

Putting some order in person memory

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UNIVERSITY OF CALIFORNIA, DAVIS

**Putting some order
in person memory
...or maybe not!**

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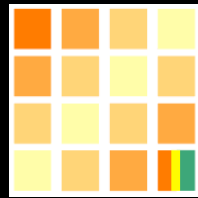
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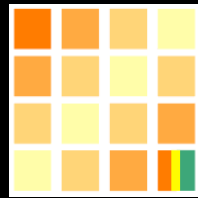
introduction

- . person memory:
 - > impression formation
- . human memory:
 - > memory for serial order
 - > order and item information



introduction

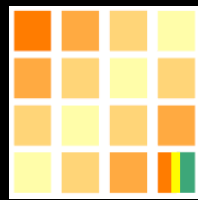
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paradigm

introduction

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paradigm

experiment 1

design / results / discussion

experiment 2

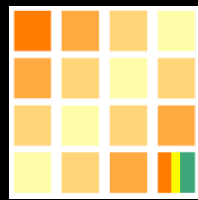
design / results / discussion

experiment 3

design / results / discussion

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paradigm

experiment 1

design / results / discussion

experiment 2

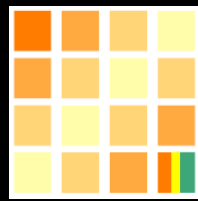
design / results / discussion

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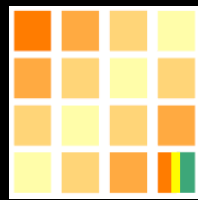
design / results / discussion

general discussion

Why do we care about **ORDER**?

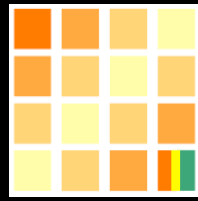


Why do we care about **ORDER**?



Well, we think that the way people perceive information, namely **the ORDER IN WHICH INFORMATION IS ENCODED AND REPRESENTED IN THE MEMORY STRUCTURE WILL PLAY AN IMPORTANT ROLE IN THE WAY PEOPLE EXTRACT MEANING FROM THE SOCIAL WORLD.**

We argue that **WHEN PEOPLE FORM IMPRESSIONS ABOUT OTHERS, THE ORDER IN WHICH THE INFORMATION IS PERCEIVED WILL BE CRUCIAL FOR THE REPRESENTATION BEING BUILT ABOUT THE TARGET PERSON.**



introduction

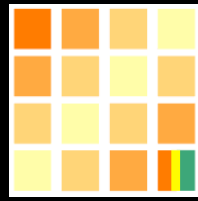
person memory

impression formation

human memory

memory for serial order

**order in
person memory**



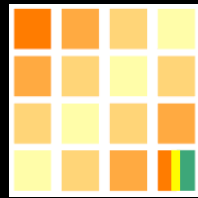
introduction

person memory

impression formation

Impression - **cognitive representation of someone:**

- **coherent**
- at encoding: **each new item is integrated with the items previously encoded** in the emergent impression
- network of **inter-item associations**
- **better organization** leads to **better recall** (free recall)

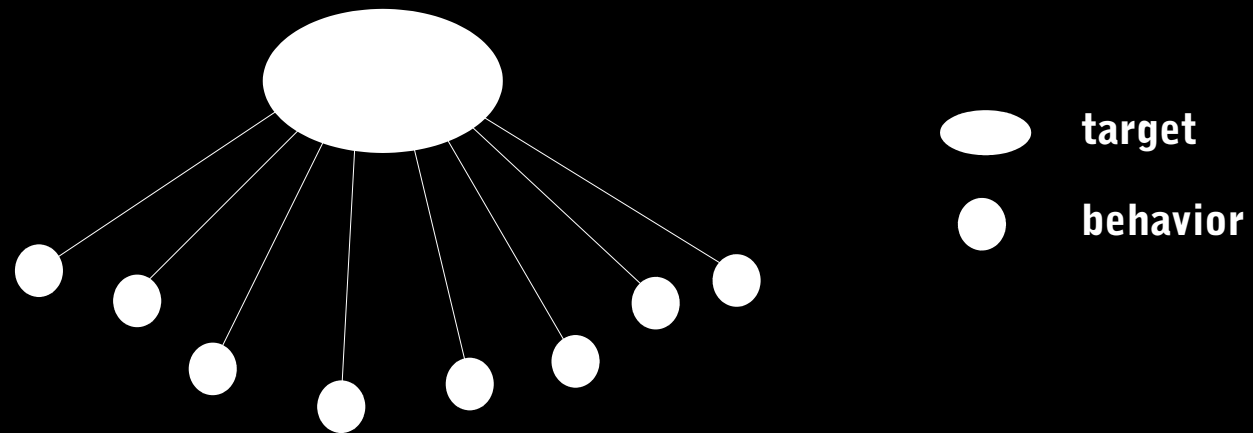


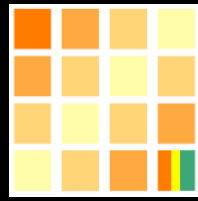
introduction

person memory

impression formation

Impression - **cognitive representation of someone:**



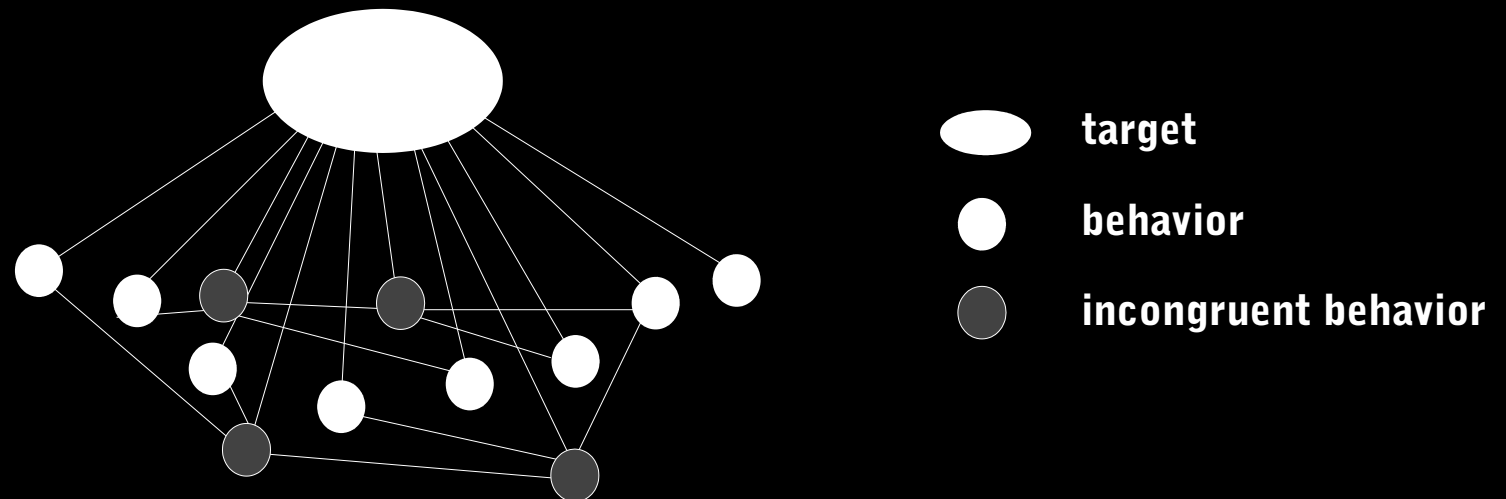


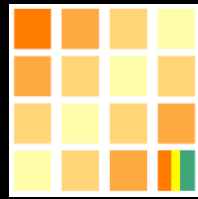
introduction

person memory

impression formation

Impression - **cognitive representation of someone:**



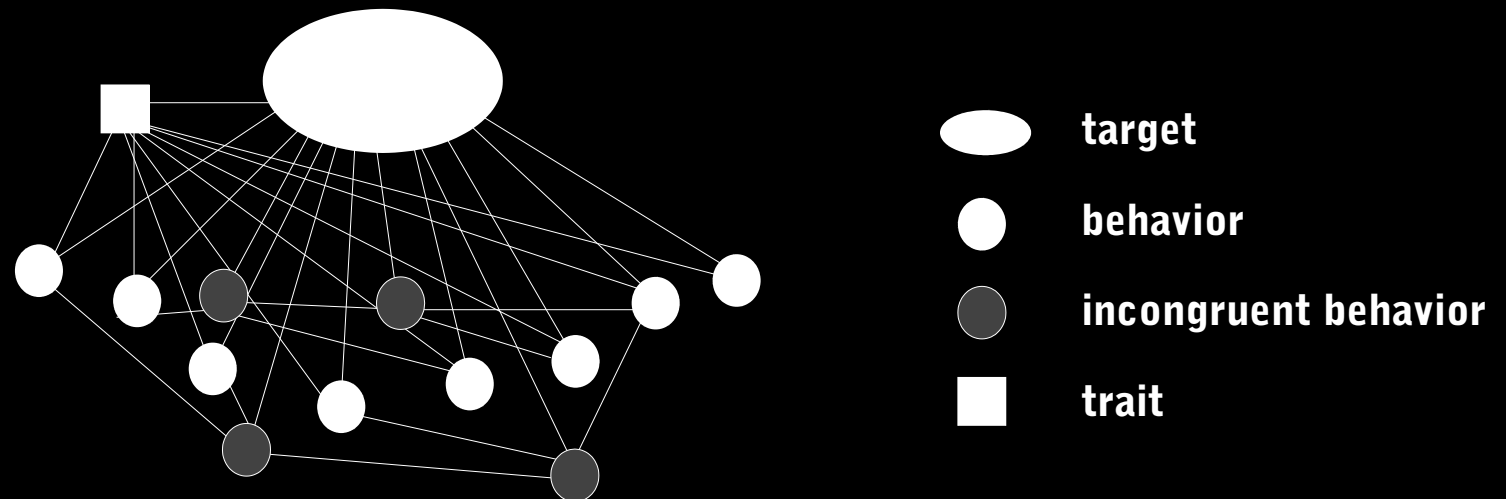


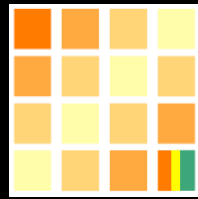
introduction

person memory

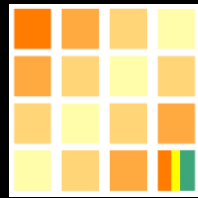
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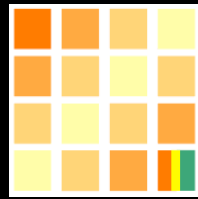
introduction



introduction

human memory

item information \neq order information

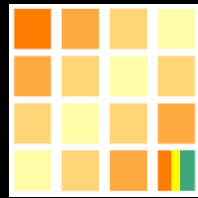


introduction

human memory

item information \neq order information

A



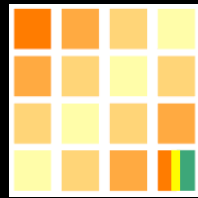
introduction

human memory

item information \neq order information

A

C

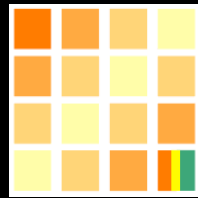


introduction

human memory

item information \neq order information

A **C** **M**

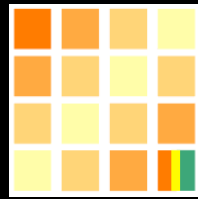


introduction

human memory

item information \neq order information

A **C** **M** **D**

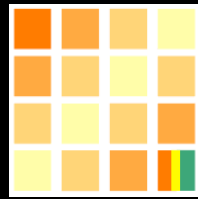


introduction

human memory

item information \neq order information

A **C** **M** **D** **N**

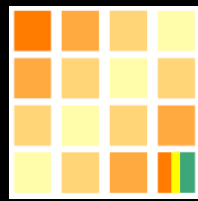


introduction

human memory

item information \neq order information

A **C** **M** **D** **N** **E**

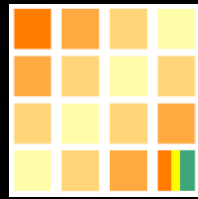


introduction

human memory

item information \neq order information

A C M D N E I

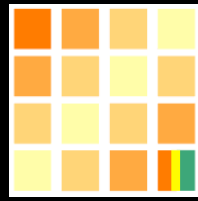


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human memory

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A C M D N E I O

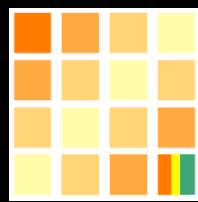


introduction

human memory

item information \neq order information

A C M D N E I O
C O M E D I A N



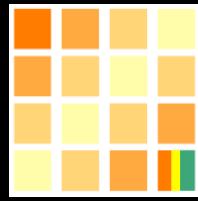
introduction

human memory

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A C M D N E I O

D E M O N I A C

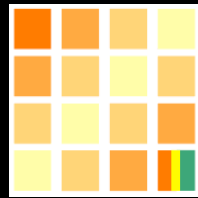


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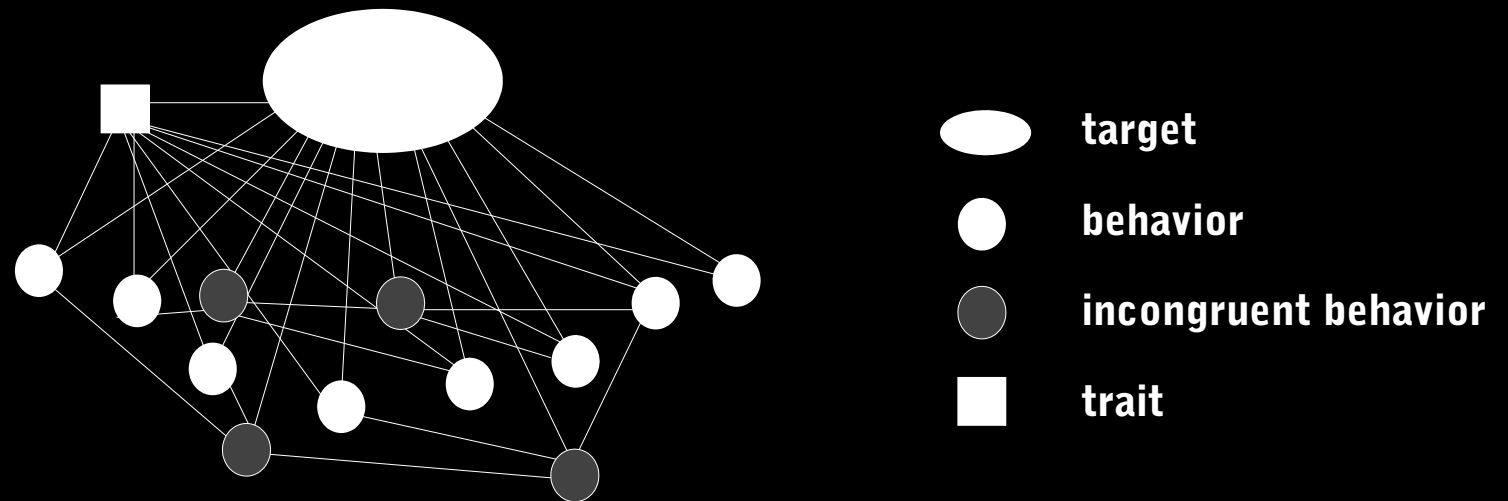
human memory

item information \neq order information

A C M D N E I O
C O M E D I A N
D E M O N I A C



introduction

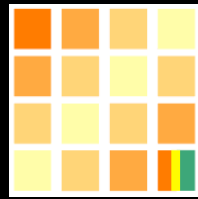




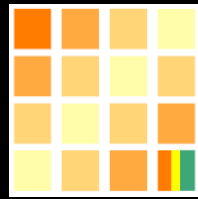
The
BIG
Lebowski

**“that rug really
tied the room
together”**

paradigm



paradigm



time

paradigm

instructions

stimuli

filler task

recall

**dependent
measures**

time



paradigm

instructions

stimuli

filler task

recall

**dependent
measures**

**Impression
Formation**
instructions

or

Memory
instructions

time 

paradigm

instructions

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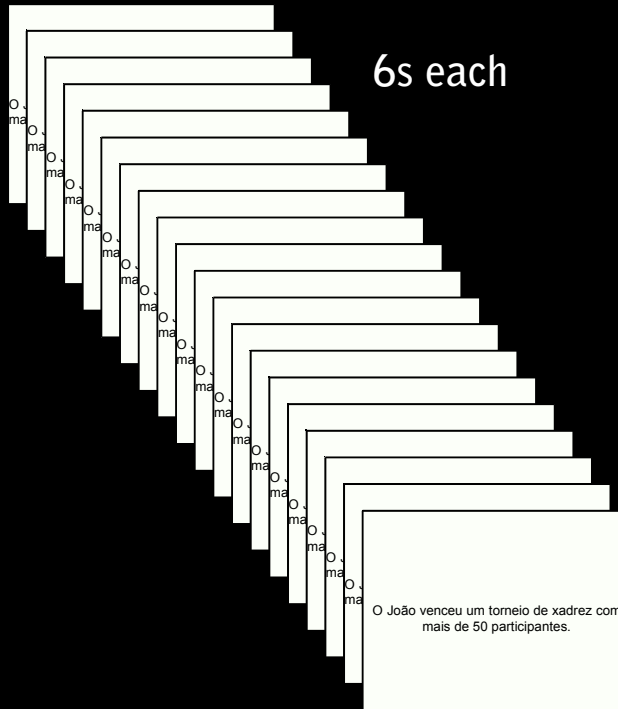
18-24 behaviors (randomly)

Impression
Formation
instructions

6s each

or

Memory
instructions



time

paradigm

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filler task

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18-24 behaviors (randomly)

Impression
Formation
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6s each

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Memory
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Math
Problems

6m

O João venceu um torneio de xadrez com
mais de 50 participantes.

time



paradigm

instructions

stimuli

filler task

recall

dependent measures

**Impression
Formation
instructions**

18-24 behaviors (randomly)

6s each

or

**Memory
instructions**

**Math
Problems**

6m

or

**Ordered
Recall**

**Free
Recall**

O João venceu um torneio de xadrez com
mais de 50 participantes.

time →

paradigm

instructions

stimuli

filler task

recall

dependent measures

Impression
Formation
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18-24 behaviors (randomly)

6s each

or

Memory
instructions

Math
Problems

6m

or

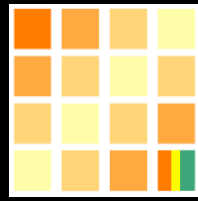
Ordered
Recall

Free
Recall

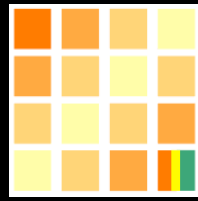
memory for
the **ITEM**
and
memory for
the **ORDER**

memory for
the **ITEM**
and
memory for
the **ORDER**

time →

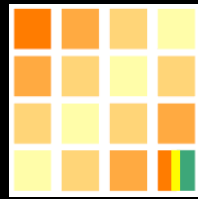


experiment 1



experiment 1

design:



experiment 1

design:

2

processing goals:

impression formation

X

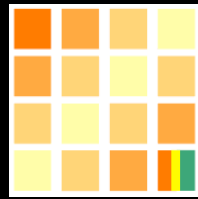
memorization of order

2

recall:

free recall

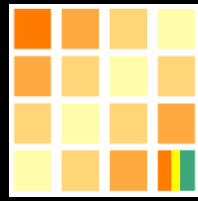
ordered recall



experiment 1

results:

