Visual World Paradigm: Exploring anticipatory language processing

2018 NTU-UT Linguistics Festa CHEN Tzu-Yin, KISHIYAMA Takeshi

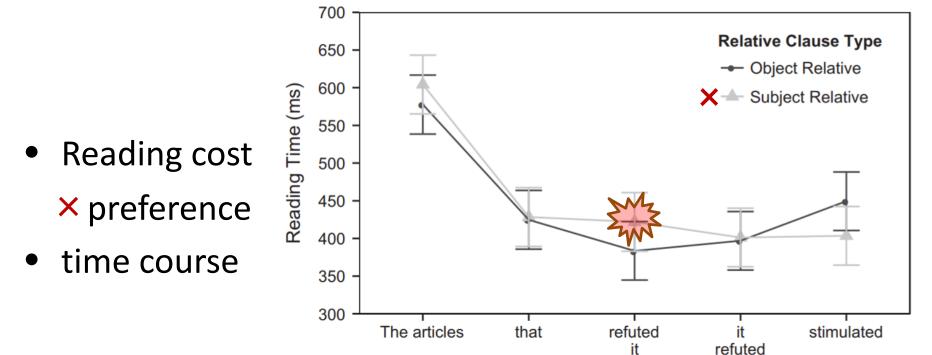
Мар

- Brief introduction (10:00-10:40)
 - Why visual world paradigm?
 - Framework of recording machines
 - Short experiment demo
- Step by step analysis (10:50-12:30)
 - Segment data trimming
 - Graphing
 - Statistics

WHY VISUAL WORLD PARADIGM?

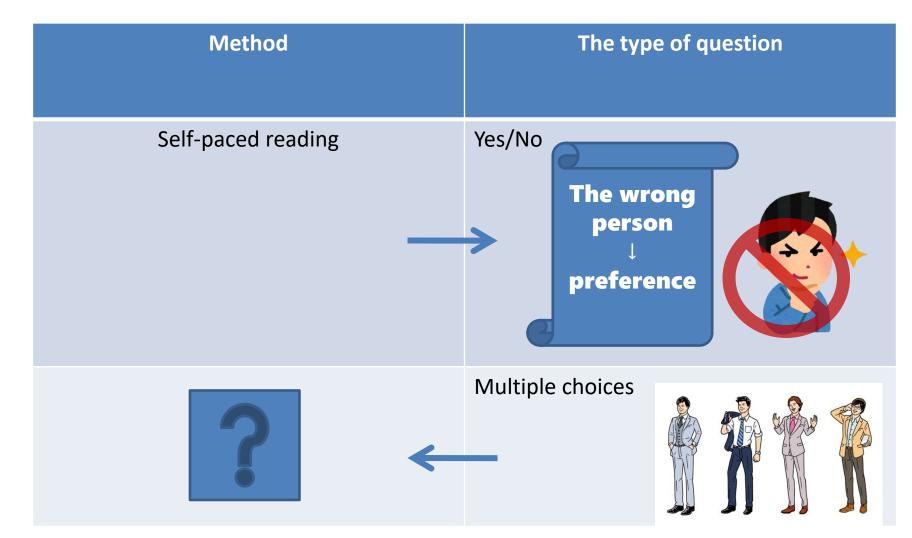
Self-paced reading

- "The experiment was very controversial."
 - (a) | The articles | that refuted kit | stimulated | the debate | in | the academic community.
 - (b) | The articles | that | it | refuted | stimulated | the debate | in | the academic community.

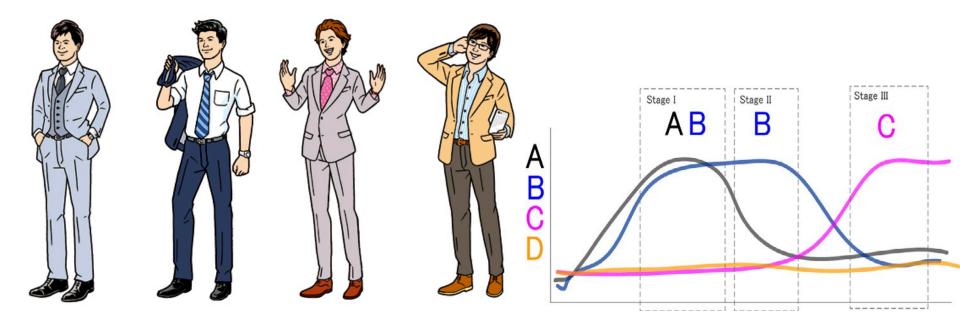


Heider, Dery & Roland (2014)

More reality?



