Music and the Mind

Dr Lauren Stewart
Dr Daniel Müllensiefen

(Music, Mind and Brain group, Goldsmiths, University of London)
Music...

- Doesn’t exist, we create it

- A super-stimulus for pleasure
Effortless learning

- Learned via exposure

- But lifelong difficulties for some
Congenital Amusia

- What it is, how we test for it

- Brains miswired for music

www.delosis.com/listening/home.html
"When the music finished the sound was always gone - as though it had never happened. And this bewildered me with a sense of failure, of failure to hold on to what I had just heard.

Others told me that if I tried to remember I would. But I never did. I have no idea what people mean when they say: "I have a tune going round in my head." I have never had a tune tell out its music in my head let alone repeat itself!“ (Sister Ruth)
WHY IS IT THAT I CAN RECALL A CIGARETTE AD JINGLE FROM 25 YEARS AGO, BUT I CAN'T REMEMBER WHAT I JUST GOT UP TO DO?
What is an earworm?

- A tune that gets stuck
- *Involuntary musical imagery*
- Related to *voluntary musical imagery*
- Not a hallucination, but seemingly little control
What we know.....

- How common are they?
  - 90% at least once a week (Liikanen, 2008)

- Are they always bothersome?
  - 15-33% are disturbing / unpleasant (Beaman & Williams, 2009; Liikanen, 2008)

- Susceptible personalities?

- Many possible triggers
What makes a tune sticky?

- Nothing?
- Repetition?
- Melodic structure?

- Answers from computational music analysis?
Computational Music Analysis: Pre-requisite

Transform notes into numbers

Melody: Sequence of tuples (notes) with time and pitch information:

\[ n_i = (t_i, p_i) \]

Melody features: Complexity, pitch range, rhythmical evenness, repetitiveness, melodic contour ....
**Computational Music Analysis: ‘Hit Song Science’**

**Task:** Identify commercially successful songs on *Revolver* using computational features (Kopiez & Müllensiefen, 2009)

**Commercially successful:**
Cover version of song entered charts (yes/no)
Computational Music Analysis: ‘Hit Song Science’

Result: Statistical classification model predicting tune success

\[
p \ (\text{chart_entry} = 1) = \frac{1}{1 + e^{-(772.4 + 141.2 \cdot \text{pitch\_range} - 4731.3 \cdot \text{pitch\_entropy})}}
\]

Interpretation:
- 2 features (pitch range and entropy/complexity) are sufficient for accurate ‘hit song’ prediction
- Plausible interpretation as compositional exercise: Invent a chorus melody such that it has a large range and uses only few pitches much more frequently than the majority of its pitches
Earworms: A research agenda

- Collaboration with Shaun Keaveny breakfast show (BBC, 6 Music)
  - Earworms
  Woken up with a tune wriggling around inside your head? Release the little musical creature onto the airwaves by getting in touch with the show...
  - Email your 'Earworms' to Shaun

- Build Database of earworm reports, including song titles and situations.

- Analyse tunes using computational methods
Striking Your Own Chord

- What constitutes plagiarism?
- Is it always deliberate?
- Presentations by experts from science and the music industry
- ‘Creative Karaoke’: write a hit song & test your musical creativity