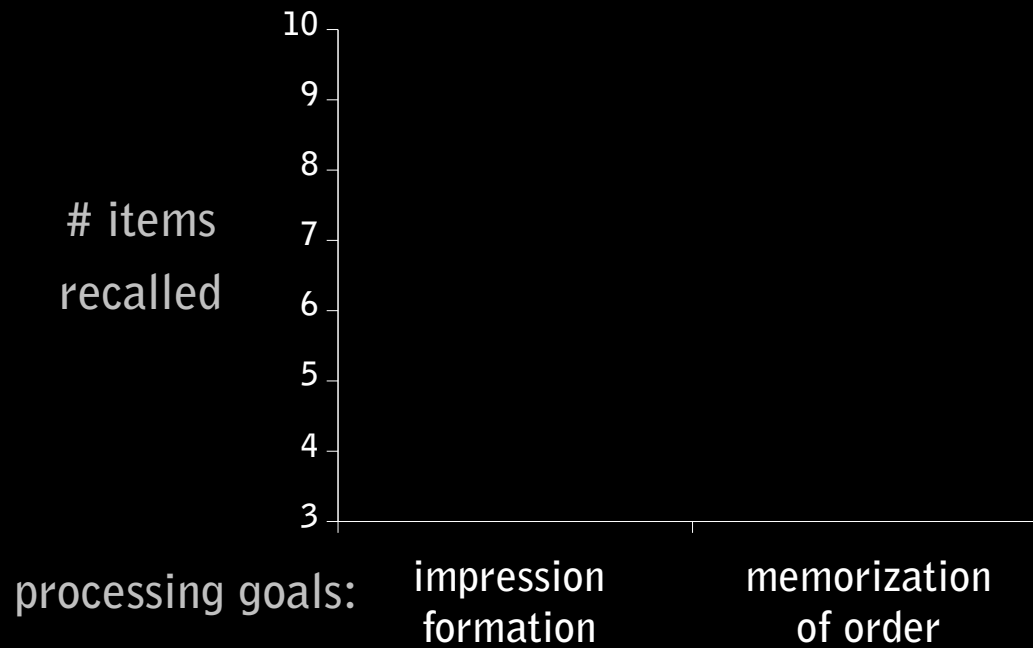
dv **ITEM:**

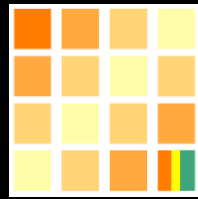


experiment 1

results:

dv **ITEM**:

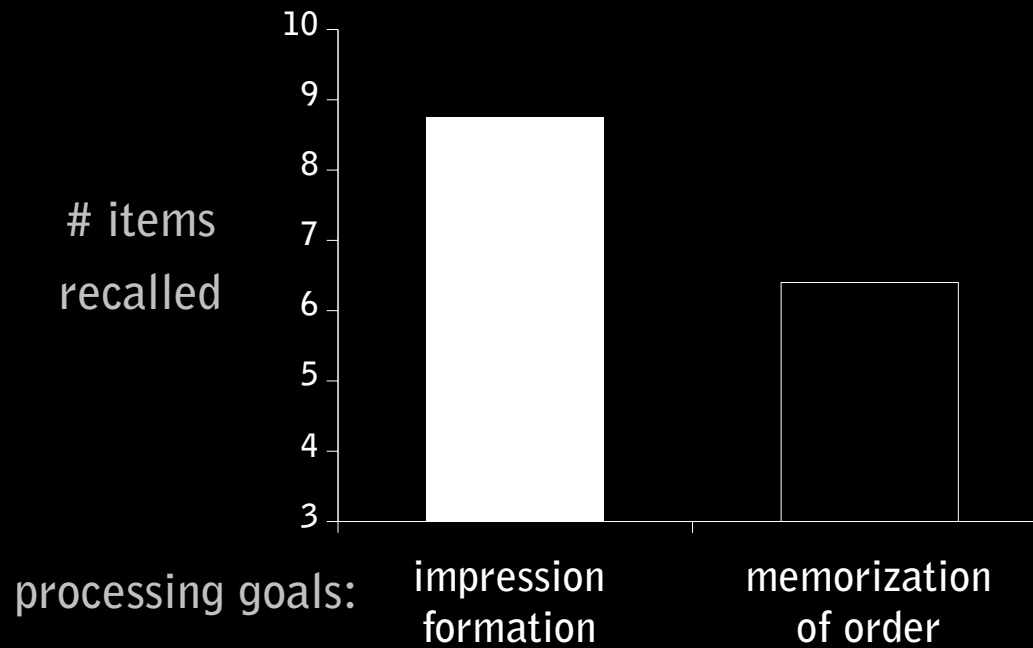




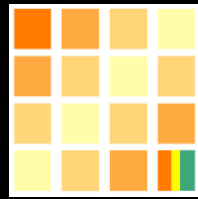
experiment 1

results:

dv **ITEM**:



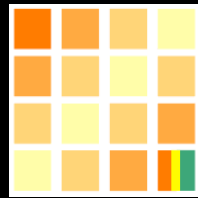
$F(1,99)=16,35; p<,00$



experiment 1

results:

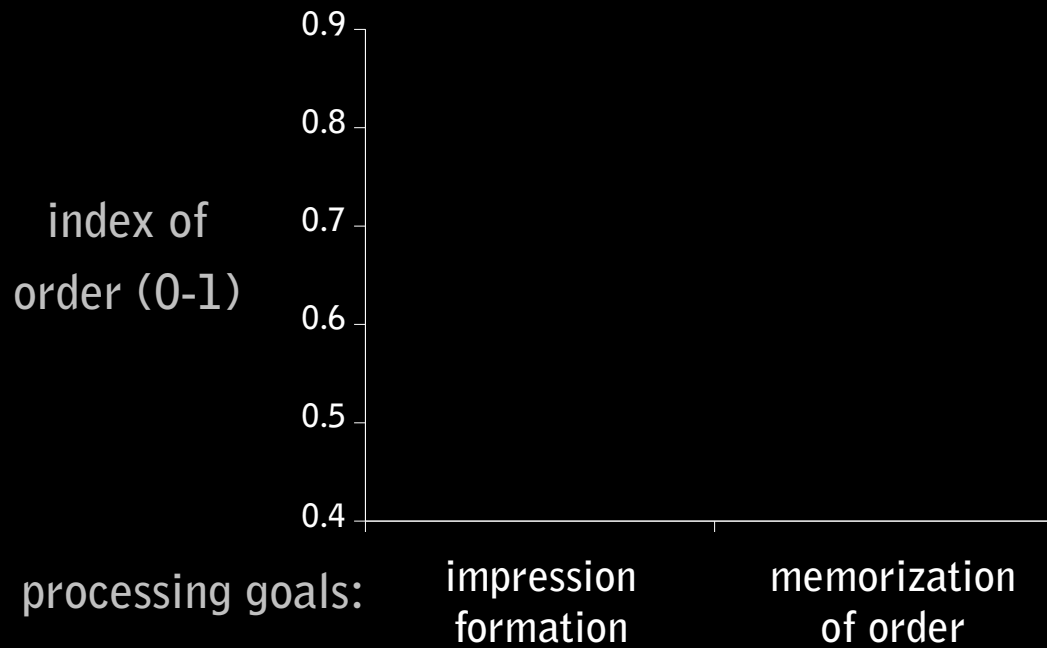
dv **ORDER:**

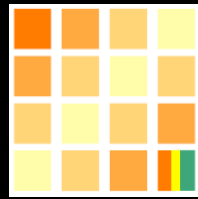


experiment 1

results:

dv **ORDER:**

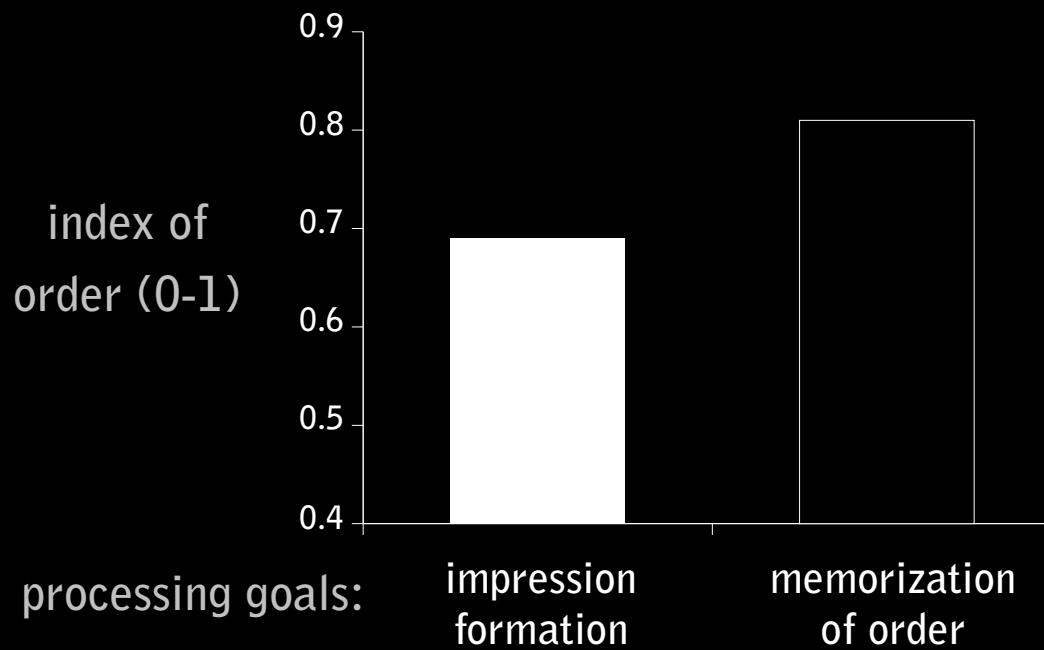




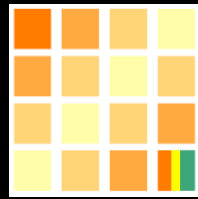
experiment 1

results:

dv **ORDER:**

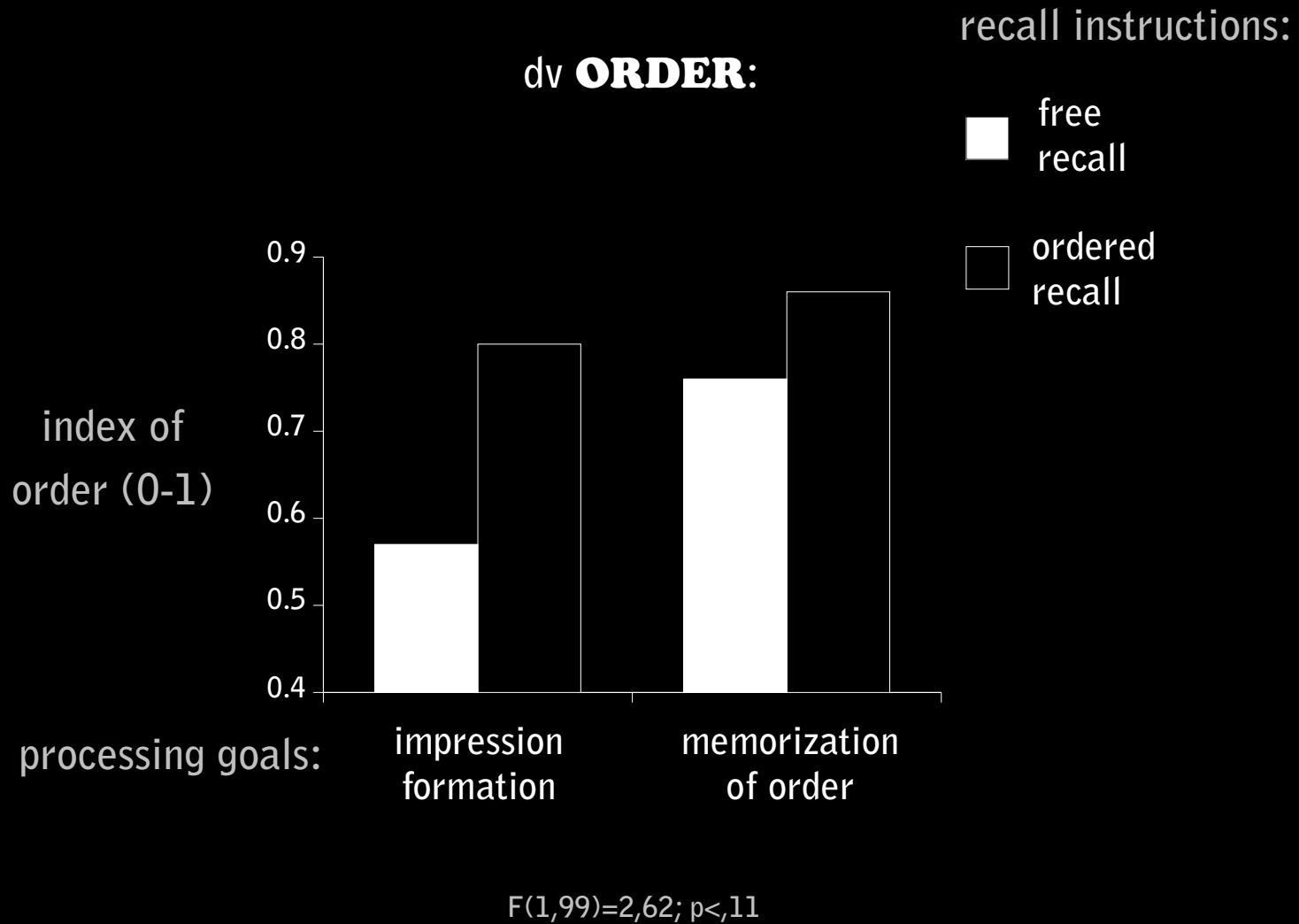


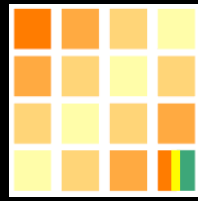
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experiment 1

results:





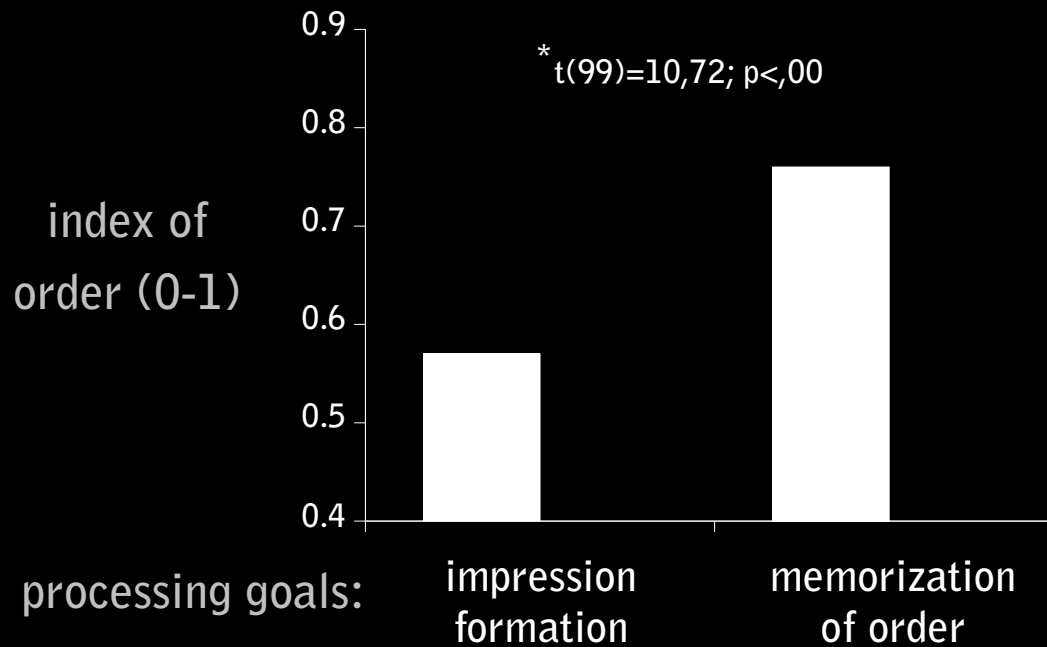
experiment 1

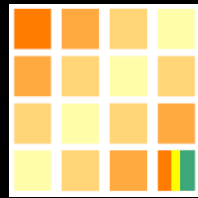
results:

dv **ORDER:**

recall instructions:

■ free
■ recall



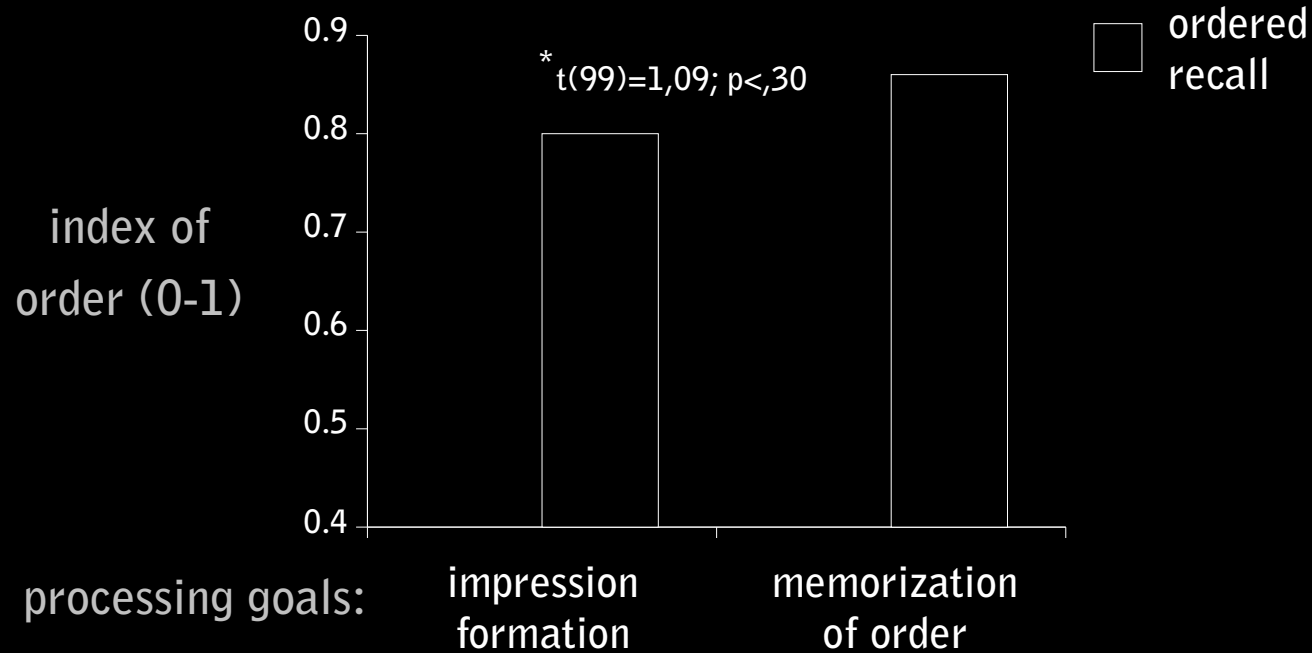


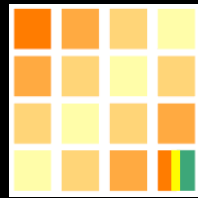
experiment 1

results:

