

Cross-morphemic transposed letter
(TL) effects argue against a single
decompositional pathway

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For more than 40 years, I have been advocating an account of polymorphemic word recognition that entails a single pathway of **obligatory decomposition** with no direct whole-word access.

Reinforced by the finding of masked priming from pseudo-derived words that cannot be ascribed to mere orthographic repetition (e.g., Longtin, Segui, & Halle, 2003; Rastle & Davis, 2008):

corner-CORN	<	tunnel-CORN,
cashew-CASH	=	mortal-CASH

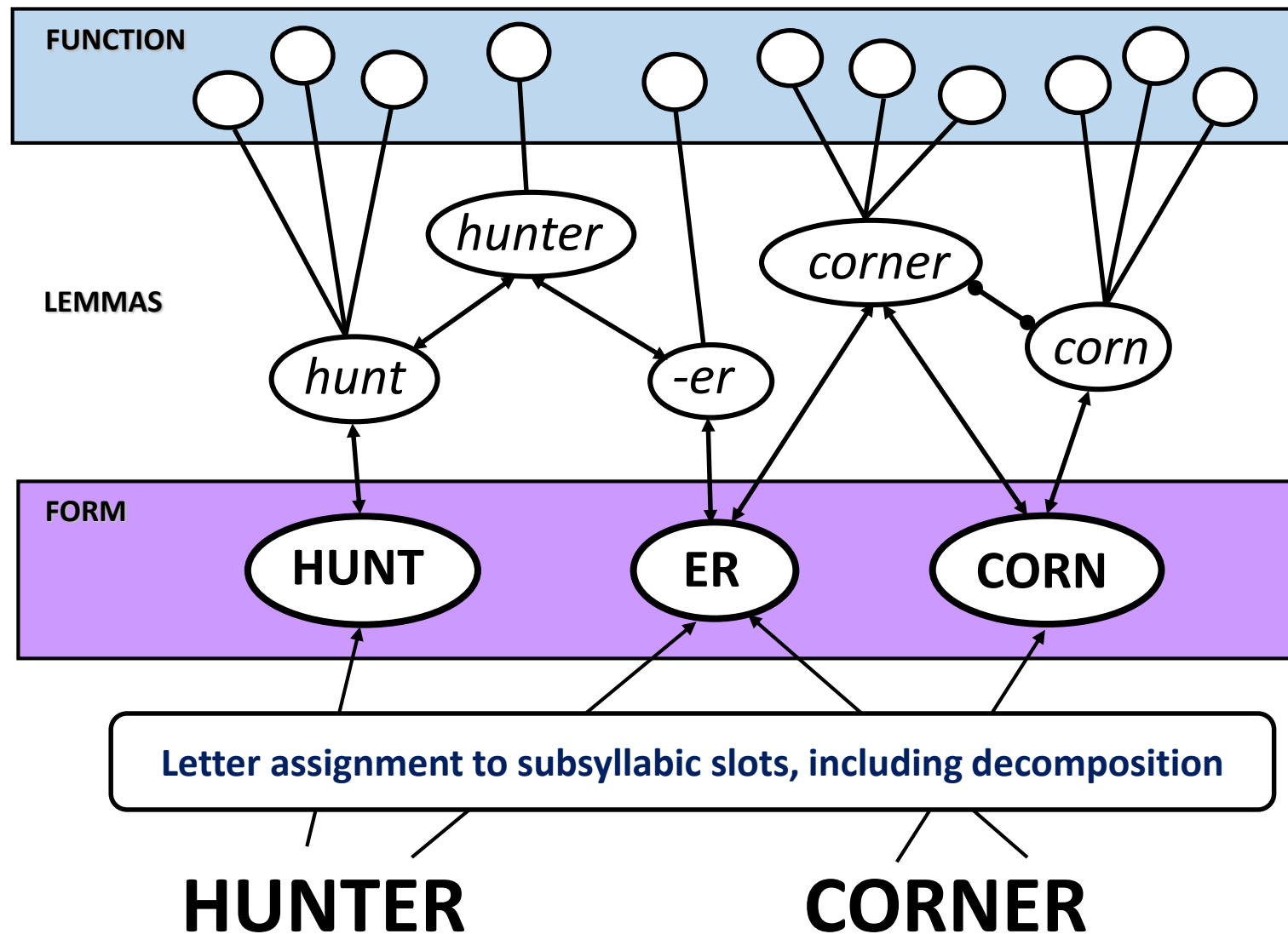
Along with:

hunter-HUNT	<	symbol-HUNT,
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the implication is that the presence of an orthographic form that simply appears to be a suffix leads to decomposition.

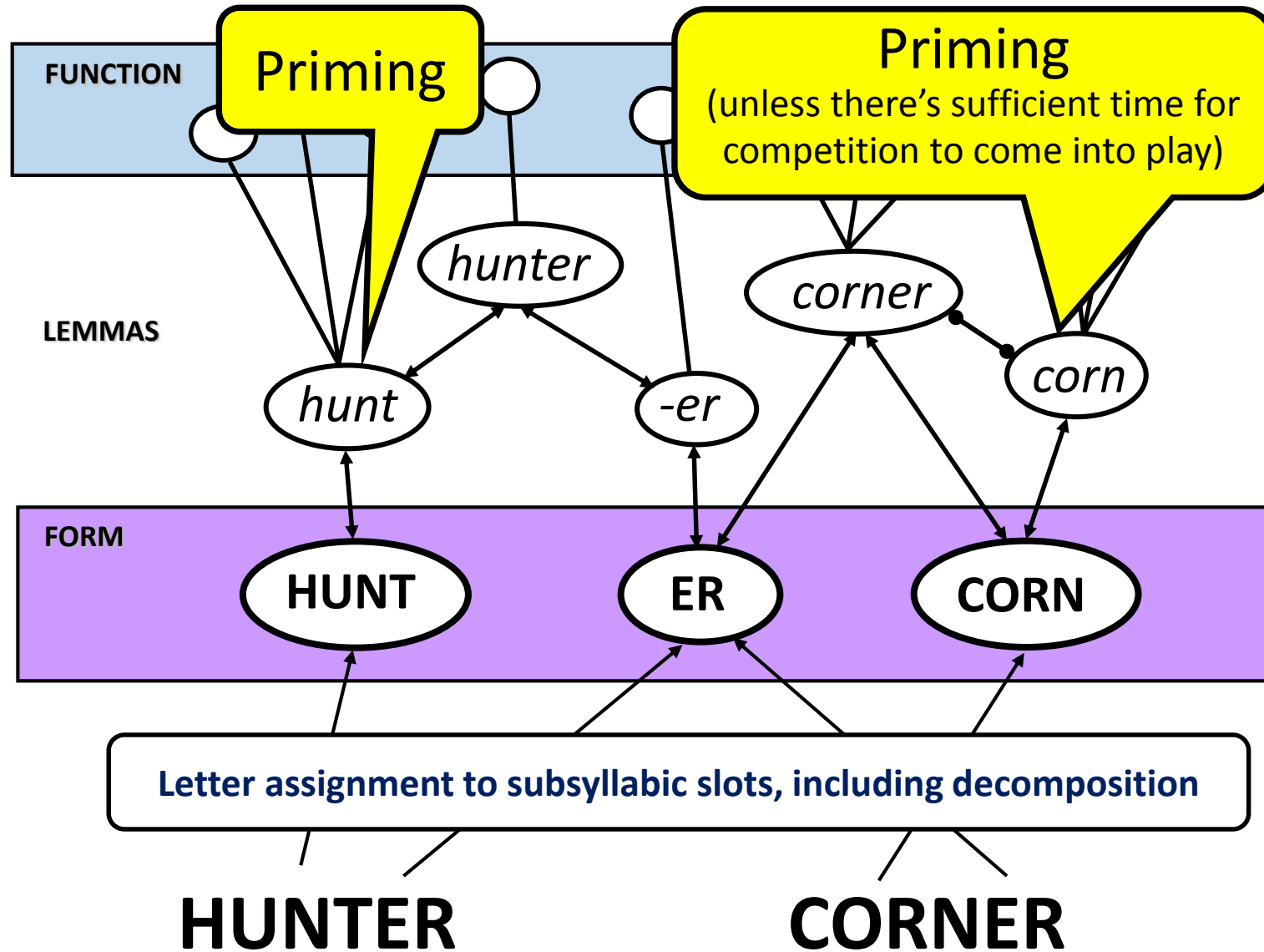
OBLIGATORY DECOMPOSITION

(e.g., Taft, 2004, 2015; Taft & Nguyen-Hoan, 2010; Taft & Nilsen, 2013; Taft, Xu, & Li, 2017).



