

Morphology II

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Week 5

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LING 20001: Introduction to Linguistics

Inflection vs. derivation

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Same category
Reflects feature of context
Different forms of 'same word'

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'New words'

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- Today, we will focus on **inflection**...

- Inflectional morphemes typically reflect certain features of its context:

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Person features	Number features	Gender features
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- This list is not exhaustive, of course...
- Languages also vary with regard to the exact features they realize.

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- We refer to this mismatch between form and meaning as **syncretism**.

Syncretism

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- This is referred to as **underspecification**

Syncretism

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	singular	plural
1st person	<i>na</i>	<i>no</i>
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- What would the realization rules look like?
- Again, we could write six rules (one for each combination)

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2nd person, singular	→	<i>ene</i>
2nd person, plural	→	<i>ene</i>
3rd person, singular	→	<i>ye</i>
3rd person, plural	→	<i>ye</i>

- What would the realization rules look like?
- Again, we could write six rules (one for each combination)
- What syncretisms do we have?

- What about the pronouns in Kuman?

	singular	plural
1st person	<i>na</i>	<i>no</i>
2nd person	<i>ene</i>	<i>ene</i>
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Decomposition

Now consider this data from Gothic:

<i>nima</i>	'I take'	<i>nimōs</i>	'we two take'	<i>nimam</i>	'we take'
<i>nimand</i>	'you (sg.) take'	<i>nimand</i>	'you two take'	<i>nimip</i>	'you (pl.) take'

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1st person	<i>-a</i>	<i>-ōs</i>	<i>-am</i>
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- What is the stem?
- Now we can put the affixes in a paradigm
- Do you notice any syncretism?
- What is the challenge here for a single realization rule?

Decomposition

	singular	dual	plural
1st person	<i>-a</i>	<i>-ōs</i>	<i>-am</i>
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- We can't get the distribution of *-and* with a single number feature

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1st person, dual	→	<i>-ōs</i>
1st person, plural	→	<i>-am</i>
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- Let us assume that each number involves two sub-features with binary values (\pm singular, \pm plural)

Decomposition

	singular [+singular, -plural]	dual	plural
1st person	<i>-a</i>	<i>-ōs</i>	<i>-am</i>
2nd person	<i>-ip</i>	<i>-and</i>	<i>-and</i>

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1st person	-a	-ōs	-am
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1st person, +singular	→	-a
1st person, -singular, -plural	→	-ōs
1st person, +plural	→	-am
2nd person, +singular	→	-ip
2nd person, - singular	→	-and

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Elsewhere

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	singular [+sing, -pl]	plural [-sing, +pl]
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3rd person	<i>is</i>	<i>are</i>

	singular [+sing, -pl]	plural [-sing, +pl]
1st person	<i>talk-∅</i>	<i>talk-∅</i>
2nd person	<i>talk-∅</i>	<i>talk-∅</i>
3rd person	<i>talk-s</i>	<i>talk-∅</i>

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1st person	<i>am</i>	<i>are</i>	1st person	<i>talk-∅</i>	<i>talk-∅</i>
2nd person	<i>are</i>	<i>are</i>	2nd person	<i>talk-∅</i>	<i>talk-∅</i>
3rd person	<i>is</i>	<i>are</i>	3rd person	<i>talk-s</i>	<i>talk-∅</i>

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2nd person	<i>are</i>	<i>are</i>	2nd person	<i>talk-∅</i>	<i>talk-∅</i>
3rd person	<i>is</i>	<i>are</i>	3rd person	<i>talk-s</i>	<i>talk-∅</i>

- Can we capture the distribution of *are* and *-s* with a single rule?
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1st person, +singular → *am*
 3rd person, +singular → *is*
 elsewhere → *are*

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elsewhere → *are*

3rd person, +singular → *-s*

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- Can we capture the distribution of *are* and *-s* with a single rule?
- We can if we make one of them an **elsewhere** form.
- Elsewhere forms have a **negative distribution** (they show up wherever another morpheme does not)

