WORKSHOP

Three things to know about the participants in your study: Measuring individual differences in music research with real people

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What is Systematic Musicology?

Systematic Musicology:

- The scientific approach to studying music ~ 'Music and Science'
- Aims to discover laws and regularities (deterministic or statistical)

⇒ *Nomothetic* (νόμος + θέτης)

- Generates and makes use of empirical evidence
- Connects to many other sciences (acoustics, economics, informatics, law, linguistics, neuroscience, psychology, sociology, …)

Historical Musicology:

- The humanities approach to studying music
- Aims to describe what is special about individual composers, works, styles from a historical perspective etc.

⇒ *Idiographic* (ἴδιος + γραφή)

- Makes use of existing documents and artifacts
- Connects to (many?) other humanities (art history, literature, history, philosophy, …)

In short

Systematic Musicology:

Discover what is general and common to …

(music, sounds, styles, musicians, listeners, …)

from empirical evidence.

Historical Musicology:

Describe what is special about …

(a composer, a work, a genre, an era, a style of composing, …)

and where it came from.

The point of this workshop

- Introducing simple tools for empirical music research
  - music research with people (e.g. in music psychology and music sociology)
  - music research within a statistical analysis framework

Why use existing measurement tools (~ tests, questionnaires)?

- No development phase
- Known validity and reliability
- Comparison with other studies (data norms)
- Replicability
- Does not take away from your creativity!

The three tools

- The Goldsmiths Musical Sophistication Index (Gold-MSI):
  - "How musical are you?"
- The Short Test of Musical Preferences (STOMP) and the MUSIC model
  - "What are your musical preferences?"
- The National Statistics Socio-economic Classification (NS-SEC)
  - "What is your socio-economic background?"

All three tools are:

- Questionnaires
- Simple
- Widely used and applied in many different contexts
- Not the only option for the specific question

Now

DIY Research!

1. Fill in the questionnaire (~10 mins)
2. Score the answers yourself (step-by-step following the instructions, ~ 15 mins)

Questionnaire contains

1. Gold-MSI (only questions for subscales Musical Training and Active Engagement)
2. Short version of the STOMP
3. NS-SEC *(if you are a full-time student answer with respect to the household you grew up in)*
4. Items for Age, Gender, Country of formative years, undergraduate degree