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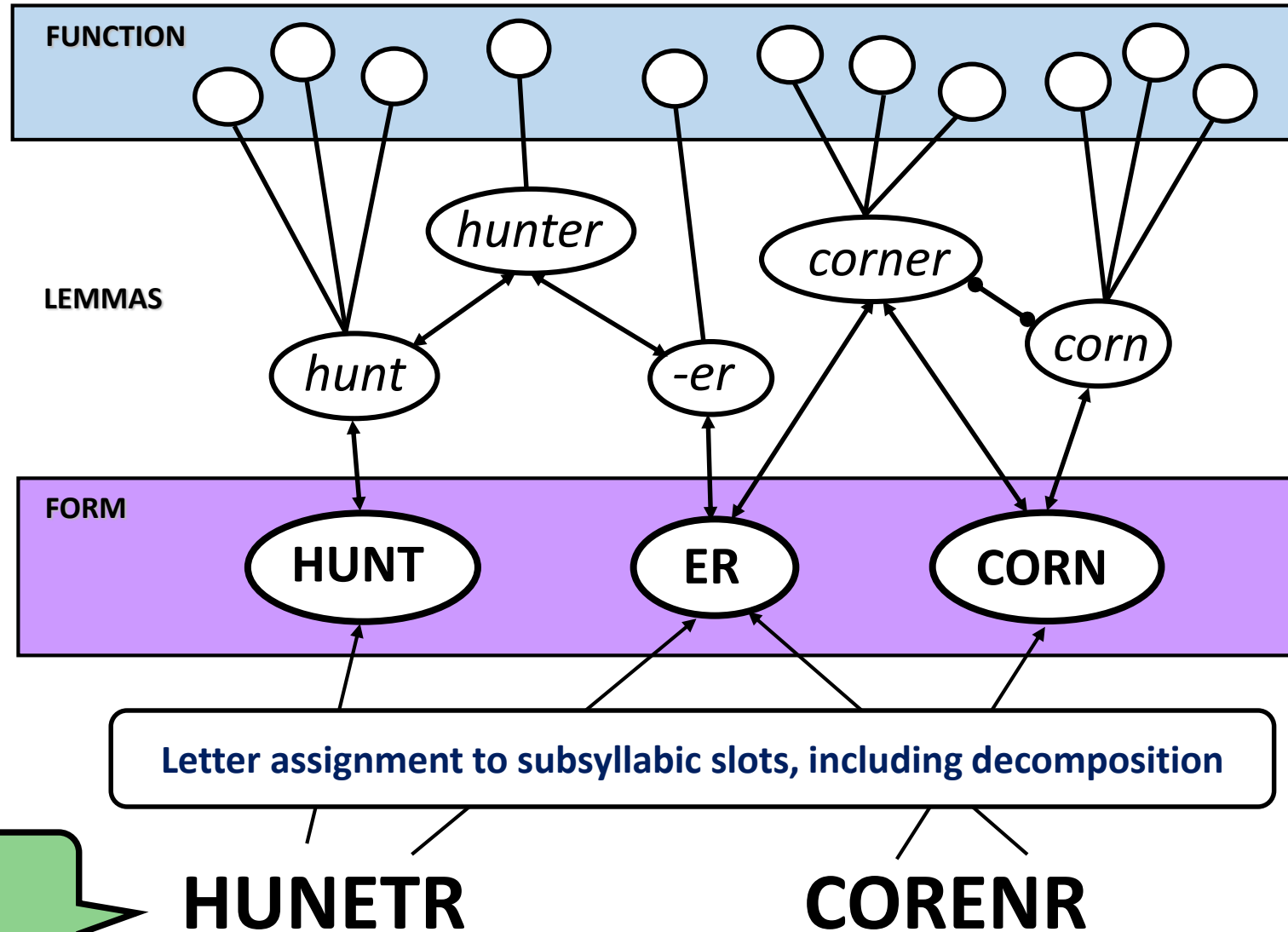


What happens if the letter-string is disrupted by the transposition of two letters that straddle the morpheme boundary?

e.g., **hunetr-HUNT** vs **hunafr-HUNT**
 corenr-CORN vs **corabr-CORN**

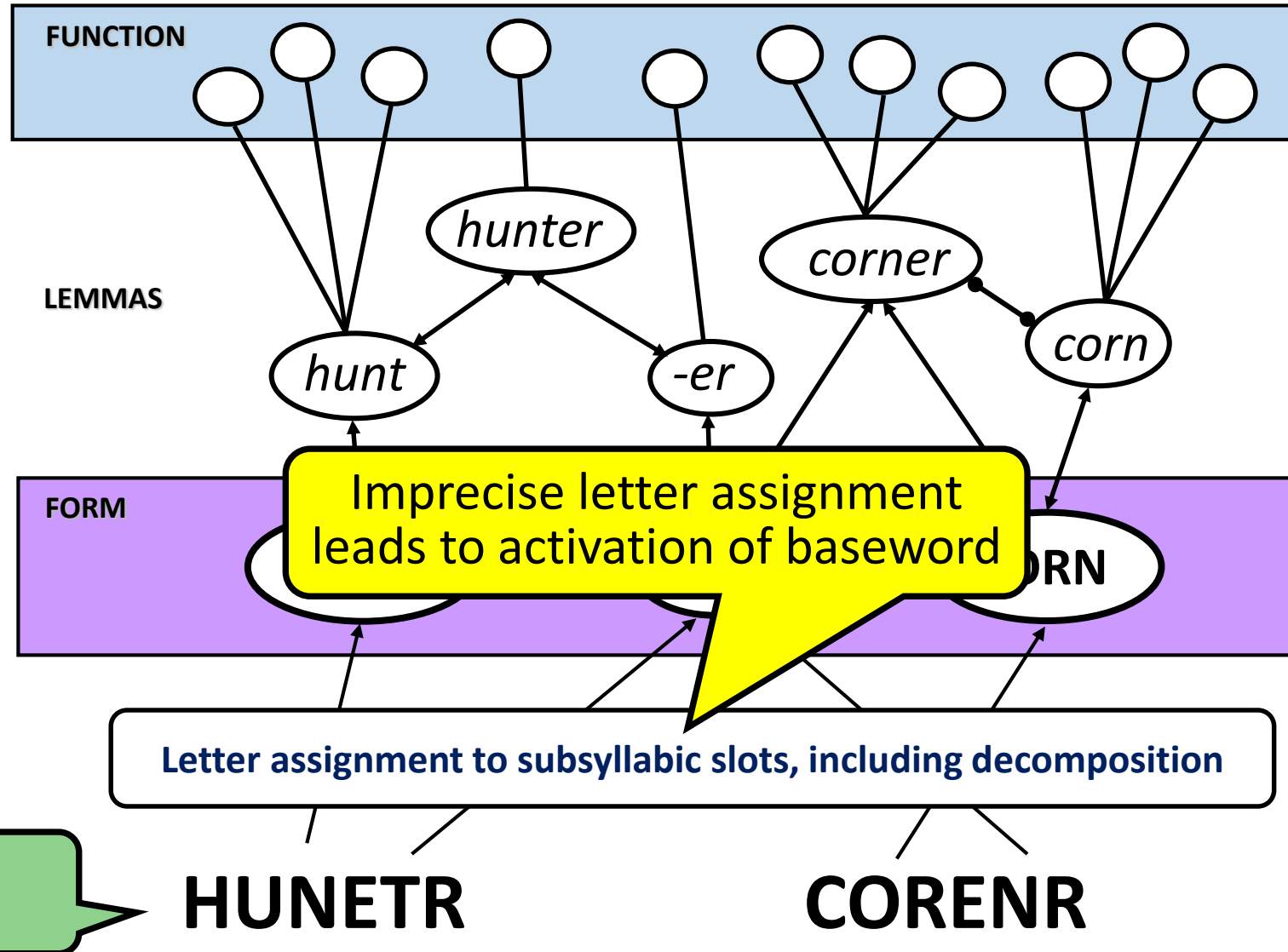
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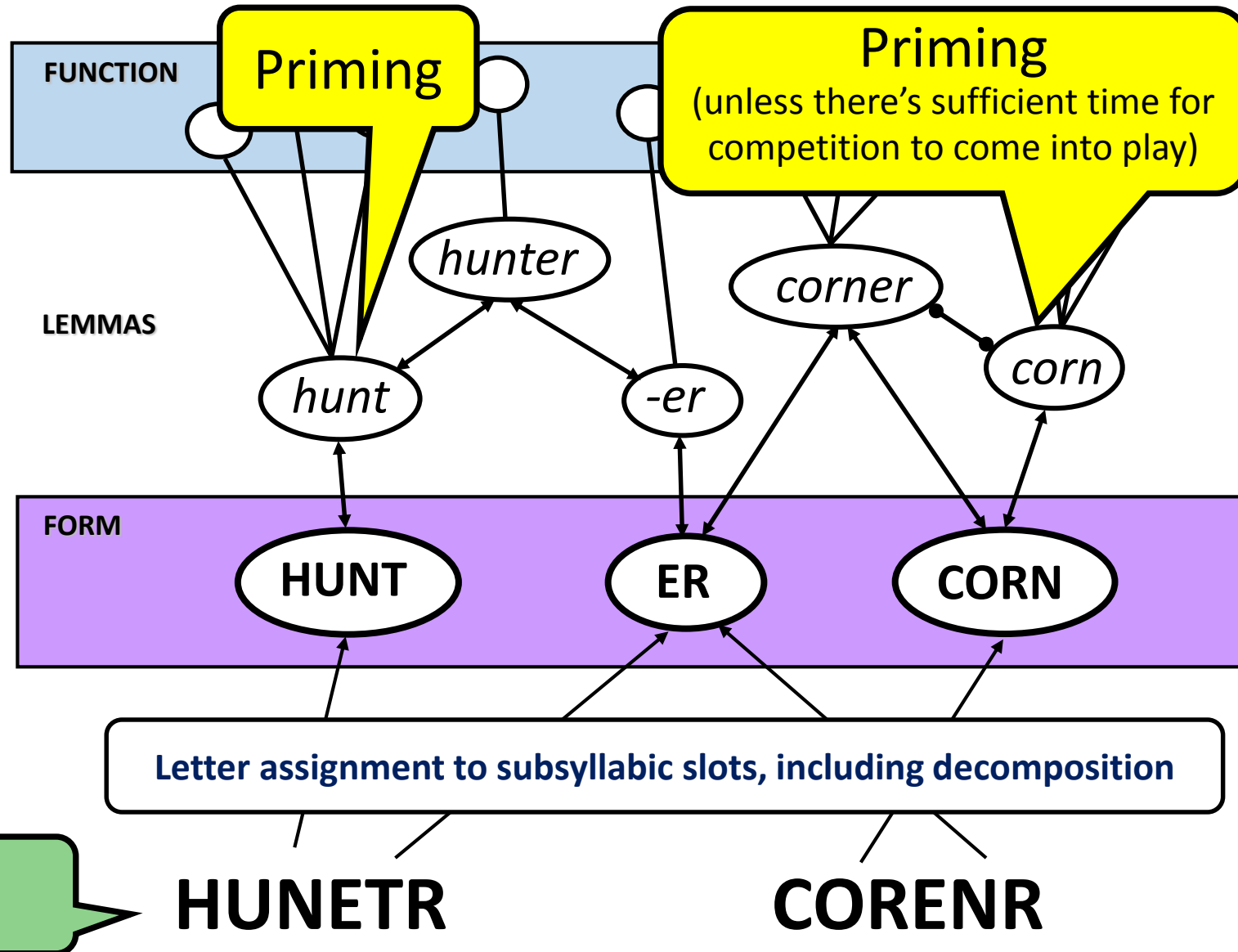
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So, exactly the same pattern of priming must be observed for **TL stimuli** and **intact stimuli**.

