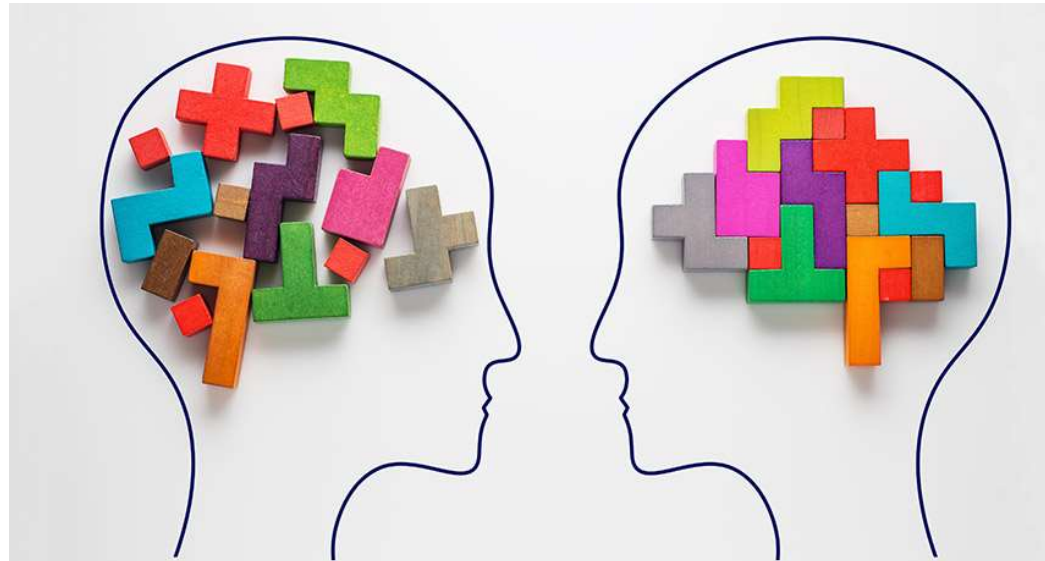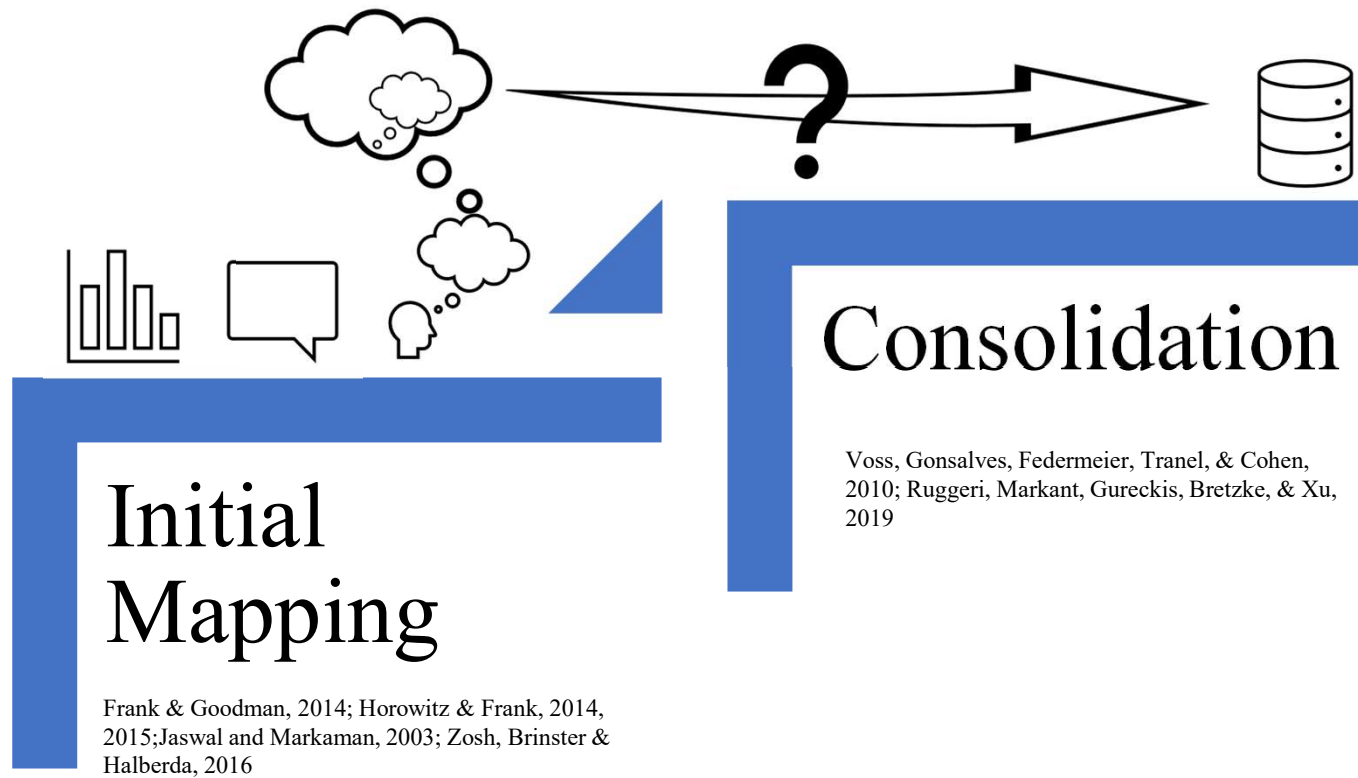# Social Cognition and Pragmatic Inference in Word Learning