Scoring the Gold-MSI

1. Find the 3 items (No. 5, 8, 9) ending with '-R' in brackets and reverse their score

   7 -> 1

   6 -> 2

   5 -> 3

   4 -> 4

   3 -> 5

   2 -> 6

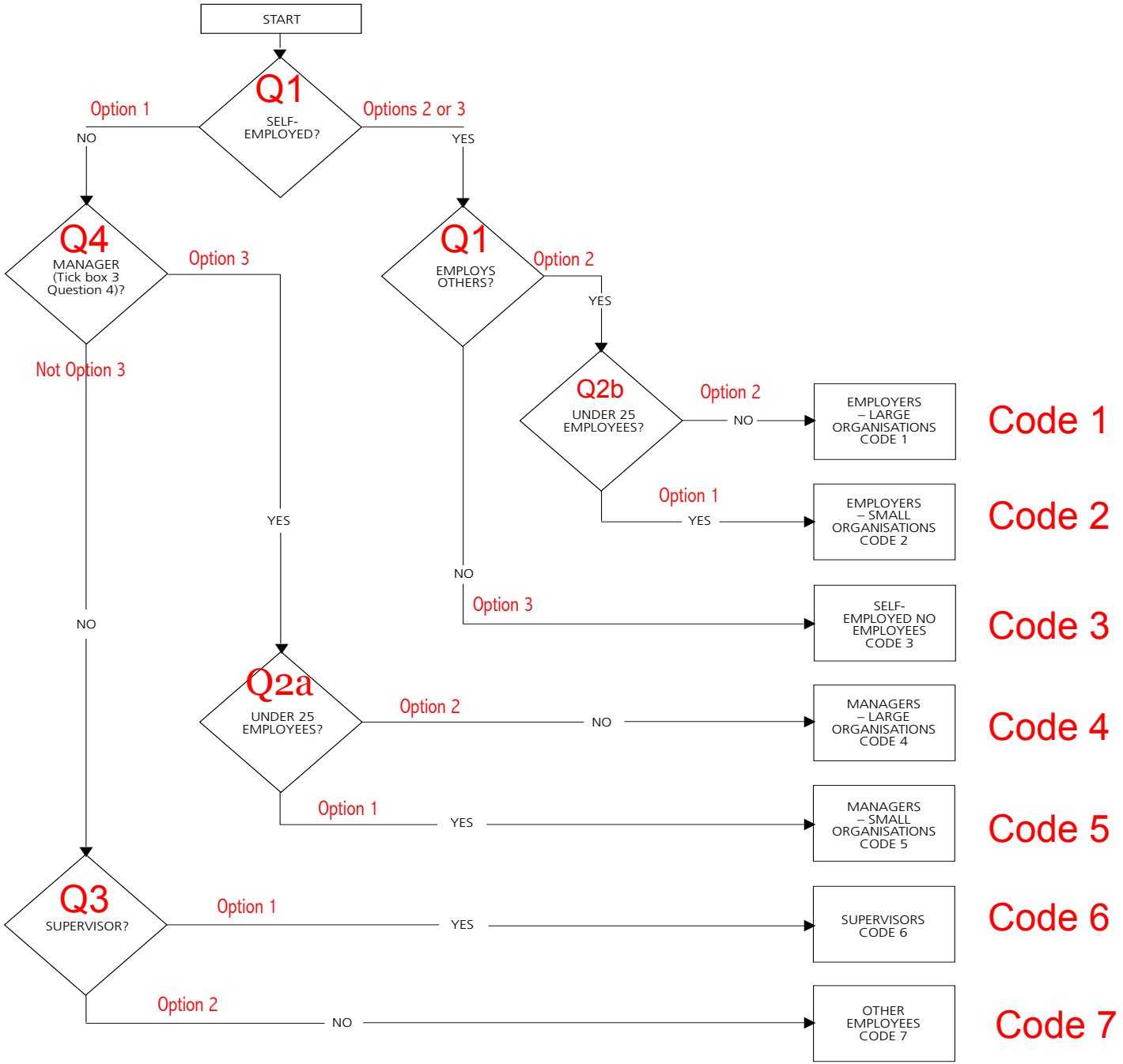
   1 -> 7

Scoring the Gold-MSI

2. Sum the scores (or reversed scores) of the 9 items of the Active Engagement subscale indicated by (AE) and write the sum into the Active Engagement box at the bottom of p. 2.
3. Sum the scores (or reversed scores) of the 7 items of the Musical Training subscale indicated by (MT) and write the sum into the Musical Training box at the bottom of p. 2.

Scoring the STOMP

1. Take the mean of the scores of items 1, 2, 5, 10 and write the mean value into the box Reflective & Complex at the bottom of p. 2.
2. Take the mean of the scores of items 9, 11, 13 and write the mean value into the box Intense & Rebellious at the bottom of p. 2.
3. Take the mean of the scores of items 3, 8, 12, 14 and write the mean value into the box Upbeat & Contemporary at the bottom of p. 2.
4. Take the mean of the scores of items 4, 6, 7 and write the mean value into the box Energetic & Rhythmic at the bottom of p. 2.


START
Q1
SELF-EMPLOYED?
Option 1
NO
Options 2 or 3
YES
Q4
MANAGER (Tick box 3 Question 4)?
Option 3
Not Option 3
Q1
EMPLOYS OTHERS?
Option 2
YES
Q2b
UNDER 25 EMPLOYEES?
Option 2
NO
EMPLOYERS – LARGE ORGANISATIONS CODE 1
Code 1
Option 1
YES
EMPLOYERS – SMALL ORGANISATIONS CODE 2
Code 2
NO
Option 3
SELF-EMPLOYED NO EMPLOYEES CODE 3
Code 3
YES
NO
Q2a
UNDER 25 EMPLOYEES?
Option 2
NO
MANAGERS – LARGE ORGANISATIONS CODE 4
Code 4
Option 1
YES
MANAGERS – SMALL ORGANISATIONS CODE 5
Code 5
Q3
SUPERVISOR?
Option 1
YES
SUPERVISORS CODE 6
Code 6
Option 2
NO
OTHER EMPLOYEES CODE 7
Code 7