However, Diependaele, Morris, Serota, Bertrand, and Grainger (2013) reported that priming for intact pseudo-derived primes (**corner-CORN**) disappeared under TL conditions (**corenr-CORN**), despite transparent priming (**hunter-HUNT**) being maintained (**hunetr-HUNT**).

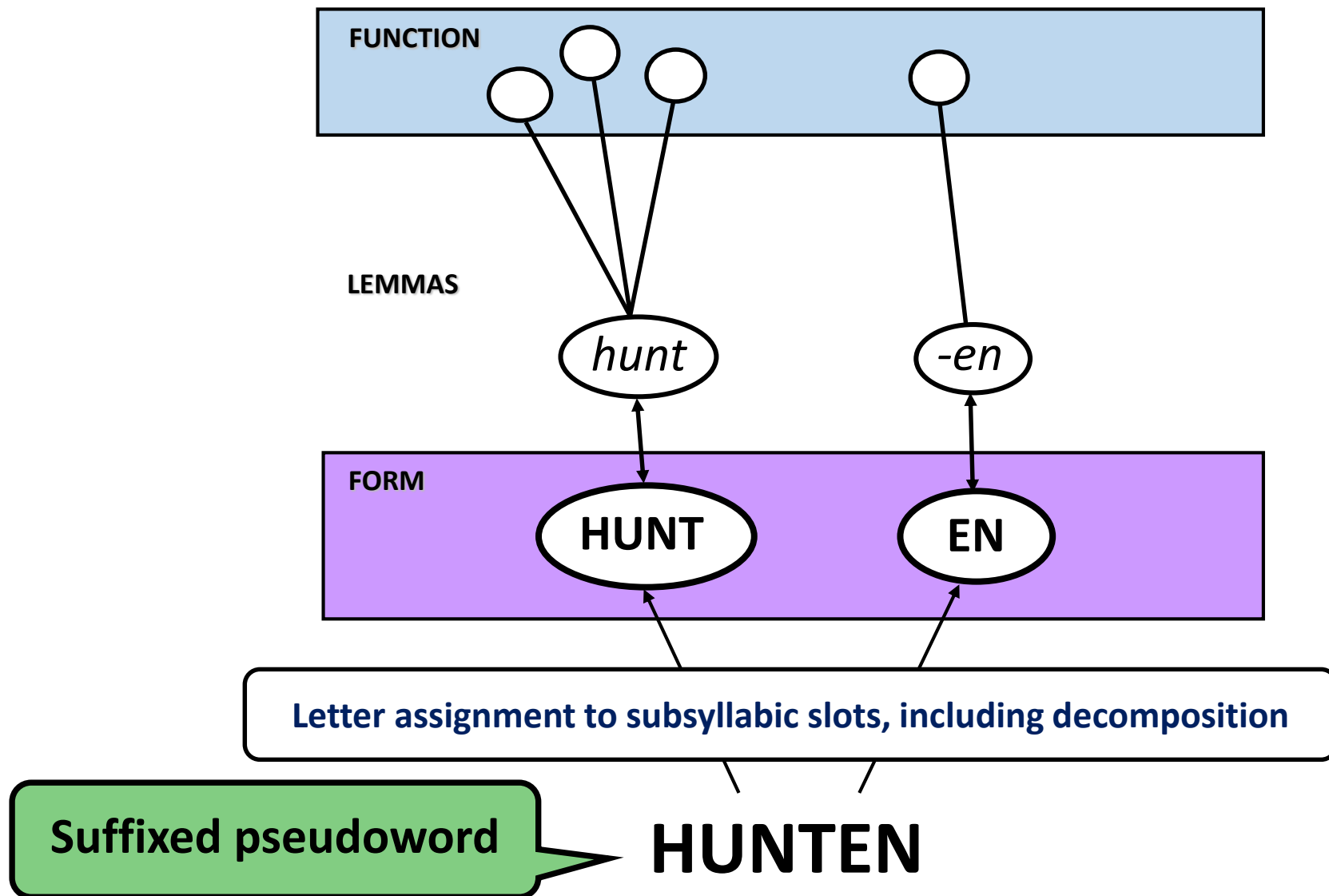
In addition, Diependaele et al. (2013) argued against obligatory decomposition from the finding that cross-morpheme transposition also disrupted the priming of the stem of a suffixed pseudoword:

e.g., **hunten-HUNT** < **carden-HUNT**

But **hunetn-HUNT** = **carden-HUNT**

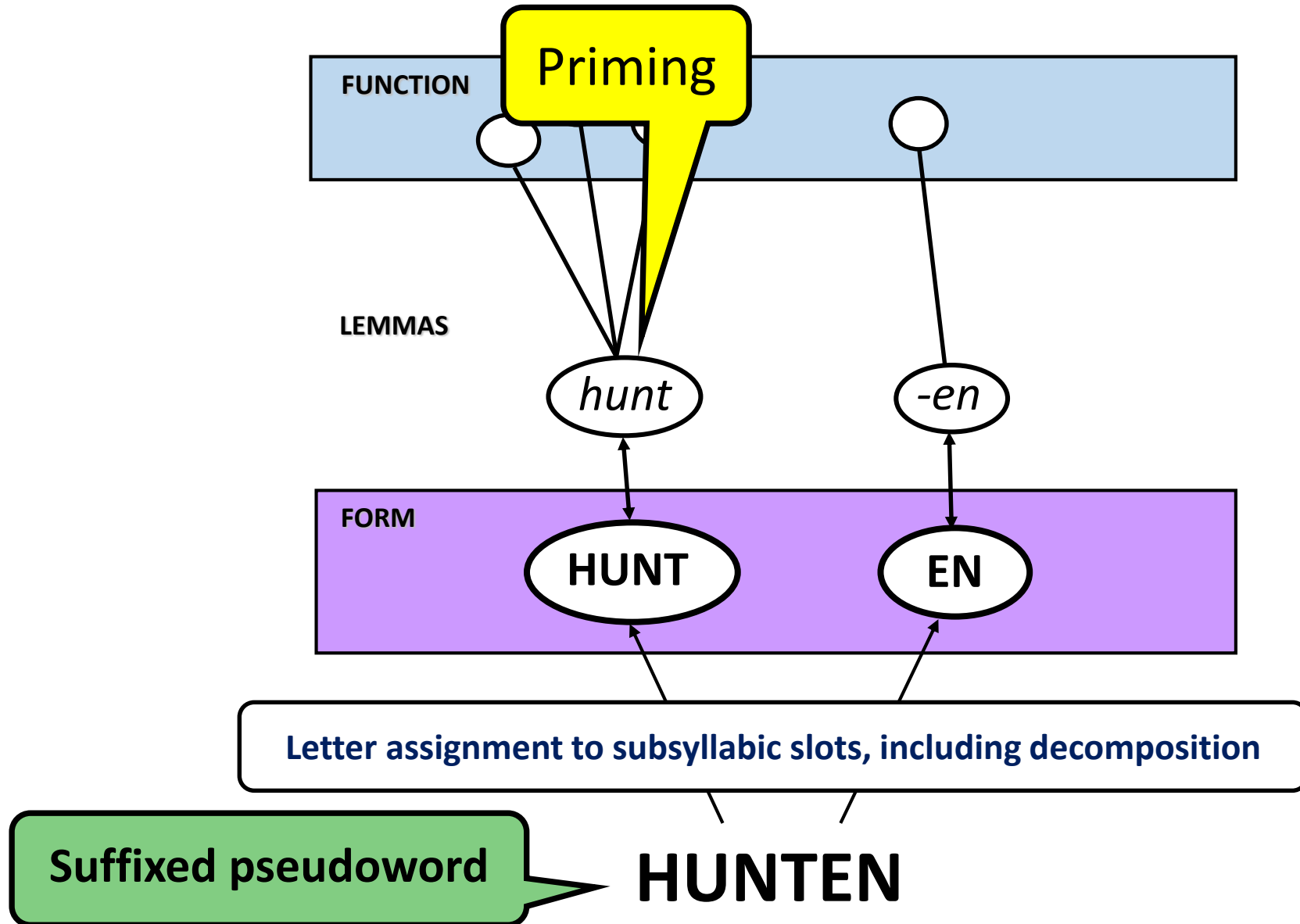
OBLIGATORY DECOMPOSITION

(e.g., Taft, 2004, 2015; Taft & Nguyen-Hoan, 2010; Taft & Nilsen, 2013).



