Implicitly learned temporal association between targets attenuates AB effect

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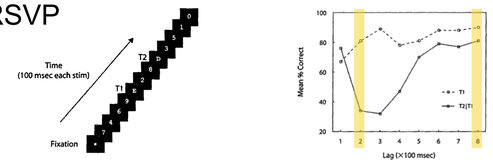
INTRODUCTION

- **AB effect**: the failure to detect T2 in RSVP



- **Relationship between targets**: attenuated AB effect by high-level relationship between T1 & T2
  - ✓ Semantically associated targets (e.g., T1 = town, T2 = city) Potter et al. (2005)
- **Statistical Learning**: implicit learning of temporal relationships among sequentially presented stimuli

Research Question

1. ***Do implicitly learned temporal associations among targets modulate the AB effect?***
2. ***How flexible is the effect?***

STEP 1: Training

STATISTICAL LEARNINIG GROUP

F A K T Q N N A K T J

- 20 Upper case letters / 50 times / for 200ms
- 4 Triplets: randomly decided for each participant
- Transitional probability: p(x2 | x1) = 1

RANDOM GROUP

Task: 1-back

Q F L N T R R J K N S

- No structure
- Uniform transitional probability: p(x2 | x1) = 0.05

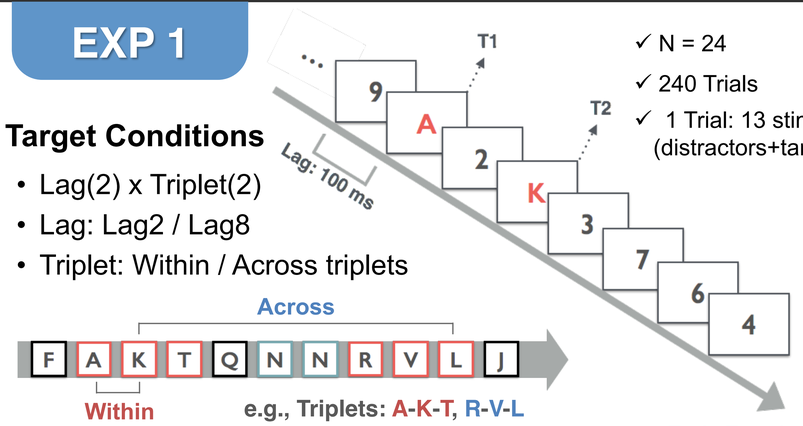
STEP 2: AB experiment

EXP 1

✓ N = 24
✓ 240 Trials
✓ 1 Trial: 13 stimuli (distractors+targets)

