

# Dissociating inhibition from dimension switching in the Stroop task: an insight from the conflict adaptation paradigm over the lifespan



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## Introduction

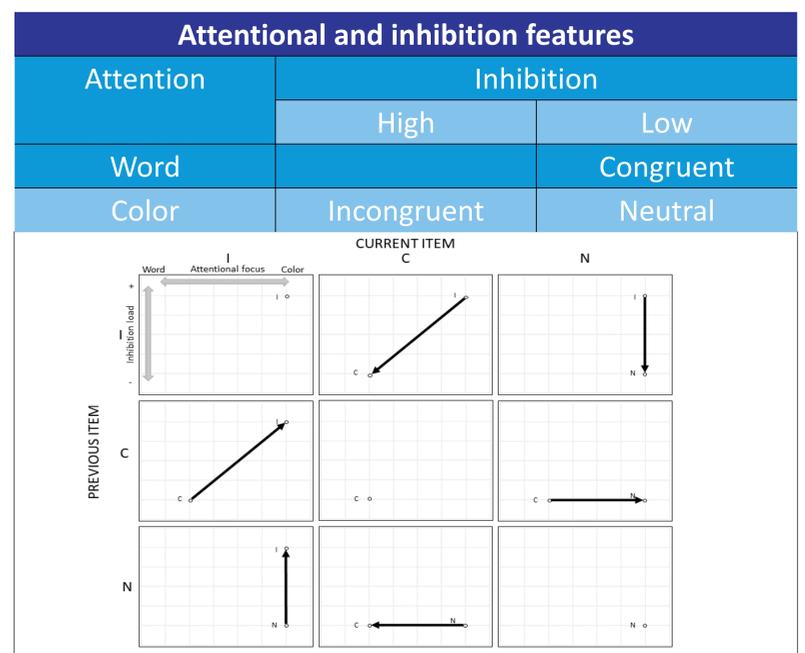
- **Stroop effect:**
  - Semantic interference → conflict between color naming and color word reading
- **Sequential congruency effect (SCE) or Conflict adaptation:**
  - Effect of the previous trial on the current one
  - Facilitation for // compared to CI → **Gratton effect** (Gratton et al., 1992)
- Lifespan approach
  - Performances for the interference effect → **U-shaped curve**
  - If processing speed is controlled for → **no effect of aging** (Rey-Mermet and Gade, 2017)
- Sequential congruency effect:
  - Same effect reported in **children and elderly** → No studies analyzing the entire lifespan

## Method

- **Task:**
  - 4 colors Stroop task with congruent (e.g. blue), incongruent (e.g. red) and neutral trials (e.g. +++)
  - 180 trials → corrected according to features integration theory
  - 9 conditions defined by combining previous and current trial (e.g: II)
- Study 1 (young adults) → 27 young adults
- Study 2 → extension over the lifespan with 124 participants dispatched in 6 age groups
- Statistics:
  - Linear mixed models, post-hocs were corrected by Bonferroni method
  - Interference index analyzed by a one-way ANOVA among age groups.

## Aims and hypotheses

- Still unclear which processes are involved in the SCE
- Dissociation between **attentional reorientation** and **inhibition activation/deactivation** (Ménétré and Laganaro, 2019)
- Dissociation achieved by introducing **neutral trials**
- Replication of the stability of the performance not only in aging but over the entire lifespan → **corrected interference index**:  $\frac{I-C}{N}$
- Investigation of the SCE over the entire lifespan



## Results

- Study 1 (on young adults):
  - Partial replication of the Gratton effect ( $CC < IC$  but  $II - CI$  not significant)
  - Effect of inhibition deactivation and both attentional reorientation effects
- Study 2 (lifespan):
  - No evolution of the SCE performances over the lifespan → all age groups merged
  - Still partial replication of the Gratton effect
  - Opposite effect of inhibition activation  $II > NI$
  - Significant combined effect of involvement of both inhibition and attentional reorientation
  - Effects of Study 1 replicated
  - No effect of lifespan evolution when processing speed is controlled for

## Discussion

- SCE → decomposed into attentional reorientation and inhibition modulation by including neutral trials
- Gratton effect partially replicated ( $II - CI$  non significant)
  - Probably the effect of neutral trials → more difficult to predict the next trial
  - Carry-over effect of the interference from the previous trial affecting the next one
- If processing speed is taken into account → no lifespan evolution
- Stability of the executive processes over time but impact of the processing speed factor
- In line with the general slowing hypothesis (Salthouse and Badcock, 1991, Salthouse, 1996)
- No evolution of the SCE over the lifespan → in SCE trials, processing speed is controlled for

## References

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