THE (DIS)ORDER OF IMPRESSION FORMATION:
ORDER INFORMATION IN PERSON MEMORY

SPSP 2009
10th Annual Conference
Tampa, Florida, US - February 5-7

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ABSTRACT

The way people represent information about others in memory is a key issue in social cognition. However, the person memory models that have been proposed in the literature focus exclusively on how we encode and retrieve events, but neglect memory for the order in which those events occurred. Yet, order information is critical for understanding the implications of others' behaviors.

According to these associative person memory models, an impression is a network of associative links between behaviors that is formed during encoding. This spontaneous organization facilitates the recall of item information. What about order information? Does the spontaneous organization that results from forming an impression hinder the retrieval of order information? Or, alternatively, is order information encoded while people form impressions?

Three experiments were conducted to address this question, contrasting impression formation (IF) with memory (M) processing goals. New measures of order information were used along with measures of item information. Results show across the 3 experiments (a) that item information is better recalled under IF goal conditions. Regarding order information, (b) when participants were asked to free recall the information, M goal conditions perform better than IF conditions, and (c) when participants are asked to retrieve the information in the order in which it was presented, IF goal conditions do as well as M conditions. These findings suggest that IF participants preserve the order information, but provide it only when specifically asked to do so. We will discuss the implications of these findings for models of impression formation.

INTRODUCTION

The **study of serial order effects is one of the main topics in HUMAN MEMORY research**. In fact, much of our cognitive performance that uses memory involves compilations of events whose order of occurrence is determinant.

There are three major ways to conceptualize serial order effects in the study of human memory (Henson, 1998; Lewandowsky & Murdoch, 1989):

- **POSITIONAL Theory:** states that order information is *stored* associating each element to its position in a sequence, being *retrieved* by the use of each position to reach its associated element.

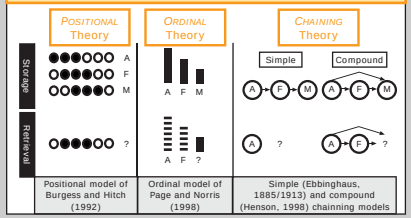
- **ORDINAL Theory:** states that the elements of a sequence can be represented in a unique dimension. Order is defined by each element's relative strength in that dimension.

- **CHAINING Theory:** states that order is *stored* by the formation or strengthening of associations between successive elements in a list. Order is *retrieved* examining through the elements of a sequence.

  - **Simple versions** of these models only assume associations between pairs of elements in sequential positions in the list.

  - **Compound models**, however, represent remote associations between items in non-successive positions in a list.

THEORIES OF MEMORY FOR SERIAL ORDER



PERSON MEMORY

ASSOCIATIVE NETWORK Models

Single Target

In **social cognition**, specifically in the **impression formation** literature, the systematic **study of memory for serial order remains absent**, though many order output effects are very well known (e.g. primacy effect, Asch, 1946).

In the **PERSON MEMORY** literature:

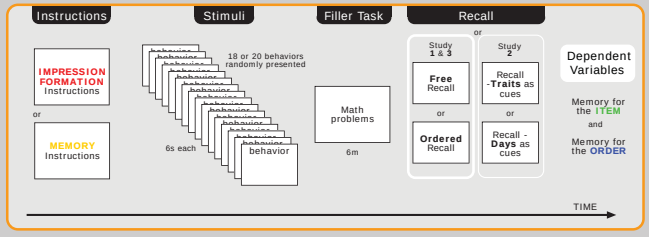
- there is a strong and robust presence of the **ASSOCIATIVE NETWORK models** in comparison to other types of cognitive representations (Smith, 1998, 2004).

- these models share the **same representational and retrieval assumptions with the chaining theory**:

  - information is represented by the formation of associative links between items, being retrieved using these associations to reach the next item to be retrieved.

  - therefore, it seems that chaining and associative network models are compatible.

