

Language

- ❖ Phonology
- ❖ Morphology
- ❖ Grammar (syntax)
- ❖ Semantics
- ❖ Discourse

Phonology

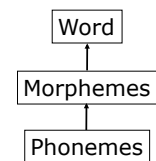
- ❖ How we assemble basic sounds into words
- ❖ Phoneme = smallest unit of sound
- ❖ Languages differ in use of phonemes

Perceiving phonemes

- ❖ Sensitivity to phonemes
- ❖ Infants must be exposed early
 - ❖ Child-directed speech may help

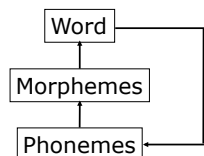
Bottom-up processing

- ❖ Start with phonemes, work up to words



Top-down processing

- ❖ Use higher-level knowledge to interpret phonemes

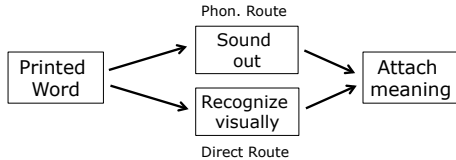


Top-down processing

- ❖ Context is important
 - ❖ Phonemic restoration effect (Warren, 1970)
 - ❖ The *eel was on the _____.
 - ❖ axle
 - ❖ shoe
 - ❖ orange
 - ❖ table
 - ❖ Word superiority effect
 - ❖ Recognizing a letter is easier when the letter is in a word

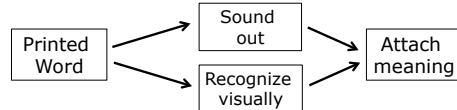
Mental processing in reading

- ❖ Translate words to representation of meaning
- ❖ **Dual-route model**
 - ❖ Phonological route (non-lexical)
 - ❖ Direct route (lexical)



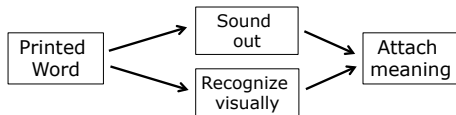
Evidence for the two routes

- ❖ **Surface dyslexia**
 - ❖ Disruption of direct/lexical route
 - ❖ Must sound things out



Evidence for the two routes

- ❖ **Phonological dyslexia**
 - ❖ Disruption of phonological/non-lexical route
 - ❖ Must use direct/lexical route



Evidence for the two routes

- ❖ Two Japanese languages
- ❖ Kana vs. Kanji

The Basic Hiragana											
	A	あ	い	う	え	お	か	き	く	け	こ
K	ka	か	ki	ku	ke	ko	ki	ki	ku	ke	ko
S	sa	さ	shi	し	su	so	shi	shi	shu	she	so
T	ta	た	chi	ち	tsu	to	chi	chi	chu	che	to
N	na	な	ni	に	nu	no	ni	ni	nu	ne	no
H	ha	は	bi	ひ	bu	ho	bi	bi	bu	be	ho
M	ma	ま	mi	み	mu	mo	mi	mi	mu	me	mo
Y	ya	や	yu	ゆ	yo	yo	yu	yu	yu	ye	yo
R	ra	ら	ri	り	ru	ro	ri	ri	ru	re	ro
W	wa	わ	we	を	wo	wo	we	we	wo	wa	wo
	in	ん									

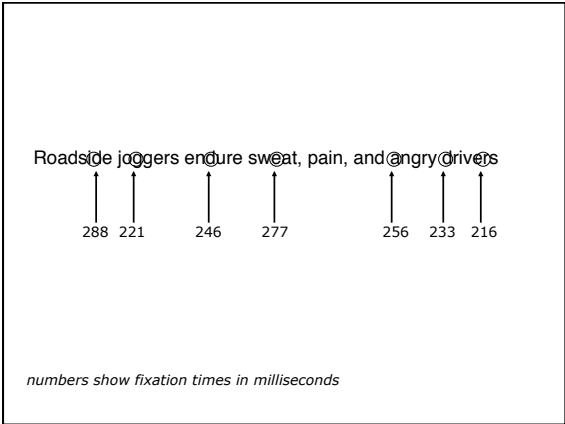
The Basic Katakana											
	A	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ
K	ka	カ	ki	キ	ku	ク	ke	ケ	ko	コ	ko
S	sa	サ	shi	シ	su	ス	shi	シ	shu	she	so
T	ta	タ	chi	チ	tsu	ト	chi	チ	chu	che	to
N	na	ナ	ni	ニ	nu	ノ	ni	ニ	nu	ne	no
H	ha	ハ	bi	ヒ	bu	ホ	bi	ヒ	bu	be	ho
M	ma	マ	mi	ミ	mu	モ	mi	ミ	mu	me	mo
Y	ya	ヤ	yu	ユ	yo	ヨ	yu	ユ	yu	ye	yo
R	ra	ラ	ri	リ	ru	ロ	ri	リ	ru	re	ro
W	wa	ワ	we	を	wo	を	we	を	wo	wa	wo
	in	ン									

The vowels are pronounced approximately as in "Father-eelie-ammitt-iggle Ollie".
 L is spoken with the lips less tightly closed than in English.
 R is pronounced with a bit of a trill and somewhat resembling English L.

Grade 2 Kanji									
毎	内	長	星	社	谷	元	活	引	
妹	南	鳥	晴	弱	国	言	間	羽	
万	肉	朝	切	首	黒	原	丸	雲	
明	馬	直	雪	秋	今	戸	岩	園	
鳴	売	通	船	週	才	古	顔	遠	
毛	買	弟	線	春	細	午	汽	何	
門	麦	店	前	書	作	後	記	科	
夜	半	点	組	少	算	語	掃	夏	
野	番	電	走	場	止	工	弓	家	
友	父	刀	多	色	市	公	牛	歌	
用	風	冬	太	食	矢	広	魚	画	
囉	分	当	体	心	姉	交	京	回	
来	聞	東	台	新	思	光	強	会	
里	米	答	地	親	紙	考	教	海	
理	步	頭	池	園	寺	行	近	兄	
話	母	同	知	数	自	高	兄	絵	
	方	道	茶	西	時	黄	形	外	
	北	読	昼	声	室	合	計	案	

Eye movements in reading

- ❖ **Fixations**
 - ❖ Eyes "fixed" at a certain location
- ❖ **Saccades**
 - ❖ Eyes jump to a new location



- ## Typical findings
- ❖ Spaces
 - ❖ Jump past certain words
 - ❖ Unusual words
 - ❖ Surprise endings
 - ❖ Good readers vs. poor readers

- ## How much can we process?
- ❖ **Perceptual span:** how much information you can take in in a glance
 - ❖ Measured using moving window technique

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure boredom, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and angry drivers

How much can we process?

Roadside joggers endure sweat, pain, and bad weather

How much can we process?

- ❖ If reading slows down, material inside perceptual span
- ❖ If reading speed stays the same, material outside perceptual span

How much can we process?

- ❖ Size of the span
- ❖ Lopsided shape makes sense