



Introduction

Marking certainty:

- Speakers should only provide information that they know to be true according to the Maxim of Quantity. Presumably they also want to be considered reliable sources for information they convey
- This suggests that speakers should structure their utterances to accurately signal their degree of confidence.
- Speakers have a variety of options available to signal certainty (e.g., disfluencies, lexical choices, hedges, facial expressions, gestures, etc)
- Listeners should be able to recover from a speaker's production their amount of confidence in their utterance (see: Smith & Clark, 1993; Brennan & Williams, 1995; Swerts & Krahmer, 2005), and take that into consideration when generalizing from the speaker's productions

Main Questions:

- 1. How and why do speakers mark their confidence-level in speech?
- 2. How do listeners use this information when generalizing from a speaker, or through continued interaction?

Pre-task

Read the following sentences out loud.



It could be a goose.

Imagine that you are in a task where you have to tell someone what you saw, but it only briefly flashed on the screen, or it's mostly occluded. So, you might know what it is, but you might also be wrong.



It could be a goose.

Exploring how speakers mark, and listeners assess, certainty

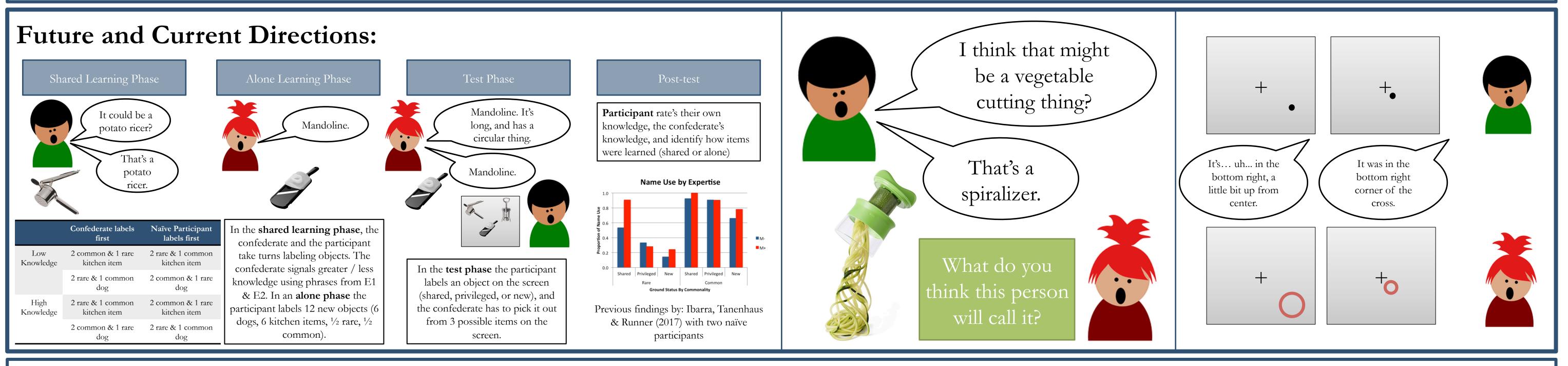
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Experiment 1

Please : certain												lease slide t certain) you t
					e.	goos	ld be a	It coul	ļ			
	etely certain	comple								ertain	ot at all ce	n
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Phrase	Read-text Confidence	Listen (Read)	Listen (Uncertainty)	Read-text Rank	Listen Rank
It could be a goose	36.994	37.706	36.283	7.125	7.063
It might be a robin	39.294	41.094	37.494	6.375	6.375
I think it's a falcon	49.918	48.918	50.919	5.688	5.644
It looks like a hummingbird	57.080	61.362	52.797	5.25	5.381
I'm pretty sure it's a woodpecker	65.476	68.110	62.842	4.063	4.319
I'm sure that it's a sparrow	84.220	87.510	80.930	2.688	2.919
It's a blackbird	86.777	88.864	84.689	2.625	2.525
It's definitely a canary	90.935	90.246	91.624	2.188	1.775

Main Findings: We find a stable order of the rated certainty of the utterances, and their rankings; but individual differences in the amount of certainty conveyed [Experiment 1]. We find a relationship between speakers' confidence ratings and the kind of phrase they would use to communicate what they saw to another person (suggesting a strong relationship between confidence and lexical choice) [Experiment 2].



References: Biederman, I. (1987). Recognition-by-components: a theory of human image understanding. Psychological review, 94, 115-147. Brennan, S. E., & Williams, M. (1995). The feeling of another's knowing: prosody and Wlled pauses as cues to listeners about the metacognitive states of speakers. Journal of Memory and Language, 34, 383-398. Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), Syntax and semantics: Speech acts (Vol. 3, pp. 41–58). New York: Academic Press. Ibarra, A., Tanenhaus, M.K., & Runner, J.T. (2017). Effects of shared learning on choice of referring expressions mitigated byclikelihood of prior knowledge. Poster Presented at the CUNY Conference on Sentence Processing. Boston, MA. Smith, V. L., & Clark, H. H. (1993). On the course of answering questions. Journal of Memory and Language, 32, 25-38. Swerts, M., & Krahmer, E. (2005). Audiovisual prosody and feeling of knowing. Journal of Memory and Language, 53(1), 81-94.

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bar below to inc	dicate how c	ertain (0 = not	at all certain,	100 = compl

beaker about what picture they saw. based on what they'ye sai ▶ 0:00 / 0:02 ● ● ● ●

chanical Turk Study: Read-Text Condition (n=16) Audio Condition (n=160)items used in the pre-test Audio: one recording of each (randomly assigned)

		E	xperi
120/220 ms	120/220 ms	120/220 ms	120/220 ms
What did you s			
car			
	are you that you correctly lab at all confident 0 10 20 30 4	com	npletely confident 0 100
	the most certain, and low change the order.	w certain you think a speak ver down being less certain)	
It could be a goo	se.		
I think it's a falco	n.		
I'm sure that it's	a sparrow.		
It's a blackbird.			
I'm pretty sure it' It looks like a hur			
It's definitely a ca	-		
	Phrase		Label Confider
It could be	a goose		25.163
It might be	a robin		28.798
I think it's a	falcon		46.458
It looks like	a humming	gbird	45.828
I'm pretty s	ure it's a wo	odpecker	68.577
I'm sure tha	nt it's a spar	row	80.300
T 6 1 1 1 1			

It's a blackbird

It's definitely a canary

ment 2

Which is the mostly likely phrase you'd use to tell another person about what you saw? ○ It's a car O It's definitely a car O I think it's a car

- O It could be a car
- O It looks like a car O I'm sure that it's a ca
- O I'm pretty sure it's a ca O It might be a car
- Mechanical Turk Study: - n=32 - 2 durations (120/220 ms)- 2 deletion types (preserves / does not preserve the geon) - 20 trials per participant (with 4 possible lists, with items counterbalanced across sbjs)

	Label Confidence		Geons Disrupted	Geons Intact		
	25.163	120ms	43.52	58.37		
	28.798	220ms	48.28	66.18		
	46.458	Results:				
	45.828	- More confident when the saw the items for longer durations ($p < .02$)				
ter	68.577					
	80.300		confident w	hen the		
	91.765		were left in			
	93.192	(p <.00)1)			
		-				