Q4

Self-coded occupation	Employment status/size of organisation						
	1 Employers – large organisations	2 Employers – small organisations	3 Self-employed – no employees	4 Managers – large organisations	5 Managers – small organisations	6 Supervisors	7 Other employees
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7
Option 1 1 Modern professional occupations	1	1	1	1	1	1	1
Option 2 2 Clerical and intermediate occupations	1	3	3	1	1	1	2
Option 3 3 Senior managers or administrators	1	3	3	1	1	1	1
Option 4 4 Technical and craft occupations	1	3	3	1	1	4	4
Option 5 5 Semi-routine manual and service occupations	1	3	3	1	1	4	5
Option 6 6 Routine manual and service occupations	1	3	3	1	1	4	5
Option 7 7 Middle or junior managers	1	3	3	1	1	1	1
Option 8 8 Traditional professional occupations	1	1	1	1	1	1	1

Everything filled in?

1. Gold-MSI (2 boxes)
2. STOMP (4 boxes)
3. NS-SEC (1 box)
4. Items for Age, Gender, Country of formative years, undergraduate degree

Undergraduate Degree (Choose One):
1. Music 2. Musicology 3. Psychology
4. Computing 5. Other

Scores:

Age	
Gender	
Country (formative years)	

NS-SEC	

Gold MSI	
Active Engagement	
Musical Training	

Stomp	
Reflective Complex	
Intense Rebellious	
Upbeat Conventional	
Energetic Rhythmic	

Why use (these) questionnaire instruments at all?

Typical empirical study:

- Main dependent and main independent variable(s) of interest
- But: Individual differences between people can influence results, quite commonly:
  - age, gender, cultural background, education, socio-economic status
  - musical preferences / familiarity with given style
  - musical expertise
  - Also: intelligence, working memory, perceptual acuity, disposable income, personality, …

"Jede Jäck is anders"
(Albrecht Schneider)

What to do with this additional information?

- Create homogeneous sample
- Control confounding factors (e.g. include as covariates in statistical model or match experimental groups)
- Test whether they interact with variables of interest
- Split your sample into more homogeneous subgroups and do a subgroup analysis
- Explore and explain outliers
- Determine the generalisability of your findings

The Goldsmiths Muiscal Sophistication Index (Müllensiefen et al., 2014, PLoS One)

The Gold-MSI is

- A self-report inventory
- A battery of musical tests
- A novel concept

The Motivation:

- Over-reliance on formal (classical) music training as proxy for musical abilities and understanding
- Recognising multiple facets of musical expertise
- Joining self-report questionnaire and ability tests into one research tool and make it freely available

Alternatives:

- Questionnaires: Cuddy, Balkwill, Peretz, & Holden (2005), Ollen (2006), Werner, Swope, & Heide (2006), MacDonald & Stewart (2008), Chin & Rickard (2012)
- Musical Ability tests: Seashore, Lewis, & Saetveit (1960), Wing (1962), Bentley (1966), Gordon (1989), Wallentin et al. (2010), Law & Zentner (2012)

The Goldsmiths Muiscal Sophistication Index

- Definition *Musical Sophistication*:
  - Psychometric construct comprising musical skills, expertise, achievements and related behaviours across a range of facets measured on different subscales.

- Assumptions:
  - Facets of musical sophistication can develop through active engagement with music in its many different forms.
  - Individuals vary in their level of sophistication on the different facets.
  - High levels of musical sophistication are generally characterised by
    - higher frequencies for exerting the musical skills or behaviours
    - greater ease, accuracy or effect of the musical behaviour when executed,
    - a greater and more varied repertoire of behaviour patterns associated with it.