Dionysia Saratsli[1], Anna Papafragou[2] & Zhenghan Qi[1]

[1] University of Delaware [2] University of Pennsylvania

Word learning

Initial Mapping

Frank & Goodman, 2014; Horowitz & Frank, 2014, 2015;Jaswal and Markaman, 2003; Zosh, Brinster & Halberda, 2016

Consolidation

Voss, Gonsalves, Federmeier, Tranel, & Cohen, 2010; Ruggeri, Markant, Gureckis, Bretzke, & Xu, 2019
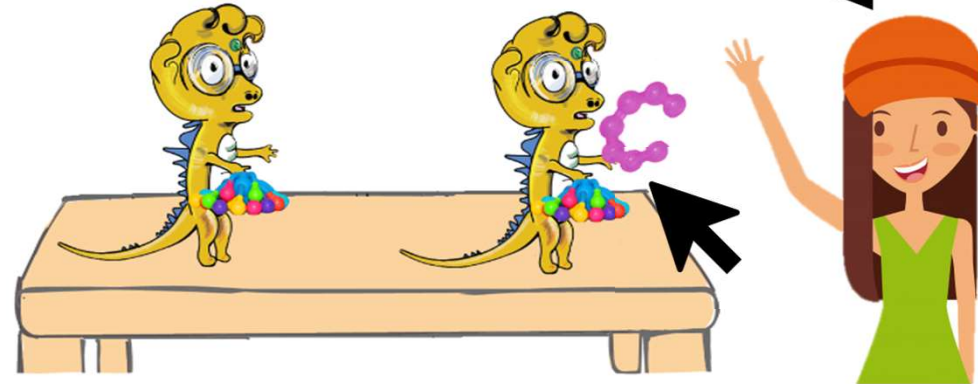
Which toy does Mary like?

Research Questions

- **Q1**: Do people have better retention for words learned through *pragmatic inference* or *direct mapping*?

- **Q2:** Does better social cognition benefit the meaning retention for inferentially acquired words?
  - Exp.1: Individual differences in ToM
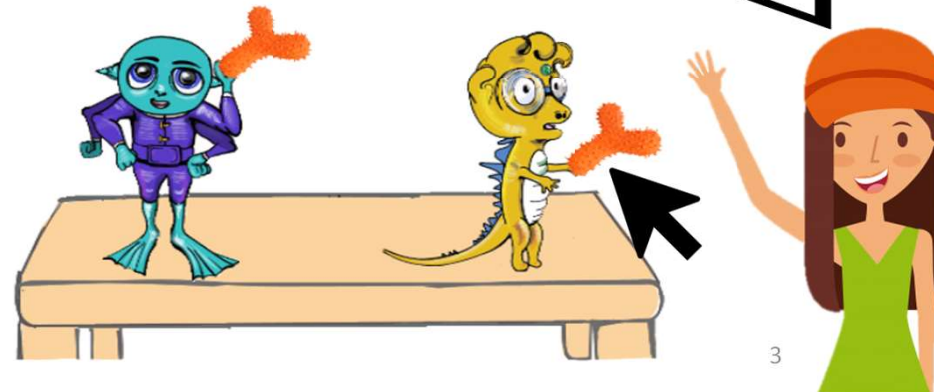 - Exp.2: Engage ToM before word learning

