Conceptualization of Task Boundaries Facilitates Implicit Learning in the SRT task

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The goal of the current study was to test an alternative hypothesis for situations under which SRT learning is disrupted when a distractor task is present. That is, learning is disrupted when the two tasks are conceptualized as integrated but not when they are distinct. We used task instructions to manipulate whether the participants in each group conceptualized the two tasks as integrated or distinct and measured the amount of sequence learning in the two conditions.

Methods – SRT task

Color Task: Make a manual keypress with the R hand to indicate the color of the square (red or green)

Color Task:

Tone Task: Make a manual keypress with the L hand to indicate whether the tone was high or low

Color task:
blocks 1 – 3 Random, blocks 4 – 9 Sequence, blocks 10 – 11 Random, block 12 Sequence

Tone task:
blocks 1 – 12 Random

Instructional manipulation:
- Separate group
  - “Today you will be responsible for 2 separate tasks…”
- Integrated group
  - “Today you will be playing the part of a concierge…”

*the timing of events was identical in both conditions

References

Background
How do humans learn a task?

- Humans can hear verbal instructions and perform complex tasks
- Learning can occur even in very distracting settings
- Task boundaries are often unclear

SRT task

- Subjects make manual responses to various types of stimuli
- Visual objects at a specific location or auditory tones mapped to pre-assigned response
- Stimuli presented in a sequence
- Learning is indicated by decreasing reaction times as the task is practiced

Distractor tasks

- Sometimes implicit learning is disrupted by a secondary task; sometimes it is not
  - Cohen, Ivy & Keele (1990): secondary distractor task did not prevent implicit sequence learning
  - Schumacher and Schwarb (2009): secondary distractor task prevents implicit sequence learning when there is overlap in the central processing system and parallel response selection is required.

Conclusions

- Only the group that received the separate task instructions showed evidence of sequence learning
- When participants received instructions that caused them to believe that the two tasks were integrated into a single task, sequence learning was disrupted
- Participants conceptualization of the task(s) can significantly affect learning and performance

Separate –
Blocks 10&11 (Random): 668 ms
Blocks 9&12 (Sequence): 636 ms
Learning = 32 ms

Integrated –
Blocks 10&11 (Random): 640 ms
Blocks 9 &12 (Sequence) 632 ms
Learning = -8 ms

* Sig Group by BlockType Interaction: F(1,62) = 9.68, p <.01
Main Effect of Group: F(1,62) = 3.58, p = .063
Main Effect of Block: F(1,62) = .541, p = .465

No Sig main effects or interactions