dv **ORDER:**

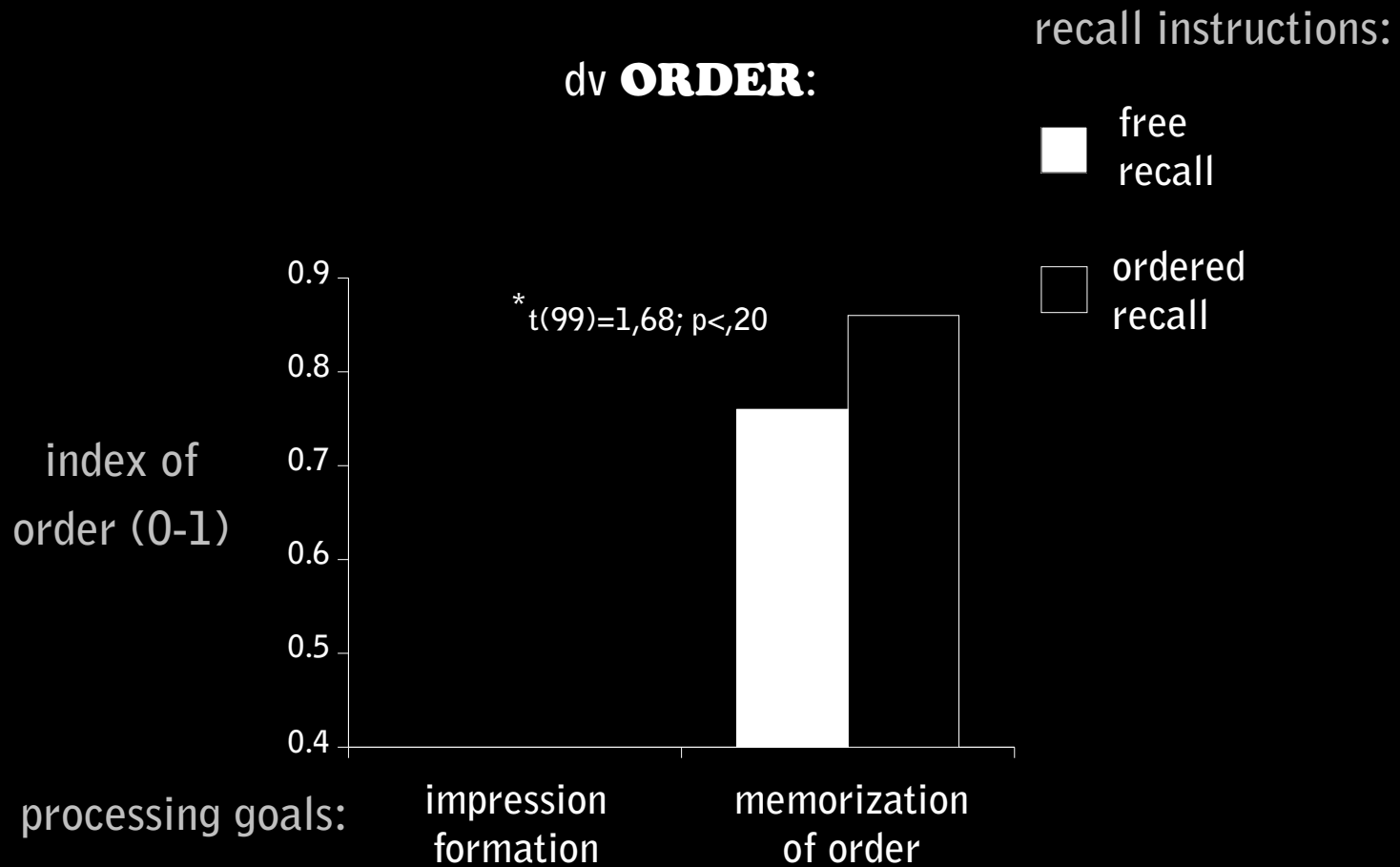
recall instructions:

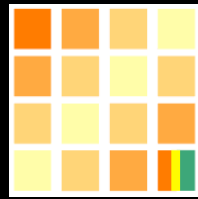




experiment 1

results:





experiment 1

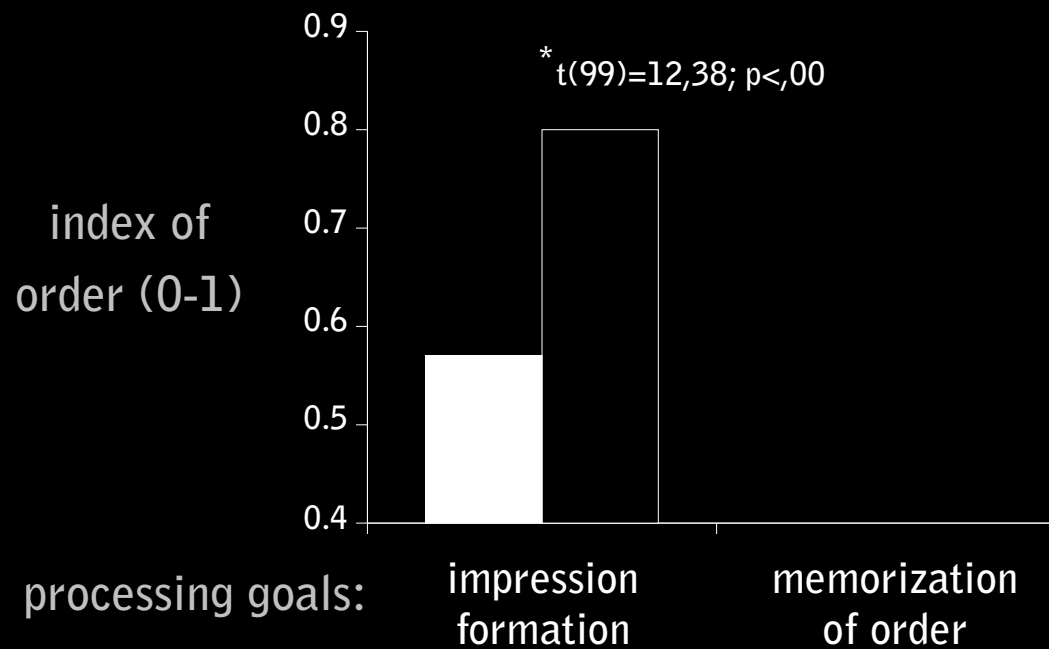
results:

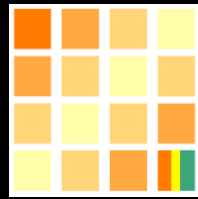
dv **ORDER:**

recall instructions:

■ free recall

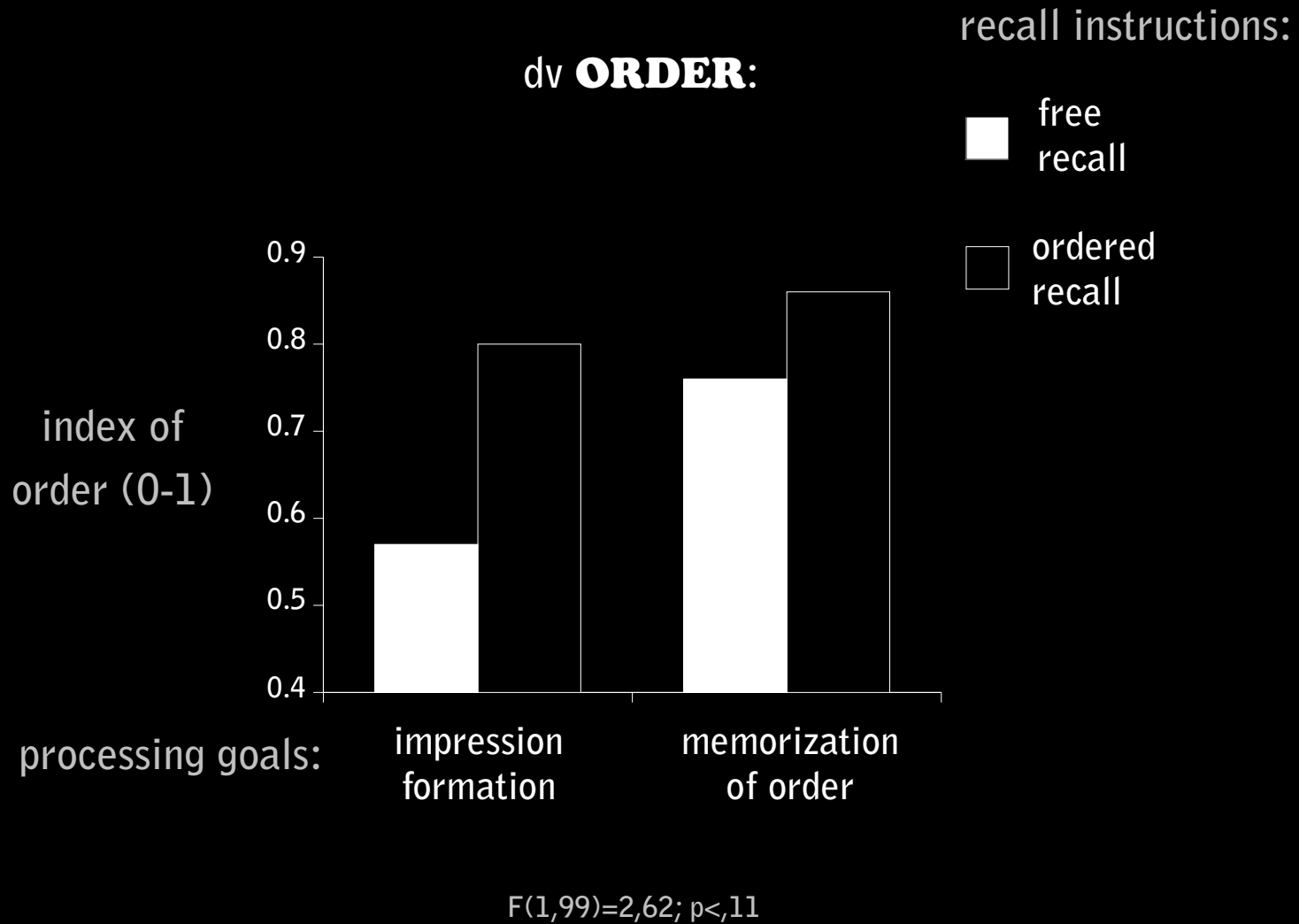
□ ordered recall

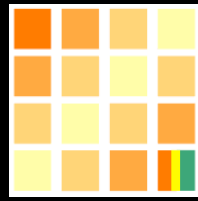




experiment 1

results:





experiment 1

discussion:

item information

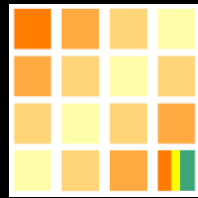
I – when people form impressions they recall more information – item memory is better (we already knew that)

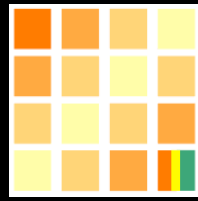
- supports the idea that the processes involved in forming an impression lead to the development of organized person memory structures

order information

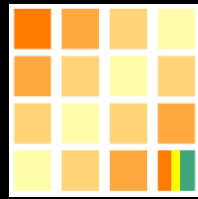
I – when people form impressions, they are also able to keep track of order information – order is represented in the person memory structure

- but participants only retrieve order information if specifically asked to do so
- spontaneously, people don't use order information to access memory



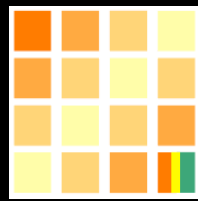


experiment 2



experiment 2

design:



experiment 2

design:

2

processing goals:

impression formation

memorization of order

X

2

expectancy:

intelligent

friendly

stupid

unfriendly

X

2

list:

congruent

incongruent

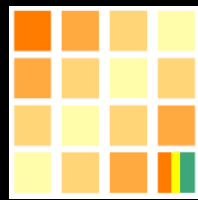
X

2

recall:

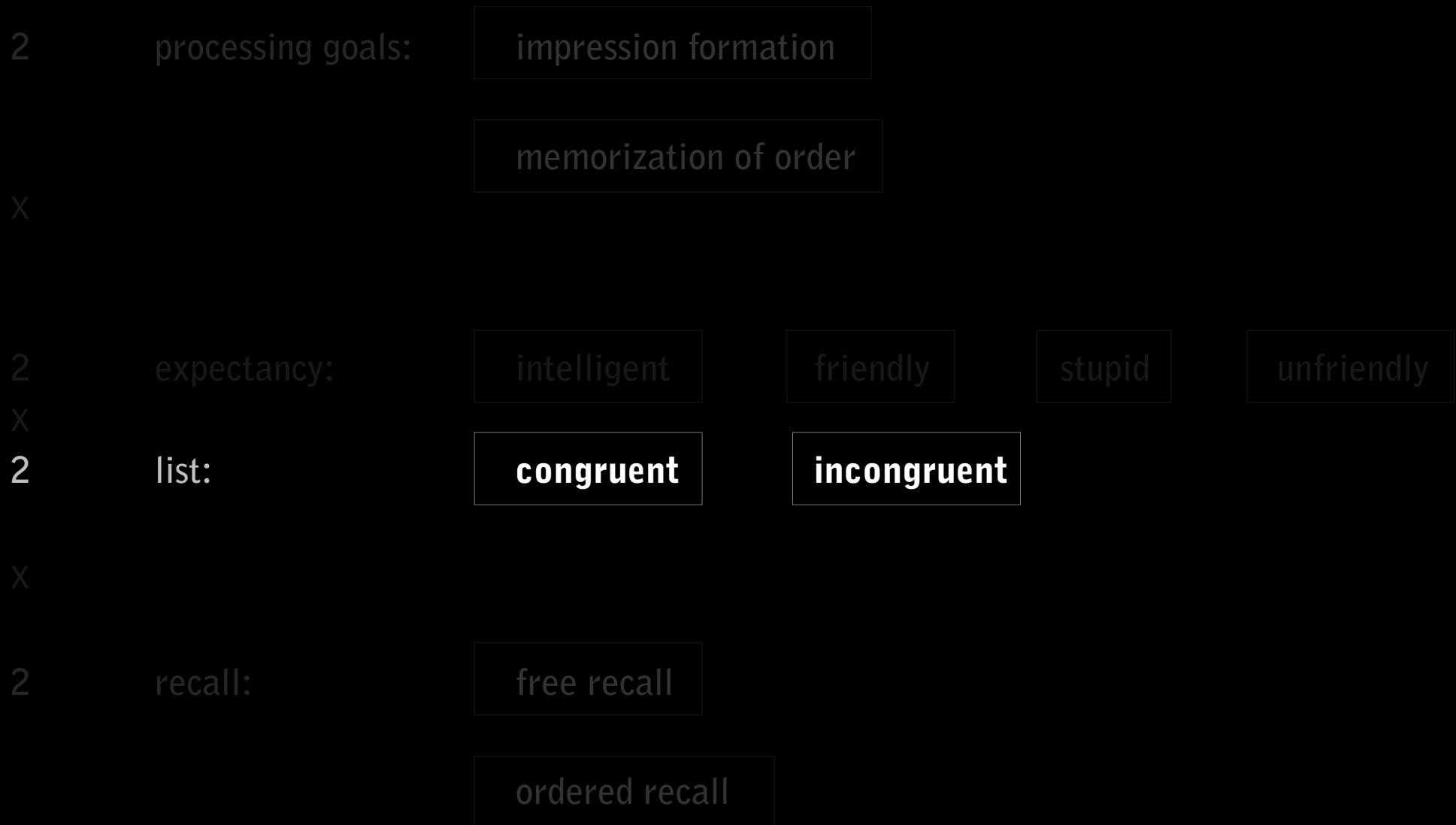
free recall

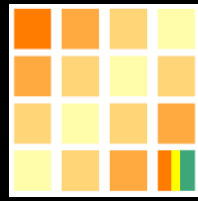
ordered recall



experiment 2

design:

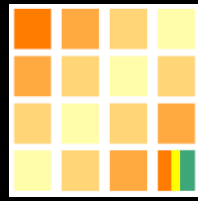




experiment 2

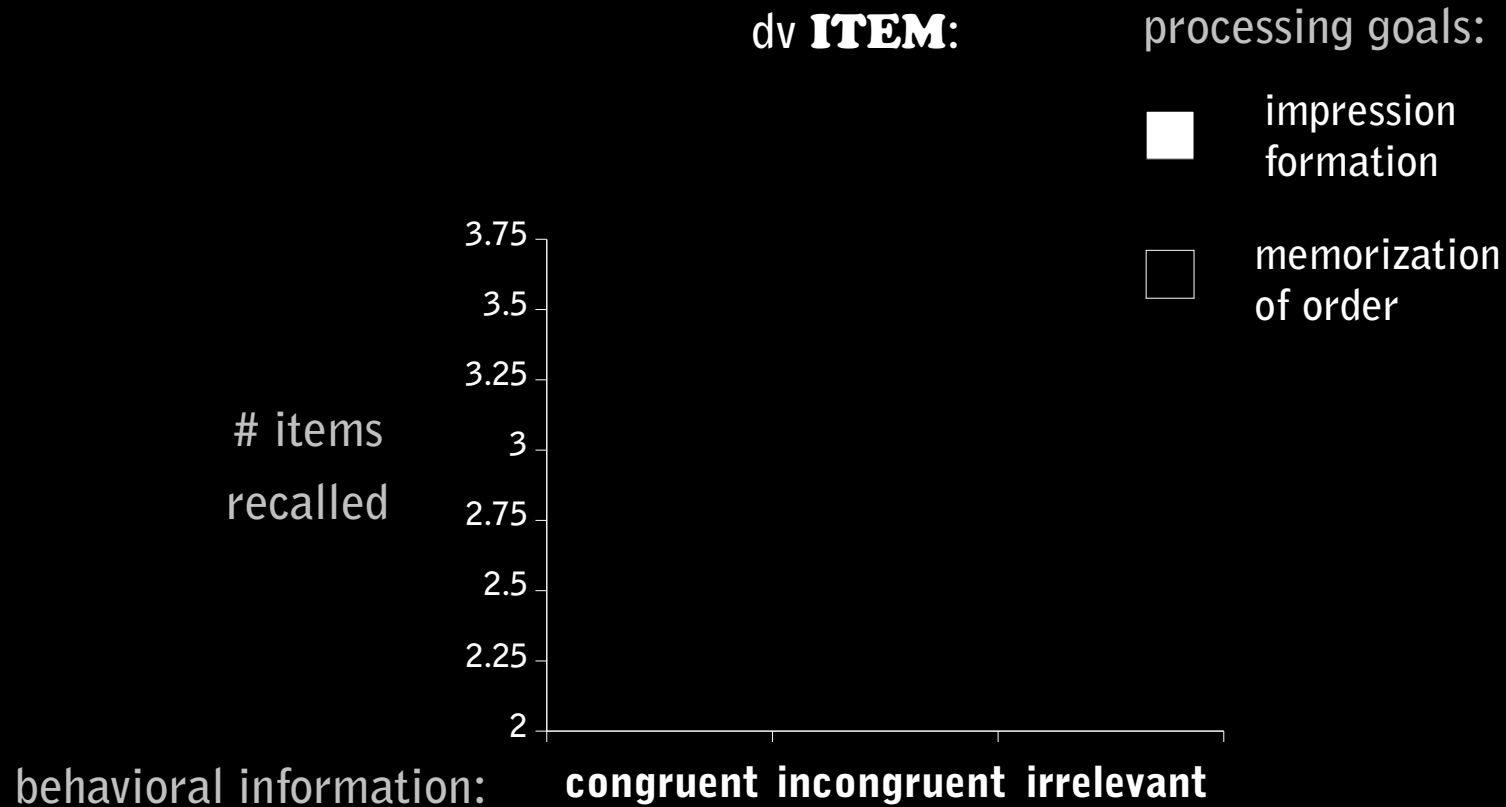
results:

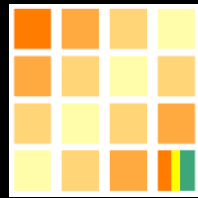
dv **ITEM:**



experiment 2

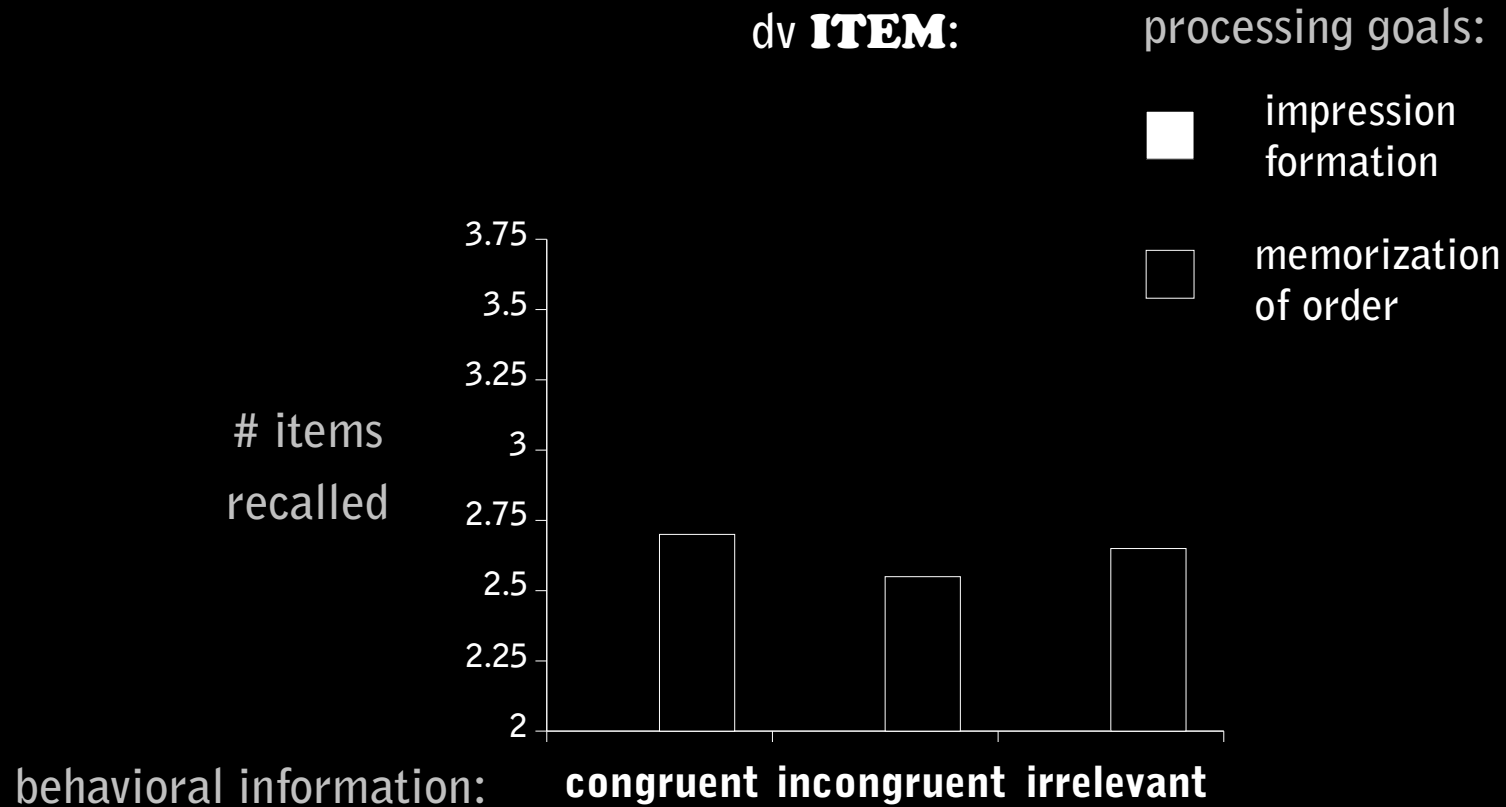
results:

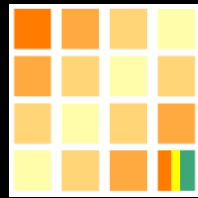




experiment 2

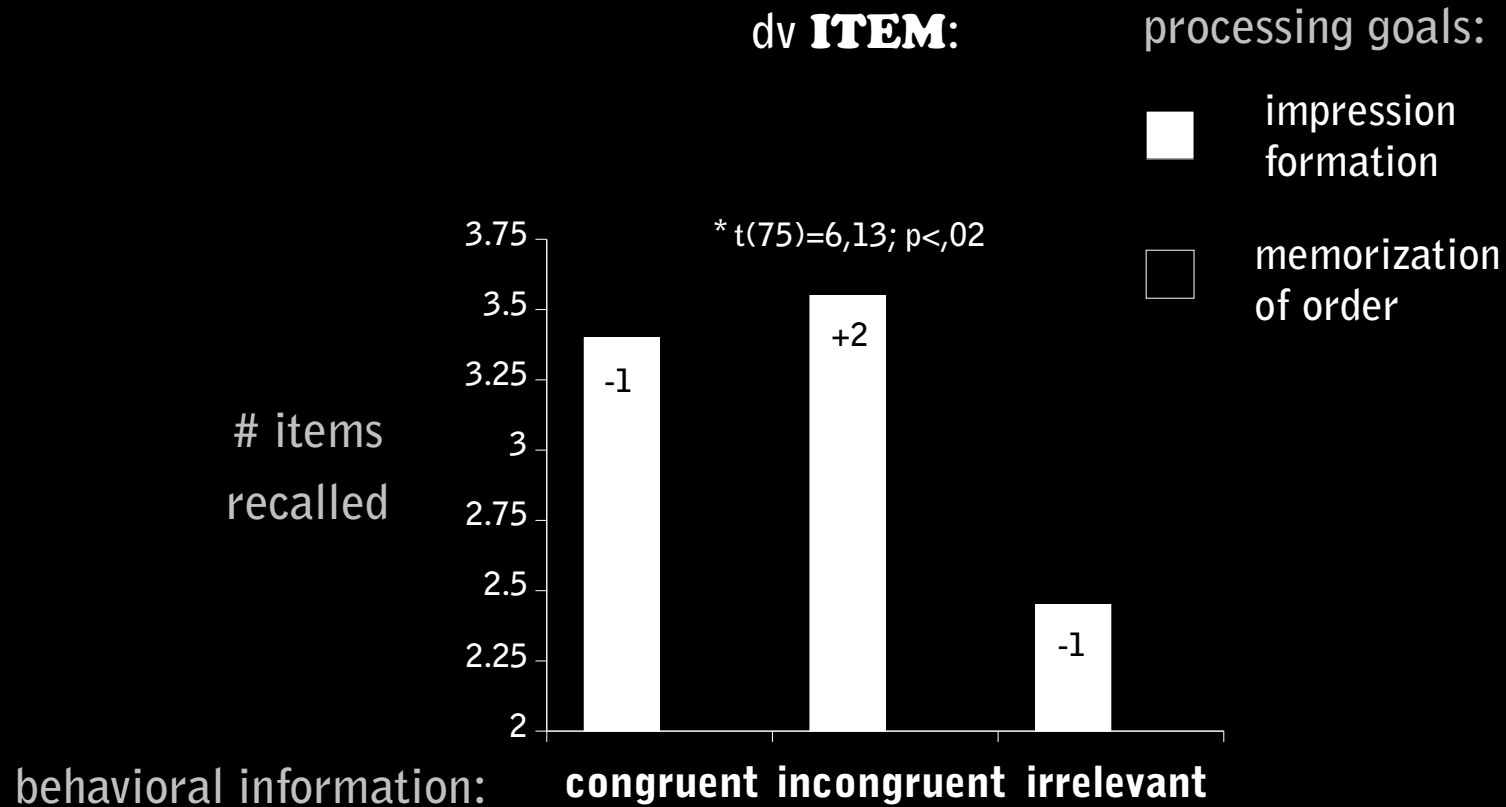
results:

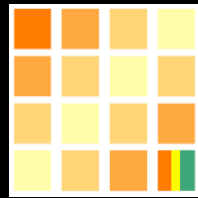




experiment 2

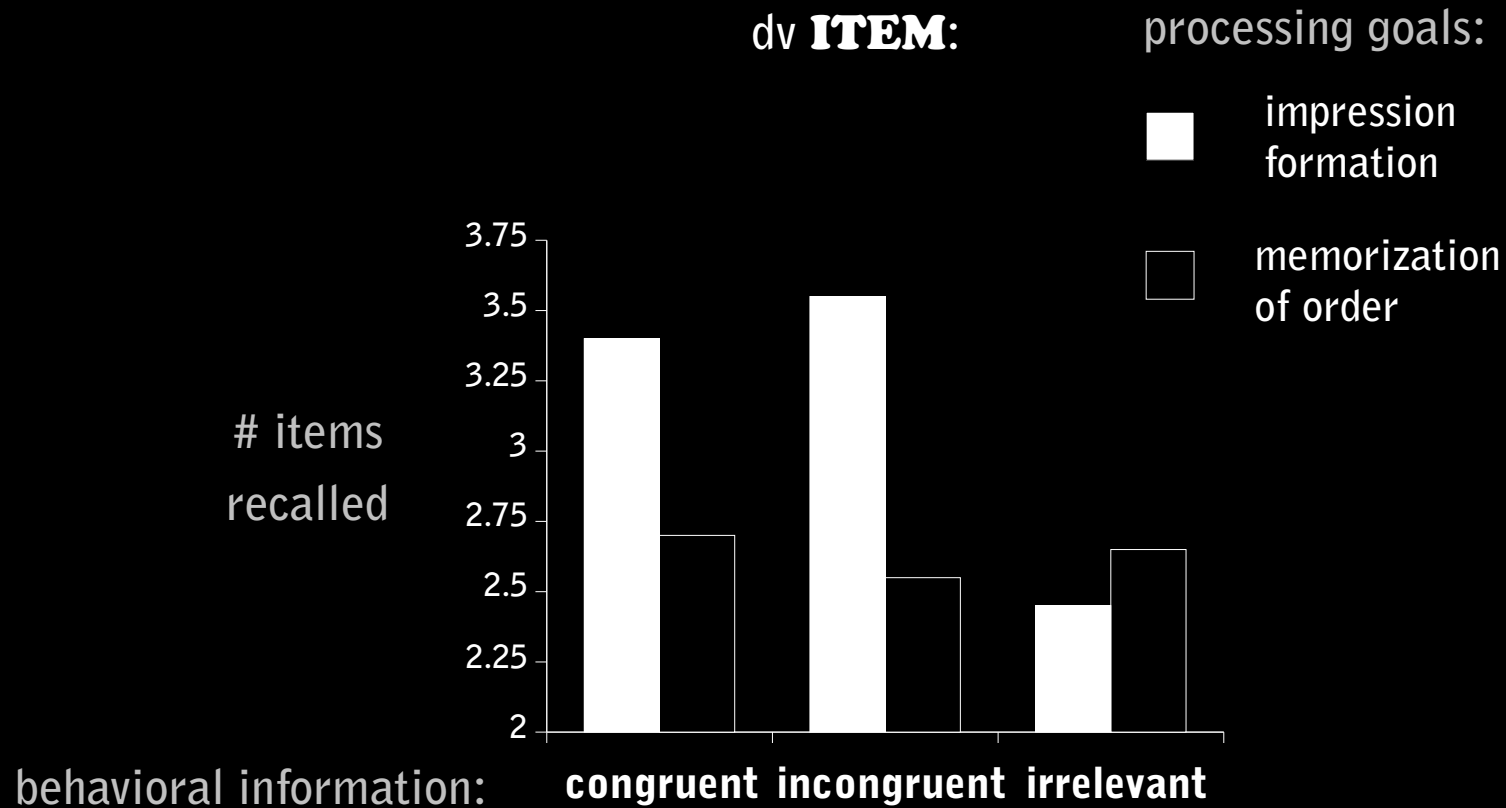
results:



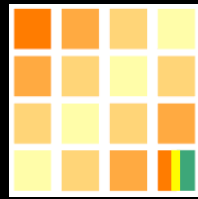


experiment 2

results:



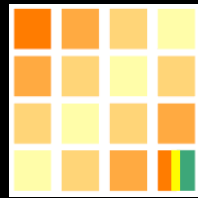
$F(2,150)=6,39; p<,00$



experiment 2

results:

dv **ORDER:**



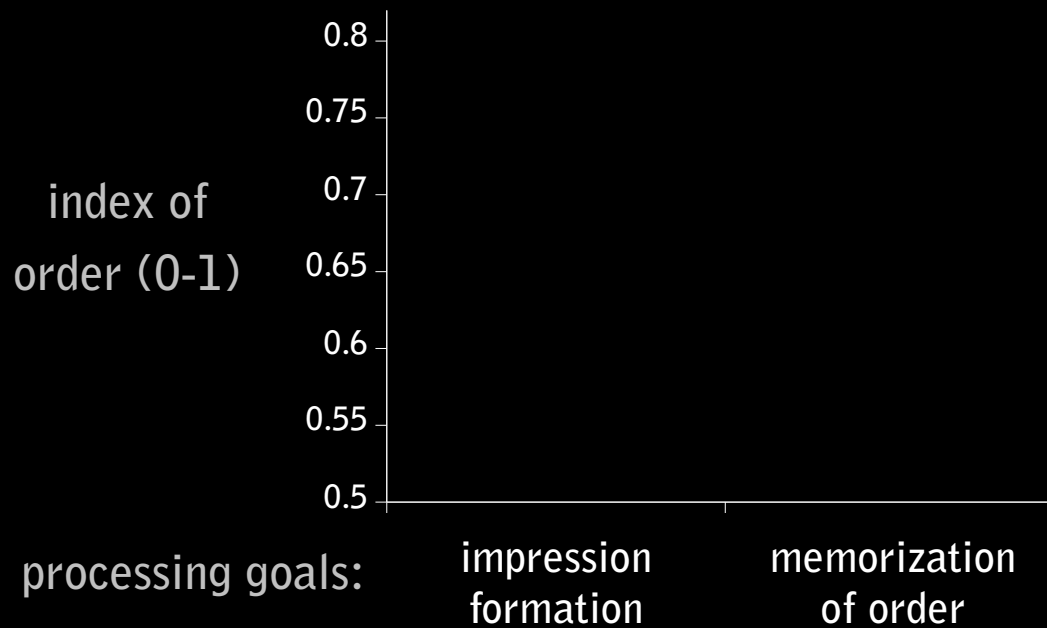
experiment 2

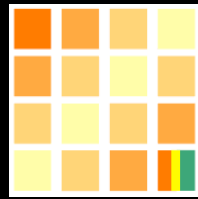
results:

dv **ORDER:**

recall instructions:

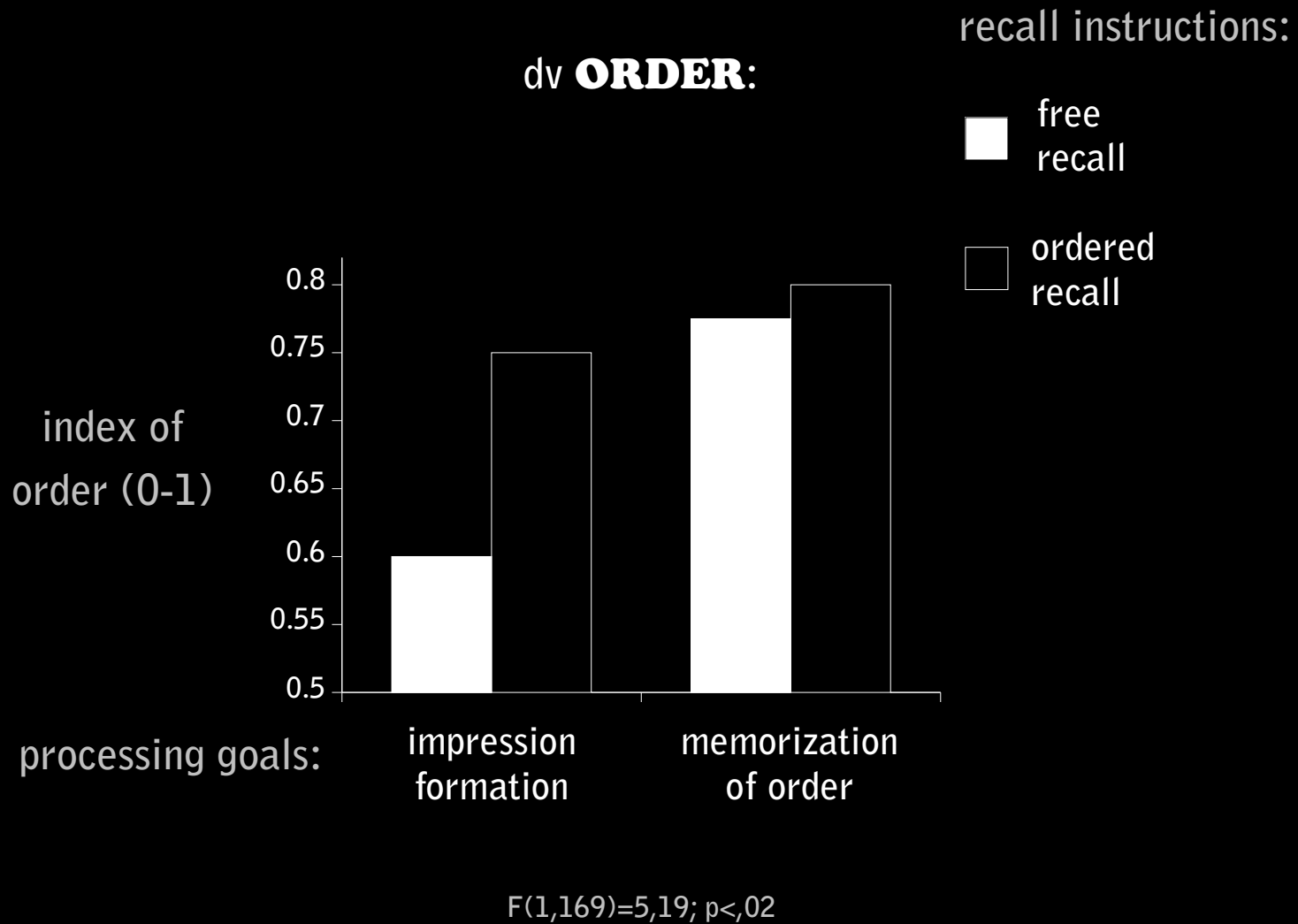
- free recall
- ordered recall

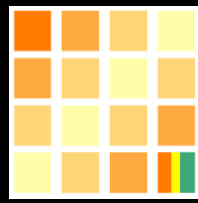




experiment 2

results:





experiment 2

discussion:

item information

1 – when people form impressions they recall more information

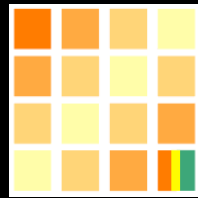
2 – incongruency effect: incongruent items are better recalled than congruent and irrelevant items

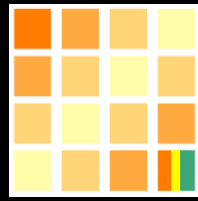
order information

1 – order is represented in the person memory structure (impression)

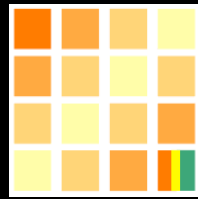
- participants only recall the information in an ordered way if they were specifically asked to so, they don't do it spontaneously