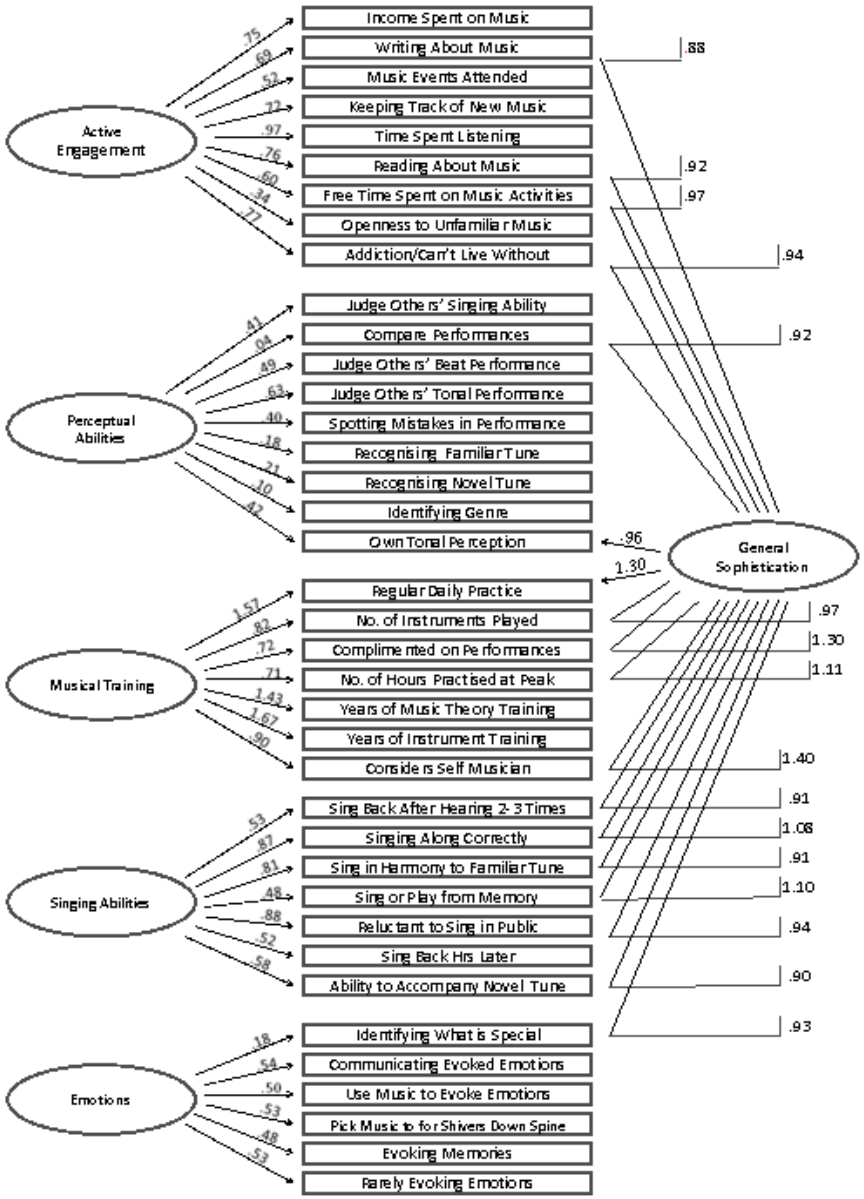
The Goldsmiths Muiscal Sophistication Index

- 38-item Self-report Inventory covering 5 different facets of musical expertise
- 13-item Melodic Memory test
- 17-item Beat Perception test
- 16-item Sound Similarity test
- 22-item Beat Production (tapping) test

All freely available from:

http://www.gold.ac.uk/music-mind-brain/gold-msi/

Factor structure: 5 subscales + 1 general factor



Short Test of Musical Preferences
(Rentfrow & Gosling, 2003)

The STOMP is

- A short scale for rating the preferences for 14 (or 23) genre (labels)
- Aggregation of preferences into 4 meta-genres:
  - Reflective & Complex
  - Intense & Rebellious
  - Upbeat & Conventional
  - Energetic & Rhythmic
- Based on data from several studies with western listeners
- A way of measuring people‘s preferences on 4 independent dimensions
- Scale is available from:

http://homepage.psy.utexas.edu/HomePage/Faculty/Gosling/scales_we.htm

Alternatives: George et al. (2007), Colley (2008), Schäfer & Sedlmeier (2009)

The MUSIC model
(Rentfrow et al., 2011; Rentfrow et al., 2013)