PARADIGM



STUDY 1

Design: 2 (processing goals: IF vs. M) X 2 (recall: FR vs. OR) between subjects design

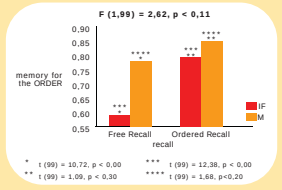
Participants, Materials and Procedure: 103 participants were randomly assigned to the 4 cells of the factorial design; participants were instructed to form impressions or to memorize the information; 20 behaviors describing a target were randomly presented for 6 seconds each; participants performed a filler task and, finally, were asked to free recall the behaviors or to recall the behaviors following the order by which they were presented

Method

Results

Memory for the ITEM

- main effect - **processing goal**, $F(1,99) = 16,36$, $p<0,00$:
ITEM information was **better retrieved under an IF** (M=8,59) **goal** compared to a M (M=6,45) goal



Memory for the ORDER

- main effect - **processing goal**, $F(1,99) = 9,49$, $p<0,00$:
ORDER information was **better retrieved under an M** (M=0,82) **goal** compared to a **IF** (M=0,69) goal

- main effect - **recall**, $F(1,99) = 11,76$, $p<0,00$:
ORDER information was **better retrieved under an OR** (M=0,82) **task** compared to a **FR** (M=0,69) task

- interaction - **processing goal X recall**, $F(1,99) = 2,62$, $p<0,11$:
in free recall (**FR**) **IF** (M=0,59) participants were **significantly worst recalling the information following the order of presentation** (compared to the M (M=0,78) participants), but when specifically asked to recall the information following the order by which the information was presented (**OR**), **IF** (M=0,80) participants were **able to access order information** as well as M (M=0,85) participants

STUDY 2

Design: 2 (processing goals: IF vs. M) X 2 (recall: Traits as cues vs. Days as cues) between subjects design

Participants, Materials and Procedure: 110 participants were randomly assigned to the 4 cells of the factorial design; participants were instructed to form impressions or to memorize the information; 20 behaviors describing a target, illustrative of 4 personality traits, were randomly presented for 6 seconds each; 5 screens, each one with one of the days of the week (e.g. Monday, Tuesday, etc.), appeared successively before every 4 behaviors; participants performed a filler task and, finally, were asked to recall the behaviors using the traits as cues or to recall the behaviors using the days of the week as cues

Method

Results

Memory for the ITEM

- main effect - **processing goal**, $F(1,106) = 17,61$, $p<0,00$:
ITEM information was **better retrieved under an IF** (M=9,11) **goal** compared to a M (M=7,07) goal

- main effect - **recall**, $F(1,106) = 3,25$, $p<0,07$:
ITEM information was **better retrieved in the conditions where the traits were used as cues to recall the information (R-T)** (M=8,53) compared to the conditions where the days were used as cues to recall information (**R-D**) (M=7,65)

Memory for the ORDER

- main effect - **recall**, $F(1,106) = 25,28$, $p<0,00$:
ORDER information was **better retrieved in the conditions where the days were used as cues (R-D)** (M=0,82), compared to the conditions where the traits were used as cues to recall order information (**R-T**) (M=0,61)

NOTE (for all studies): the DV *memory for the order* reflects the degree in which the list of recalled behaviors resembles the sequence of behaviors that was presented at the study phase, and varies from 0 (max incorrectness) to 1 (max correctness).

STUDY 3

Design: 2 (processing goals: IF vs. M) X 4 (expectancy replication: Intelligent, Friendly, Stupid, Unfriendly) X 2 (stimulus list: Congruent vs. Incongruent) X 2 (recall: FR vs. OR) between subjects design

Participants, Materials and Procedure: 185 participants were randomly assigned to the cells of the factorial design; participants were instructed to form impressions or to memorize the information; 18 behaviors describing a target were randomly presented for 6 seconds each; the list of behaviors presented was either Congruent with the prior Expectancy (6C + 12IRR) or Incongruent (6I + 6C + 6IRR); participants performed a filler task and, finally, were asked to free recall the behaviors or to recall the behaviors following the order by which they were presented