2 – increasing the density of the network of inter-item associations
- incongruency effect – has no effect on memory for the order



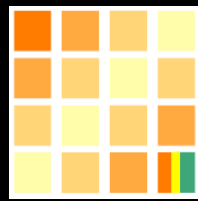


experiment 3



experiment 3

design:



experiment 3

design:

2 processing goals: impression formation

memorization of order

X

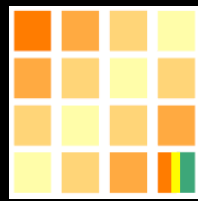
2 directed forgetting: remember

forget

X

2 recall: free recall

ordered recall



experiment 3

design:

2

processing goals:

impression formation

X

memorization of order

2

directed forgetting:

remember

X

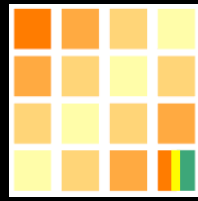
forget

2

recall:

free recall

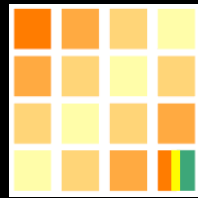
ordered recall



experiment 3

results:

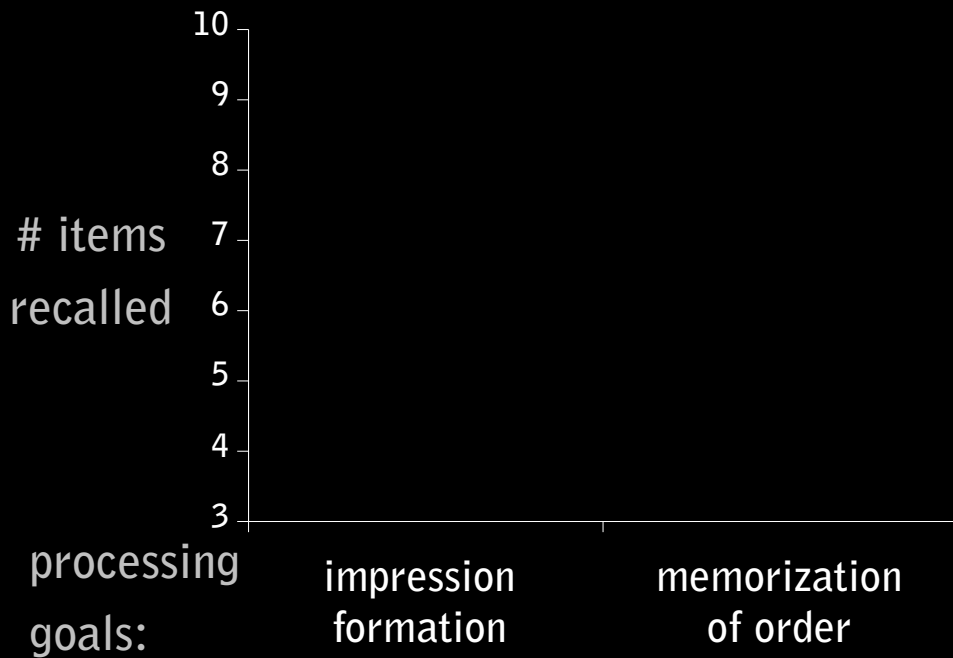
dv **ITEM:**

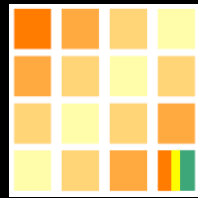


experiment 3

results:

dv **ITEM:**

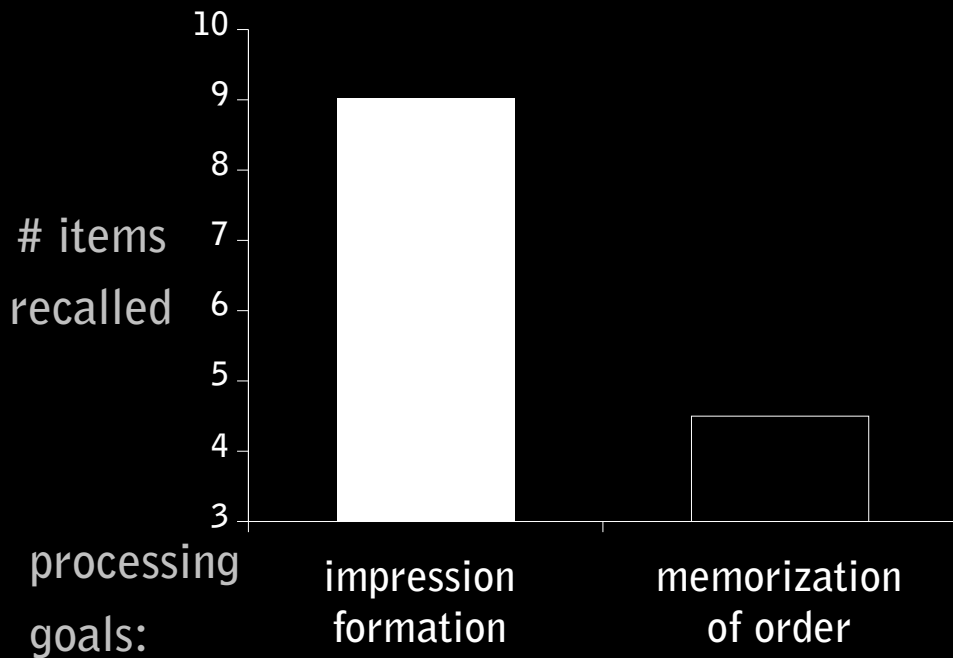




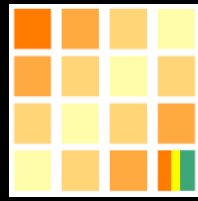
experiment 3

results:

dv **ITEM**:



$F(1,168)=92,86; p<,000$



experiment 3

results:

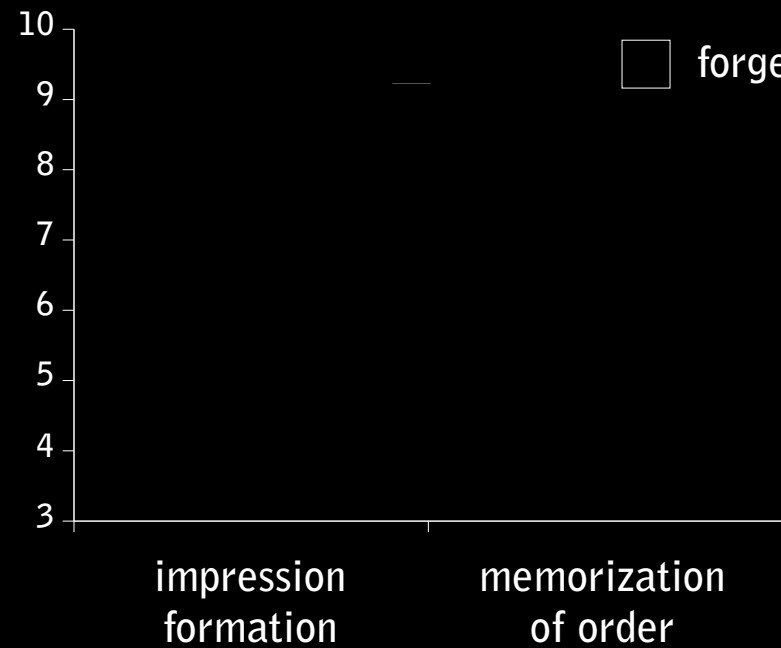
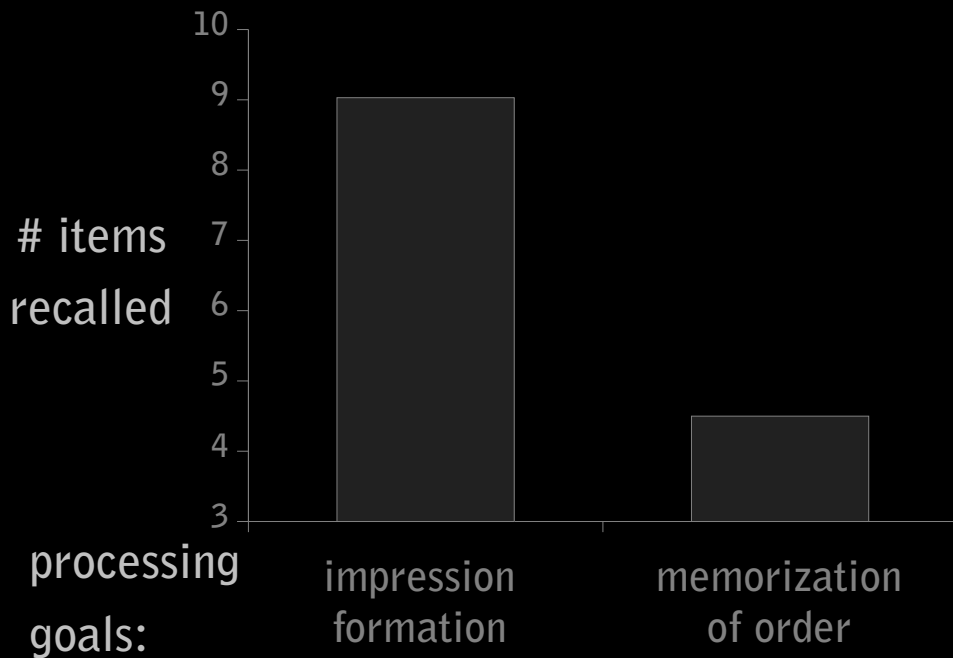
dv **ITEM**:

directed

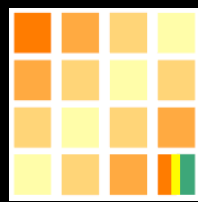
forgetting:

remember

forget



$F(1,168)=92,86; p<,000$



experiment 3

results:

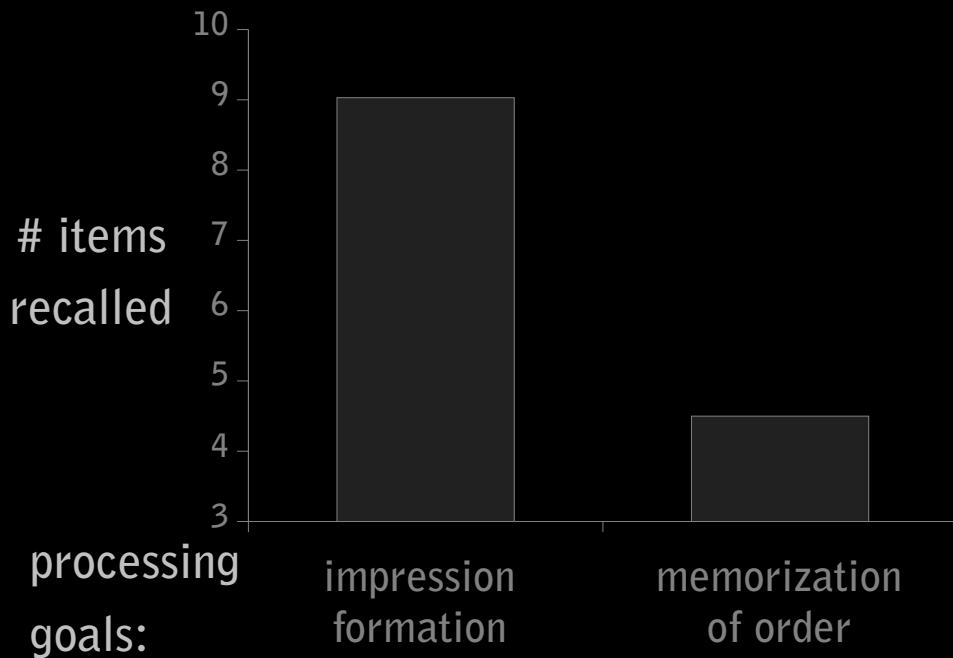
dv **ITEM**:

directed

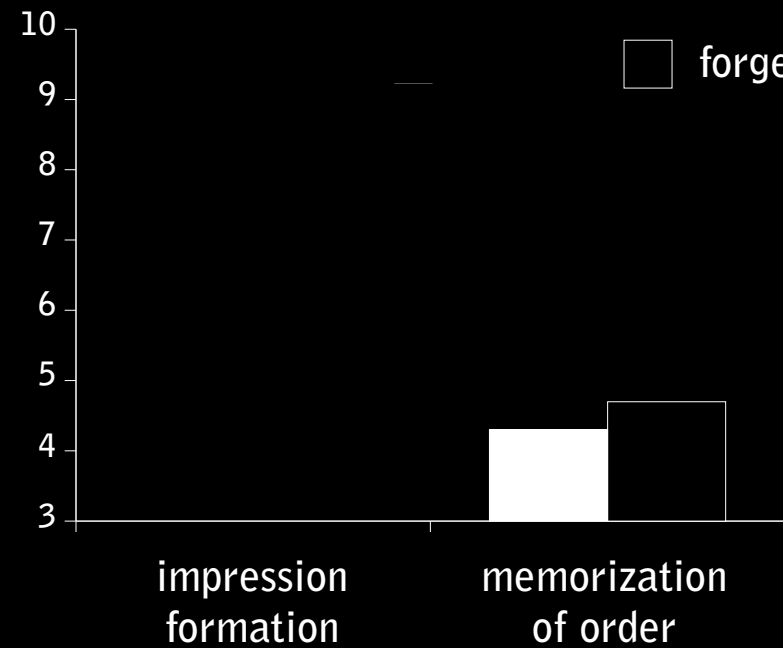
forgetting:

remember

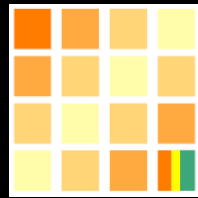
forget



$F(1,168)=92,86; p<,000$



$F(1,168)=5,25; p<,023$



experiment 3

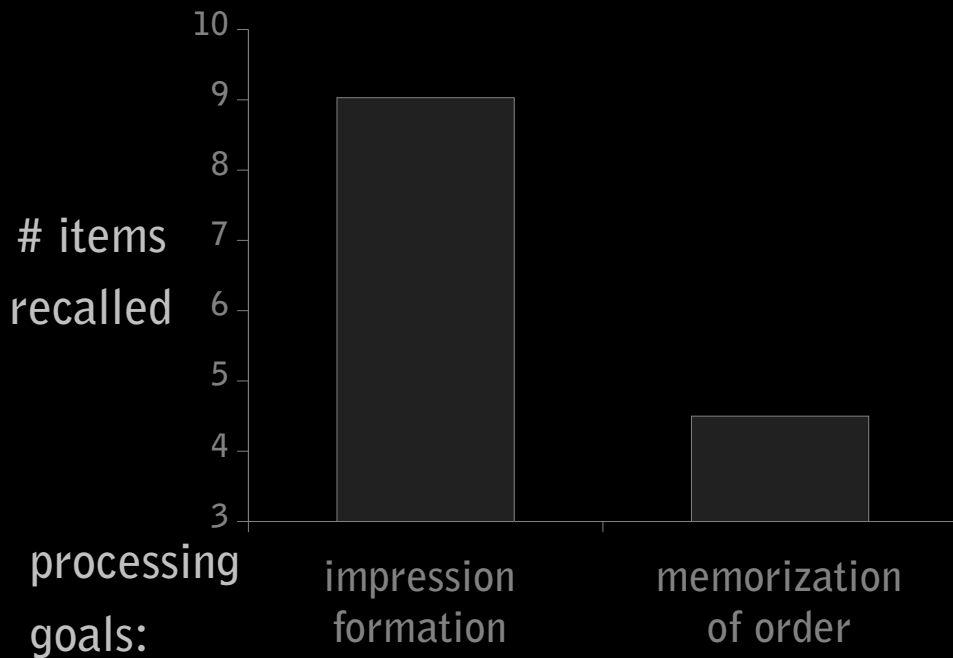
results:

dv **ITEM**:

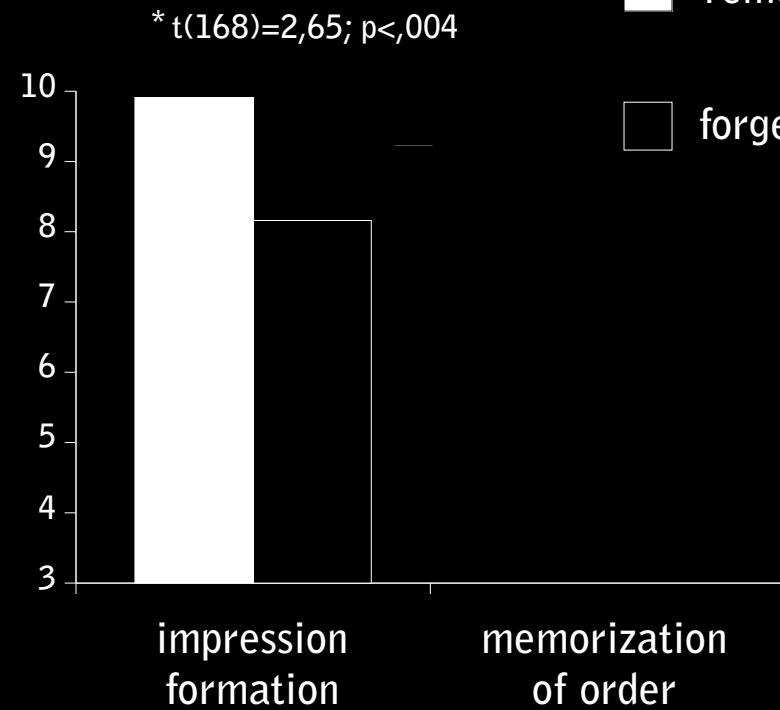
directed
forgetting:

remember

forget

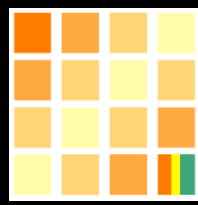


$F(1,168)=92,86; p<,000$



* $t(168)=2,65; p<,004$

$F(1,168)=5,25; p<,023$



experiment 3

results:

