Investigating the relationship between infant learning and measured effect size in preferential looking paradigms

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NSF-GRFP DGE-1747503 to M.Z.,D.B.

NICHD R37HD037466 to J.S. and U54 HD090256 to the Waisman Center

2020 ICIS 7-7-2020

INTERPRETING LOOKING TIMES

How should we interpret *the magnitude of looking time differences* in infant learning studies?

Quantitative differences in looking time are assumed to be meaningful in most analytic approaches, but how these measures map onto learning is unclear.

These questions are especially relevant for
- Choosing the best statistical analysis approach
- using participant-level looking time differences as an individual difference measure
- interpreting meta-analyses

EXPERIMENTAL APPROACH

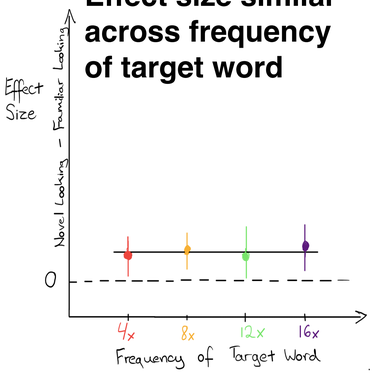
Test whether frequency of exposure systematically affects effect size in a novel word recognition study

Training study testing infants' recognition of familiar words (e.g., Jusczyk & Aslin, 1995) presented in citation form during training and test.

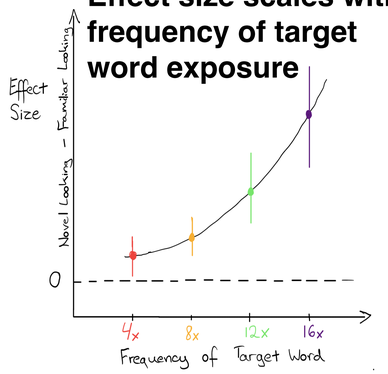
Frequency of novel word occurrence during training manipulated across groups (~ strength of learning)

Possible patterns of results:

Effect size similar across frequency of target word



Effect size scales with frequency of target word exposure



DESIGN

Initial experiment to test the feasibility of training paradigm

Participants: 51 6-9-month-olds (M = 7.4 months; 26 F)
Pre-registered: n = 64, 32 per condition

https://osf.io/j49gr

Training Phase
8 nonse words presented in citation form, 80 total tokens
Frequency of target words manipulated between groups
4 Occurrences Condition: target words occur 4 times
16 Occurrences Condition: target words occur 16 times

Test Phase (Head-Turn Preference Procedure)
2 familiar (target) words vs. 2 novel words, presented in citation form; 12 test trials across 3 blocks

	List 1 - 16x	List 1 - 4x
16x	manu	doopy
16x	kita	virdex
12x	fiffin	fiffin
12x	pizer	pizer
8x	tosip	tosip
8x	regli	regli
4x	doopy	manu
4x	virdex	kita

	List 2 - 16x	List 2 - 4x
16x	sarel	doopy
16x	boskot	virdex
12x	fiffin	fiffin
12x	pizer	pizer
8x	tosip	tosip
8x	regli	regli
4x	doopy	sarel
4x	virdex	boskot

TEST ITEMS
identical across participants

manu
kita
sarel
boskot

manu, kita are familiar if trained on List 1 and novel if trained on List 2

sarel, boskot are familiar if trained on List 2 and novel if trained on List 1

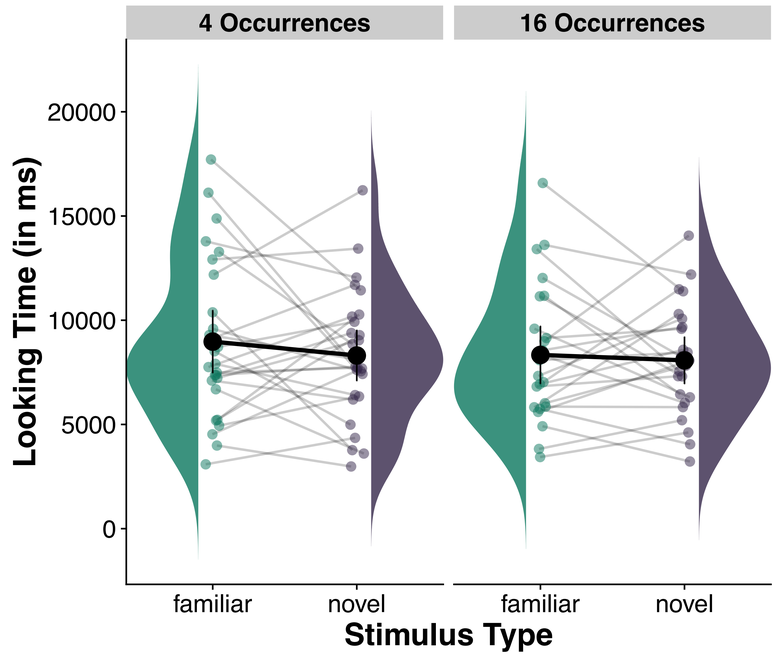
Link to stimuli and experimental materials:

https://github.com/mzettersten/effie

PRELIMINARY RESULTS

No evidence of learning in either condition or evidence of differences between conditions.

4 Occurrences: $t(26) = 0.95$, $p = .35$, $BF_{01} = 3.27$
16 Occurrences: $t(23) = 0.41$, $p = .69$, $BF_{01} = 4.32$
No condition effect, $t(49) = -0.42$, $p = .67$, $BF_{01} = 3.31$



NEXT STEPS

Revisit paradigm
Ideal paradigm will yield strong effects and allow for parametric manipulation of factor known to influence learning.

Looking for collaborators
Large sample size will be key.

References
Jusczyk, P., & Aslin, R. (1995), *Cog Psych*