (Neubauer 1986), Descartes (1618/1987), Rousseau (1781/1993), Wittgenstein (1953), Spencer (1857) Bernstein (1973)
- rhetorical view of music in the eighteenth century (van Dijk, van der Leeuw 1981)
- Darwinian view on the evolution of language (1871)

auditory domain

- language and music both unique to the species (McDermott & Hauser 2005)
- both ubiquitous elements of all cultures (Molino 2000)
- both develop spontaneously in childhood

temporal domain

- both language and music are rule-based systems composed of sequential events that unfold in time (Lerdahl & Jackendoff 1983)
- both exhibit specific rhythm and specific segmental and suprasegmental information organized into (recursive) higher-order structures (Besson & Schön 2001;Raffman 1993)

syntax

Syntactic knowledge allows the mind to accomplish a remarkable transformation of the input: a linear sequence of elements is perceived in terms of hierarchical relations that convey organized patterns of meaning. (Patel 2003)

Listeners demonstrate *implicit knowledge of syntactic patterns* and principles in a number of ways, including judgments of correctness, memory advantages for rule-governed sequences, and production of plausible substitutions when linguistic or musical sequences are recalled less than perfectly (Blacking, 1973; Sloboda, 1985).

Shared Syntactic Integration Resources Hypothesis

(Patel 2003)

Overlap in syntactic processing of language and music: overlap in the neural areas and operations which provide the resources for syntactic integration.

Proficiency in a foreign language is characterized by:

- adequate vocabulary
- correct syntax
- shared prosodic features

..which can be demonstrated in the context of speech production by competence in three specific areas:

1. replication
2. manipulation
3. generation

1. replication

Verbatim repetition:

- Statement: I got up at 5 and then I practiced for five hours.
- Repetition: I got up at 5 and then I practiced for five hours.

Synonymous repetition

- I rose at dawn and then I practiced till ten.

2. manipulation

Reconjugation:

- He got up at 5 and then practiced for five hours.

Recursivity:

- The student who got up at five, practiced for five hours.

Ornamentation:

- The industrious conservatory student who got up around five in the morning was able to practice five hours before going to school.

4. generation

Response:

- Question: What time did the industrious student get up?
- Answer: He got up at five and practiced until ten.

Free improvisation:

- I go to bed at 5 and do my best work after midnight.

- How can the measure of *non score-dependency* among instrumental performers be determined?

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- How is the measure of oral proficiency among speakers of a foreign language determined?

Non score-dependency is characterized by:

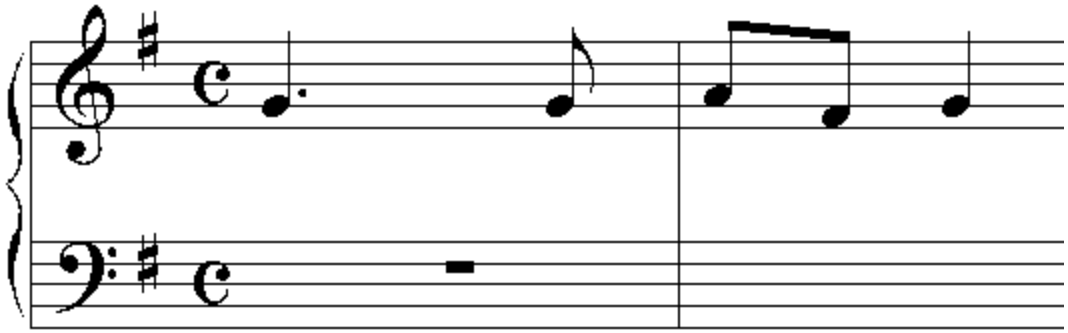
- richness of musical structure
- correct syntax
- agreement between musical structure and expressive performance