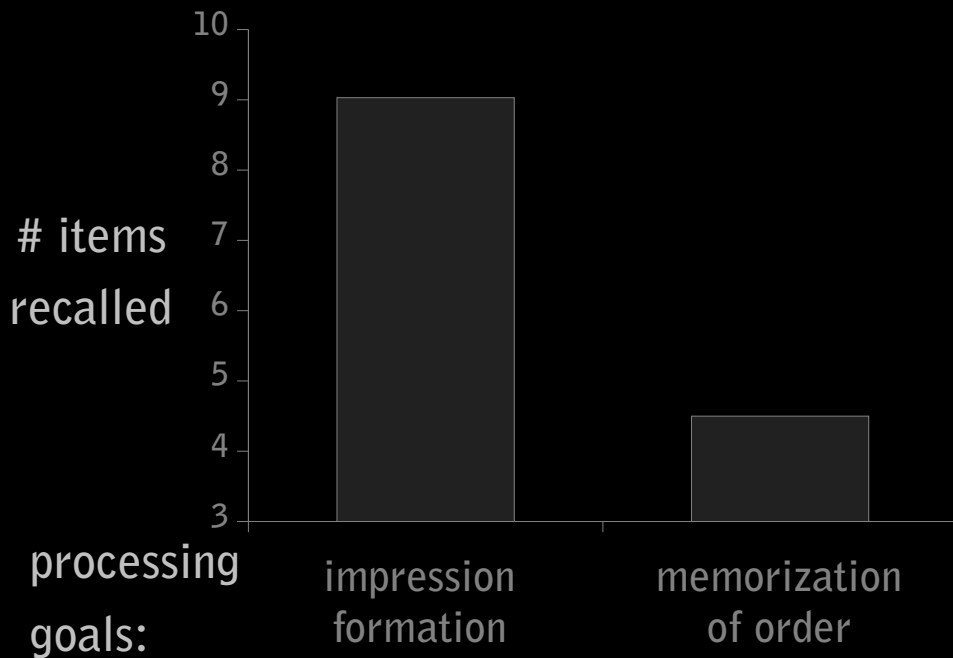
dv **ITEM**:

directed

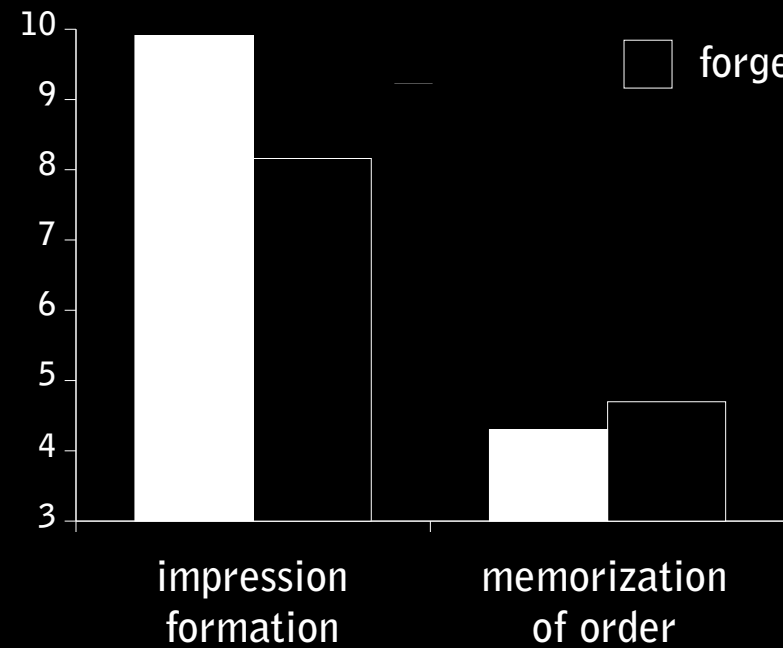
forgetting:

remember

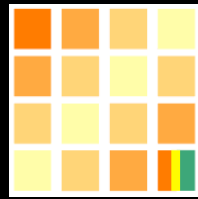
forget



$F(1,168)=92,86; p<,000$



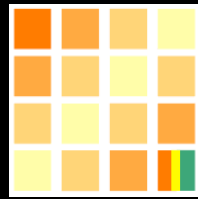
$F(1,168)=5,25; p<,023$



experiment 3

results:

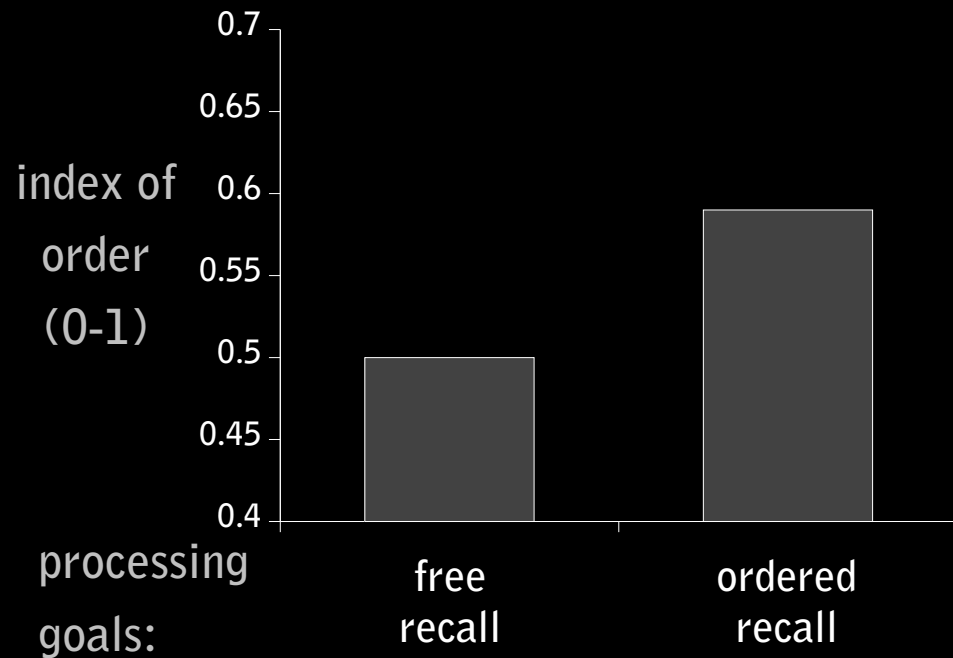
dv **ORDER:**



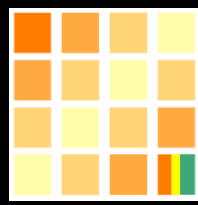
experiment 3

results:

dv **ORDER:**



$F(1,168)=3,79; p<,053$



experiment 3

results:

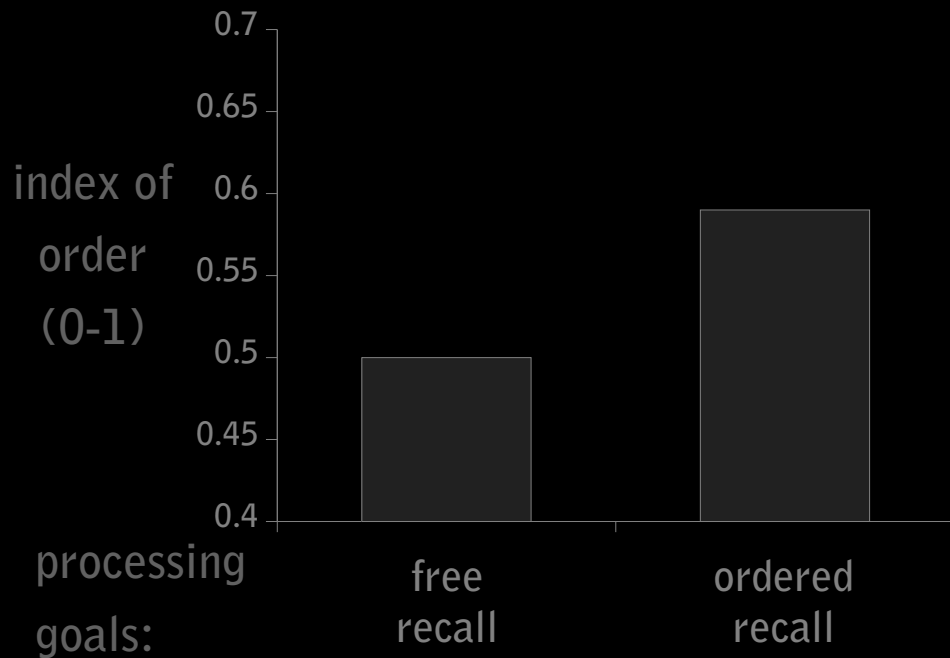
dv **ORDER:**

recall

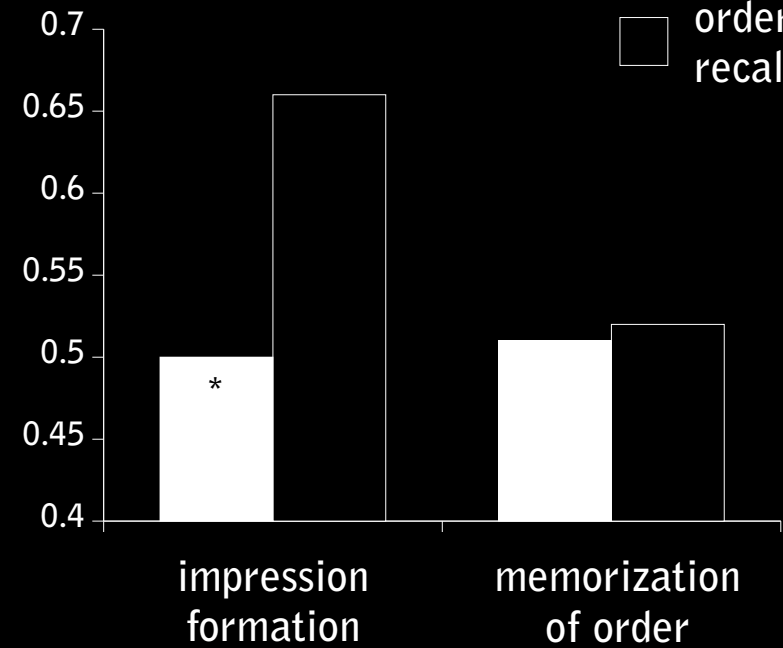
instructions:

■ free recall

□ ordered recall

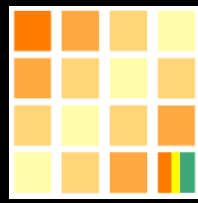


$F(1,168)=3,79; p<,053$



$F(1,168)=2,70; p<,102$

* $t(168)=2,55; p<,006$



experiment 3

discussion:

item information

1 – when people form impressions they recall more information

2 – the directed forgetting paradigm affected the ability to recall item information – episodic memory

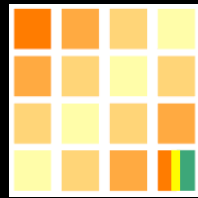
- item information was sensitive (in the IF conditions) to a manipulation that is known to interfere with episodic memory (and not with semantic memory)

order information

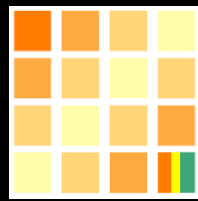
1 – order is represented in the person memory structure (impression)

- participants only recall the information in an ordered way if they were specifically asked to so, they don't do it spontaneously

2 – memory for order information was not affected by the directed forgetting manipulation – semantic memory



general discussion



general discussion

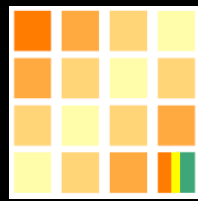
item information

- 1** - impression formation facilitates item memory (1,2,3)
- 2** - incongruency effect (2)
- 3** - item information → episodic memory (3)

order information

- 1** - order is represented in the person memory structure (impression)
 - not spontaneously (1, 2,3)
- 2** - the incongruency effect didn't hinder the ability to access order (2)
- 3** - order information → semantic memory (3)
 - unaffected by manipulations that play around with inter-item associations

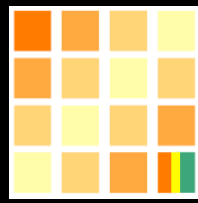
- 4** - order information is kept in situations where it is useless to make sense about a target



semantic/episodic memory

semantic memory: general knowledge that people have about the world

episodic memory: information about specific experiences defined in time and context



thanks!

- to the **SO**cial **C**ognition **bA**scket **aS**sociation, aka **SOCAS**

André Mata

David Kellen

Leonel Garcia-Marques

Ludmila Nunes

Margarida Gomes

Mário Ferreira

Marta Guerreiro

Rita Jerónimo

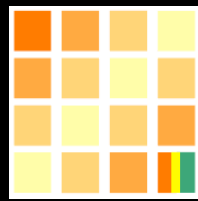
Rui Mata

Sara Hagá

Sérgio Moreira

Sofia Santos

Tânia Ramos



semantic/episodic memory

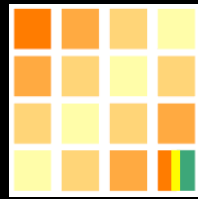
semantic memory: general knowledge that people have about the world

episodic memory: information about specific experiences defined in time and context

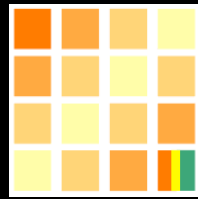
Incongruity effect explanation according to the **semantic/episodic framework** (Almeida, 2006) :

- **congruent items** will be encoded in terms of the **semantic fit** with the activated expectancy – they are easily assimilated into the person impression (high conceptual fluency → conceptual encoding)
- **incongruent items** are semantically unfit and, therefore, will incur in additional processing – **episodic encoding** (low conceptual fluency → perceptual encoding)

(Note: **Trait inference inhibition** – Jerónimo, Garcia-Marques & Macrae, in prep)

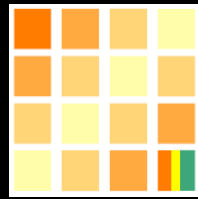


experiment 2



experiment 2

design:



experiment 2

design:

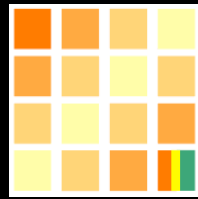
2 processing goals: impression formation

memorization of order

X

2 recall: cued recall: **trait**

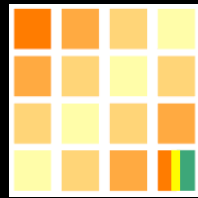
cued recall: **day**



experiment 2

results:

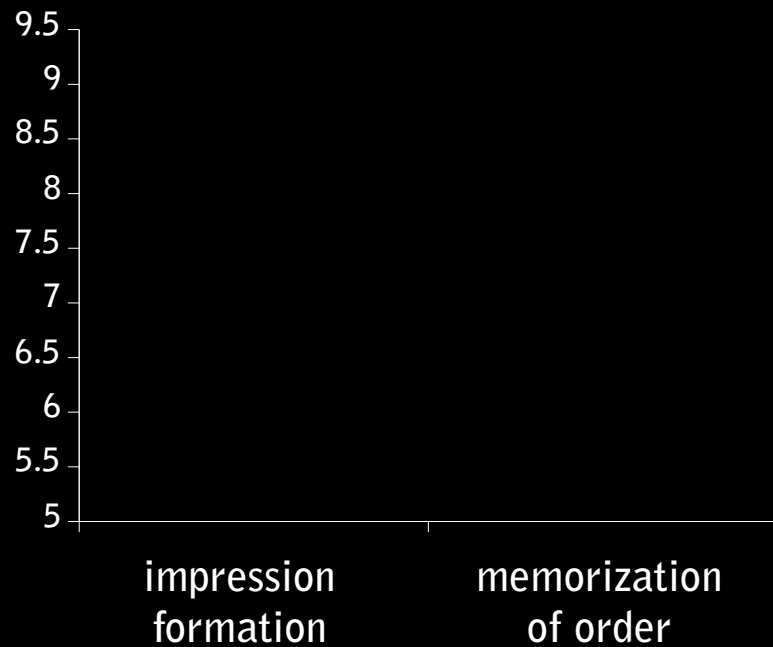
dv **ITEM**: # items recalled

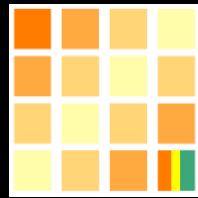


experiment 2

results:

dv **ITEM**: # items recalled

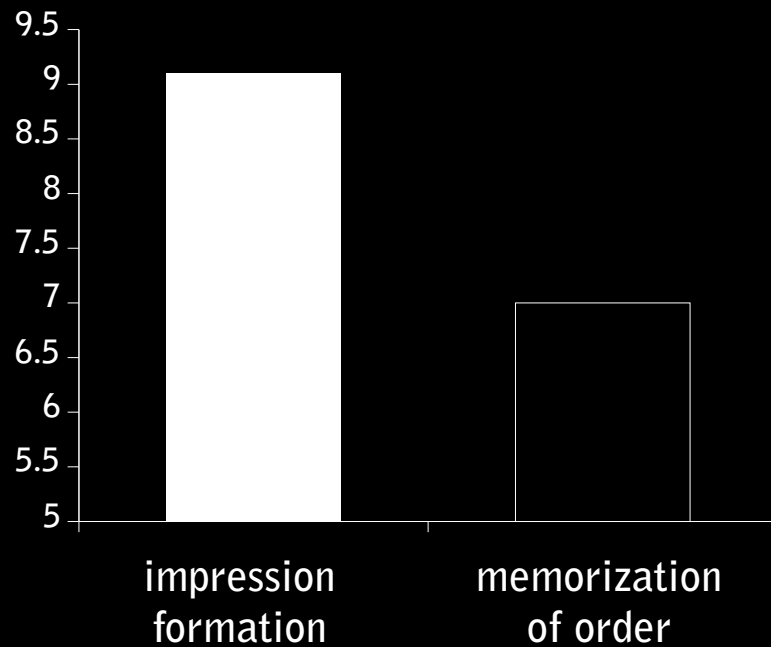




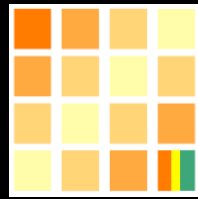
experiment 2

results:

dv **ITEM**: # items recalled



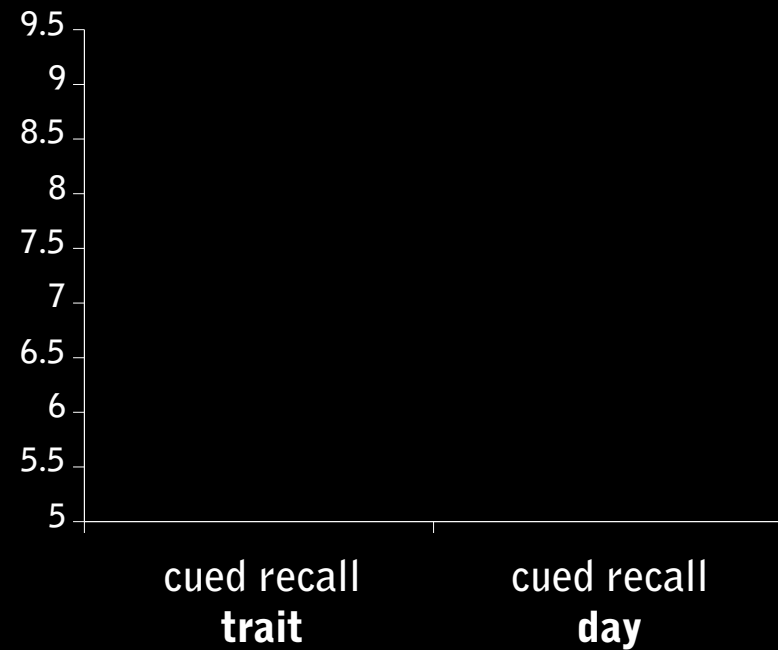
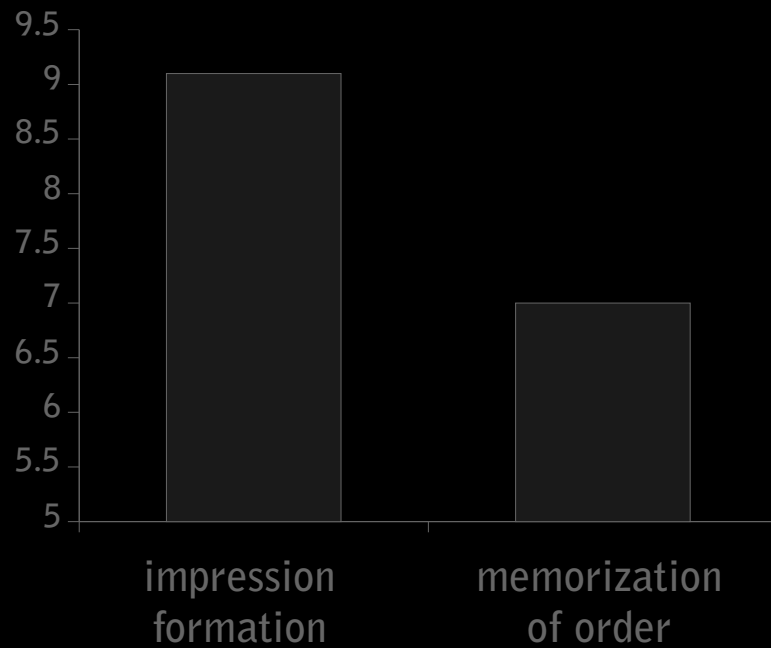
$F(1,106)=17,61; p<,00$