Method

Results

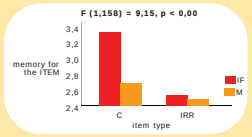
Memory for the ITEM

Congruent

- main effect - **processing goal**, $F(1,158) = 5,96$, $p<0,02$:
ITEM information was **better retrieved under an IF** (M=2,91) **goal**, compared to a M (M=2,57) goal

- main effect - **item type**, $F(1,158) = 27,09$, $p<0,00$:
ITEM information was **better retrieved for the C items** (M=3,01), compared with the IRR items (M=2,47)

- interaction - **processing goal X item type**, $F(1,158) = 9,15$, $p<0,00$:
ITEM information was **better retrieved under an IF** (M=3,34) **goal**, compared to a M (M=2,68) goal **only for the C items**, and not for the IRR ones (M(IF) = 2,48 / M(M)=2,45)

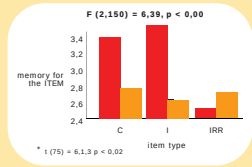


Incongruent

- main effect - **processing goal**, $F(1,75) = 5,70$, $p<0,02$:
ITEM information was **better retrieved under an IF** (M=3,14) **goal**, compared to a M (M=2,68) goal

- main effect - **item type**, $F(2,150) = 5,94$, $p<0,00$:
ITEM information was **better retrieved for the C items** (M=3,05) **and I items** (M=3,09), compared with the IRR items (M=2,59), (planned comparison: I vs. C & IRR: $t(75) = 3,53$, $p<0,06$)

- interaction - **processing goal X item type**, $F(2,150) = 6,39$, $p<0,00$:
ITEM information was **better retrieved for the C** (M=3,37) **and I** (M=3,55) **items in the IF conditions**, compared to the M (C - M=2,73 / I - M = 2,62) conditions. This difference disappears for the IRR items (IF - M = 2,50 / M - M=2,68). Only the IF processing goal is affected by the congruency or incongruency of the information, not the M processing goal.

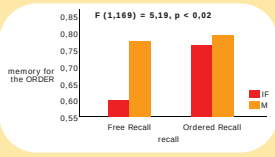


Memory for the ORDER

- main effect - **processing goal**, $F(1,169) = 11,40$, $p<0,00$:
ORDER information was **better retrieved under an M** (M=0,78) **goal** compared to a **IF** (M=0,67) goal

- main effect - **recall**, $F(1,169) = 7,07$, $p<0,00$:
ORDER information was **better retrieved under an OR** (M=0,76) **task** compared to a **FR** (M=0,68) task

- interaction - **processing goal X recall**, $F(1,169) = 5,19$, $p<0,02$:
in free recall (**FR**) **IF** (M=0,59) participants were **significantly worst recalling the information following the order of presentation** (compared to the M (M=0,77) participants), but when specifically asked to recall the information following the order by which the information was presented (**OR**), **IF** (M=0,75) participants are **able to access order information** as well as M (M=0,78) participants



GENERAL DISCUSSION

With these experiments we intended to start pursuing the study of memory for serial order in the context of social cognition. Results showed that: **a) IF participants outperformed M participants in the number of behaviors recalled.** This finding was replicated across the 3 studies suggesting that when people try to make sense about others, the organizational process underlying the formation of personality impressions will result in a dynamic network of associations between the items represented in memory. When it is necessary to access the encoded information, the available associative links are easily used. These data replicates the effects found by Hamilton et al. (1980) and Garcia-Marques and Hamilton (1996). **b) forming an impression encodes order information.** IF participants do not spontaneously retrieve information from memory following the way the information was encoded, however, when asked to recall the information following the order by which the information was presented, IF participants performed as well as M participants. **c)** the use of **traits as cues facilitates the access to item information** and **hinders the access to order information**. On the other hand, the use of the **days of the week as cues facilitates the access to order information**, **imparing the ability to access item information**. **d) congruent and incongruent information are better recalled under an IF goal condition.** The existence of incongruent and congruent information does not affect M participants ability to recall behaviors. **e)** the presence of **incongruent information does not affect IF participants' ability to access order information**, suggesting that order can not be represented exclusively by the formation of associative links between items, since the presence of incongruent information increases the density of the inter-associative links in memory that would compete with the chaining associations.

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