Which guy is better for me?



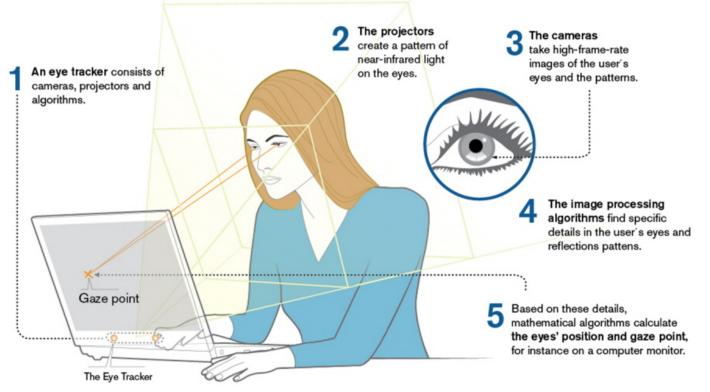
• ABCD \rightarrow (I) AB \rightarrow (II) B \rightarrow (III) C

-??(I) black hair \rightarrow (II) wax \rightarrow (III) perm

-??(I) white collar \rightarrow (II) younger \rightarrow (III) funny

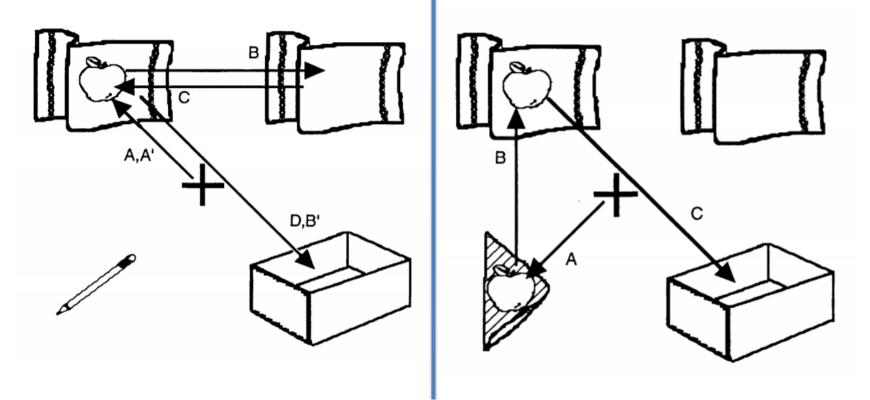
Eye-movement reflects prediction

 Spontaneously direct sight to elements which are most closely related to the meaning currently heard (Cooper, 1974)



Tanenhaus et al. (1995)

"Put the apple on the towel in the box"
Comparison between napkin and towel helps processing

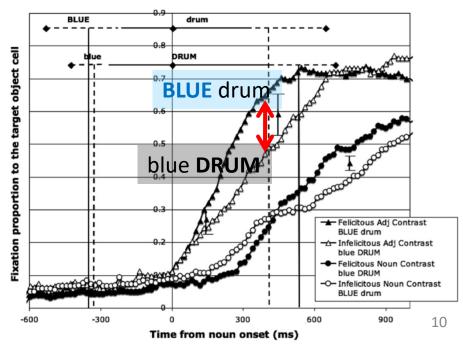


MORE EXAMPLES

Ito & Speer (2008)

- Contrastive pitch accent
- "Hang the green drum."
 - (a) "Now, hang the **BLUE** drum"
 - (b) "Now, hang the blue DRUM"