(Baron-Cohen, Leslie, & Frith, 1985; Baron-Cohen, Wheelwright., Hill, Raste, & Plumb, 2001; Apperly, 2012; Fairchild et. al. 2020; Halberda, 2006)

Inference

Look, I like this dinosaur! It is holding a MEL!
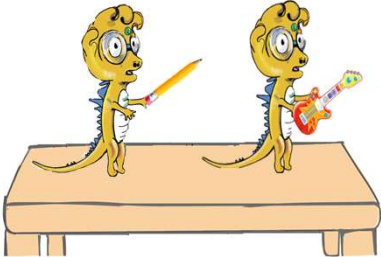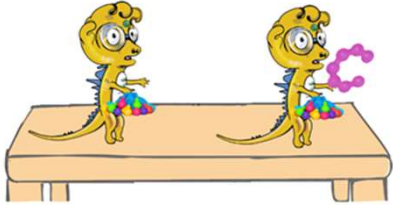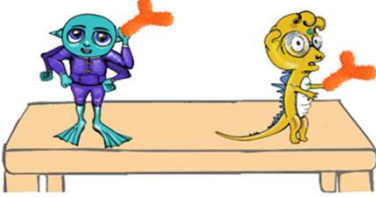
Direct mapping
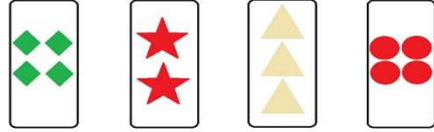
Look, I like this BINK! It is on the dinosaur!

Word Learning Paradigm

Practice (x2) **Which toy does Mary like?**	Condition	**Learning Phase** 2 trials per word 8 word per condition	**Immediate Recall (x8)** **10-min Retention (x16)**
	Inference context		
	👂	"Look! I like this dinosaur! It is holding a **mel**!"	
	Direct mapping context		
"Look! I like the dinosaur that's holding a guitar!"	👂	"Look! I like this **bink**! It is on the dinosaur!"	"Which one is a [novel word]?"

Individual Difference Measures

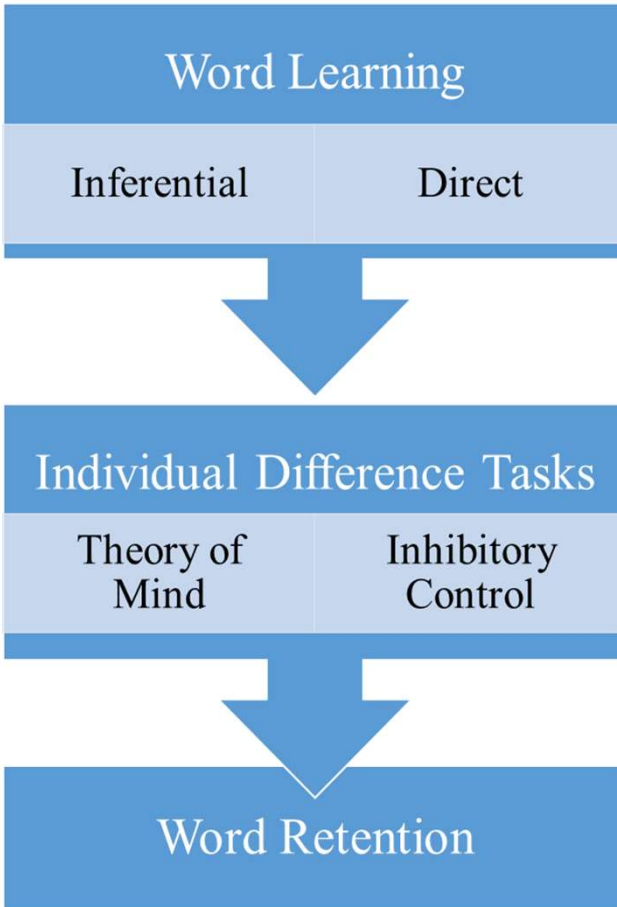|		
Mind in the Eyes (x36)	Theory of Mind	 jealous panicked arrogant hateful Total # of correct answers
Flanker (x36)	Inhibitory control	Press **F** for Left Press **J** for Right Congruency effect on RT
Wisconsin Card Sorting (x48)	Flexibility	Which card does this one match with?