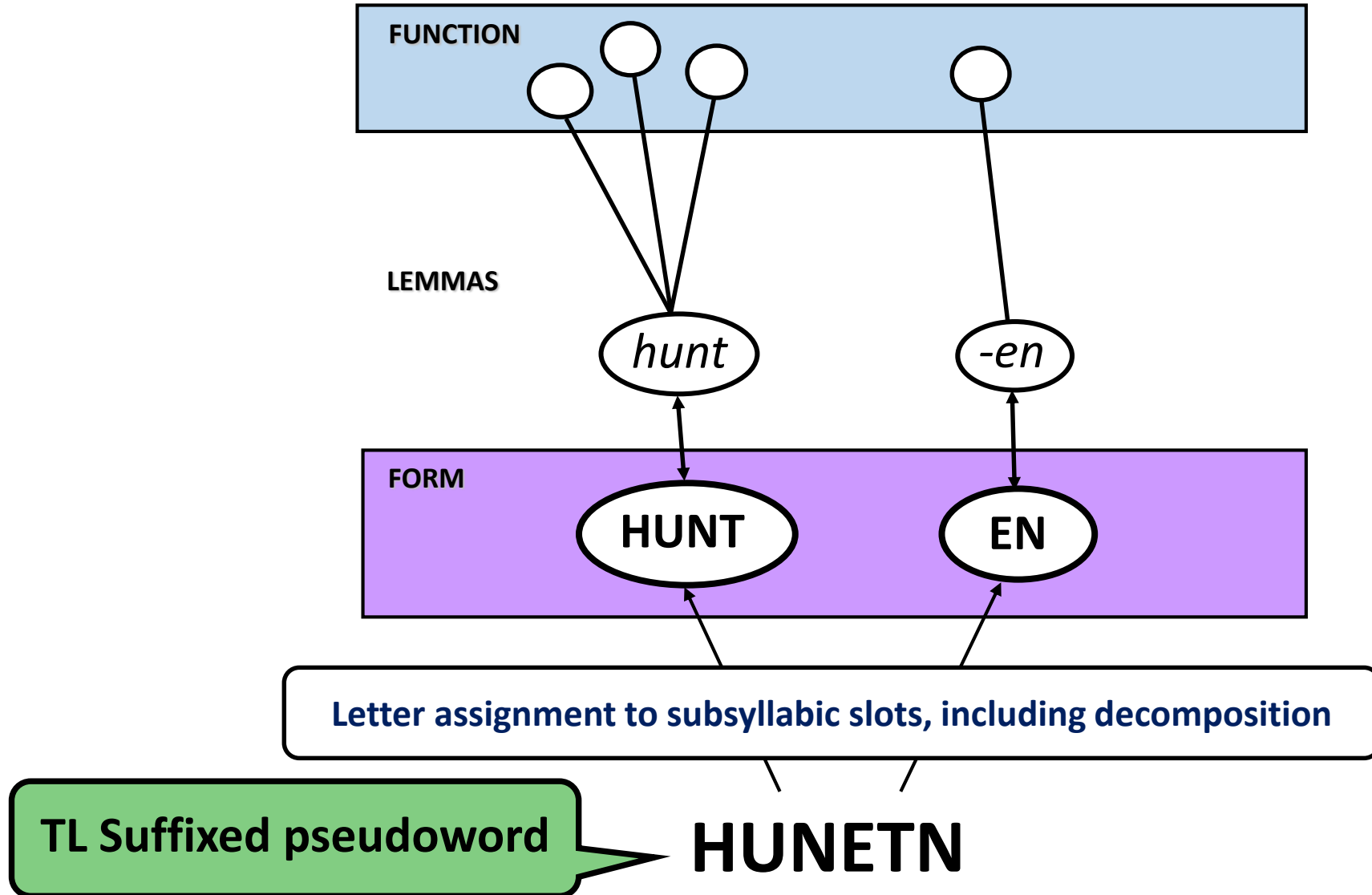
OBLIGATORY DECOMPOSITION

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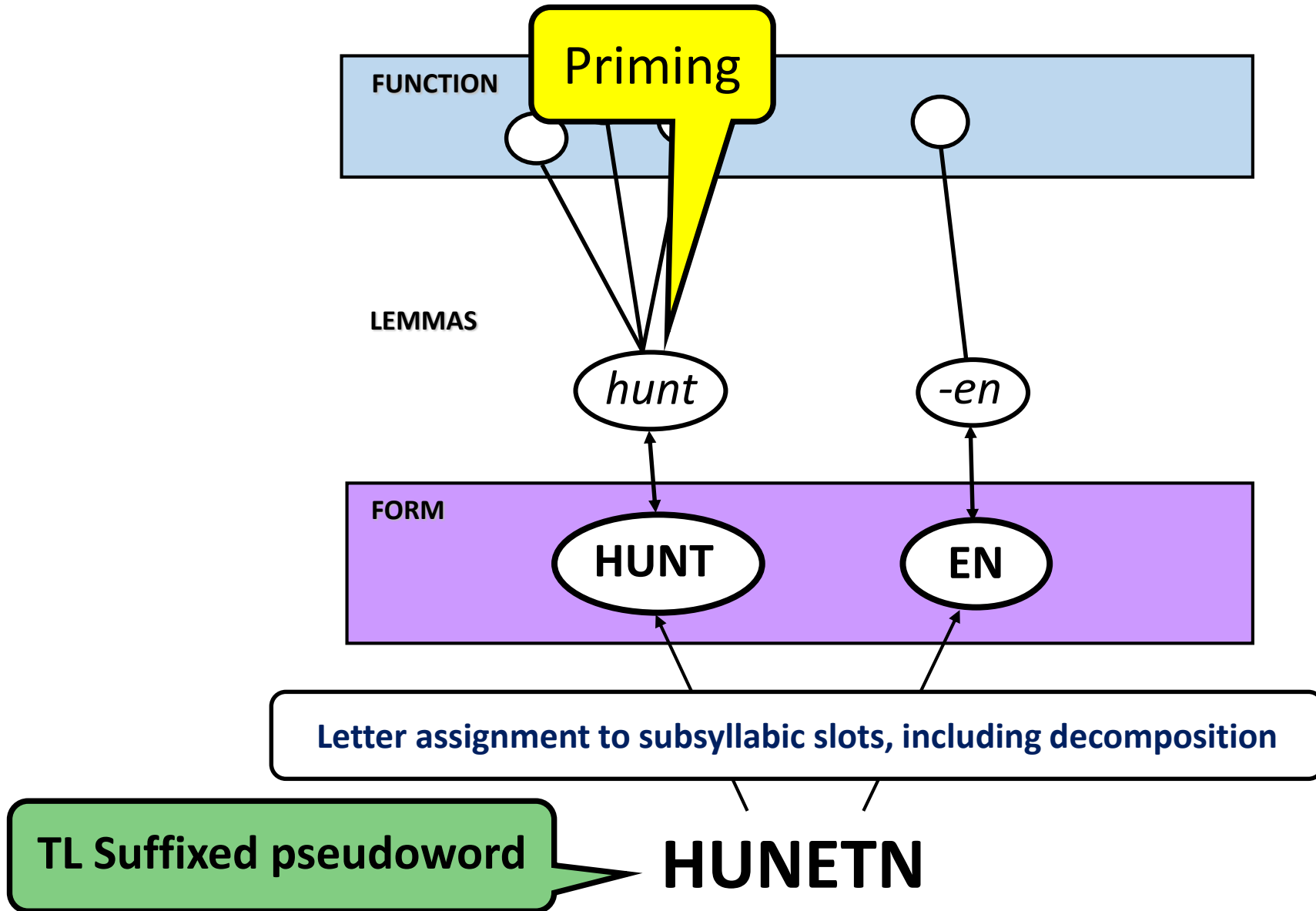
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So, if the single-pathway obligatory decompositional model is to be maintained, it is critical to establish whether these two effects are genuine.

EXPERIMENT 1

Used items derived from the intact stimuli tested by Beyersmann, Ziegler, Castles, Coltheart, Kezilas, & Grainger (2015).

They found standard priming effects:

hunter-HUNT	<	symbol-HUNT
corner-CORN	<	tunnel-CORN
cashew-CASH	=	mortal-CASH

	TL Prime	Control
Transparent	hunetr-HUNT	hunafr-HUNT
Pseudo-derived	corenr-CORN	corabr-CORN
Form-related	casehw-CASH	casagw-CASH

	TL Prime	Control	Priming
Transparent	hunetr-HUNT 574 ms	hunafr-HUNT 594 ms	+20 *

	TL Prime	Control	Priming
Transparent	hunetr-HUNT 574 ms	hunafr-HUNT 594 ms	+20 *
Form-related	casehw-CASH 594 ms	casagw-CASH 594 ms	0

	TL Prime	Control	Priming
Transparent	hunetr-HUNT 574 ms	hunafr-HUNT 594 ms	+20 *
Pseudo-derived	corenr-CORN 602 ms	corabr-CORN 604 ms	+2
Form-related	casehw-CASH 594 ms	casagw-CASH 594 ms	0

So, the results of Diependaele et al. (2013) are replicated and the single-pathway obligatory decompositional model cannot handle them.

EXPERIMENT 2

Priming for suffixed pseudowords compared to suffixed real words.
Same suffixes used for both.

INTACT:

hunter-HUNT	vs	hunten-HUNT	vs	hundir-HUNT
golden-GOLD	vs	golder-GOLD	vs	golkir-GOLD

TL:

hunetr-HUNT	vs	hunetn-HUNT	vs	hunidr-HUNT
