~~Using Knockout Strategies to Reveal Conscious Function~~

Multiple Levels of Unconscious Cognition

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NEW FRONTIERS IN STUDIES OF NONCONSCIOUS PROCESSING

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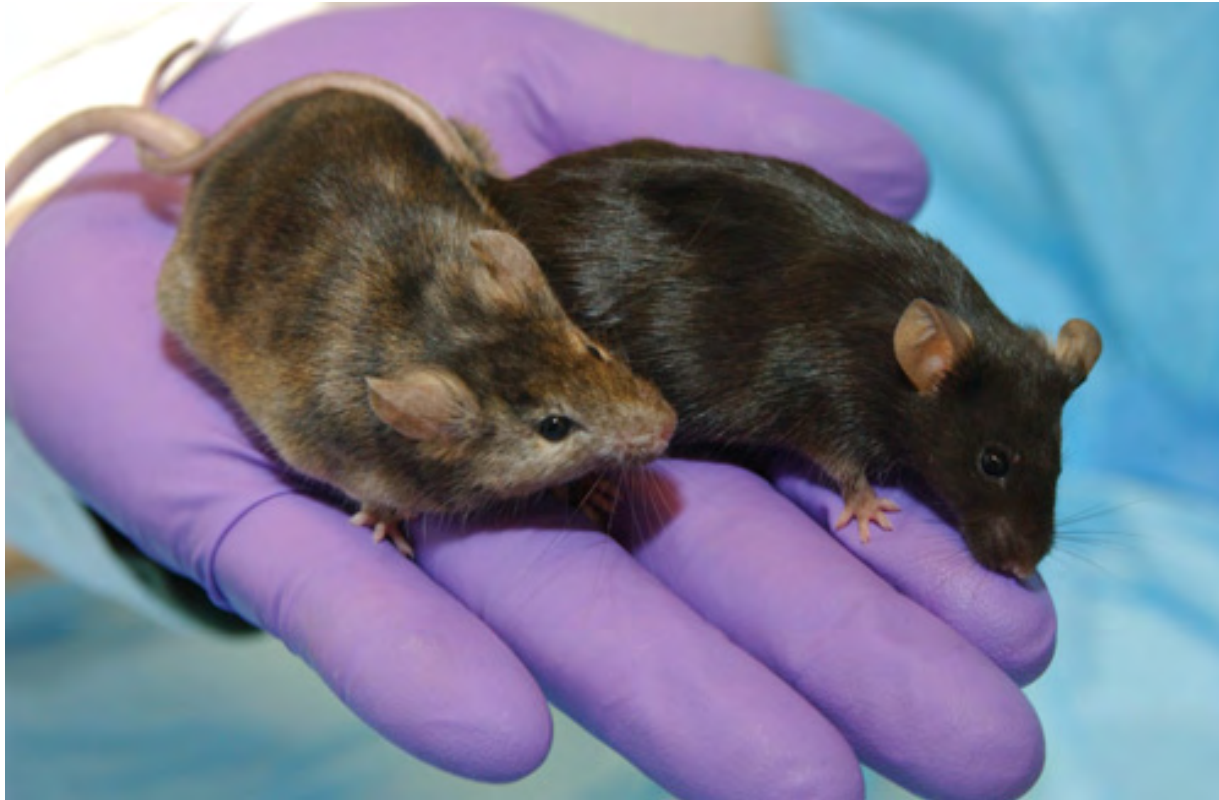### elsewhere

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Knockout logic

Gene affecting hair growth knocked out for mouse on left

Showing what can no longer be done when some process is knocked can reveal what the function does — what it's needed for

Knockout logic applied to visual masking

- Visual masking can knock out conscious awareness of vision.

- Observing what can't be done cognitive analysis is obliterated by visual masking of words reveals what conscious awareness of words is needed for.

- Few researchers are interested in establishing that anything other than verbal report of word identity is eliminated by visual masking.

- This misses an opportunity to identify some of the simplest cognitive feats for which conscious awareness of visually presented words is necessary

What gets knocked out along with visual awareness of words?

(i.e., what is consciousness of visually presented words needed for?)