| Experiment 1 (Learning First) | Experiment 2 (ToM First vs. IC First) |

Experiment 1 (Learning First)

Word Learning

| Inferential | Direct |

Individual Difference Tasks

| Theory of Mind | Inhibitory Control |

Word Retention

N = 36

Experiment 2 (ToM First vs. IC First)

Engaging Task

Theory of Mind

Word Learning

| Inferential | Direct |

Individual Difference Tasks

| Inhibitory Control | Flexibility |

Word Retention

N = 21

Engaging Task

Inhibitory Control

Word Learning

| Inferential | Direct |

Individual Difference Tasks
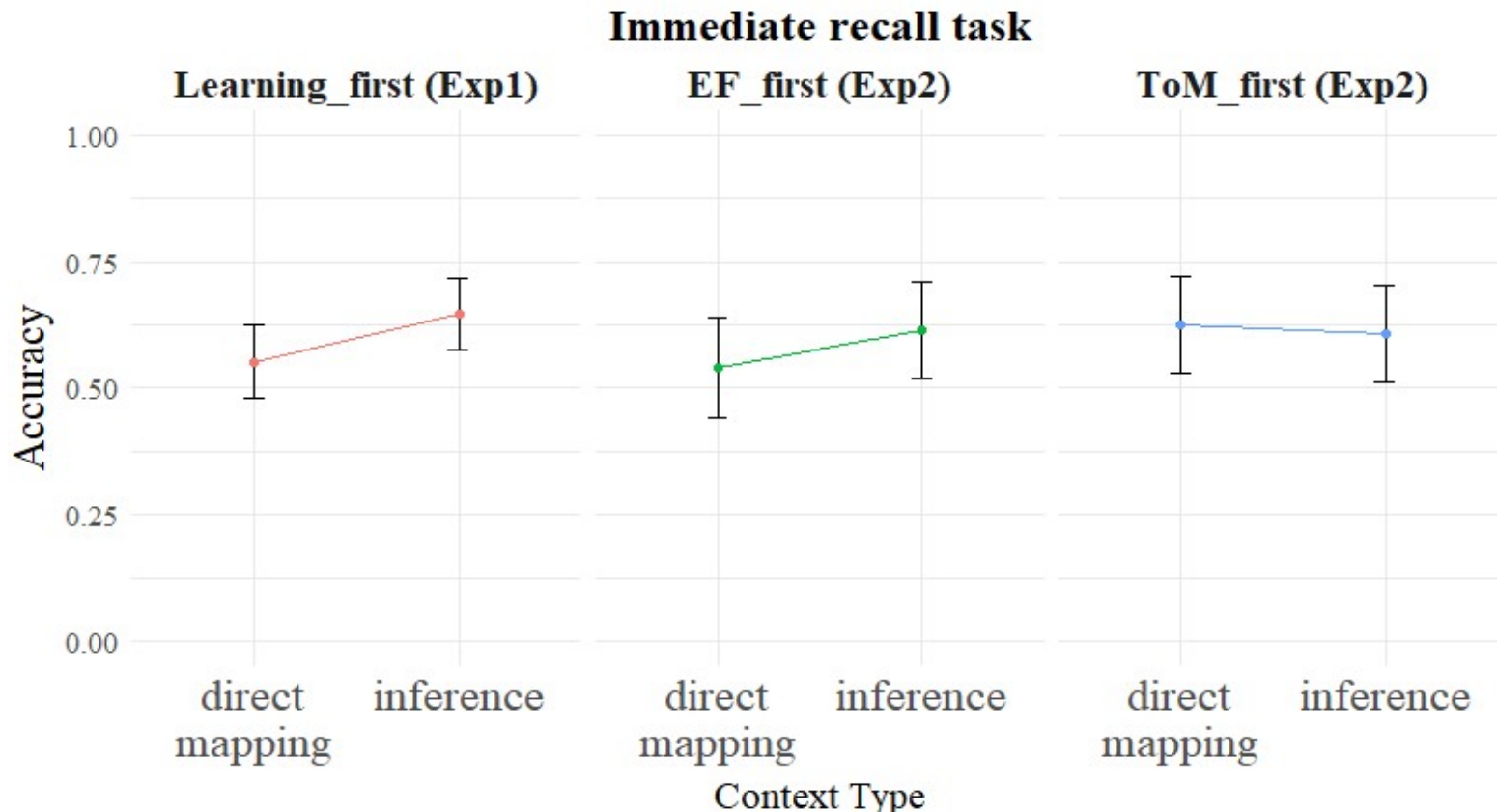
| Theory of Mind | Flexibility |