goledn-GOLD	vs	goledr-GOLD	vs	golikr-GOLD

	Real	Pseudo	Control	Real priming	Pseudo priming
Intact	hunter-HUNT 613 ms	hunten-HUNT 610 ms	hundir-HUNT 629 ms	+16 *	+19 *

	Real	Pseudo	Control	Real priming	Pseudo priming
Intact	hunter-HUNT 613 ms	hunten-HUNT 610 ms	hundir-HUNT 629 ms	+16 *	+19 *
TL	hunetr-HUNT 621 ms	hunetn-HUNT 625 ms	hunidr-HUNT 637 ms	+16 *	+12 *

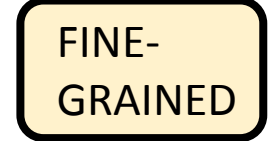
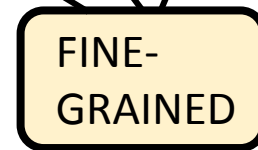
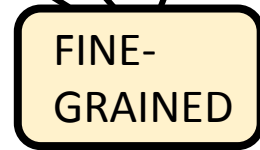
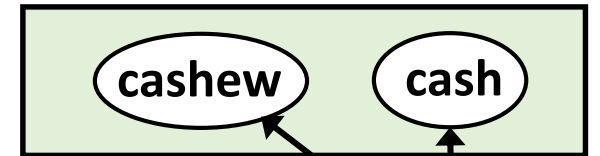
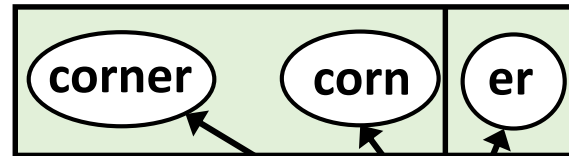
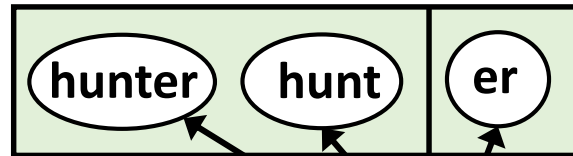
So, contrary to Dipiendaele et al. (2013), TL suffixed pseudowords do generate priming, consistent with the single-pathway obligatory decomposition model.

How do we explain a **lack of TL pseudo-derived priming** (corenr-CORN) along with the **existence of TL pseudoword priming** (hunetn-HUNT)?

Account based on my interpretation of the new model outlined in **Grainger and Beyersmann: *Psychology of Learning and Motivation*, Vol 67, in press.**

(A development of the **Dual Pathways** approach outlined by Diependaele et al., 2013, and Grainger & Ziegler, 2011).

Orthographic representations



HUNTER

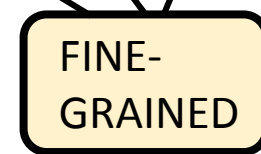
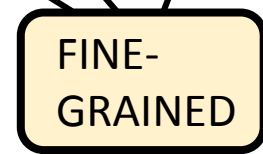
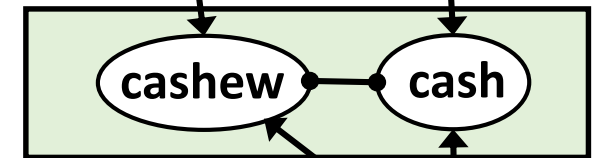
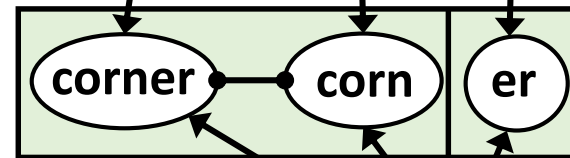
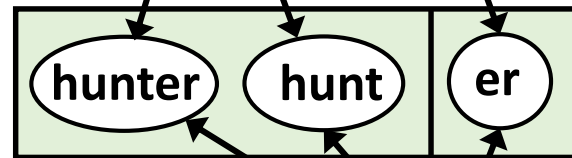
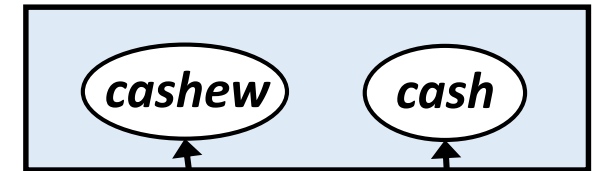
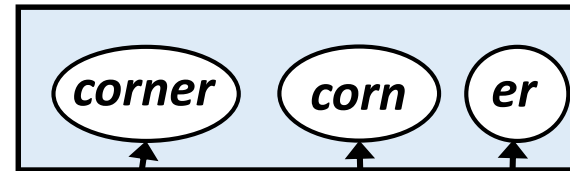
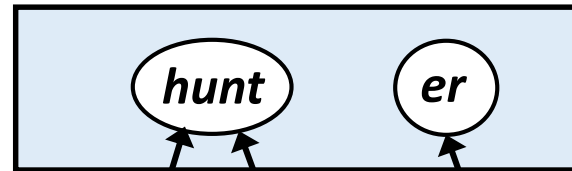
CORNER

