Final exam

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LING 20: Introduction to Linguistic Analysis
Due: 23:59, 19 March 2021

Please double-check that you upload your entire exam! Read the instructions carefully, and answer all questions legibly. At the end of the exam, you will find the IPA chart, the list of morphological rules, and the list of phrase-structure rules.

1 *9 points*

Using the IPA, please transcribe the following words as they are pronounced in the audio file **"final-audio.m4a"**. You must use the IPA transcription system for English that we developed in class.

a) UCLA

b) Royce

c) Kerckhoff

2 *6 points*

[pliz ʃo͡w ha͡w ðə sılæbıfıke͡jʃən ælgəɹıðəm sılæbıfa͡jz ðə fɑlo͡wıŋ wɛɹdz juzıŋ ðə tʃɹi no͡wte͡jʃən]

a) [tʃɑklıt]

b) [pıstæʃio͡w]

3 *12 points*

Compare the **oral stops** and **fricatives** in the following data from Middle High Narnian. Their distribution is conditioned by a single phonotactic constraint and a single rule. **Pay careful attention to the syllable boundaries!**

[ti]	'wardrobe'	[ti.ʔy]	'wardrobes'
[daks]	'lamppost'	[dax.ty]	'lampposts'
[mo.ro.tɑs]	'tree'	[mo.ro.tɑ.tu]	'trees'
[dem.mæx]	'lion'	[dem.mæ.ky]	'lions'
[jyh]	'Turkish delight'	[jy.ʔy]	'Turkish delight (PL)'
[ʔɛl.lag̠ j̠]	'faun'	[ʔɛl.laɣ.ɟy]	'fauns'
[duz.cɑç]	'witch'	[duz.cɑ.cu]	'witches'

a) State a generalization about when oral stops and fricatives appear, respectively.

b) What are the phonemes?

c) State a phonotactic constraint that prohibits the underlying forms in the right environments. Write this constraint using IPA symbols.

d) Now state this constraint using articulatory features instead of IPA symbols. The constraint must be a single statement ("It is not possible to have ...") and must not involve disjunction ("X *or* Y").

e) Based on this constraint, provide a rule that changes the underlying forms in the right environments. Use IPA symbols in this rule.

f) Now formulate this rule using features instead of IPA symbols.

4 *5 points*

As we discovered in class, not all sequences of English sounds are possible English onsets. Out of the following onsets, only the ones in the column on the left are allowed in English. The ones in the column on the right do not conform to the phonotactic constraints of English.

possible onsets	*impossible onsets*
[dɹ]	*[pm]
[pɹ]	*[dn]
[kl]	*[bn]
[pl]	*[nd]
[gl]	*[pd]
[gɹ]	*[kt]
[st]	*[mn]
[sp]	*[kt]
	*[tk]
	*[db]

State a single phonotactic constraint on English onsets that prohibits all of the impossible onsets but still allows the possible ones. This constraint should not involve disjunction ("X *or* Y"). You will need to use articulatory features to write the constraint.

5 *6 points*

Let us consider two phonological rules from Orcish. The first rule changes front vowels to back vowels when they precede velars:

(1) **Rule 1:**
Change / +front / to [+back, –front] if it precedes [+velar].

(2) *Examples of rule 1:*
/ vagɾ͡ɔʃ / → [vɑgɾ͡ɔʃ] 'chain mail'
/ minyŋ / → [minuŋ] 'blood'

The second rule voices the sound following a velar:

(3) **Rule 2:**
Change / –voice / to [+voice] if it follows [+velar].

(4) *Examples of rule 2:*
/ ŋʌlkpu / → [ŋʌlkbu] ‘king’
/ alŋfɪf / → [alŋvɪf] ‘body’

Against this background, the underlying form / ŋøghuʒ / becomes [ŋogɦuʒ] in Orcish. [ŋogɦuʒ] is the only possible surface form of this word.

a) Based on the underlying form / ŋøghuʒ /, what is the result that is produced if Rule 1 applies first, followed by Rule 2? Show the output of each rule.

Underlying form:	/ ŋøghuʒ /
Rule 1:	
Rule 2:	
Output:	

b) What happens if the two rules apply in the opposite order? Again, show the output of each rule.

Underlying form:	/ ŋøghuʒ /
Rule 2:	
Rule 1:	
Output:	

c) What is the relationship between the rules (no interaction, feeding or bleeding)? Briefly explain why (1–2 sentences).

6 *10 points*

Based on our set of morphological rules, please give the morphological structure(s) of the following words. If the morphological rules produce multiple structures, give all of them. **Give all the grammatical-category labels that we can identify.** Write the morphemes in IPA.

a) unsoften

b) rereadable

c) actionlessness

7 *4 points*

Please answer the following two questions.

a) What is the minimum number of words that our phrase-structure rules allow a sentence to have?

b) What is the maximum number of words that our phrase-structure rules allow a sentence to have?