Answer:

<u>the simplest types of syntactic analysis</u>

analyzing 2-item combinations in which meaning
depends on item order, such as:

• 2-word sentences

• negations involving "not" or prefix

• 2-word idiomatic phrases connoting gender

• 2-digit numbers (e.g., distinguishing 46 from 64)

Using the knockout strategy to identify distinct levels of unconscious cognition

- Show that some cognitive analyses occur under one set of masking conditions (Level A)

- but not under another set of conditions (Level B)

This affords the conclusion:

- Level A is required for the function (which cannot be done by Level B)

- I.e., Levels A and B are distinct levels of unconscious cognition

What will be shown:

- Varied presentation duration of masked words $\rightarrow$ distinct forms (levels) of unconscious cognition.

- At longer duration (Level A):
  - analysis of word meaning
  - classical conditioning of word meaning to masked nonsense-string conditioned stimuli.

- At shorter duration (Level B):
  - orthographic analysis of letter strings
  - no analysis of word meaning
  - no classical conditioning of word meaning

Procedure for the classical conditioning experiment

	female gender	male gender
Visible target words for gender (ADFHJLNOPWY)	joan, donna, dawn, lola, polly, wanda, anna, hannah, holly, ann, nora, wynona	john, jonah, andy, dan, alan, wally, noah, dylan, nolan, ladd, jay, donald
masked letter strings (conditioned stimuli)	BMVZ MVZB VZBM ZBMV	GKQX KQXG QXGK XGKQ

PROCEDURE

- 240 acquisition trials (100% consistent association; 75 ms CS duration)
- 288 conditioning test (= extinction = priming) trials with 25-ms or 75-ms CS duration (within-subjects)
- 288 visibility test trials, 25-ms or 75-ms CS duration (within-subjects)

Procedure
Demonstration

Procedure for experiment with varied practice in classifying later-to-be-masked primes

Practiced Male Name Primes

JOHN
JONAH
ANDY
DAN
ALLAN
WALLY
NOAH
DYLAN
NOLAN
LAD
JAY
DONALD

Unpracticed Male Name Primes

ERIC
CURT
TIM
MIKE
RUSS
KIRK
MERV
BURT
STEVE
ZEKE
RICK
EMMET

Practiced Female Name Primes

JOAN
DONNA
DAWN
LOLA
POLY
WANDA
ANNA
HANNAH
HOLLY
ANN
NORA
WYNONA

Unpracticed Female Name Primes

EVE
MEG
SUSIE
IRIS
TESS
SUE
VICKI
BESS
MIMI
TERI
KERI
TRIXIE

Practice with names all from this letter set:

ADFHJLNOPWY

Priming test with names all from this letter set:

BCEGIKMQRSTUVXZ

25-ms gender primes previously practiced as targets
Result: Clear gender priming with practiced primes
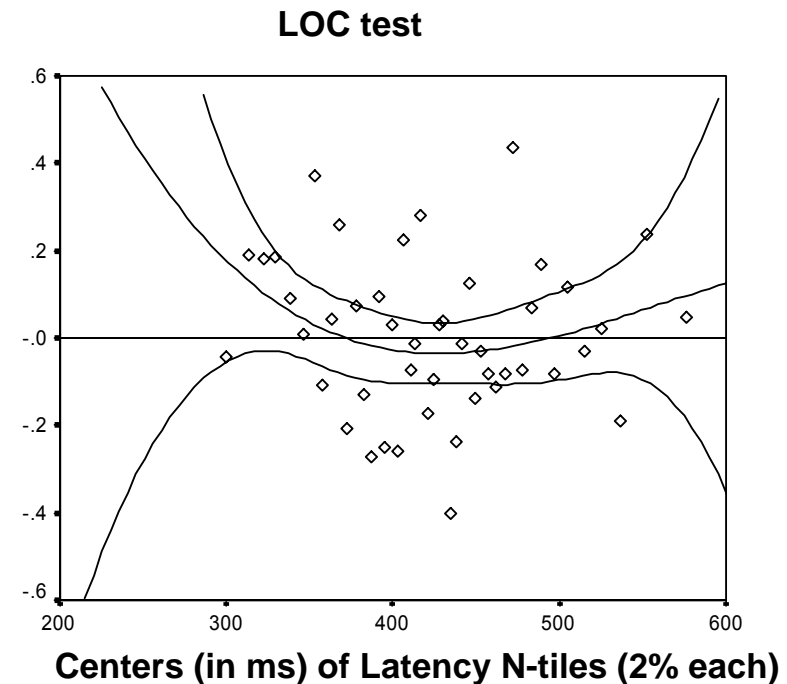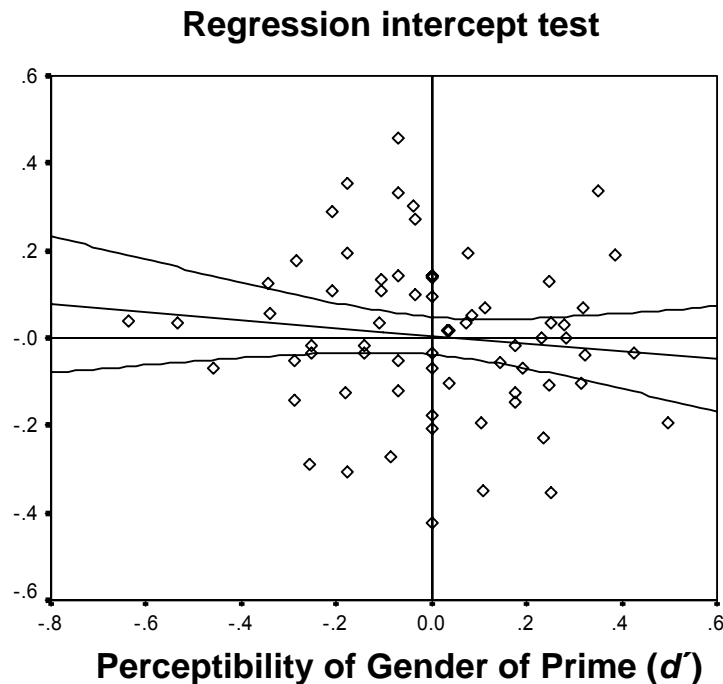
DV is effect of Gender of Prime on Response to Target (d')

Regression intercept test

Perceptibility of Gender of Prime (d')

LOC test

Centers (in ms) of Latency N-tiles (2% each)
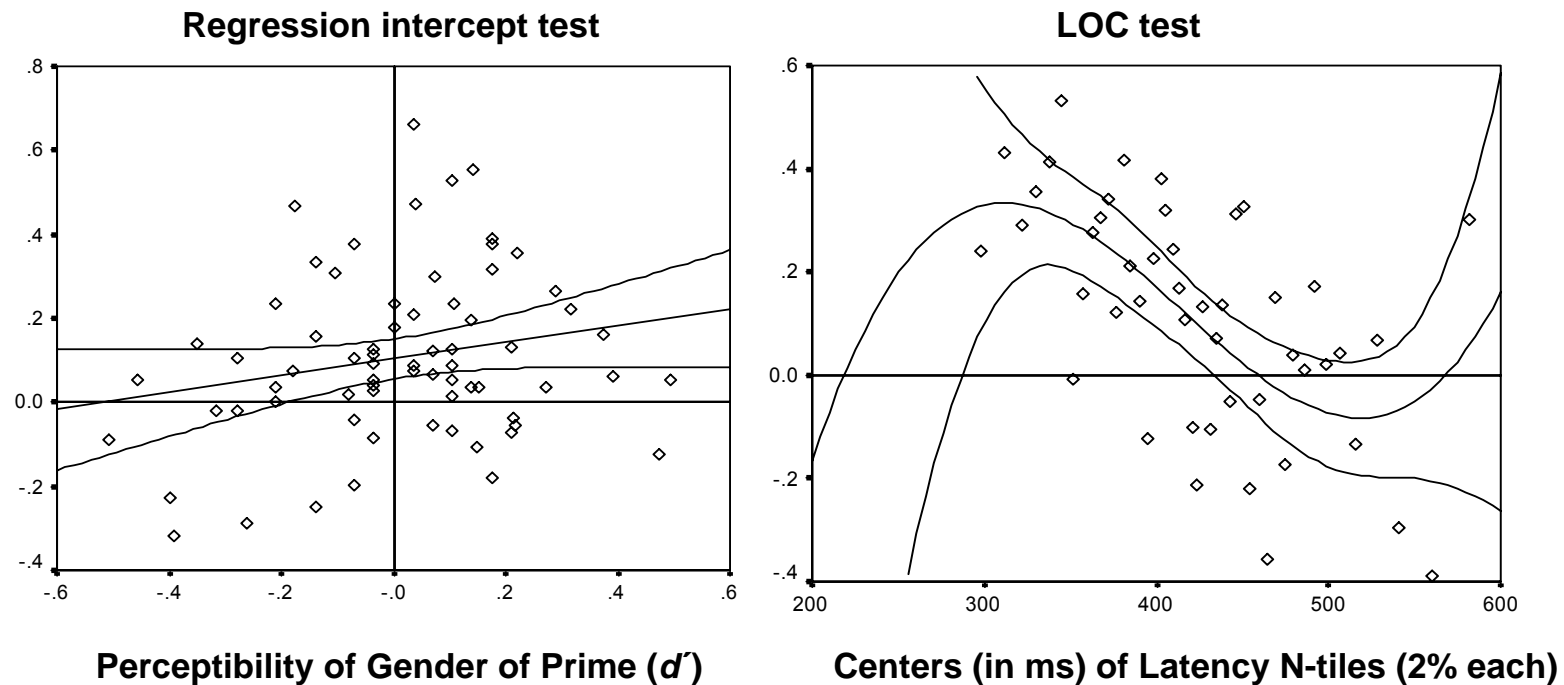
Data from Klauer, Eder, & Greenwald (2007), Experiment 3