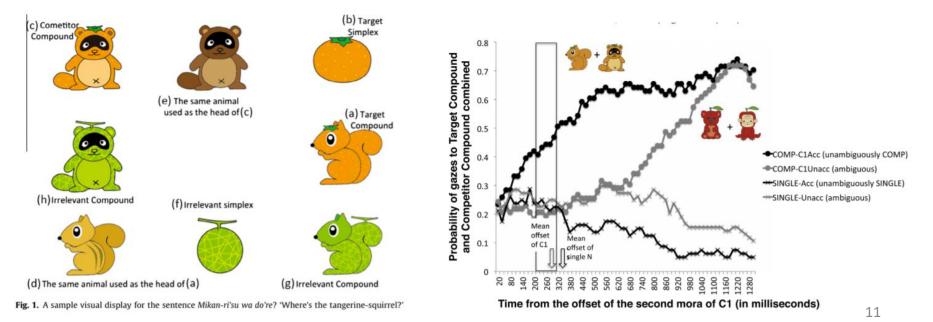




Hirose & Mazuka (2015)

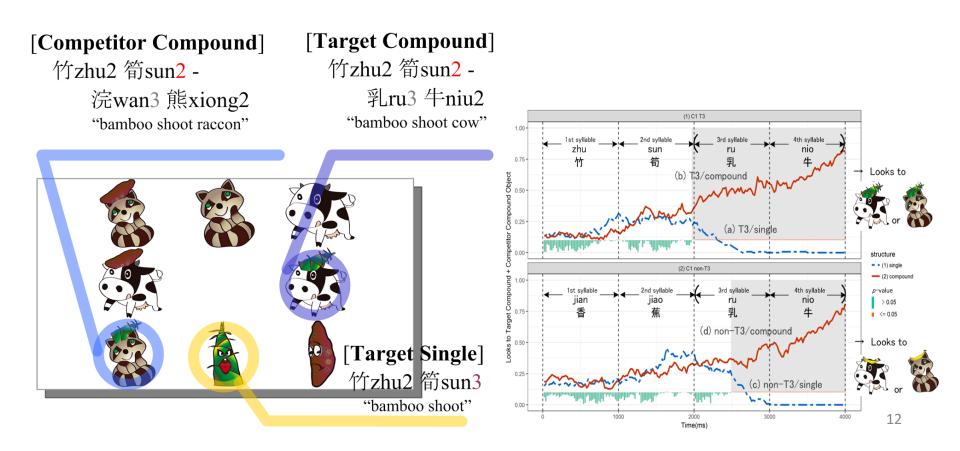
- Compound Accent Rule in Tokyo Japanese
- Single: Mikan "orange"
- Compound: Mikan-risu "orange-squirrel"
- "Mikan...." \rightarrow more looks on compound nouns

(before head "-risu" is encountered)



Chen et al. (2016)

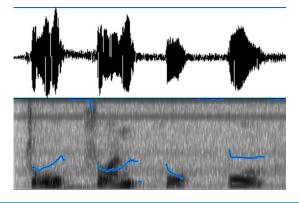
- Tone 3 Sandhi in Mandarin Chinese
- T3 + T3 \rightarrow T2 + T3



CONDUCT A VWP EXPERIMENT

What should you prepare?

Sound files (e.g. 4 conditions)



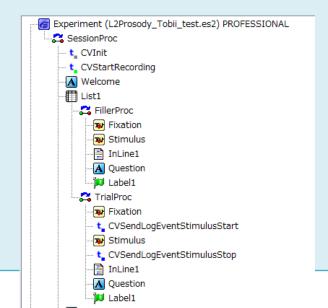
Visual displays (e.g. > 4 divisions is OK)



