Cognitive styles and individual differences in learning

12/3/2018
Roadmap

- Cognitive styles
  - Field-dependence/independence
  - Reflectivity/Impulsivity
- Learning styles and individual differences
- Cognitive aging
Learning objectives

1. What is cognitive style?
2. How are field-dependence and impulsivity tested?
3. What is learning and what are different views on learning?
4. What are the characteristic of different learning styles?
5. What are some factors contributing to cognitive aging?
Cognitive styles

• Field-dependent vs. Field independent
  ⇒ External vs. Internal
  ⇒ Dependent vs. Autonomous
Cognitive styles

- Field-dependence/independence

Embedded Figure Test (EFT)
Cognitive styles

• Field-dependence/independence

Block design task
Cognitive styles

- Field-dependence/independence
- Block design task
Cognitive styles

- Field-dependence/independence

Block design task

Solid line: Autism group
Dashed line: learning disability group

(Happe 1999)
Cognitive styles

• Field-dependence/independence
  ➢ Weak central coherence
• Better at extracting the embedded picture
• ”Detail-focused”
• Found in Autism Spectrum Disorder
Cognitive styles

• Reflectivity/Impulsivity

Matching Familiar Figure Test

https://goo.gl/SJN4p4
Cognitive styles

• Reflectivity/Impulsivity Matching Familiar Figure Test

• Does it only measure reflectivity and impulsivity?

• What else does it measure?
Cognitive styles

• Reflectivity/Impulsivity Matching Familiar Figure Test

<table>
<thead>
<tr>
<th></th>
<th>MDMA (n=19, 3♀)</th>
<th>Cannabis (n=19, 3♀)</th>
<th>Controls (n=19, 3♀)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Σ errors (number)</td>
<td>8.16 (4.09)</td>
<td>5.95 (4.36)</td>
<td>6.47 (4.23)</td>
</tr>
<tr>
<td>Mean latency to first response (s)</td>
<td>49.5 (19.3)</td>
<td>53.3 (21.7)</td>
<td>60.5 (29.9)</td>
</tr>
<tr>
<td>Impulsivity score (z-score)</td>
<td>0.76 (1.43)</td>
<td>0.12 (1.49)</td>
<td>0.00 (1.77)</td>
</tr>
<tr>
<td>Efficiency score (z-score)</td>
<td>−0.03 (0.82)</td>
<td>0.36 (0.99)</td>
<td>0.00 (0.93)</td>
</tr>
</tbody>
</table>

Quednow et al. (2007)
Cognitive styles

• Reflectivity/Impulsivity

Matching Familiar Figure Test

➢ What else can it test for?

➢ Attention Deficit/Hyperactivity Disorder
Learning styles and individual differences

• The science of *learning*
  ➢ Psychology
  ➢ Education
  ➢ Philosophy

• Different views on learning
  ➢ Behaviorism
  ➢ Nativism
  ➢ Empiricism
Learning styles and individual differences

• What is *learning*??
  ➢ Acquisition of knowledge/skills
    ◦ Implicit learning
    ◦ Explicit learning
Learning styles and individual differences
Yang (2015)

• Novel word learning
  ➔ Similar to cross-model binding task
• Picture paired with English nonwords
• Manipulation 1: One group see written form but the other group did not.
• Manipulation 2: Some objects can have two auditory labels differing in one sound
• Manipulation 3: A letter can be pronounced in two ways (<o> ➔ [o][u])
Yang (2015): Group 1
Yang (2015): Group 1
Yang (2015): Group 2

<bofes>
Imagine you are learning these words. What cognitive processes are involved? And do you use any learning strategies?

Yang (2015)
Yang (2015): Summary

• Written form doesn’t really help in learning the variation in pronunciation

• Large individual differences
  ➢ Learning styles
  ➢ Motivation
Implicit learning of non-linguistic sequences (see Week 4.2 for review)

• Seeing sequences of faces on the screen.
• Serial Reaction Time task: Press the button corresponding to the face location on the screen.
• Learning quantified by reduction in reaction time over time.
• In the testing phase, Ss also see sequences that do not follow the patterns they see in the training phase (i.e., ungrammatical sequence).
Implicit learning of non-linguistic sequences

Individual differences: what’s going on?

Ungrammatical > Grammatical

*thresholded at different significance level
Learning styles and individual differences

• Contributing factors to Individual differences in learning
  ➢ Cognitive abilities (memory, attention, perceptual ability, etc.)
  ➢ Motivation
  ➢ Learning styles
Learning styles and individual differences

Honey & Mufford (1992): Learning Style Questionnaire (LSQ)

1. Activists: learning by doing
2. Reflectors: learning by reflection
3. Theorists: learning from models and concepts
4. Pragmatists: learning by putting theories into practice
Cognitive aging

https://goo.gl/vU9BD9
Cognitive aging

• Everyone follows the same pattern of cognitive decline?

• What may contribute to cognitive aging?
Cognitive aging

• What may contribute to individual diff. in cognitive aging?
To name just a few:

» Living environment
» Stimulus
» Education
» Health history
» Cognitive style