25-ms primes not previously practiced as targets

Result: No gender priming with unpracticed primes
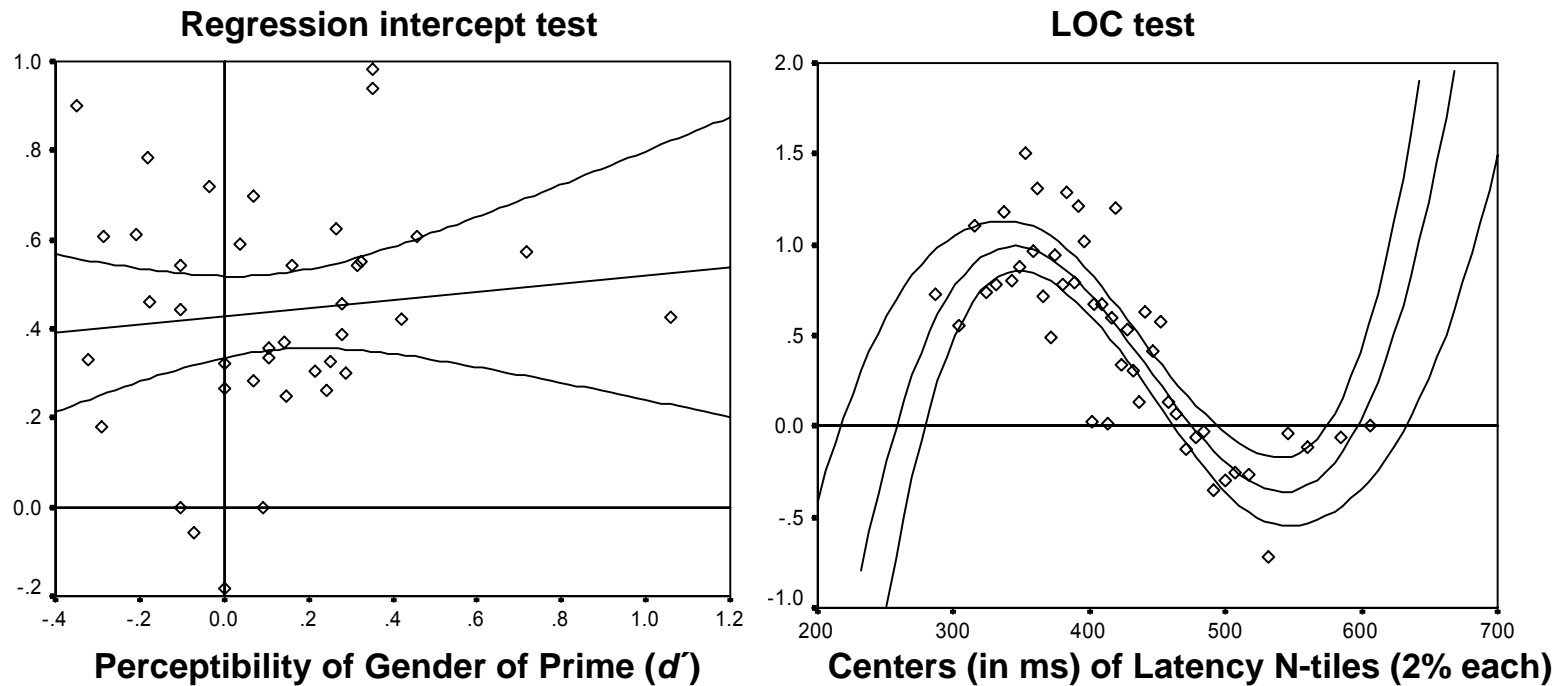
DV is effect of Gender of Prime on Response to Target (d')