CASHEW

Edge-aligned processing

Morpho-
semantics

Orthographic
representations

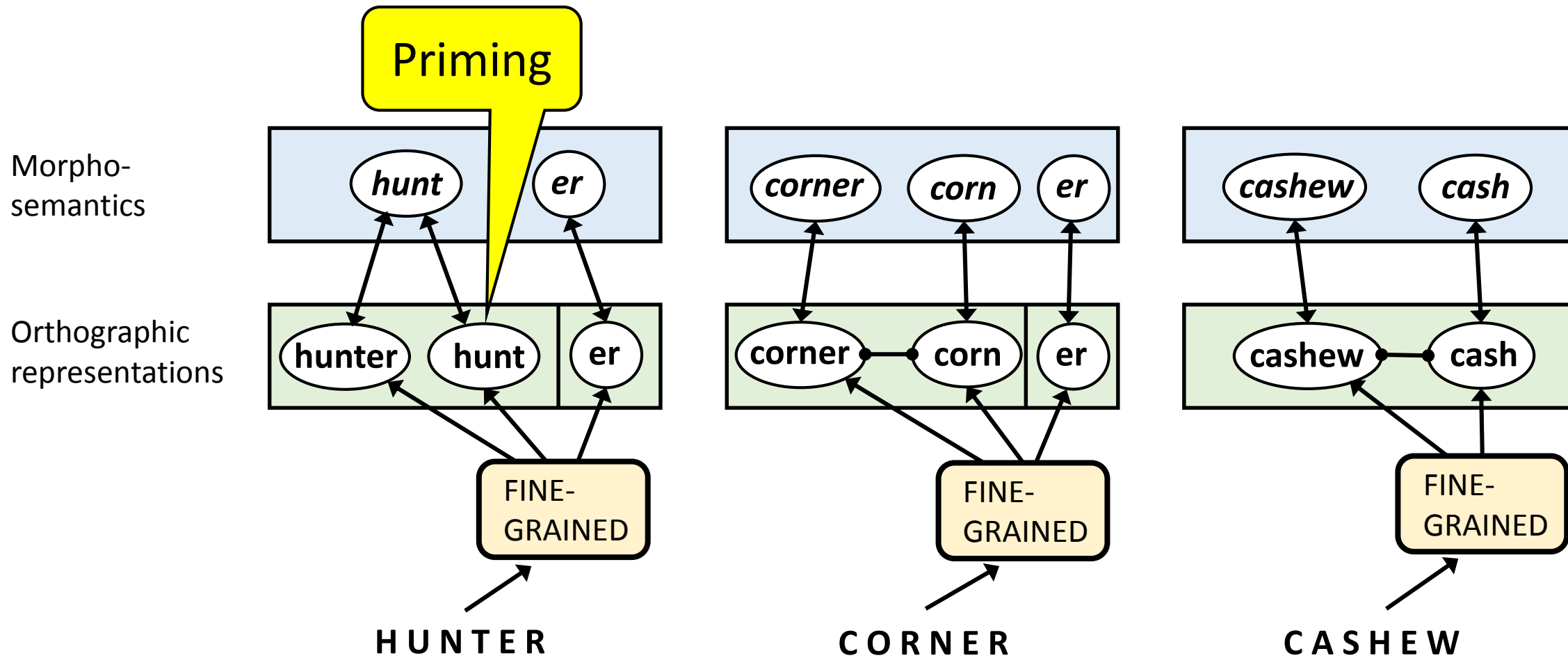


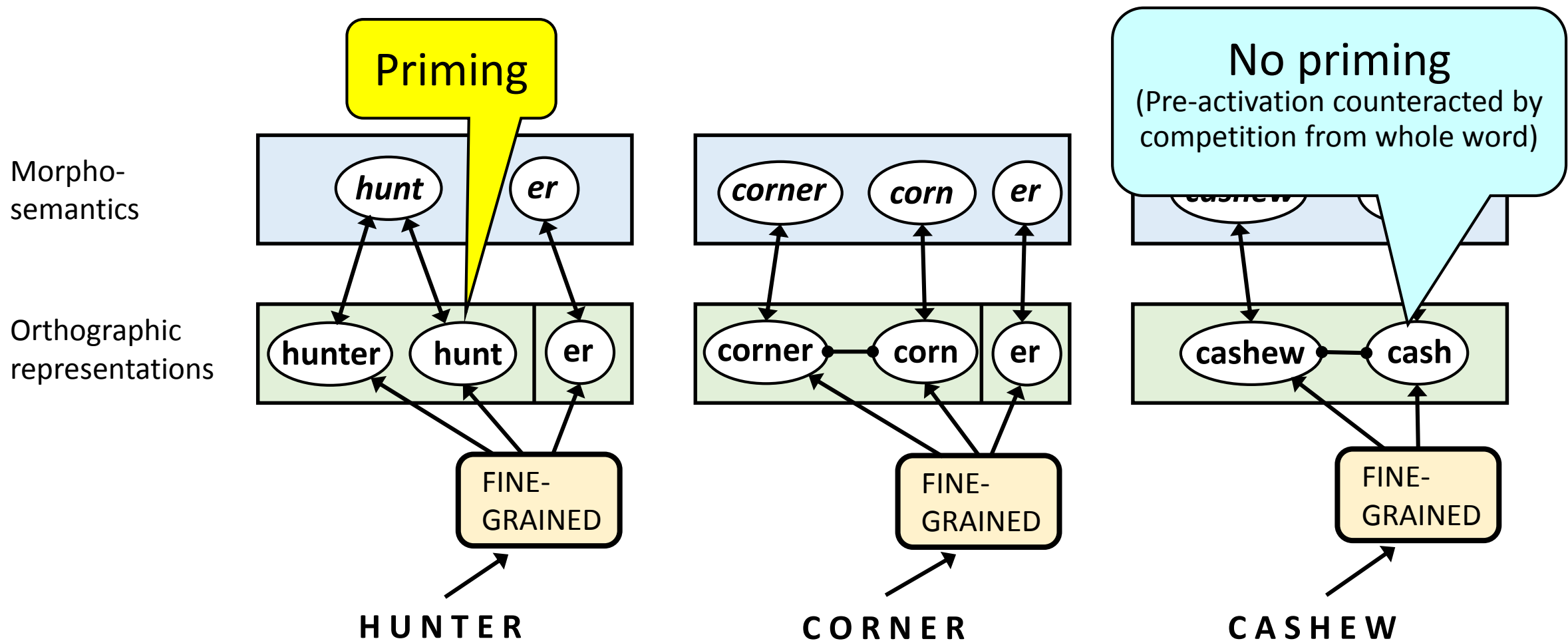
HUNTER

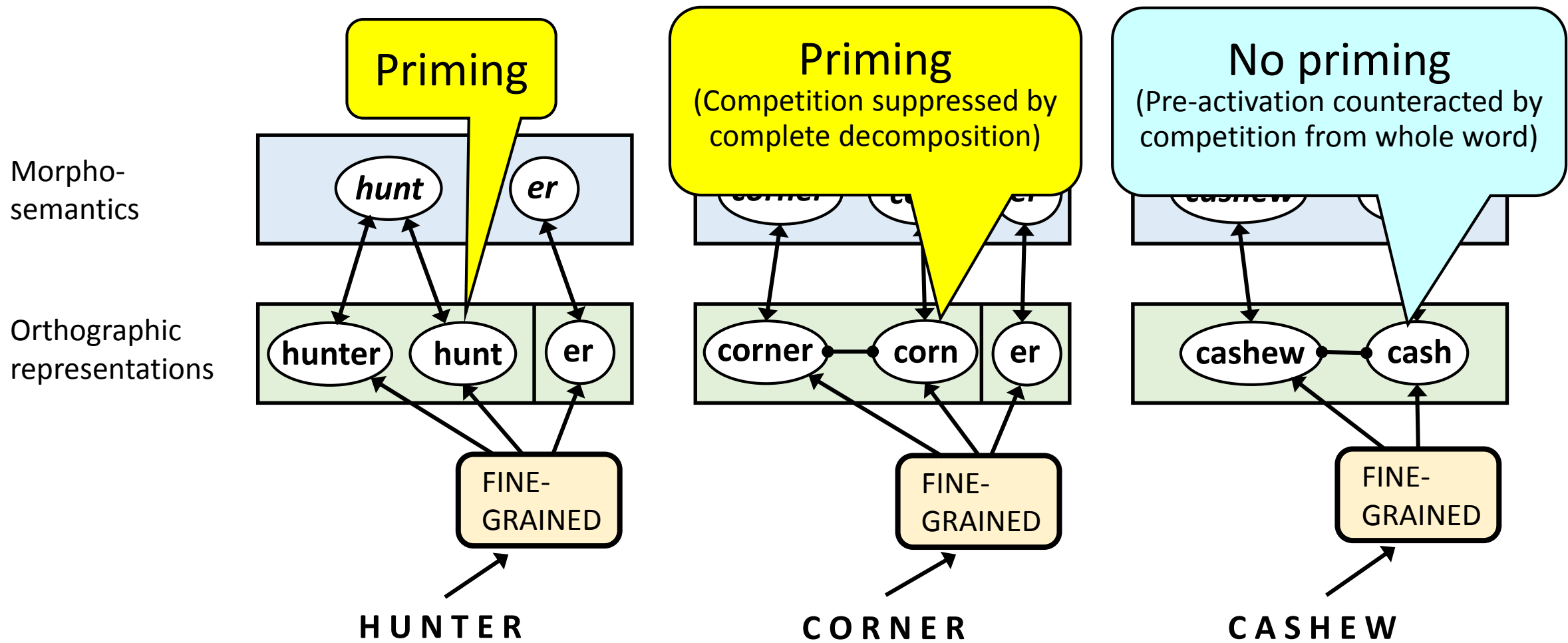
CORNER

CASHEW

Edge-aligned processing

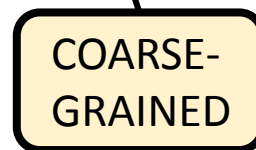
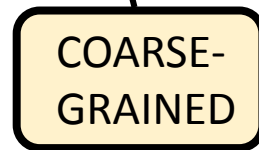
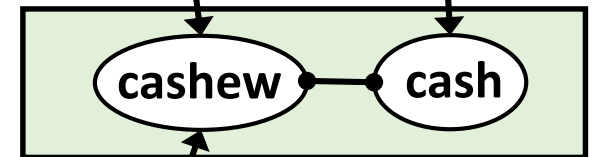
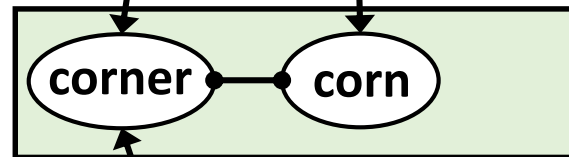
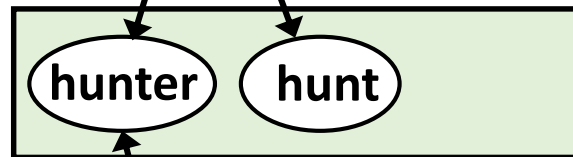
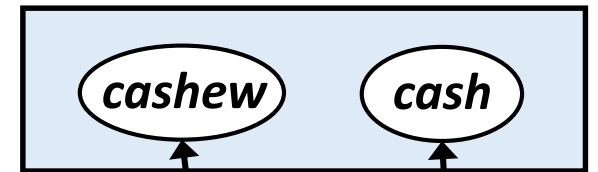
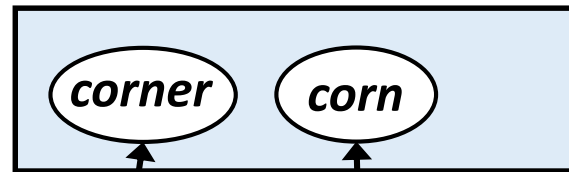
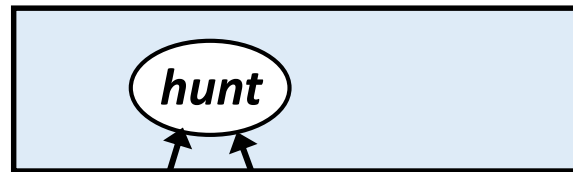