8 *10 points*

The sentence in (5) is **ambiguous**. It has **two** possible tree structures. Using our phrase-structure rules plus the additional rule in (6), please draw these two trees and briefly explain how they differ in meaning.

(5) Alex ordered a pizza or a taco and a drink.

(6) $\alpha \longrightarrow \alpha$ *or* α

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9 *12 points*

The sentence in (7) involves **movement** and is **ambiguous**. It has **two** possible tree structures. Using our phrase-structure rules, please draw these two trees and briefly explain how they differ in meaning. For both trees, please indicate how movement transforms the tree (i.e. using an arrow).

(7) Jon knew what the big orange cat ate on Monday.

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10 *6 points*

The set of phrase-structure rules that we developed in class cannot produce the following sentences:

(8) a. Alex smells bad.

b. Sam looks happy.

a) What we find in (8) is that a VP can be made up of a verb and an adjective. We need to add a rule to our set of phrase-structure rules that will allow a VP of this sort. As a first approximation, please write the rule that produces VPs like the ones in (8).

RULE: _____

b) When we look more closely, though, things are a bit more tricky. The adjective that we find in these VPs can come along with some PPs. For instance, we find sentences like (9).

(9) Sam looks happy [$_{PP}$ with the homework].

The adjective and the PP that follows it form a constituent. Let us call this constituent an Adjective Phrase (AP). In (9), the AP is *happy with the homework*. The rule that you gave above will not allow for such an AP, so we need something else. Please provide **two rules** that replace your earlier one: one that states where APs can appear, and one that describes the internal structure of APs.

RULE 1: _____

RULE 2: _____

Make sure that these two rules allow for all the sentences we have seen so far!

c) Now consider the sentences in (10).

(10) a. Sam became [$_{AP}$ angry at the teacher about the homework].

b. Sam became [$_{AP}$ angry at the teacher in class about the homework].

c. Sam became [$_{AP}$ angry before class at the teacher in the hallway about the homework].

d. Sam became [$_{AP}$ angry before class at the teacher in the hallway about the homework for no reason].

In each of these sentences, the PPs modify an AP that contains *angry*. That is, each of the PPs tells you something about *angry*. In (10a), for example, Sam is angry at the teacher, and she is angry about the homework. In other words, *about the homework* has to modify *angry at the teacher*. The same holds for the other sentences. The PPs are all inside the AP, then.

To account for these sentences, you will need two rules that tell you about the internal structure of APs. (*Hint:* We saw a similar problem for VPs in class. Model your answer after our solution for VPs.)

RULE 1: _____

RULE 2: _____

11 *8 points*

The following sentence is not a possible sentence of English because it violates an island constraint.

(11) *Ethan revealed which show Valentina believed that the news about ___ had shocked Adam and Beth.

Why is this sentence impossible? To answer this question, please complete the following tasks: provide the tree structure for (11), indicate the movement with an arrow, circle the part of the structure that prohibits this movement, and name the relevant constraint.

Note: There is an ambiguity in this sentence due to coordinating proper names, which could be conjoined at NP, $\overline{\text{N}}$, or N. We will accept all three!

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12 *11 points*

The sentences in (12) are from a dialect of Elvish spoken in Braavos. The word order differs markedly from English.

(12) a. ngye stri di ajut hote.
tired woman the sleeping is
'The tired woman is sleeping.'

b. kalay di katemu hcarr hpyi.
children the cake eating are
'The children are eating cake.'

c. kalay di nout di aain mmar kahcarr.
children the house the behind games played
'The children played games behind the house.'

d. yaarp htote di hang ngye di kyaung di tirih.
blue hat the with woman the cat the petted
'The woman with the blue hat petted the cat.'

Please develop a complete set of phrase-structure rules that produces these sentences. Your phrase-structure rules should be as similar as possible to the ones we have for English.

13 *10 points*

Consider the following sentence:

(13) Alex may leave.

The sentence in (13) seems to lead to the inference that "it is not the case that Alex has to leave". That is, *may* seems to imply *not have to*.

a) Please show that this inference is an **implicature** by using *both* of the diagnostics for implicatures: Cancellability and Reinforceability.

b) Please give a step-by-step walk-through of the Gricean reasoning that gives rise to the inference in (13).

