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Unmet Expectations May Impede Figure Assignment

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Background

Object Memories Influence Figure Assignment

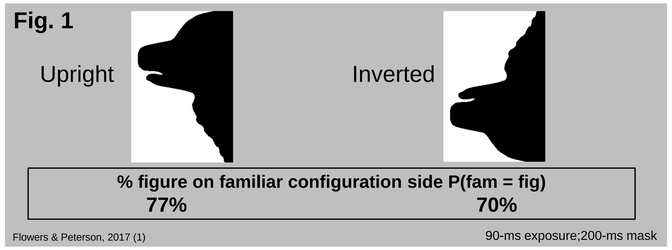


Figure assignment = object detection (know where object is wrt border)

Semantics activated during fig assignment

Shown by word categorization RTs (Natural/Artificial) [2-4]

Question

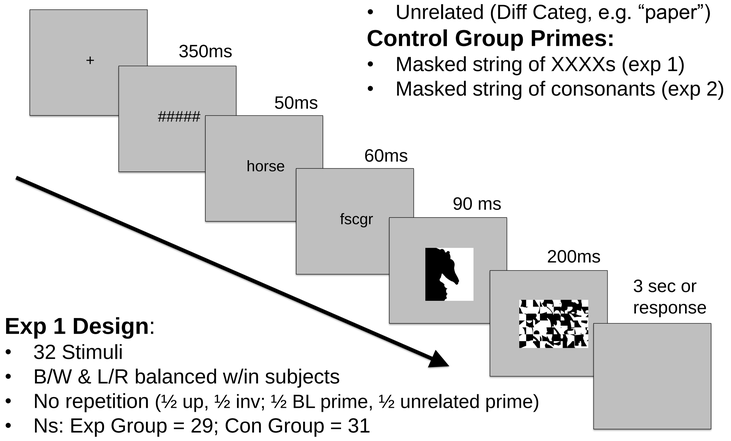
Can semantic activation from a word prime, ***a form of predictive coding***, increase P(fam = fig)?

If so, expect ↑ P(fam= figure) following prime = basic-level name of familiar configuration

Experiments 1 & 2: Method

Exp Group Primes:
Masked Words
- Basic Level
- Unrelated (Diff Categ, e.g. "paper")

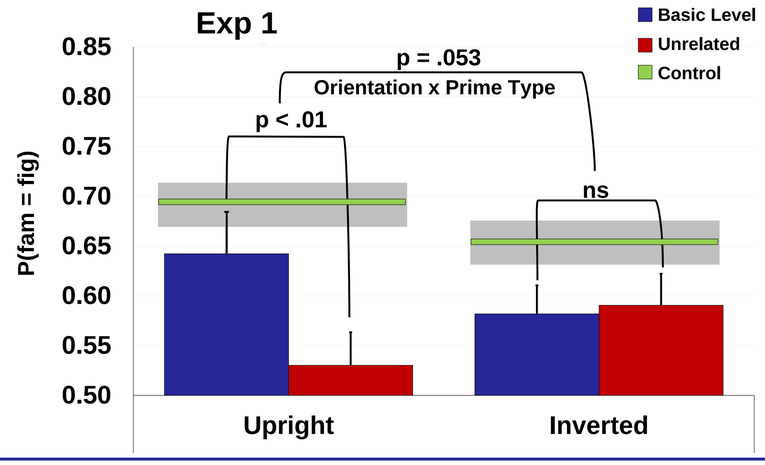
Control Group Primes:
- Masked string of XXXXs (exp 1)
- Masked string of consonants (exp 2)



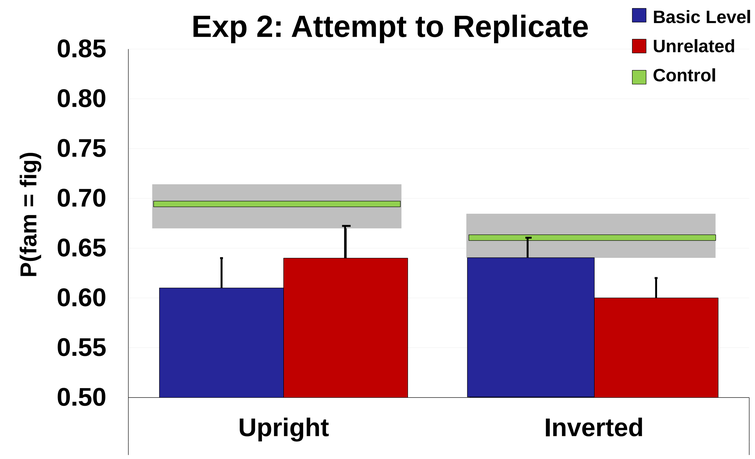
Exp 1 Design:
- 32 Stimuli
- B/W & L/R balanced w/in subjects
- No repetition (½ up, ½ inv; ½ BL prime, ½ unrelated prime)
- Ns: Exp Group = 29; Con Group = 31