Item list

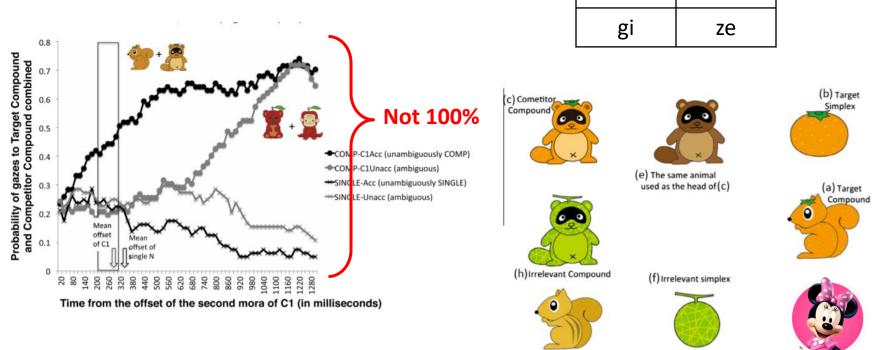
	A	В	С	D	E	F	G	н	I	J	K	L	М
1	List1												
2	Random	Weight	Nested	Procedure	ListNo	TrailNo	ItemNoA	ItemNoB	Condition	Picture	Sound	AOI1	AOI2
3	1	1		FillerProc	1	1	7	31	filler	Pn007f	An6	filler	filler
4	1	1		TrialProc	1	2	10	34	n3	Pn010	Pn1As3	TargetSim	Irrelevant(
5	2	1		TrialProc	1	3	3	3	33	Ps003	Ps5As5	Competito	IrrelevantS
6	2	1		FillerProc	1	4	20	20	filler	Ps020f	An2	filler	filler
7	3	1		TrialProc	1	5	21	21	3x	Ps021	Ps5	Irrelevant	TargetCor
8	4	1		TrialProc	1	6	8	32	nx	Pn008	Pn3	Irrelevant	Irrelevant(
9	3	1		FillerProc	1	7	3	27	filler	Pn003f	An6	filler	filler
10	5	1		TrialProc	1	8	23	23	33	Ps023	Ps4As5	TargetCor	SingleHea
11	6	1		TrialProc	1	9	2	26	n3	Pn002	Pn4As4	Irrelevant	TargetSim
12	4	1		FillerProc	1	10	16	16	filler	Ps016f	An3	filler	filler
13	7	1		TrialProc	1	11	4	28	nx	Pn004	Pn4	Irrelevant	Irrelevant(
14	8	1		TrialProc	1	12	22	46	n3	Pn022	Pn3As3	TargetSim	Irrelevant(
15	5	1		FillerProc	1	13	24	24	filler	Ps024f	An6	filler	filler
16	9	1		TrialProc	1	14	17	17	3x	Ps017	Ps4	Irrelevant	TargetSim
17	10	1		TrialProc	1	15	14	38	n3	Pn014	Pn2As4	Irrelevant	TargetCor
18	6	1		FillerProc	1	16	19	43	filler	Pn019f	An6	filler	filler
19	11	1		TrialProc	1	17	11	11	33	Ps011	Ps6As2	Irrelevant	Competito
20	12	1		TrialProc	1	18	5	5	3x	Ps005	Ps6	TargetCor	Irrelevant(
21	7	1		FillerProc	1	19	11	35	filler	Pn011f	An1	filler	filler
22	13	1		TrialProc	1	20	7	7	33	Ps007	Ps1As2	Competito	Irrelevant(
23	14	1		TrialProc	1	21	15	15	33	Ps015	Ps5As1	filler	SingleHea
24	8	1		FillerProc	1	22			filler	Ps008f	An4	filler	filler
				- · · -			-	-	•			· ···	~~~

Programming (e.g. Eprime, PsychoPy)



Some Notices

- Analysis according auditory conditions
- Fillers in visual display



(d) The same animal used as the head of (a)

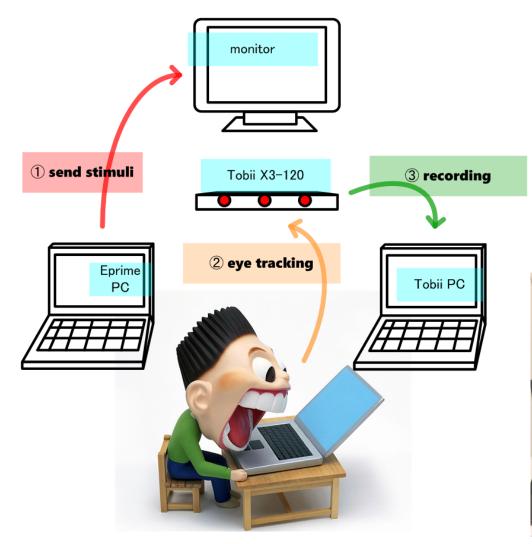
Fig. 1. A sample visual display for the sentence Mikan-ri'su wa do're? 'Where's the tangerine-squirrel?'