Doing morphology: Icelandic

Consider the following data from Icelandic:

<i>hestur</i>	'horse' (nom. masc.)	<i>mynd</i>	'picture' (nom. fem.)	<i>borð</i>	'table' (nom. neut.)
<i>hest</i>	'horse' (acc. masc.)	<i>mynd</i>	'picture' (acc. fem.)	<i>borð</i>	'table' (acc. neut.)
<i>hesti</i>	'horse' (dat. masc.)	<i>mynd</i>	'picture' (dat. fem.)	<i>borði</i>	'table' (dat. neut.)
<i>hests</i>	'horse' (gen. masc.)	<i>myndar</i>	'picture' (gen. fem.)	<i>borðs</i>	'table' (gen. neut.)

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- These all involve nouns that differ in **gender** (masculine, feminine, neuter) and **case** (nominative, accusative, dative, genitive).

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<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd</i>	'picture' (dat. fem.)	<i>borði</i>	'table' (dat. neut.)
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<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

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<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

- These all involve nouns that differ in **gender** (masculine, feminine, neuter) and **case** (nominative, accusative, dative, genitive).
- First step: identify the affixes
- How many affixes can we find in the first column (*hestur*, etc.)?
- Next step: Arrange the words into a paradigm.

Doing morphology: Icelandic

<i>hest-ur</i>	'horse' (nom. masc.)	<i>mynd-Ø</i>	'picture' (nom. fem.)	<i>borð-Ø</i>	'table' (nom. neut.)
<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

	Masculine	Feminine	Neuter
Nominative			
Accusative			
Dative			
Genitive			

Doing morphology: Icelandic

<i>hest-ur</i>	'horse' (nom. masc.)	<i>mynd-Ø</i>	'picture' (nom. fem.)	<i>borð-Ø</i>	'table' (nom. neut.)
<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

	Masculine	Feminine	Neuter
Nominative			
Accusative			
Dative			
Genitive			

- Let's enter the forms into the paradigm.

Doing morphology: Icelandic

<i>hest-ur</i>	'horse' (nom. masc.)	<i>mynd-Ø</i>	'picture' (nom. fem.)	<i>borð-Ø</i>	'table' (nom. neut.)
<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

	Masculine	Feminine	Neuter
Nominative	<i>hest-ur</i>	<i>mynd-Ø</i>	<i>borð-Ø</i>
Accusative	<i>hest-Ø</i>	<i>mynd-Ø</i>	<i>borð-Ø</i>
Dative	<i>hest-i</i>	<i>mynd-Ø</i>	<i>borð-i</i>
Genitive	<i>hest-s</i>	<i>mynd-ar</i>	<i>borð-s</i>

- Let's enter the forms into the paradigm.

Doing morphology: Icelandic

<i>hest-ur</i>	'horse' (nom. masc.)	<i>mynd-Ø</i>	'picture' (nom. fem.)	<i>borð-Ø</i>	'table' (nom. neut.)
<i>hest-Ø</i>	'horse' (acc. masc.)	<i>mynd-Ø</i>	'picture' (acc. fem.)	<i>borð-Ø</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-Ø</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

	Masculine	Feminine	Neuter
Nominative	<i>hest-ur</i>	<i>mynd-Ø</i>	<i>borð-Ø</i>
Accusative	<i>hest-Ø</i>	<i>mynd-Ø</i>	<i>borð-Ø</i>
Dative	<i>hest-i</i>	<i>mynd-Ø</i>	<i>borð-i</i>
Genitive	<i>hest-s</i>	<i>mynd-ar</i>	<i>borð-s</i>

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...