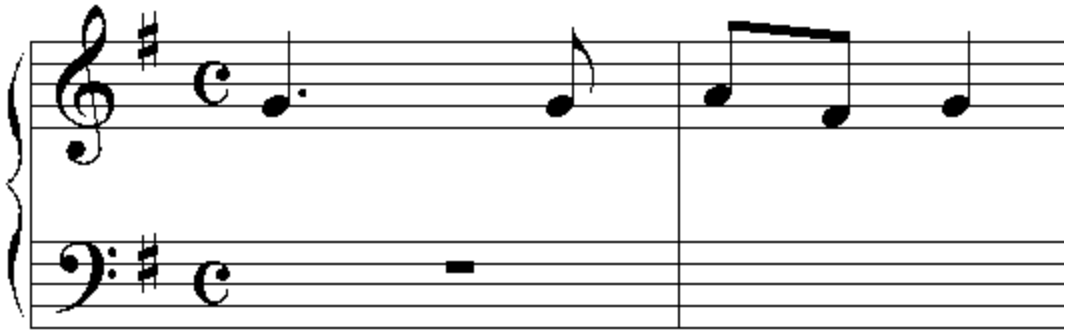
..which can be demonstrated in the context of performance by competence in three specific areas:

1. replication
2. manipulation
3. generation

1. replication

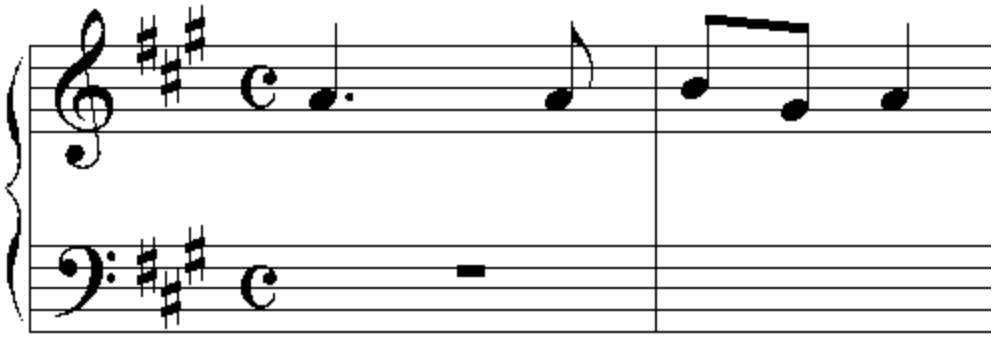
a. exact repetition:





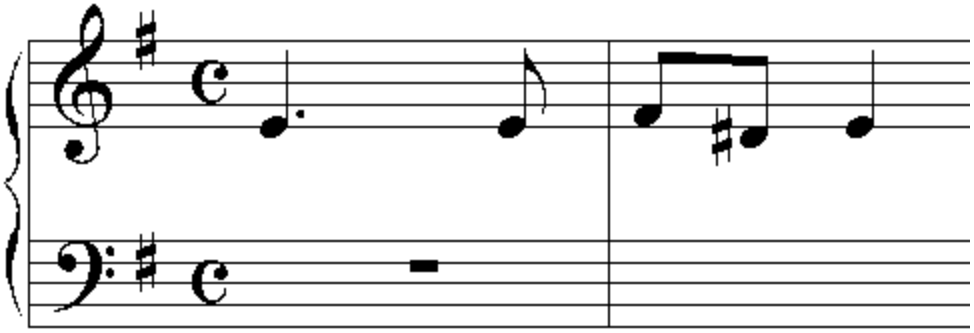
1. replication

b. transposition:



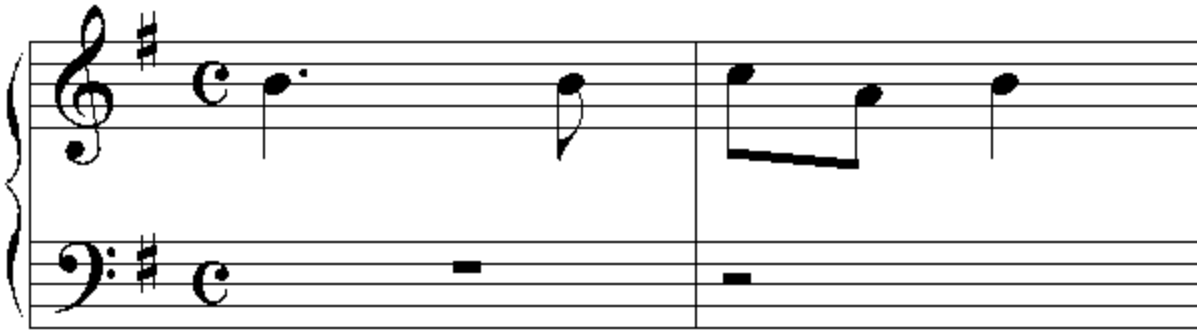
1. replication

c. modal shift:



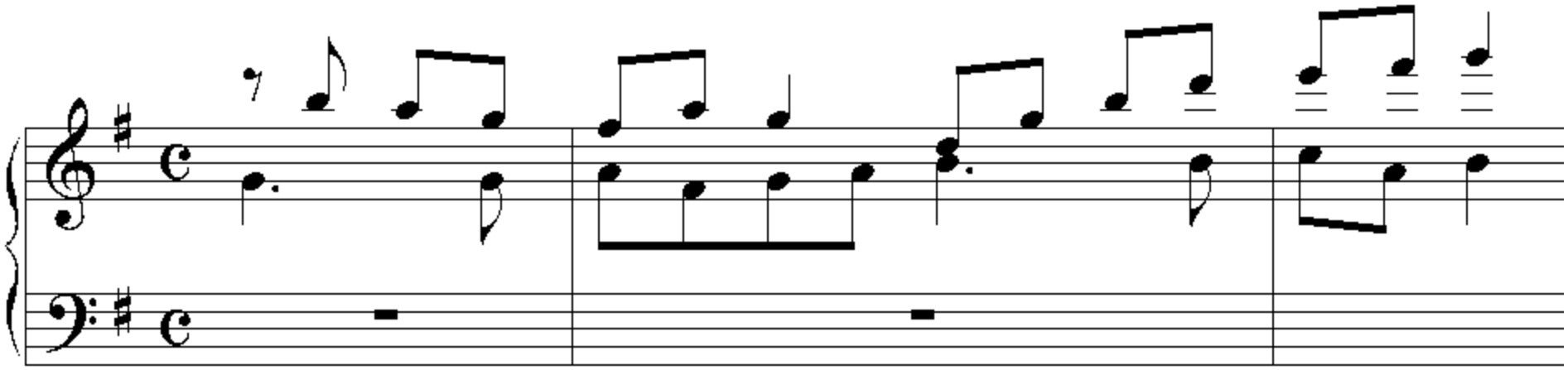
1. replication

d. interval shift



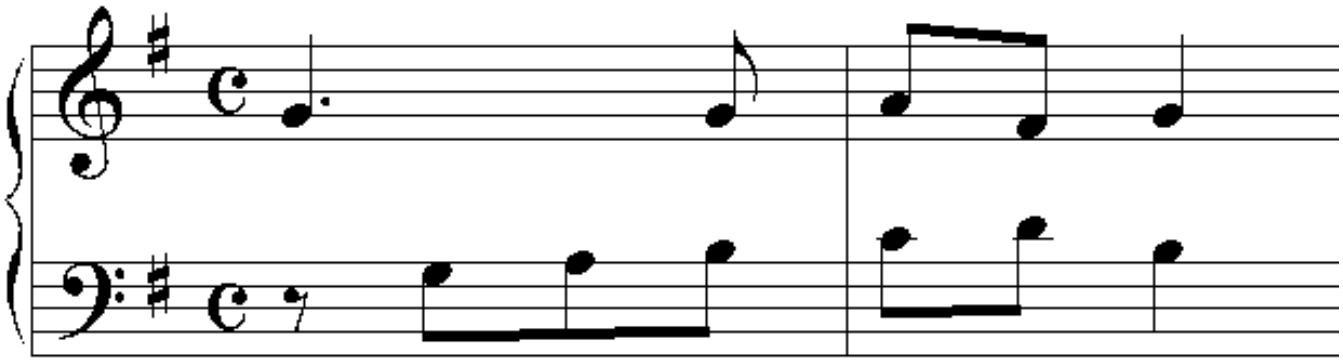
2. manipulation

a. secondary voices: descant



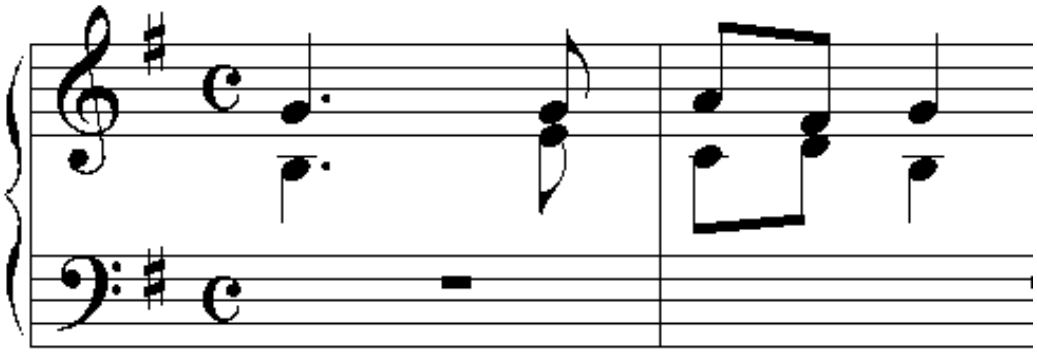
2. manipulation

b. bass



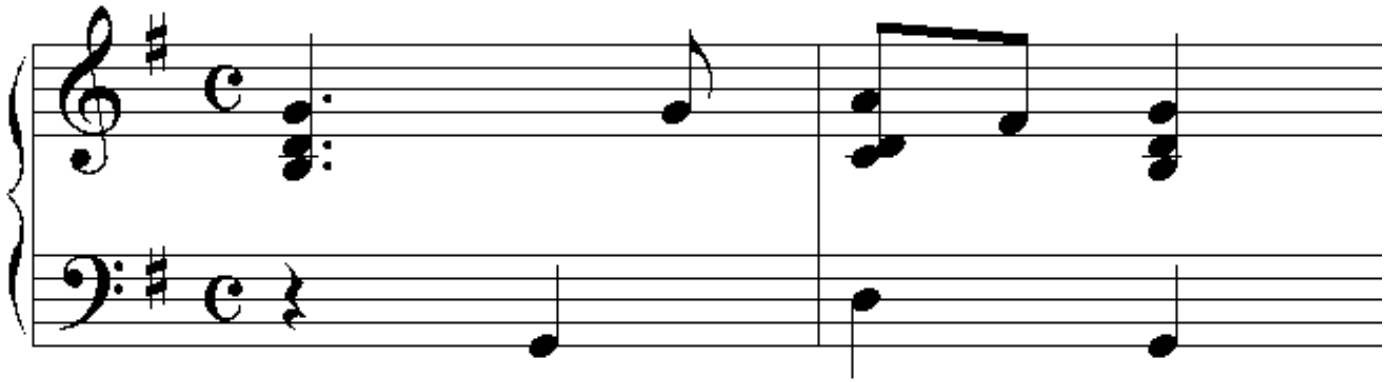
2. manipulation

c. thirds and sixths



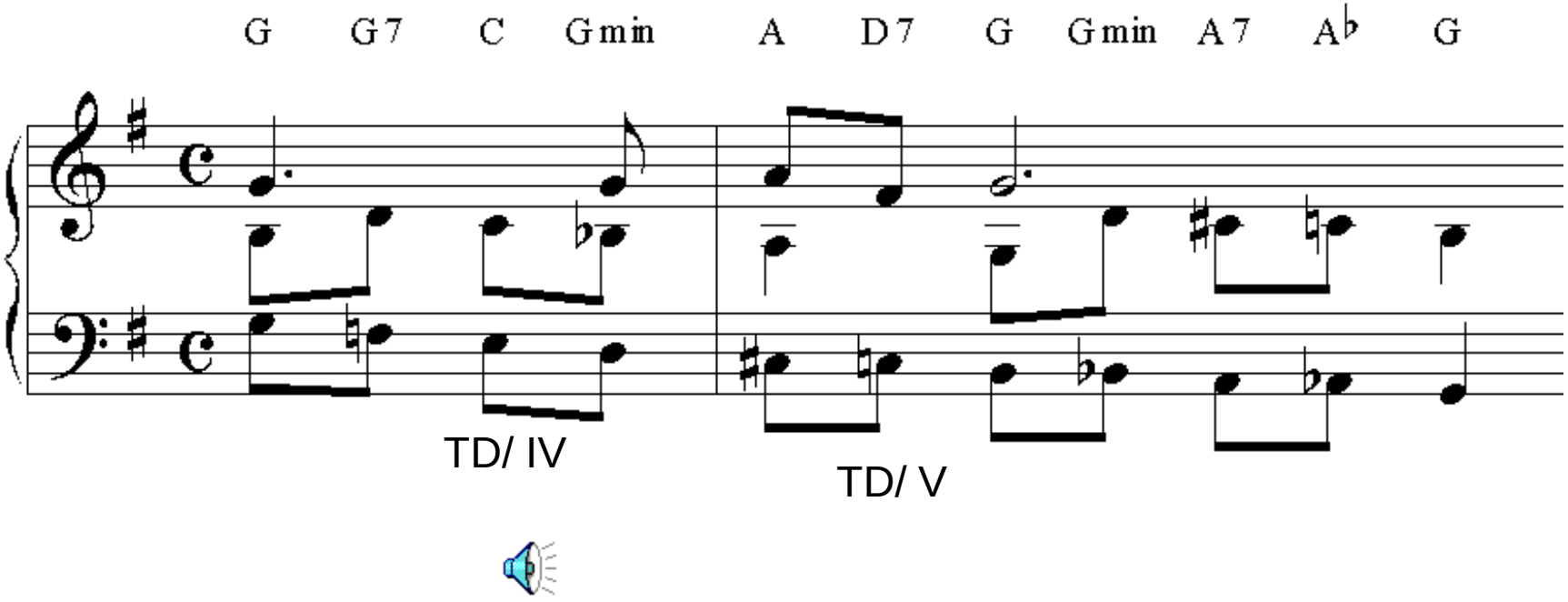
2. manipulation

d. chords



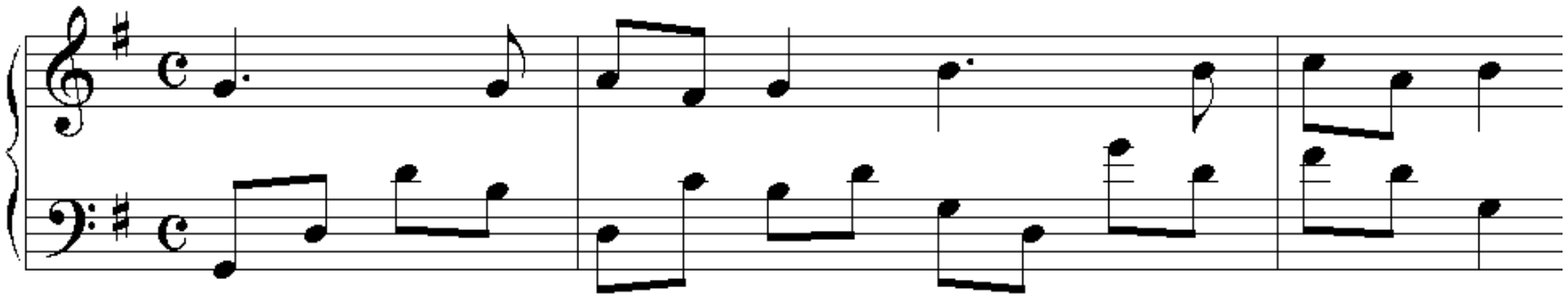
2. manipulation

e. recursive harmony



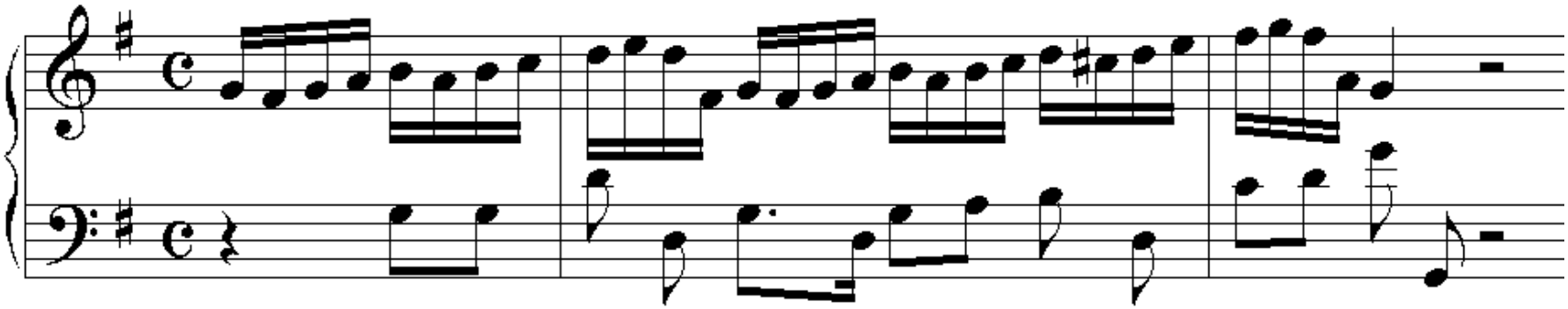
2. manipulation

f. accompaniment



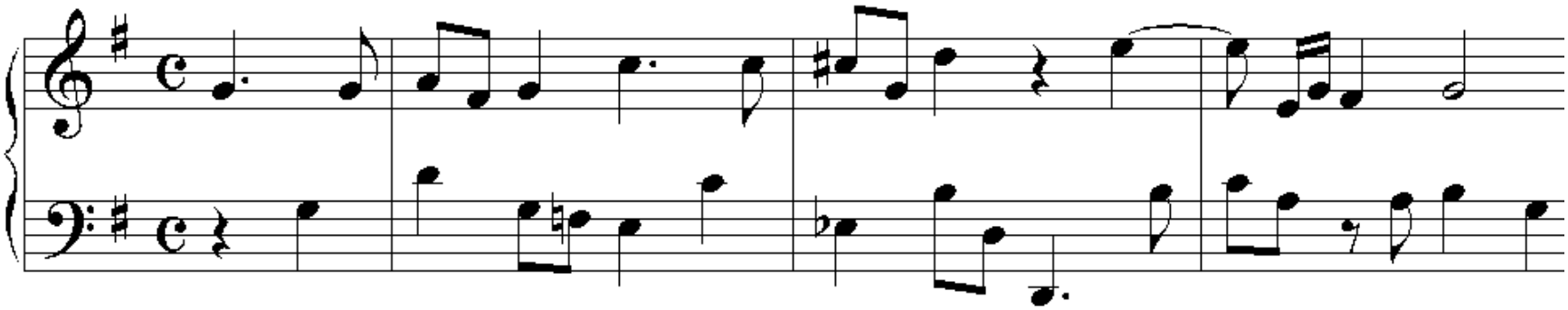
2. manipulation

g. Theme and variations



3. generation

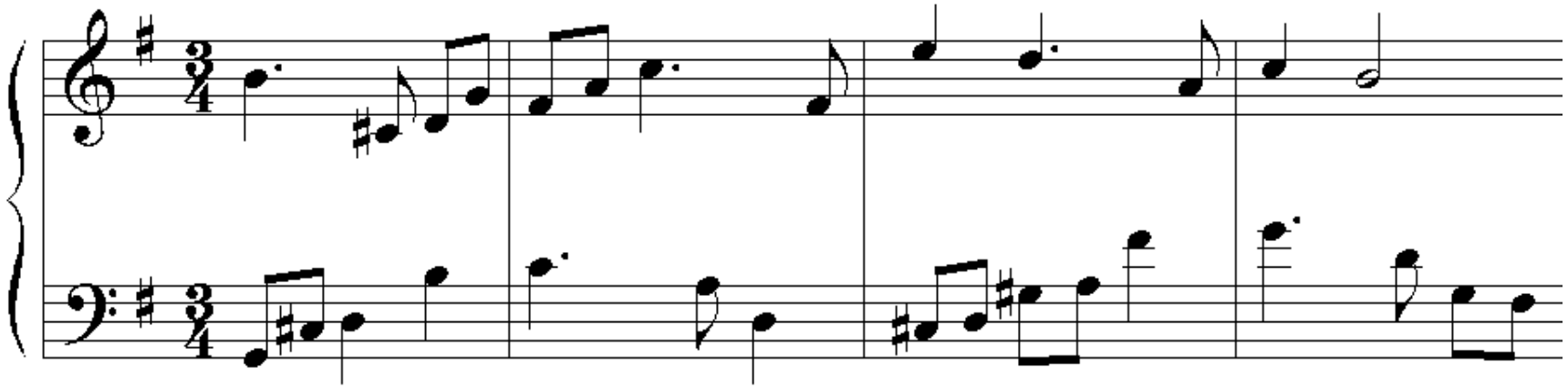
a. antecedent: model – consequent: improvisation