Word Retention

N = 22

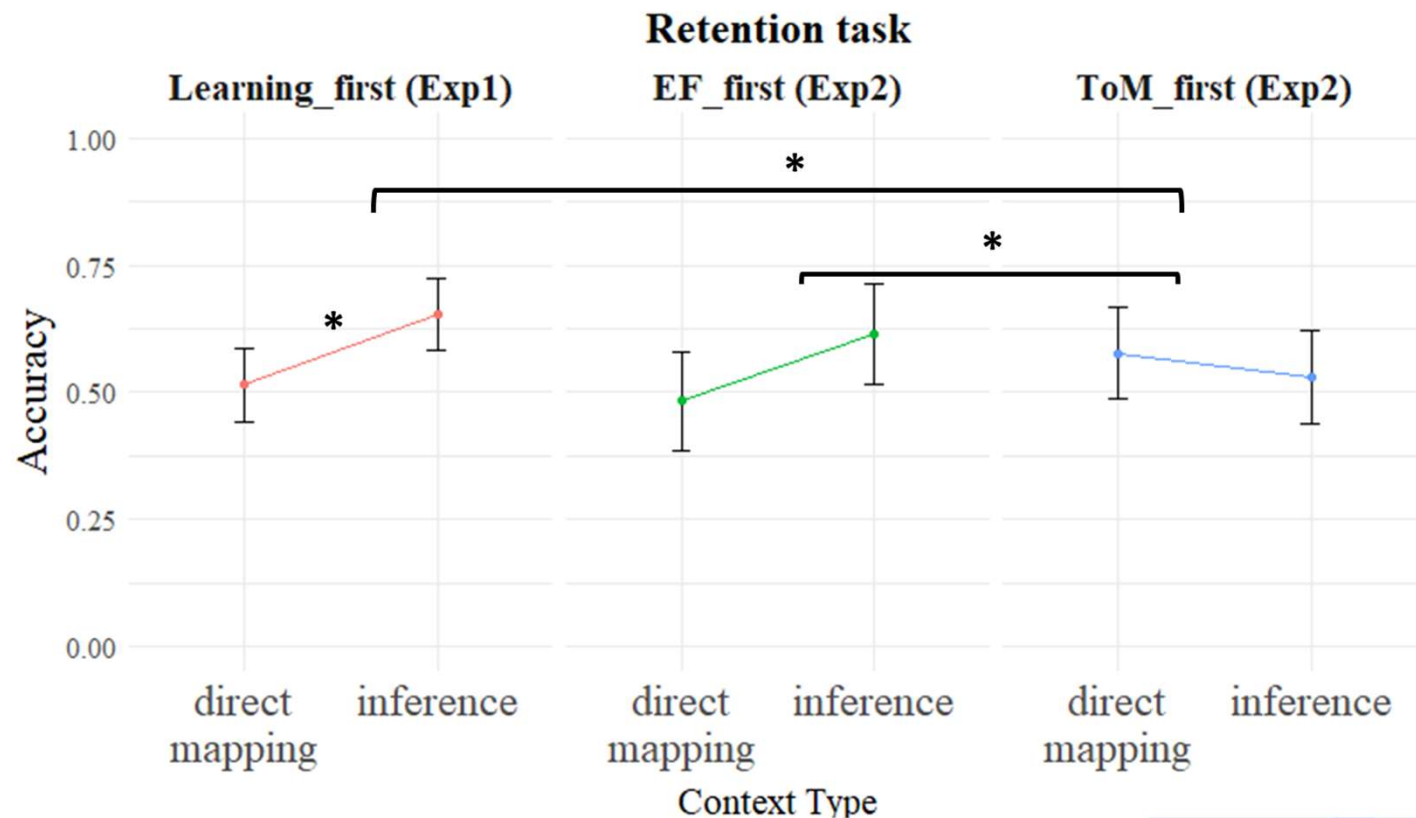# Results: Immediate recall and retention

No group effect or context effect on Immediate Recall.