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2020)

CONSONANTS (PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
ʘ Bilabial	ɓ Bilabial	’ Examples:
| Dental	ɗ Dental/alveolar	pʼ Bilabial
! (Post)alveolar	ʄ Palatal	tʼ Dental/alveolar
ǂ Palatoalveolar	ɠ Velar	kʼ Velar
‖ Alveolar lateral	ʛ Uvular	sʼ Alveolar fricative

OTHER SYMBOLS

ʍ Voiceless labial-velar fricative

w Voiced labial-velar approximant

ɥ Voiced labial-palatal approximant

ʜ Voiceless epiglottal fricative

ʢ Voiced epiglottal fricative

ʡ Epiglottal plosive

ɕ ʑ Alveolo-palatal fricatives

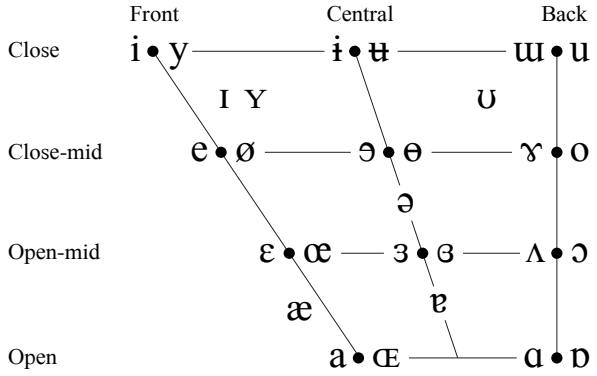
ɺ Voiced alveolar lateral flap

ʩ Simultaneous ʃ and x

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.

t͡s k͡p

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

SUPRASEGMENTALS

ˈ Primary stress ˌfoʊnəˈtɪʃən

ˌ Secondary stress

ː Long eː

ˑ Half-long eˑ

˘ Extra-short ĕ

| Minor (foot) group

‖ Major (intonation) group

. Syllable break ɹi.ækt

‿ Linking (absence of a break)

TONES AND WORD ACCENTS

LEVEL		CONTOUR	
é or ˥	Extra high	ě or ˩˥	Rising
é ˦	High	ê ˥˩	Falling
ē ˧	Mid	ě ˨˩˦	High rising
è ˩	Low	ě ˩˦	Low rising
ȅ ˩˩	Extra low	ȇ ˦˩	Rising-falling
↓	Downstep	↗	Global rise
↑	Upstep	↘	Global fall

DIACRITICS

◌̥	Voiceless	n̥ d̥	◌̤	Breathy voiced	b̤ a̤	◌̪	Dental	t̪ d̪
◌̬	Voiced	s̬ t̬	◌̰	Creaky voiced	b̰ a̰	◌̺	Apical	t̺ d̺
◌ʰ	Aspirated	tʰ dʰ	◌̼	Linguolabial	t̼ d̼	◌̻	Laminal	t̻ d̻
◌̹	More rounded	ɔ̹	◌ʷ	Labialized	tʷ dʷ	◌̃	Nasalized	ẽ
◌̜	Less rounded	ɔ̜	◌ʲ	Palatalized	tʲ dʲ	◌ⁿ	Nasal release	dⁿ
◌̟	Advanced	u̟	◌ˠ	Velarized	tˠ dˠ	◌ˡ	Lateral release	dˡ
◌̠	Retracted	e̠	◌ˤ	Pharyngealized	tˤ dˤ	◌̚	No audible release	d̚
◌̈	Centralized	ë	◌̴	Velarized or pharyngealized	ɫ			
◌̽	Mid-centralized	e̽	◌̝	Raised	e̝ (ɪ̝ = voiced alveolar fricative)			
◌̩	Syllabic	n̩	◌̞	Lowered	e̞ (β̞ = voiced bilabial approximant)			
◌̯	Non-syllabic	e̯	◌̘	Advanced Tongue Root	e̘			
◌˞	Rhoticity	ɚ a˞	◌̙	Retracted Tongue Root	e̙			

Some diacritics may be placed above a symbol with a descender, e.g. n̊ŋ̊

Morphological rules:

V + /ɪɹ/ = N
V + /mɛnt/ = N
V + /əbl̩/ = A
A + /nɛs/ = N
N + /lɛs/ = A
/dɪs/ + V = V
V + /d/ = V
A + /ən/ = V
/ɹi/ + V = V
/ʌn/ + A = A
/ʌn/ + V = V
N + /fʊl/ = A
N + /z/ = N

Phrase-structure rules:

NP ⟶ (D) $\overline{\text{N}}$ (CP)
$\overline{\text{N}}$ ⟶ A $\overline{\text{N}}$
$\overline{\text{N}}$ ⟶ $\overline{\text{N}}$ PP
$\overline{\text{N}}$ ⟶ N
S ⟶ NP VP
S ⟶ CP VP
CP ⟶ C S
PP ⟶ P NP
α ⟶ α *and* α
VP ⟶ VP PP
VP ⟶ V (NP) (CP)
VP ⟶ Aux VP
VP ⟶ Adv VP
VP ⟶ VP Adv