antecedent….. consequent……

3. generation

b. free improvisation (no aural model)



Subjects will listen to short aural models characterized by:

- tonal harmony
- homophony
- lack of performance expression

  (WAV files generated digitally)

Subjects will perform on a MIDI piano which generates a MIDI file of the performance for analysis using the MIDI toolbox.

Een audio recording (WAV file) will be made of condition four (oral improvisation).

conditions

1. Replicate
   - a. play as heard
   - b. transpose to …. (specified key)
   - c. transpose to the relative minor
   - d. play the melody with a tonal shift starting on…

conditions

2. Manipulate
   - a. harmonize the melody with a descant voice
   - b. harmonize the melody with a bass voice
   - c. harmonize the melody in thirds and sixths
   - d. harmonize the melody with full chords
   - e. harmonize the melody with the indicated bass
   - f. play a broken chord accompaniment in the left hand
   - g. play a variation on this theme

4. Generate
   - a. finish the phrase
   - b. whistle a happy tune (oral improvisation: audio recording)
   - C. improvise a happy tune at the keyboard (MIDI recording).

Analysis

The results will be analyzed according to

- melodic similarity between model and performance (method Peter van Kranenburg, Meertens Institute)
- correct syntax (theoretical analysis)

Using the MIDI toolbox, analysis of

- force of keystroke (MIDI toolbox)
- timing (MIDI toolbox)

will be employed to discover discrepancies between musical structures and expressive performance.

Results of the two conditions free improvisation ‘whistle a happy tune’ and ‘play a happy tune’ at the keyboard will be analyzed to discover discrepancies between oral and manual domains.

Possible tools for analysis are:

- tonal and harmonic analysis to uncover discrepancies in structural richness and regularity.
- MIDI toolbox to uncover discrepancies between timing and dynamics between both domains.
- statistical analysis to uncover variation in the frequency of appearance of the seven tones of the scale.

correlation

The results of the various tests will be correlated with one another to validate their use in a battery of tests designed to measure non score-dependency among instrumentalists.