Regression intercept test

LOC test

Perceptibility of Gender of Prime (d')

Centers (in ms) of Latency N-tiles (2% each)

Data from Klauer, Eder, & Greenwald (2007), Experiment 3

42-ms gender primes previously practiced as targets
Result: Strong gender priming with practiced primes
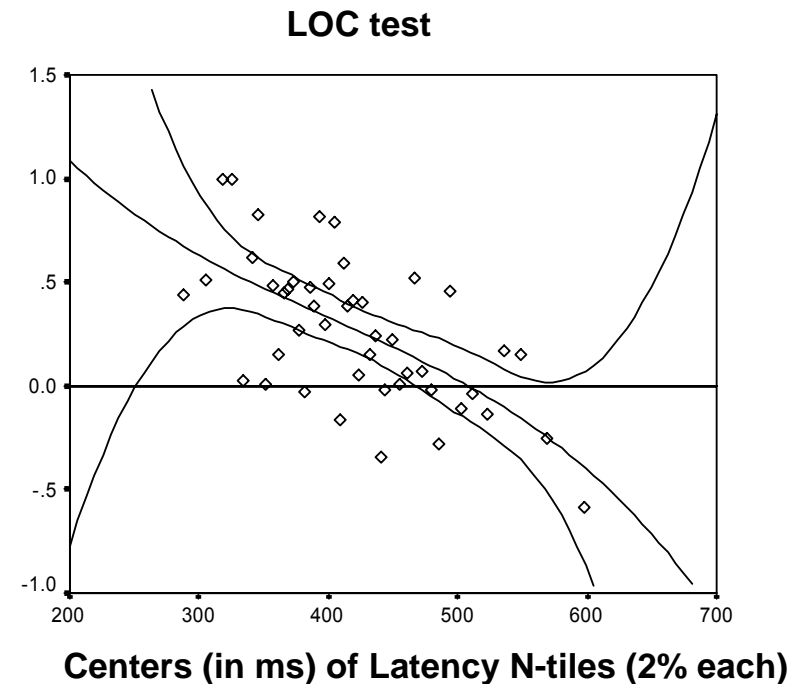
DV is effect of Gender of Prime on Response to Target (d')

Data from Klauer, Eder, & Greenwald (2007), Experiment 3

42-ms primes not previously practiced as targets

Result: Yes, gender priming with unpracticed primes

DV is effect of Gender of Prime on Response to Target (d')

Regression intercept test

LOC test

Perceptibility of Gender of Prime (d')

Centers (in ms) of Latency N-tiles (2% each)

Data from Klauer, Eder, & Greenwald (2007), Experiment 3

Conclusion

Two levels of unconscious cognition.

- One (Phil) appears with relatively long-duration masked primes and permits both semantic analysis of words and semantic classical conditioning

- The other (Tony) appears with shorter-duration masked primes and supports subword (presumably orthographic) analysis, but not semantic analysis or words or semantic classical conditioning

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