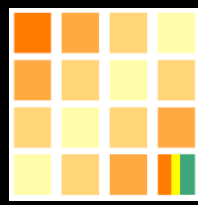
experiment 2

results:

dv **ITEM**: # items recalled



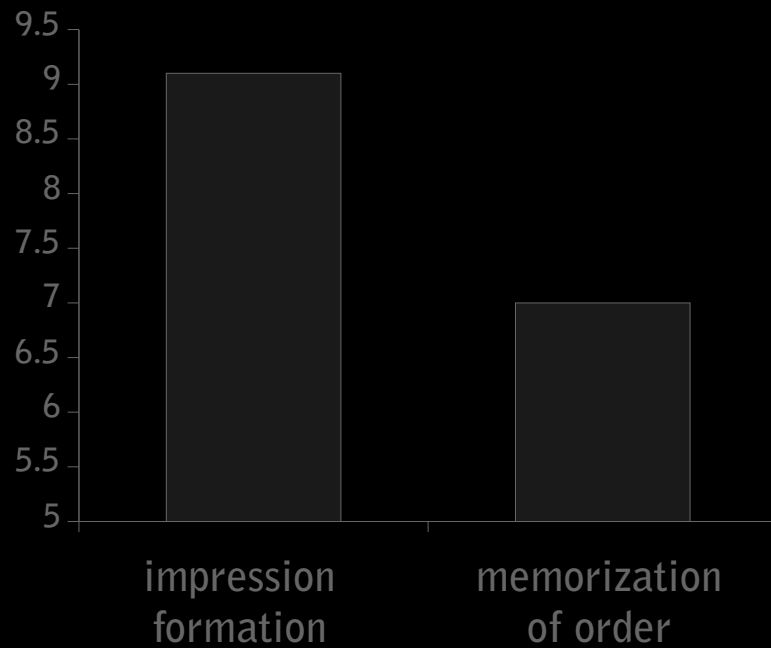
$F(1,106)=17,61; p<,00$



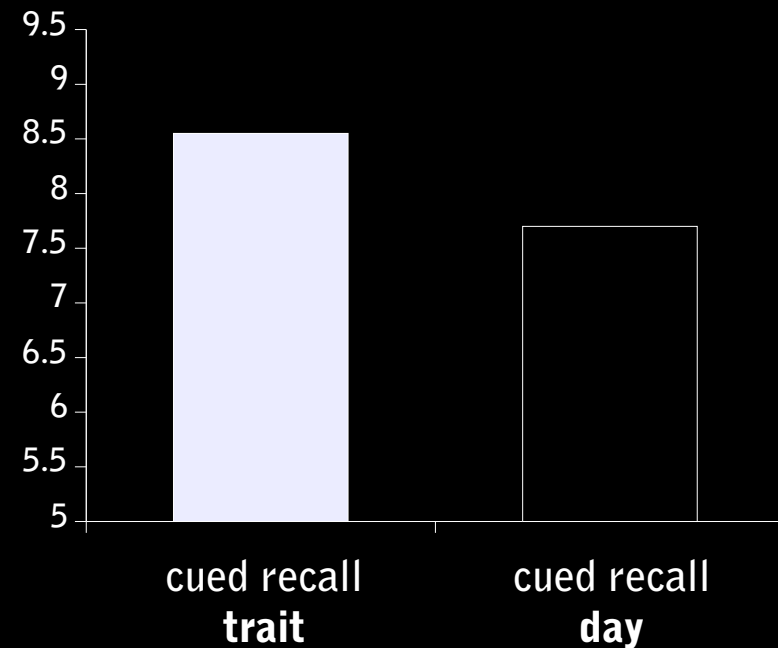
experiment 2

results:

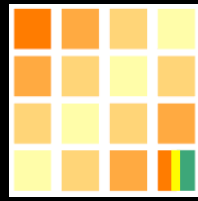
dv **ITEM**: # items recalled



$F(1,106)=17,61; p<,00$



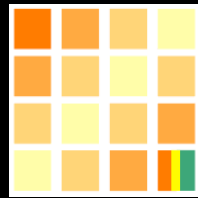
$F(1,106)=3,25; p<,07$



experiment 2

results:

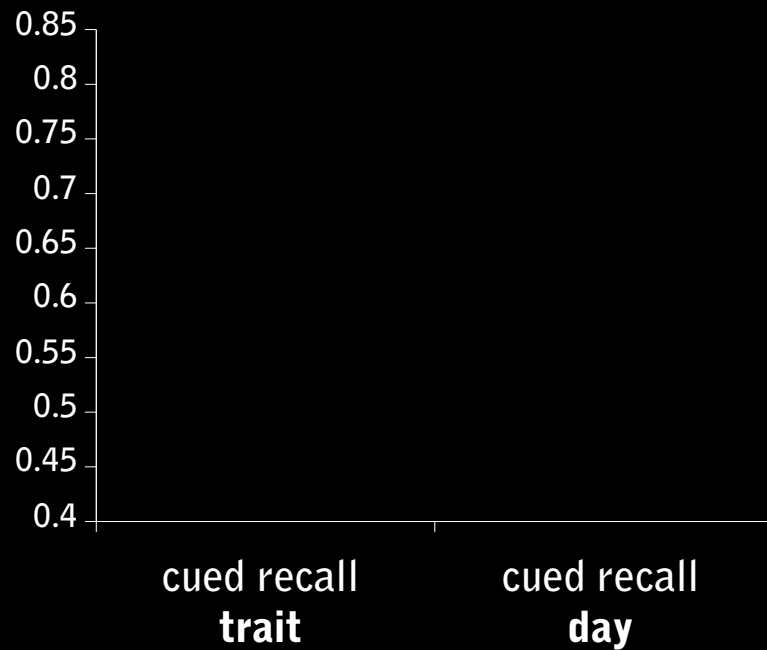
dv **ORDER**: index of order (0-1)

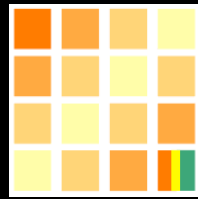


experiment 2

results:

dv **ORDER**: index of order (0-1)

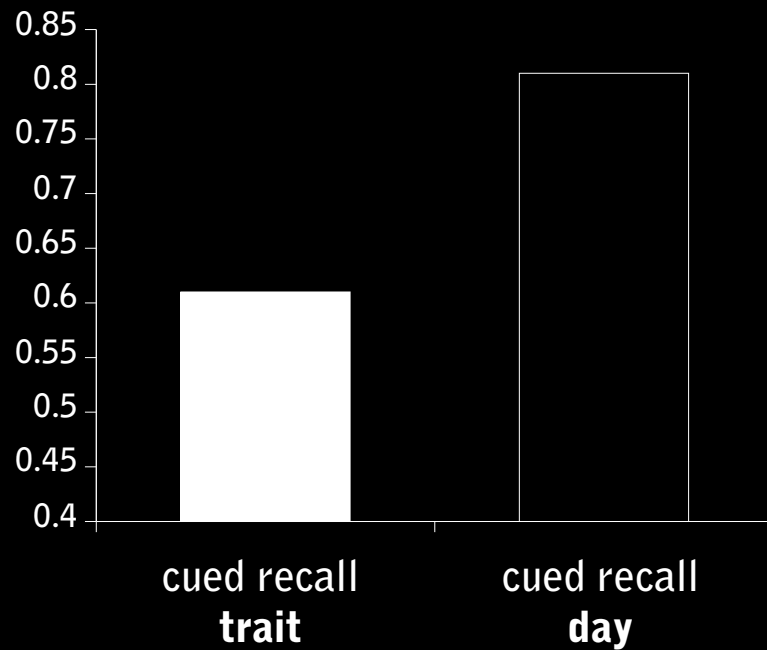




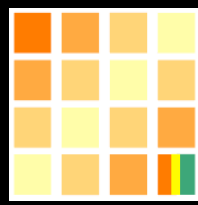
experiment 2

results:

dv **ORDER**: index of order (0-1)



$F(1,106)=26,28; p<,00$

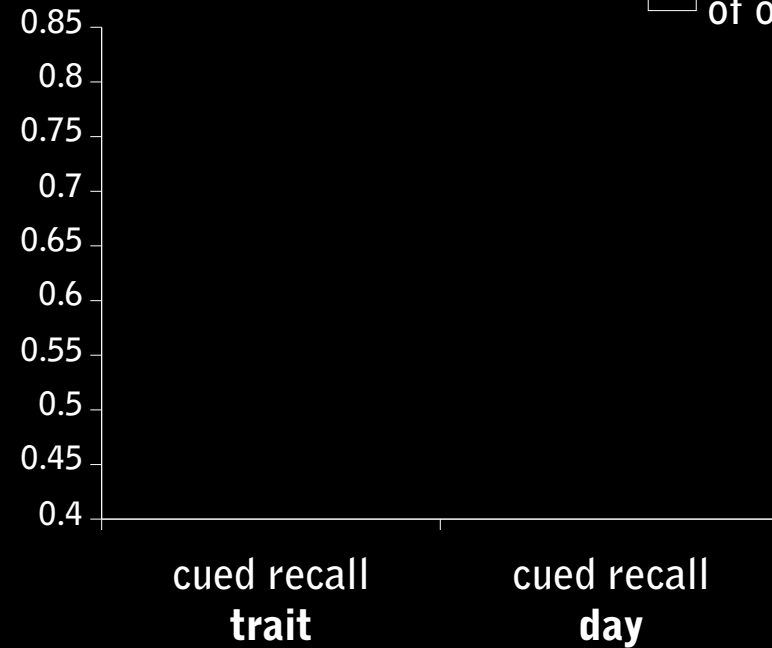
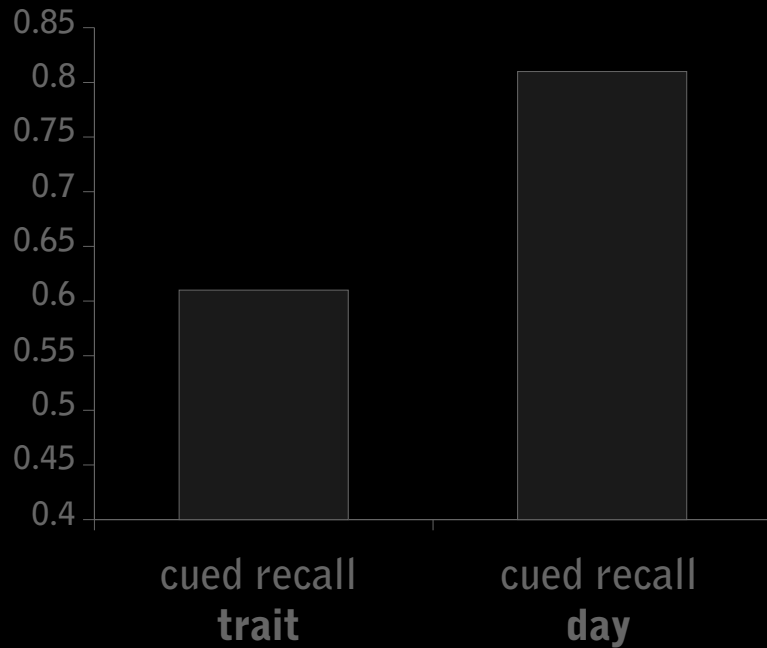


experiment 2

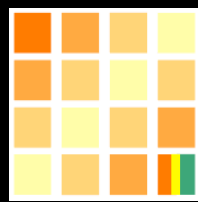
results:

dv **ORDER**: index of order (0-1)

- impression formation
- memorization of order



$F(1,106)=26,28; p<,00$



experiment 2

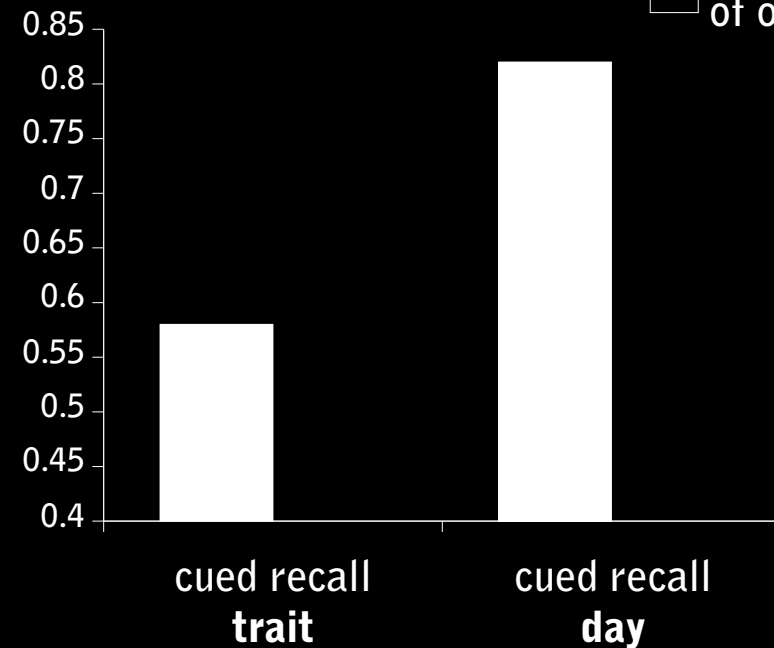
results:

dv **ORDER**: index of order (0-1)

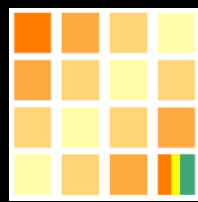
- impression formation
- memorization of order



$F(1,106)=26,28; p<,00$



$F(1,106)=4,17; p<,04$



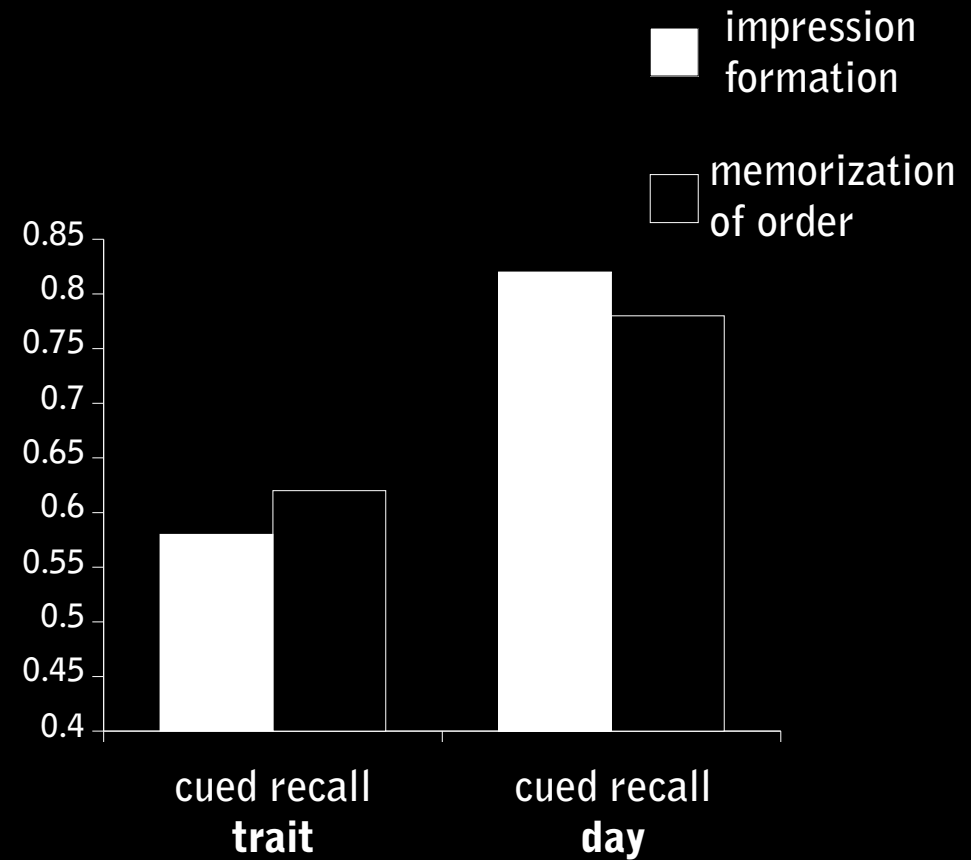
experiment 2

results:

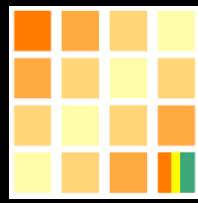
dv **ORDER**: index of order (0-1)



$F(1,106)=26,28; p<,00$



$F(1,106)=4,17; p<,04$



experiment 2

discussion:

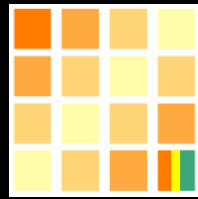
item information

1 – impression formation results in better recall of item information

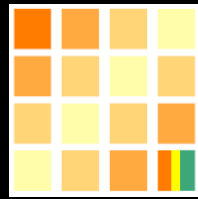
2 – providing participants with traits as recall cues facilitates the recall of item information

order information

1 – providing participants with the days of the week in which the behaviors were performed facilitates the memory for order

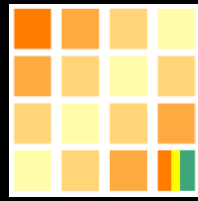


experiment 5



experiment 5

design:



experiment 5

design:

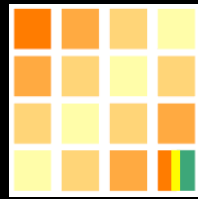
3 processing goals: impression formation

memorization of order

X counting vowels – E's

2 recall: free recall

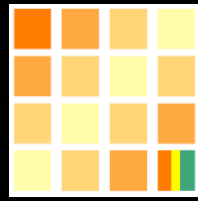
ordered recall



experiment 5

results:

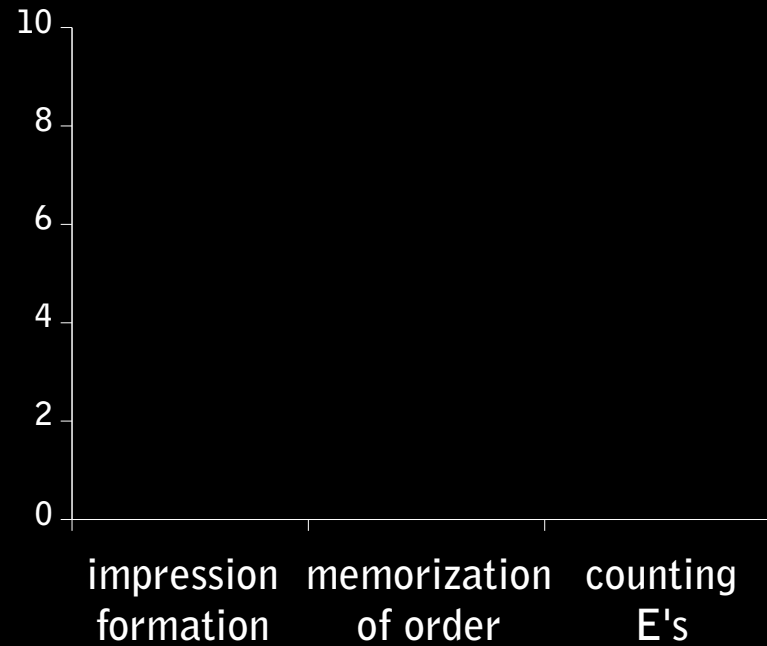
dv **ITEM**: # items recalled

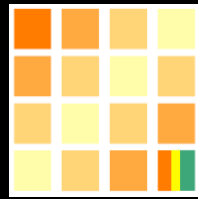


experiment 5

results:

dv **ITEM**: # items recalled

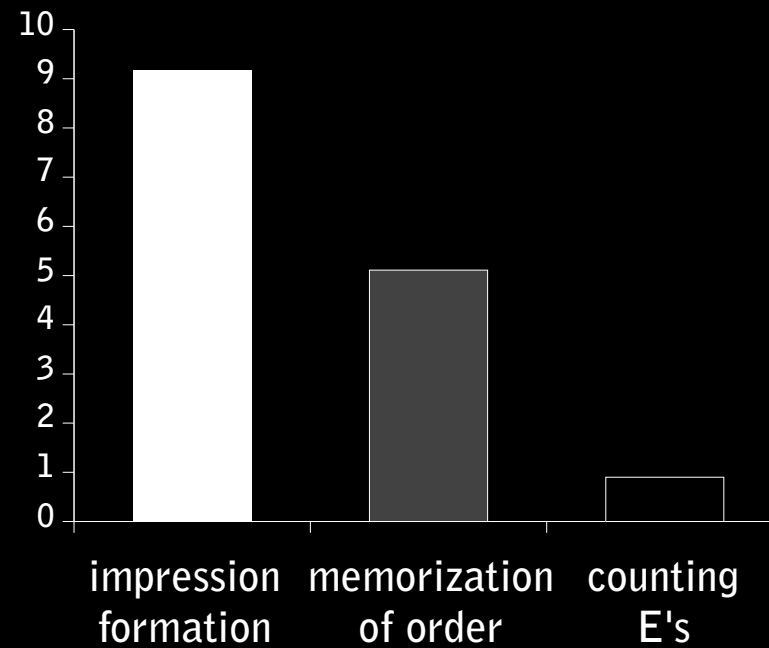




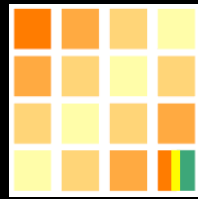
experiment 5

results:

dv **ITEM**: # items recalled



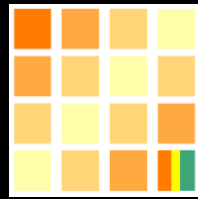
$F(2,112)=143,67; p<,000$



experiment 5

results:

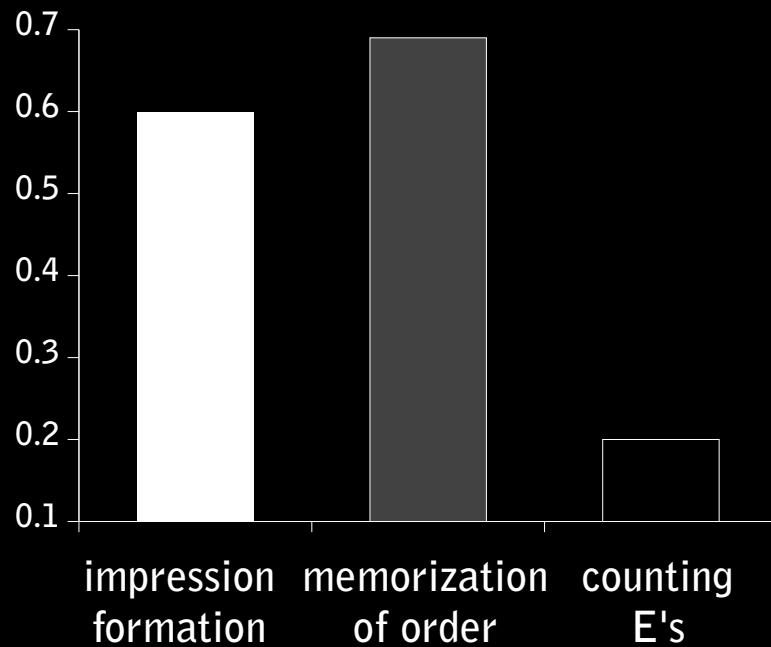
dv **ORDER**: index of order (0-1)



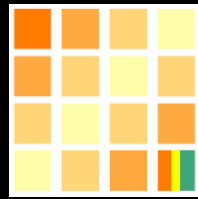
experiment 5

results:

dv **ORDER**: index of order (0-1)



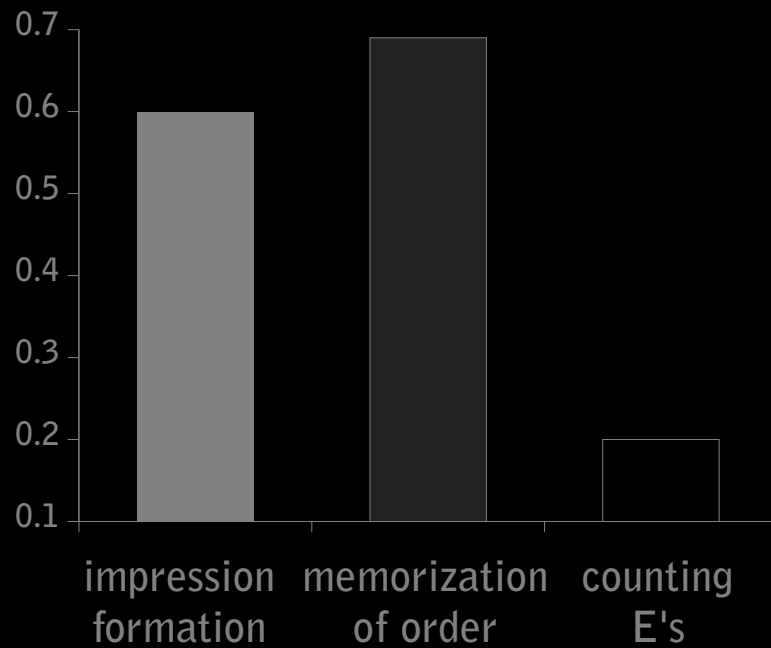
$F(2,112)=29,07; p<,000$



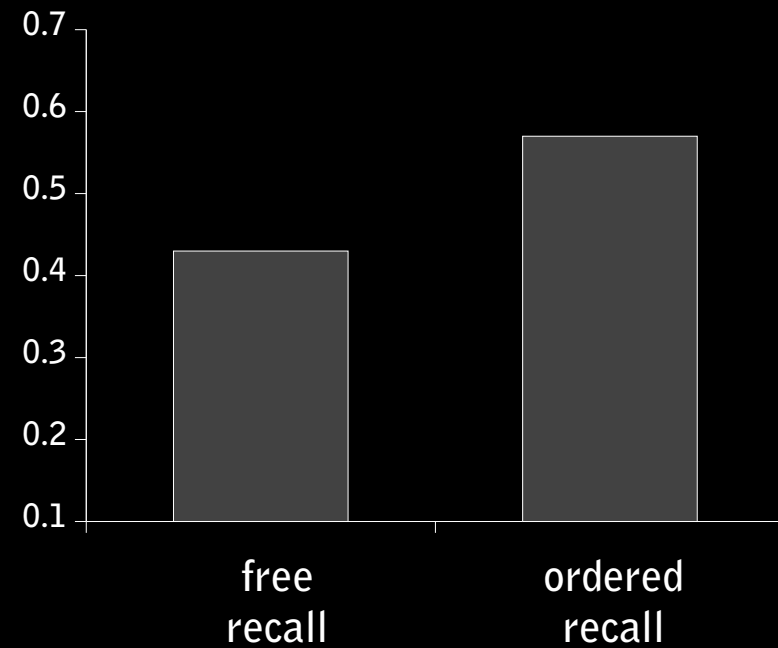
experiment 5

results:

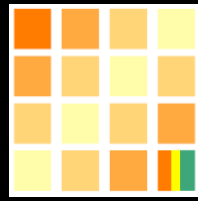
dv **ORDER**: index of order (0-1)



$F(2,112)=29,07; p<,000$



$F(1,112)=5,77; p<,018$



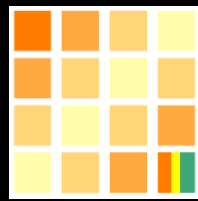
experiment 5

discussion:

- 1** - the memorization of order processing goal condition is not equivalent to the low-level of processing condition (counting a vowel).
 - This is especially relevant because that means that our memorization processing goal condition can not be categorized as a low-level of processing condition. Therefore, it is difficult to argue that our findings are based on the fact that we use a low-level of processing condition (memorization of order) in contrast to a high-level of processing, elaborative condition (impression formation). The memorization condition involves elaboration.

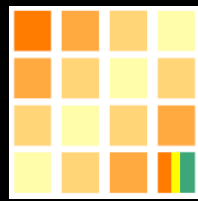
- 2** - our order of measure is actually discriminative and it is sensitive to the amount of processing involved

Why do we care about ORDER?



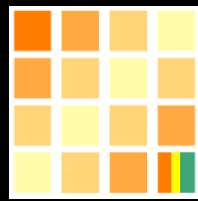
- Is it because we are very authoritarian, right-wing people?

Why do we care about ORDER?



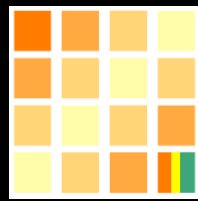
- Is it because we are very authoritarian, right-wing people?
YES!

Why do we care about ORDER?



- Is it because we are very authoritarian, right-wing people?
No, not really.

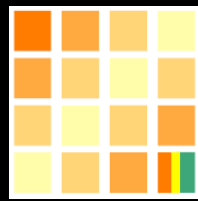
Why do we care about **ORDER**?



- Is it because we are very authoritarian, right-wing people?
No, not really.

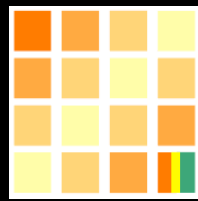
- Is it because we are in search for the **meaning of life**?

Why do we care about **ORDER**?



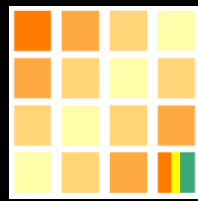
- Is it because we are very authoritarian, right-wing people?
No, not really.
- Is it because we are in search for the **meaning of life**?
Why bother? We have the **Monty Python!**

Why do we care about **ORDER**?

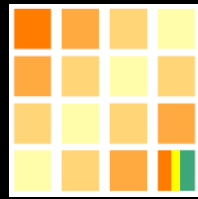


- Is it because we are very authoritarian, right-wing people?
No, not really.
- Is it because we are in search for the **meaning of life**?
Why bother? We have the **Monty Python!**
- Is it because **I have a crappy memory** and somehow we have this strange belief that by studying something we get better at it?

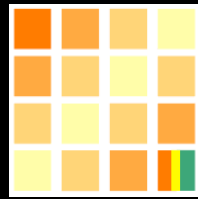
Why do we care about **ORDER**?



- Is it because we are very authoritarian, right-wing people?
No, not really.
- Is it because we are in search for the **meaning of life**?
Why bother? We have the **Monty Python!**
- Is it because **I have a crappy memory** and somehow we have this strange belief that by studying something we get better at it?
YES!

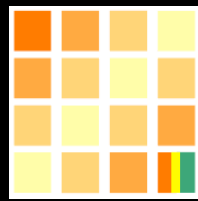


experiment 6



experiment 6

design:



experiment 6

design:

5 processing goals:

impression formation

comparative impression formation – **similar**

comparative impression formation – **different**

X

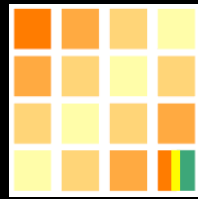
comparative impression formation – **previous**

memorization of order

2 recall

free recall

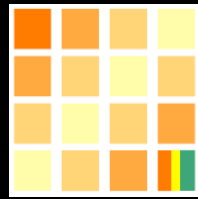
ordered recall



experiment 6

results:

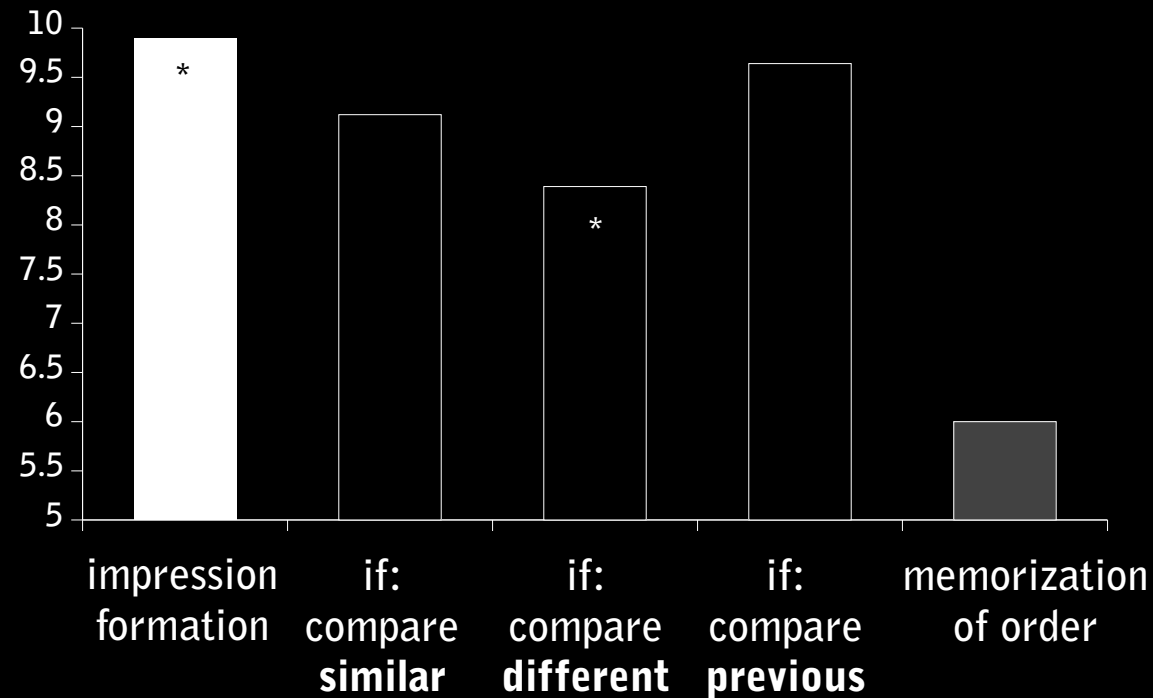
dv **ITEM**: # items recalled



experiment 6

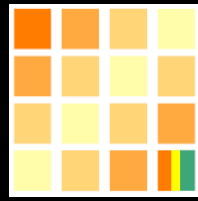
results:

dv **ITEM**: # items recalled



$F(4,149)=7,78; p<,000$

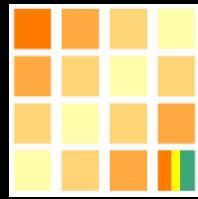
* $t(149)=2,00; p<,023$



experiment 6

results:

dv **ORDER**: index of order (0-1)



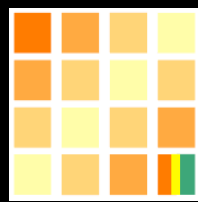
experiment 6

results:

dv **ORDER**: index of order (0-1)



$F(1,148)=30,16; p<,000$



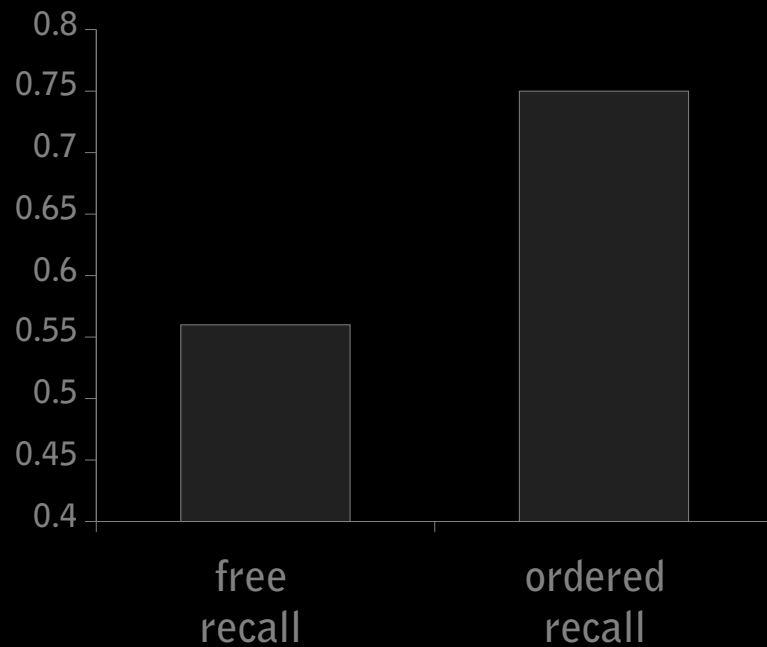
experiment 6

results:

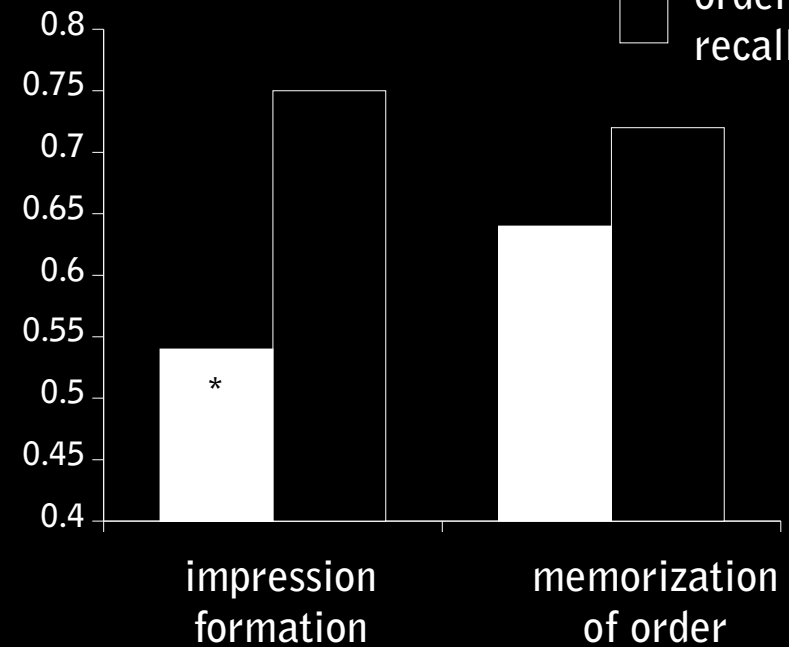
dv **ORDER**: index of order (0-1)

free recall

ordered recall

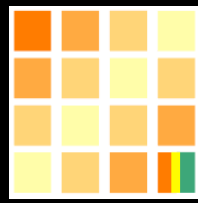


$F(1,148)=30,16; p<,000$



$F(4,148)=1,63; p<,170$

* $t(148)=2,86; p<,002$



experiment 6

discussion:

item information

1 – impression formation results in better recall of item information

2 – while forming an impression, comparing (associating) each encoded item with different items (different traits) impairs the ability to recall item memory

- impressions as coherent representations

order information

1 – impression formation keeps track of order information

- participants only recall the information in an ordered way if they were specifically asked to so, they don't do it spontaneously

2 – promoting inter-item associations, as well as manipulating the specific nature of these associations does not impair (or facilitate) memory for order