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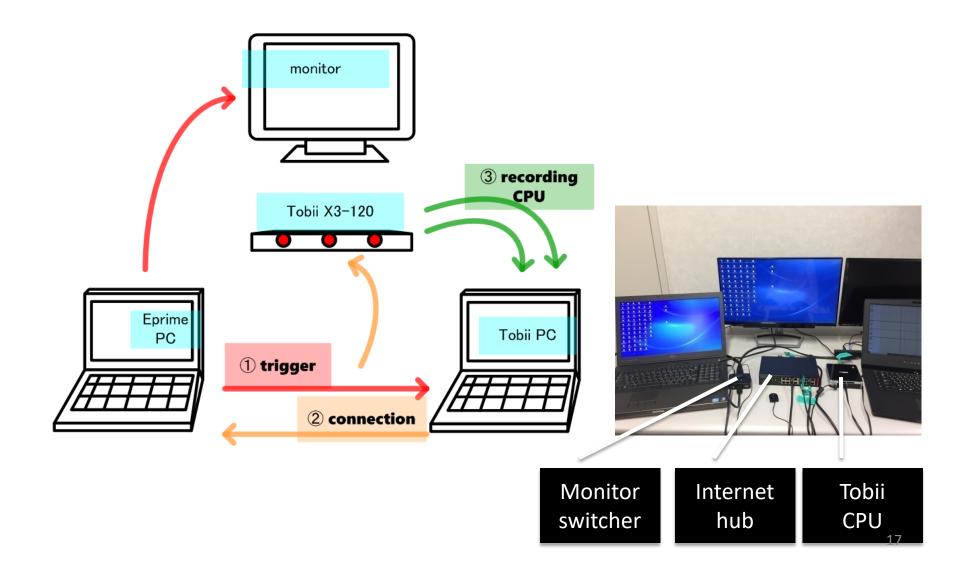
(g) Irrelevant Compound