Results: Immediate recall and retention

**Learning first**: <u>inference > direct mapping</u> (β=-0.71, z=-2.02, p= 0.04)

<u>ToM-first vs EF_first/Learning-first</u>: Group x Context interaction - Diminished inference context effect only in the ToM-first group (β=1.24, z=2.06, p= 0.03)

Individual differences and word retention (Exp 1)

Retention	Inference	Direct mapping
ToM	$t = 2.32, p = 0.02$	$t = 1.71, p = 0.09$
Inhibitory Control	n.s.	n.s.

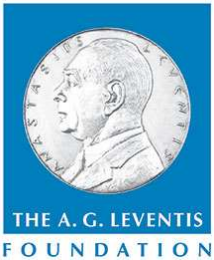**Theory of Mind and Retention - Inference context words**

$R = 0.36, p = 0.033$
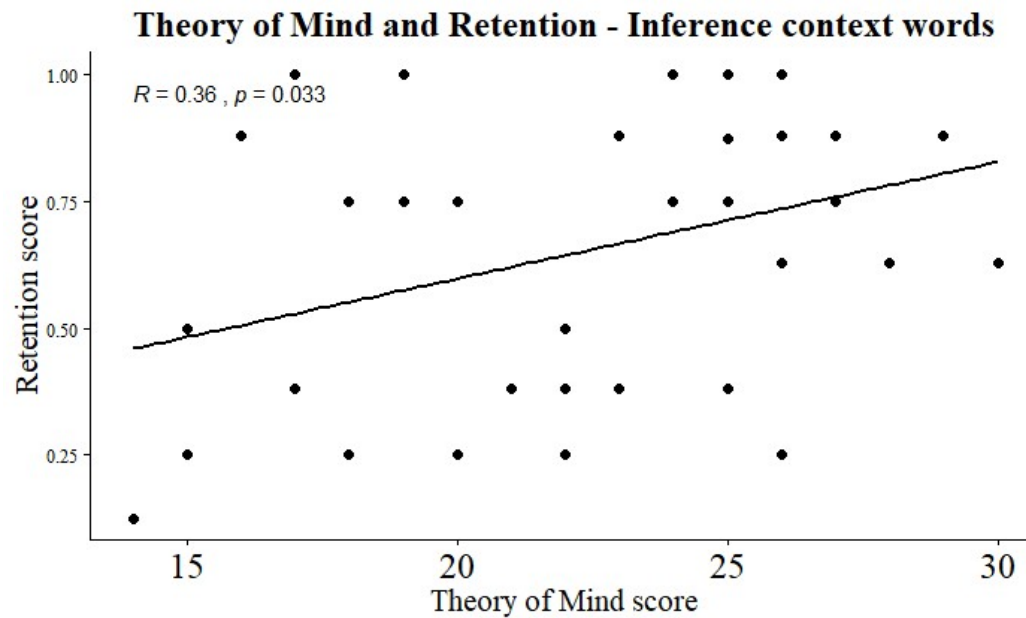
Summary

❖ The meaning of novel words acquired through pragmatic inference is better retained compared to the meaning of novel words acquired through direct mapping

- Prior research does not usually explore word learning contexts contrastively and rarely tests for later retention
  (Jaswal and Markaman, 2003; Halberda, 2006; Zosh, Brinster & Halberda, 2016)

❖ Engaging social cognition before word learning specifically affects the retention outcome of inferentially acquired words.

❖ Individuals' social cognition, but not executive function, is uniquely associated with the retention of word meaning

- Individual differences in such socio-cognitive skills have not been systematically explored in relation to word learning

Thank you!

We would like to thank all members of the *Language Acquisition and Brain Lab* as well as the *Language and Cognition Lab* for their help and feedback.