Exp 2 Design same as Exp 1 except
- Two hidden blocks
- 32 Stimuli repeated in block 2 with (diff B/W, L/R of familiar config)
  - Primes still unrepeated
- Ns: Exp Group = 36; Con Group = Exp. 1 Control subjects

Results



Unrelated (diff category) **prime *reduces* P(fam = figure)**
➔ **Unmet Expectations May Impede Figure Assignment**
No facilitatory effect of Basic-level prime



Significant interaction of Orientation x Prime Type p=.025
But follow-up tests failed to reveal any significant differences
No B1 – B2 diff

No influence of primes in Exp 2

Design of Exps 1 & 2 may not maximize sensitivity of test

1. Con P(fam = fig) < w/o mask string before it, p < .001; See Fig 1
   ➔ prime strings may interfere with access to object memories, reducing sensitivity to influence of basic-level prime
2. Task set (report perceived figure) concerns shape, not semantics;[6,7] may reduce sensitivity to prime semantics. (Perhaps Exp. 1 subjects were less affected by task set)

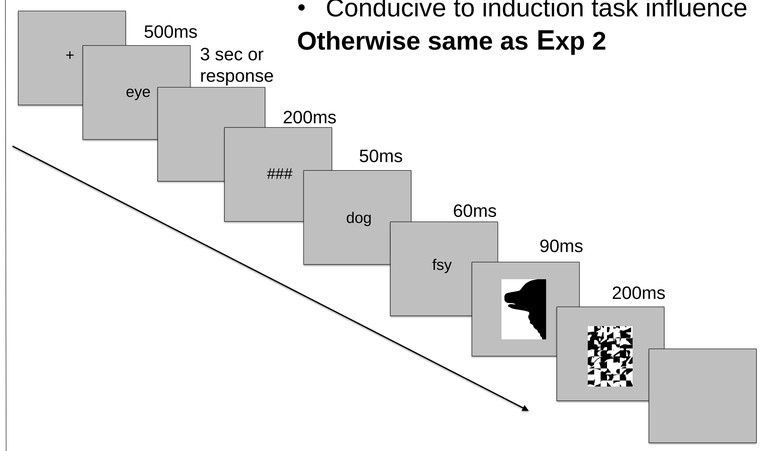
Exp 3 (in progress)

Use Induction task to ↑ sensitivity to prime semantics

Induction Task in Exp Group
Categorize unmasked words (Natural Art.)
- Same Categ as prime: (Natural Artificial)

Response-to-Prime Interval = 200 ms
- Conducive to induction task influence

Otherwise same as Exp 2



Predictions

Expect semantic priming effects
- Only ↓P(fam = fig) with unrelated prime (like Exp 1)?
  - If so, places limits on predictive coding because no effect of matched expectations
- Also ↑P(fam = fig) after basic level prime?

Future Experiment

If Exp 3 replicates Exp 1, try to maximize likelihood of ↑ P(fam = fig) after basic level prime by limiting noise from prime :Use longer delay betw prime mask & test display.

If still no effect of basic level prime, perhaps expectations must be for specific token to affect figure assignment.

Support: MAP ONR N00014-14-1-067

References

1) Flowers, C.S., & Peterson, M.A. (2017). VSS Annual Meeting 2017.
2) Peterson, M. A., et al. (2012). *Gestalt Theory*, *34*(3/4), 297–314.
3) Sanguinetti, J. L., et al. (2014). *Psychological Science*, *25*(1), 256–264.
4) Cacciamani, L., et al. (2014). *AP&P, 76,* 2531- 2547.
5) Lupyan, G., & Ward, E. J. (2013). *PNAS*, *110*(35), 14196–14201.
6) Martens, U., et al. (2011). *Psychological Science*, *22*(2), 282–291.
7) Kiefer, M. (2012). *Frontiers in Human Neuroscience, 6*(61), 71-82.

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