The MUSIC model is

- An audio tool for rating musical preferences for 25 (or 94) short unknown music clips
- Avoiding the connotations of genre labels
- Individual preferences and music pieces in 5-D meta-genre space:
  - Mellow
  - Unpretentious (Conventional)
  - Sophisticated (Reflective & Complex)
  - Intense (Intense & Rebellious)
  - Contenporary (Upbeat / Energetic & Rhythmic)

- Linked to individuals‘ personality, identity, and impression
- Linked psychosocial stages in life-span perspective
- Linked to sound features

The National Statistics Socio-economic Status

(Office for National Statistics, 2001; Goldthorpe, 1997)

The NS-SEC is

- A measurement tool for assessing socio-economic status (SES), as an important variable interacting with many aspects with people‘s lifes
- A scheme for classifying SES based on occupation and work relationships
- Only comprised of 4 items
- A British scheme but with analogous schemes in other countries (e.g. ESeC)

The NS-SEC does not (directly) cover:

- Education
- Income / wealth

Alternatives: ISCO-88 (Ganzeboom & Treiman, 1996), ISEI, International Standard Classification of Education (ISCED, 1997)

Other useful tools

- Emotions
  - GEMS for assessing emotionts felt during music listening (Zentern et al., 2008; http://www.zentnerlab.com/psychological-tests/geneva-emotional-music-scales)
  - Film soundtrack clips for emotion induction (Eerola & Vuoskoski, 2011, https://www.jyu.fi/hum/laitokset/musiikki/en/research/coe/materials/emotion/soundtracks/)
  - Profile of Mood States (POMS, McNair et al., 1971)
- Personality
  - Big Five Inventory (BFI)
  - Ten item personality inventory (TIPI, Gosling et al., 2003)
- Hearing Abilities
  - Test of Basic Auditory Capabilities (TBAC, Kidd et al., 2007)
  - Speech in Noise Hearing Test (Smits et al., 2004)
- Cognitive Ability
  - Wechsler Abbreviated Scale of Intelligence
  - Digit-span test
  - n-back test

Computational music analysis tools

- Music analysis from audio
  - MIR toolbox for Matlab (Lartillot & Toiviainen, 2007, https://www.jyu.fi/hum/laitokset/musiikki/en/research/coe/materials/mirtoolbox)
  - Sonic Visualizer (Cannam et al., 2010, http://www.sonicvisualiser.org/)
- Music Analysis from MIDI
  - MIDI toolbox for Matlab (Eerola & Toiviainen, 2004, https://www.jyu.fi/hum/laitokset/musiikki/en/research/coe/materials/miditoolbox/)
  - FANTASTIC for melody analysis in R (Müllensiefen, 2009, http://doc.gold.ac.uk/isms/mmm/?page=Software%20and%20Documentation)
  - MeloSpySuite for melodic feature extraction (http://jazzomat.hfm-weimar.de/index.html)
  - SIMILE for melodic similarity analysis (Müllensiefen & Frieler, 2004, http://doc.gold.ac.uk/isms/mmm/?page=Software%20and%20Documentation)

Modelling the SysMus2014 data

- Musical expertise, preferences and SES can be variables of main interest
- But often used as covariates to separate out effects from main variables

⇒*Predict musical preference from background variables!*

Implementation:

- Predict most preferred STOMP meta-genre from Age, Gender, SES, Country, Musical Sophistication
- Explore how different background variables contribute to it
- Use classification tree model

Predict their most preferred STOMP meta-genre

Kelly

_____

Reflective & Complex

Georgina

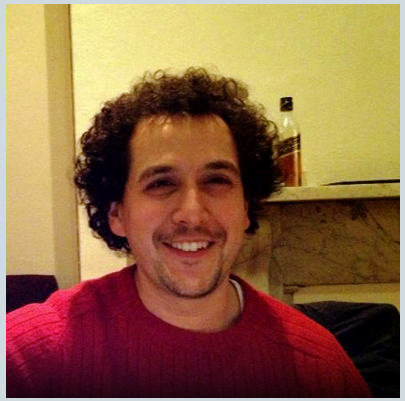
_____

Energetic & Rhythmic

Naoko

_____

Reflective & Complex



Nico

_____

Energetic & Rhythmic

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