Doing morphology: Icelandic

<i>hest-ur</i>	'horse' (nom. masc.)	<i>mynd-∅</i>	'picture' (nom. fem.)	<i>borð-∅</i>	'table' (nom. neut.)
<i>hest-∅</i>	'horse' (acc. masc.)	<i>mynd-∅</i>	'picture' (acc. fem.)	<i>borð-∅</i>	'table' (acc. neut.)
<i>hest-i</i>	'horse' (dat. masc.)	<i>mynd-∅</i>	'picture' (dat. fem.)	<i>borð-i</i>	'table' (dat. neut.)
<i>hest-s</i>	'horse' (gen. masc.)	<i>mynd-ar</i>	'picture' (gen. fem.)	<i>borð-s</i>	'table' (gen. neut.)

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	<i>-∅</i>	<i>-∅</i>
Accusative	<i>-∅</i>	<i>-∅</i>	<i>-∅</i>
Dative	<i>-i</i>	<i>-∅</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	<i>-Ø</i>	<i>-Ø</i>
Accusative	<i>-Ø</i>	<i>-Ø</i>	<i>-Ø</i>
Dative	<i>-i</i>	<i>-Ø</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	<i>-Ø</i>	<i>-Ø</i>
Accusative	<i>-Ø</i>	<i>-Ø</i>	<i>-Ø</i>
Dative	<i>-i</i>	<i>-Ø</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...
- What are the realization rules for each affix?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	<i>-Ø</i>	<i>-Ø</i>
Accusative	<i>-Ø</i>	<i>-Ø</i>	<i>-Ø</i>
Dative	<i>-i</i>	<i>-Ø</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

→ *-ur*

→ *-ar*

→ *-i*

→ *-s*

→ *-Ø*

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...
- What are the realization rules for each affix?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	<i>-Ø</i>	<i>-Ø</i>
Accusative	<i>-Ø</i>	<i>-Ø</i>	<i>-Ø</i>
Dative	<i>-i</i>	<i>-Ø</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

→ *-ur*

→ *-ar*

→ *-i*

→ *-s*

→ *-Ø*

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...
- What are the realization rules for each affix?
- Note the syncretisms we find...

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

→ *-ur*

→ *-ar*

→ *-i*

→ *-s*

→ $-\emptyset$

- Let's enter the forms into the paradigm.
- But we only really care about the affixes...
- What are the realization rules for each affix?
- Note the syncretisms we find...

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

→ *-ur*

→ *-ar*

→ *-i*

→ *-s*

→ $-\emptyset$

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

→ *-ur*

→ *-ar*

→ *-i*

→ *-s*

→ $-\emptyset$

- What feature combination does *-ur* realize?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
→ *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
→ *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?
- We cannot capture its distribution with reference to a single feature

Doing morphology: Icelandic

	Masculine	Feminine	Neuter
Nominative	<i>-ur</i>	$-\emptyset$	$-\emptyset$
Accusative	$-\emptyset$	$-\emptyset$	$-\emptyset$
Dative	<i>-i</i>	$-\emptyset$	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ $-\emptyset$

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?
- We cannot capture its distribution with reference to a single feature
- Solution: We can decompose our gender categories into sub-features: $[\pm\text{masculine}]$ and $[\pm\text{feminine}]$

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine	Neuter
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
→ -i
→ -s
→ -∅

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?
- We cannot capture its distribution with reference to a single feature
- Solution: We can decompose our gender categories into sub-features: [±masculine] and [±feminine]

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
→ -i
→ -s
→ -∅

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?
- We cannot capture its distribution with reference to a single feature
- Solution: We can decompose our gender categories into sub-features: [±masculine] and [±feminine]

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
→ -i
→ -s
→ -∅

- What feature combination does *-ur* realize?
- What feature combination does *-ar* realize?
- What about *-i*?
- We cannot capture its distribution with reference to a single feature
- Solution: We can decompose our gender categories into sub-features: [±masculine] and [±feminine]