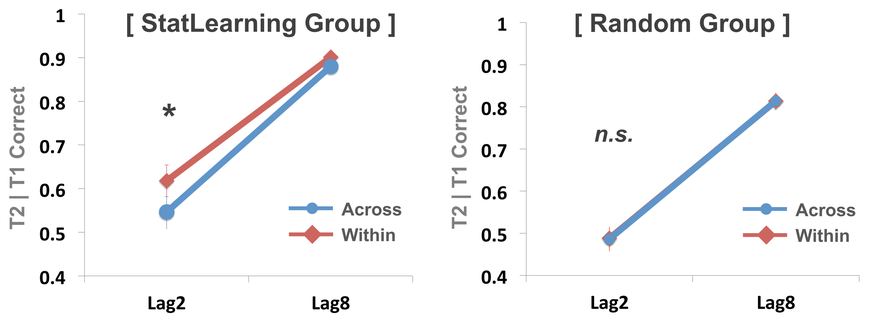
Target Conditions

- Lag(2) x Triplet(2)
- Lag: Lag2 / Lag8
- Triplet: Within / Across triplets



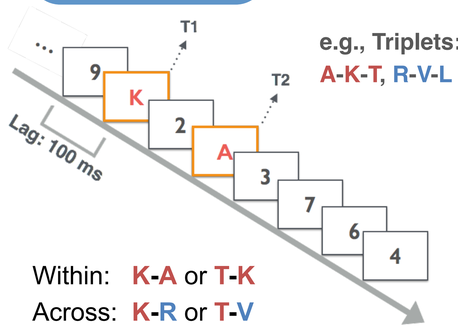
e.g., Triplets: A-K-T, R-V-L

Within: A-K or K-T Across: A-V or K-L



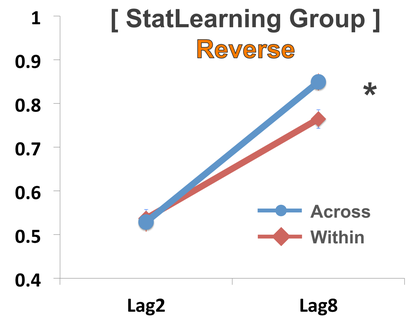
➡ **Statistically learned targets attenuate AB effect**

EXP 3 — Reversed triplets — N = 18

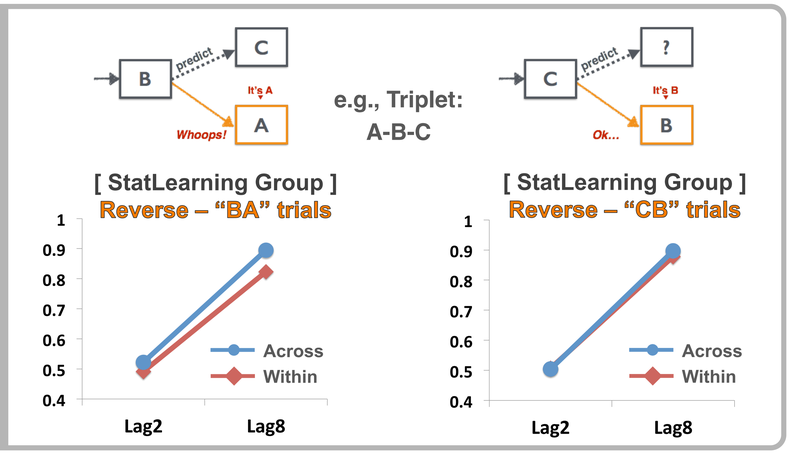


e.g., Triplets: A-K-T, R-V-L

Within: K-A or T-K
Across: K-R or T-V

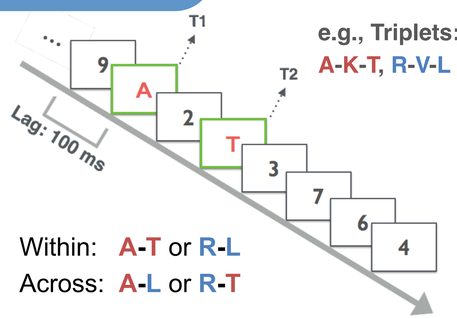


Prediction Error ?



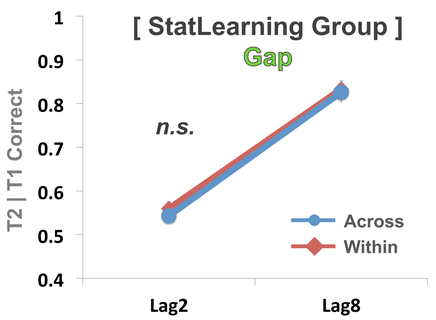
➡ **The direction of temporal association matters**

EXP 2 — Gap within triplets — N = 24



e.g., Triplets: A-K-T, R-V-L

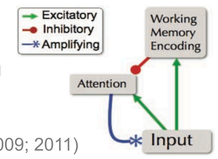
Within: A-T or R-L
Across: A-L or R-T



➡ **The immediate temporal association matters**

DISCUSSION

- Temporal association between targets attenuates AB effect
- The order/sequence of the learned association matters
- What is the underlying mechanism?
  - ✓ Advantages in the competition between attentional enhancement and suppression



(Wyble et al., 2009; 2011)