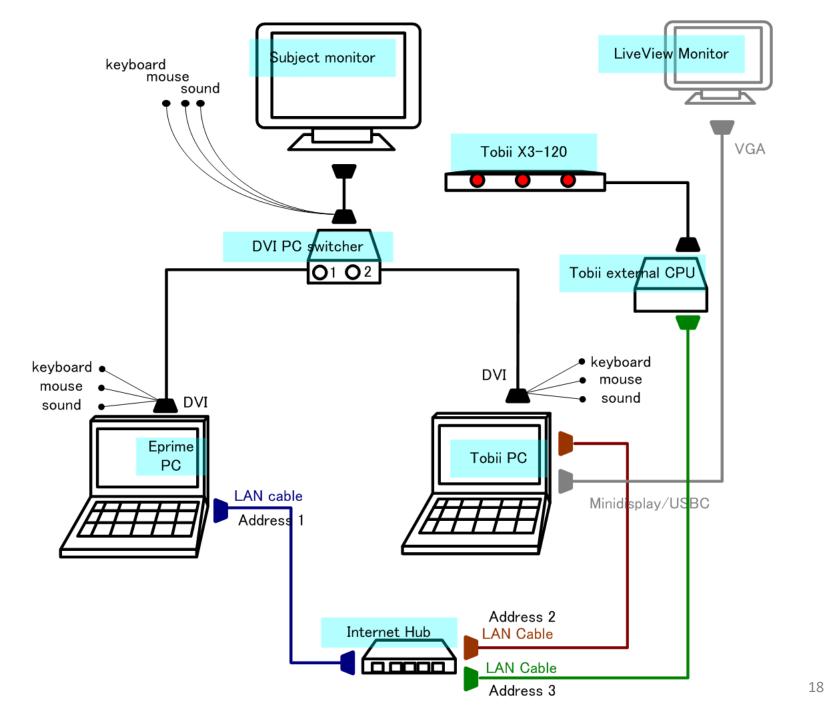
Basic framework

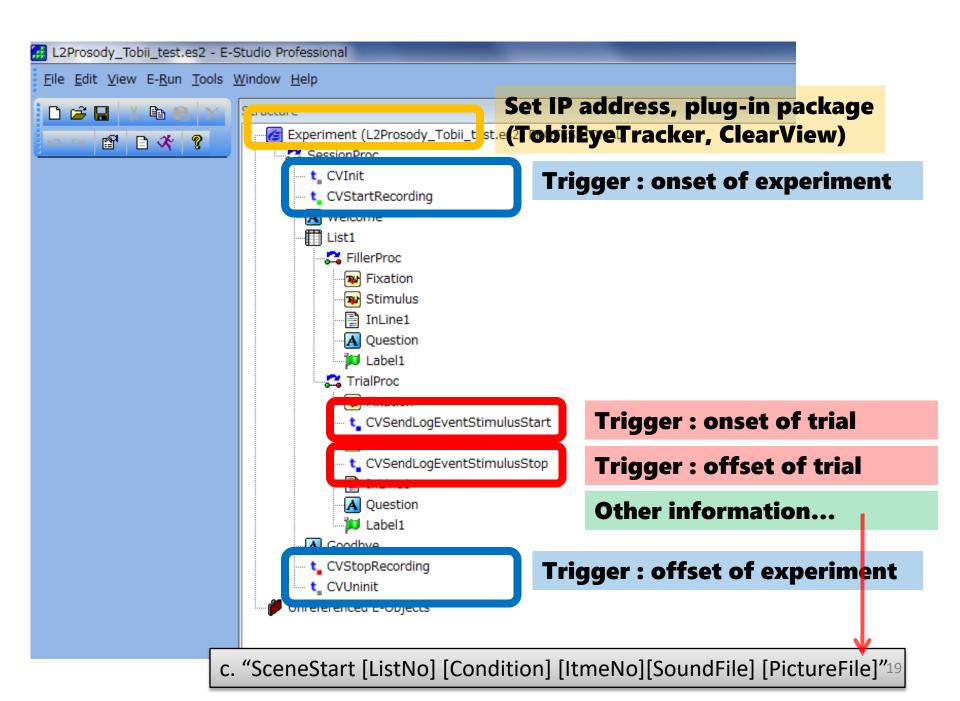




Sub equipments

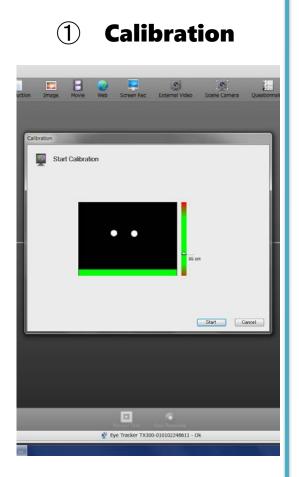




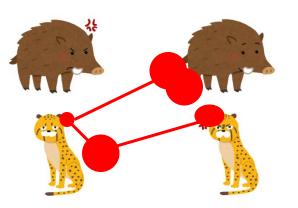


EXPERIMENT DEMO

VWP procedure



2 Recording



English: Chie Nakamura Japanese: Takashi Kishiyama Chinese: Tzu-Yin Chen

3 Data output

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Reference

- Heider, Paul M., Jeruen E. Dery, Douglas Roland (2014). The processing of it object relative clauses: Evidence against a finegrained frequency account_o Journal of Memory and Language. 75, 58-76.
- Coorper, Roger M. (1974). The Control of Eye Fixation by the Meaning of Spoken Language: A New Methodology for the Real-Time Investigation of Speech Perception, Memory, and Language Processing. Cognitive Psychology, 6, 84-107.
- Ito, Kiwako, Shari R. Speer. (2007). Aniticipatory effects of intonation: Eye movements during instructued visual search. Journal of Memory and Language, 58, 541-573.
- Hirose, Yuki, Reiko Mazuka. (2015). Predictive processing of novel compounds: Evidence from Japanese. Cognition, 136, 350-358.
- Chen, T.-Y., Hirose, Y., & Ito, T. (2016). Mandarin Chinese Tone 3 Sandhi as a prosodic cue in the lexical processing. *AMLAP*.