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	<i>-ur</i>	<i>-∅</i>	<i>-∅</i>
Accusative	<i>-∅</i>	<i>-∅</i>	<i>-∅</i>
Dative	<i>-i</i>	<i>-∅</i>	<i>-i</i>
Genitive	<i>-s</i>	<i>-ar</i>	<i>-s</i>

nominative, masculine → *-ur*
genitive, feminine → *-ar*
→ *-i*
→ *-s*
→ *-∅*

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
→ -i
→ -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
→ -i
→ -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, masculine → -ur
genitive, feminine → -ar
dative, -feminine → -i
→ -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, +masculine → -ur
genitive, +feminine → -ar
dative, -feminine → -i
→ -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, +masculine → -ur
genitive, +feminine → -ar
dative, -feminine → -i
→ -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?
- What feature combination does -s realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, +masculine → -ur
genitive, +feminine → -ar
dative, -feminine → -i
genitive, -feminine → -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?
- What feature combination does -s realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, +masculine → -ur
genitive, +feminine → -ar
dative, -feminine → -i
genitive, -feminine → -s
→ -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?
- What feature combination does -s realize?
- What feature combination does -∅ realize?

Doing morphology: Icelandic

	Masculine [+masc, -fem]	Feminine [-masc, +fem]	Neuter [-masc, -fem]
Nominative	-ur	-∅	-∅
Accusative	-∅	-∅	-∅
Dative	-i	-∅	-i
Genitive	-s	-ar	-s

nominative, +masculine → -ur
genitive, +feminine → -ar
dative, -feminine → -i
genitive, -feminine → -s
elsewhere → -∅

- Now we can use these sub-features to refer to masculine and neuter as a **natural class** (i.e. a context that can be referred to with a single feature, -feminine).
- What feature combination does -i realize?
- What feature combination does -s realize?
- What feature combination does -∅ realize?

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

	'who'	'what'
nom	<i>kto</i>	<i>co</i>
acc	<i>kogo</i>	<i>co</i>
gen	<i>kogo</i>	<i>czego</i>

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

	'who'	'what'
nom	<i>kto</i>	<i>co</i>
acc	<i>kogo</i>	<i>co</i>
gen	<i>kogo</i>	<i>czego</i>

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

	'who'	'what'
nom	<i>kto</i>	<i>co</i>
acc	<i>kogo</i>	<i>co</i>
gen	<i>kogo</i>	<i>czego</i>

What features are involved?

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

		'who' [+subject]	'what' [-subject]
[+nominative,-genitive]	nom	<i>kto</i>	<i>co</i>
[-nominative,-genitive]	acc	<i>kogo</i>	<i>co</i>
[-nominative,+genitive]	gen	<i>kogo</i>	<i>czego</i>

What features are involved?

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

		'who' [+subject]	'what' [-subject]
[+nominative,-genitive]	nom	<i>kto</i>	<i>co</i>
[-nominative,-genitive]	acc	<i>kogo</i>	<i>co</i>
[-nominative,+genitive]	gen	<i>kogo</i>	<i>czego</i>

What features are involved?

What are the realization rules?

- *kto*
- *kogo*
- *co*
- *czego*

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

		'who' [+subject]	'what' [-subject]
[+nominative, -genitive]	nom	<i>kto</i>	<i>co</i>
[-nominative, -genitive]	acc	<i>kogo</i>	<i>co</i>
[-nominative, +genitive]	gen	<i>kogo</i>	<i>czego</i>

What features are involved?

What are the realization rules?

[+nominative(, -genitive)] → *kto*
→ *kogo*
→ *co*
→ *czego*

Doing morphology: Polish

What are the syncretisms we find with Polish question words?

		'who' [+subject]	'what' [-subject]
[+nominative, -genitive]	nom	<i>kto</i>	<i>co</i>
[-nominative, -genitive]	acc	<i>kogo</i>	<i>co</i>
[-nominative, +genitive]	gen	<i>kogo</i>	<i>czego</i>

What features are involved?

What are the realization rules?

[+nominative, -genitive]	→	<i>kto</i>
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[-genitive]	→	<i>co</i>
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