Morpho-
semantics

Orthographic
representations

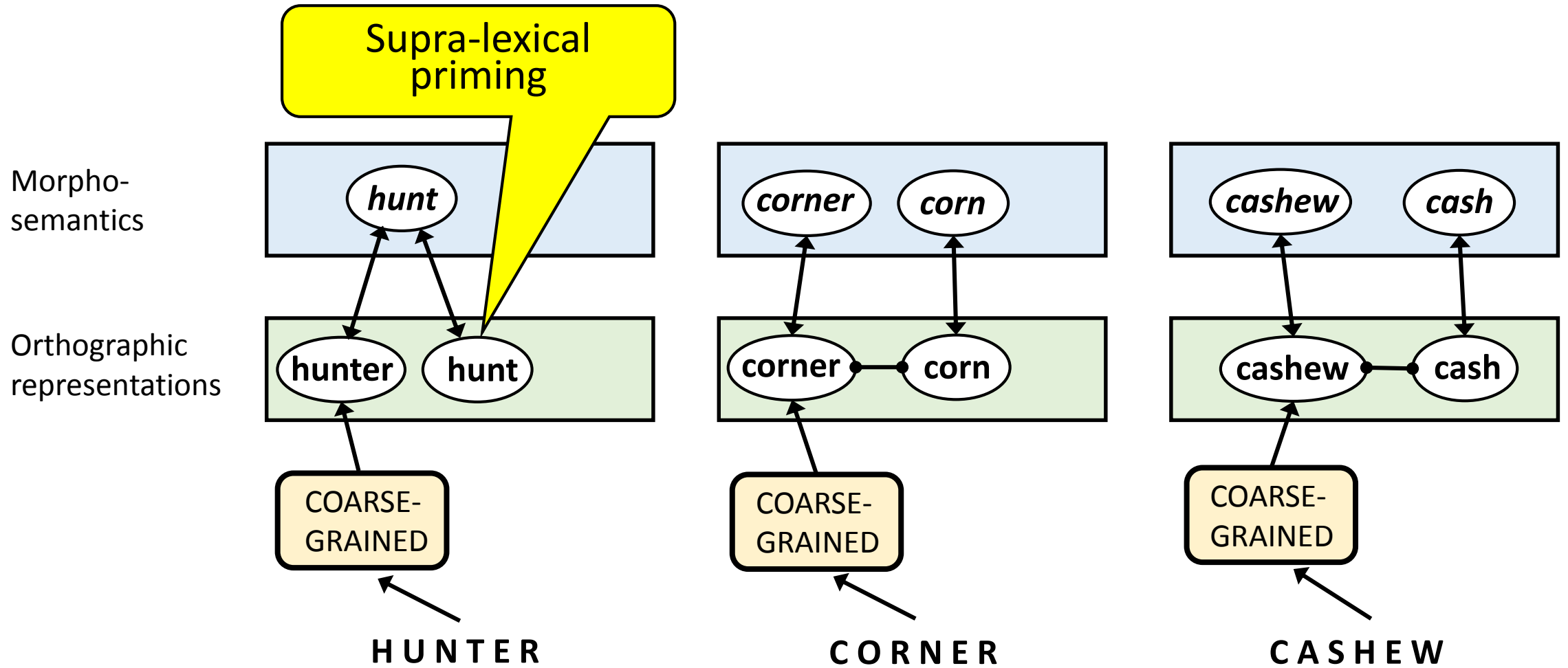


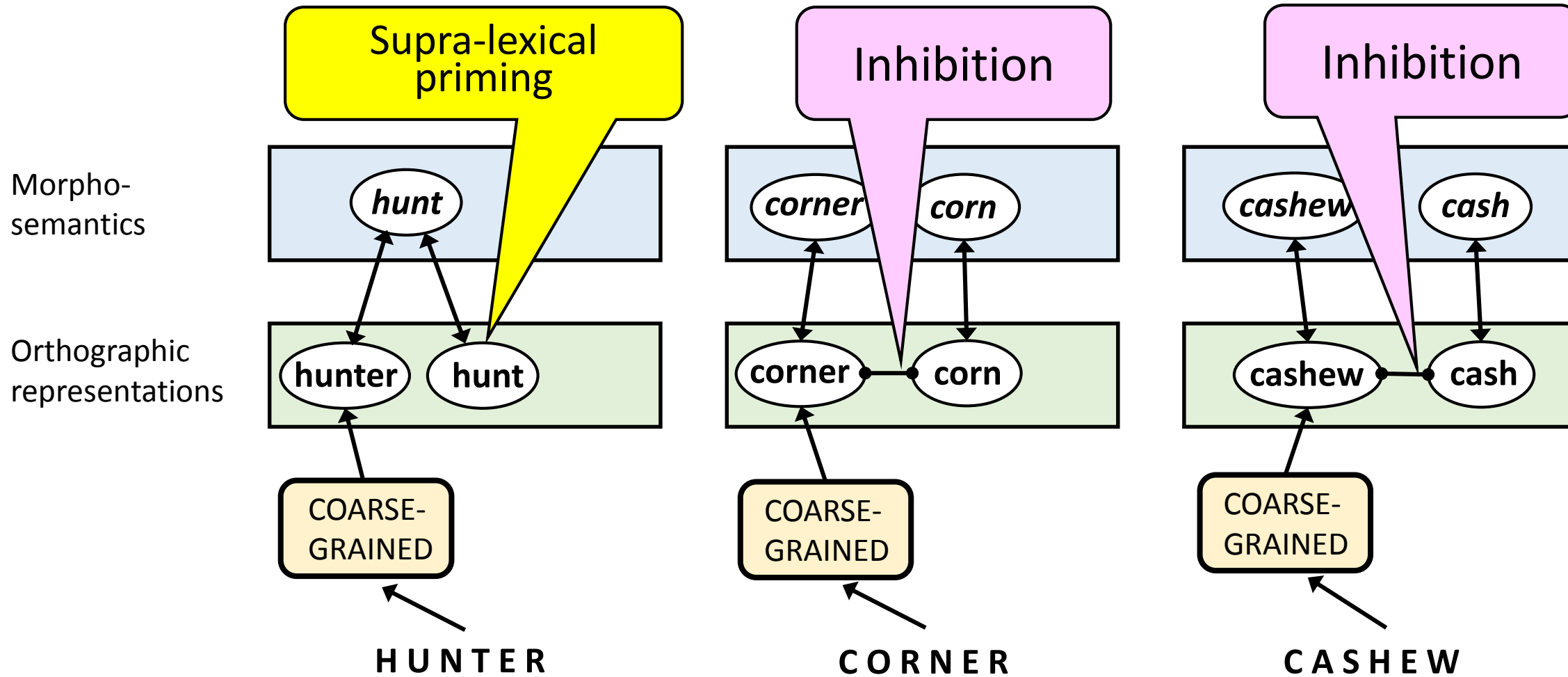
HUNTER

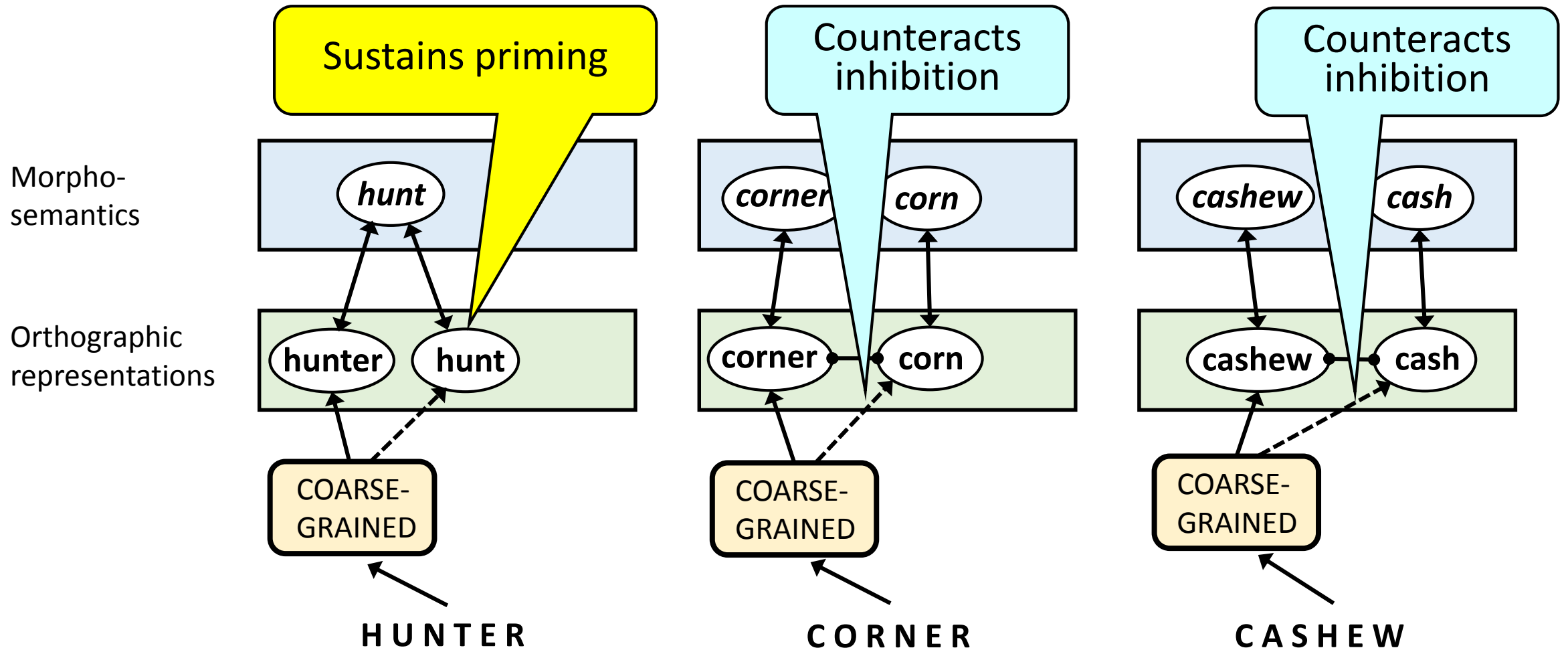
CORNER

CASHEW

But also coarse-grained pathway (open bigrams?)



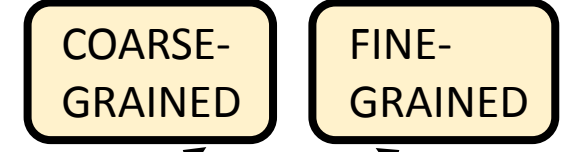
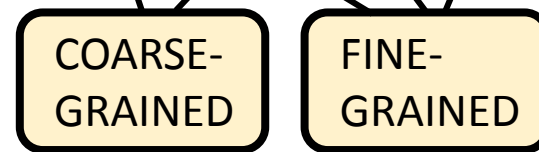
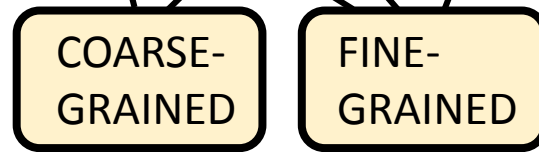
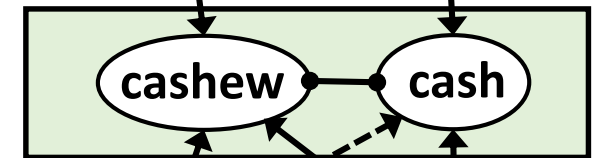
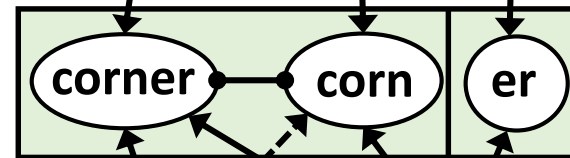
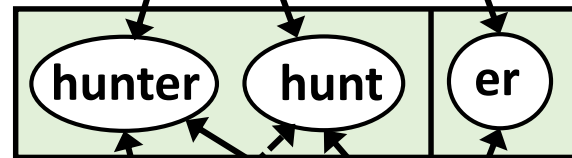
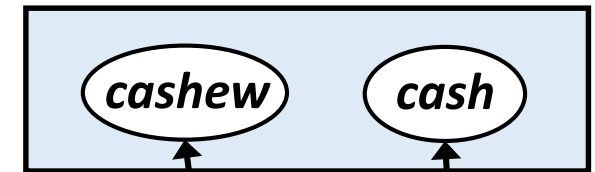
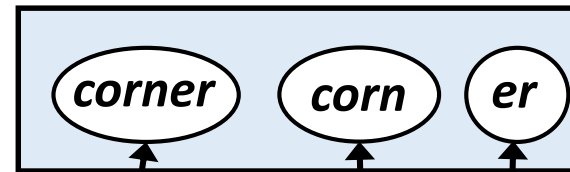
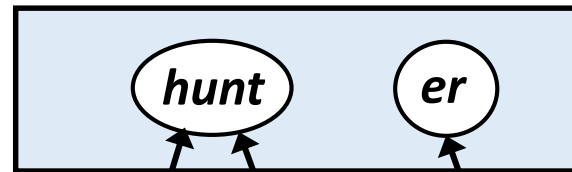




But also activation of the embedded word that is subordinate to the activation of the whole word

Morpho-
semantics

Orthographic
representations

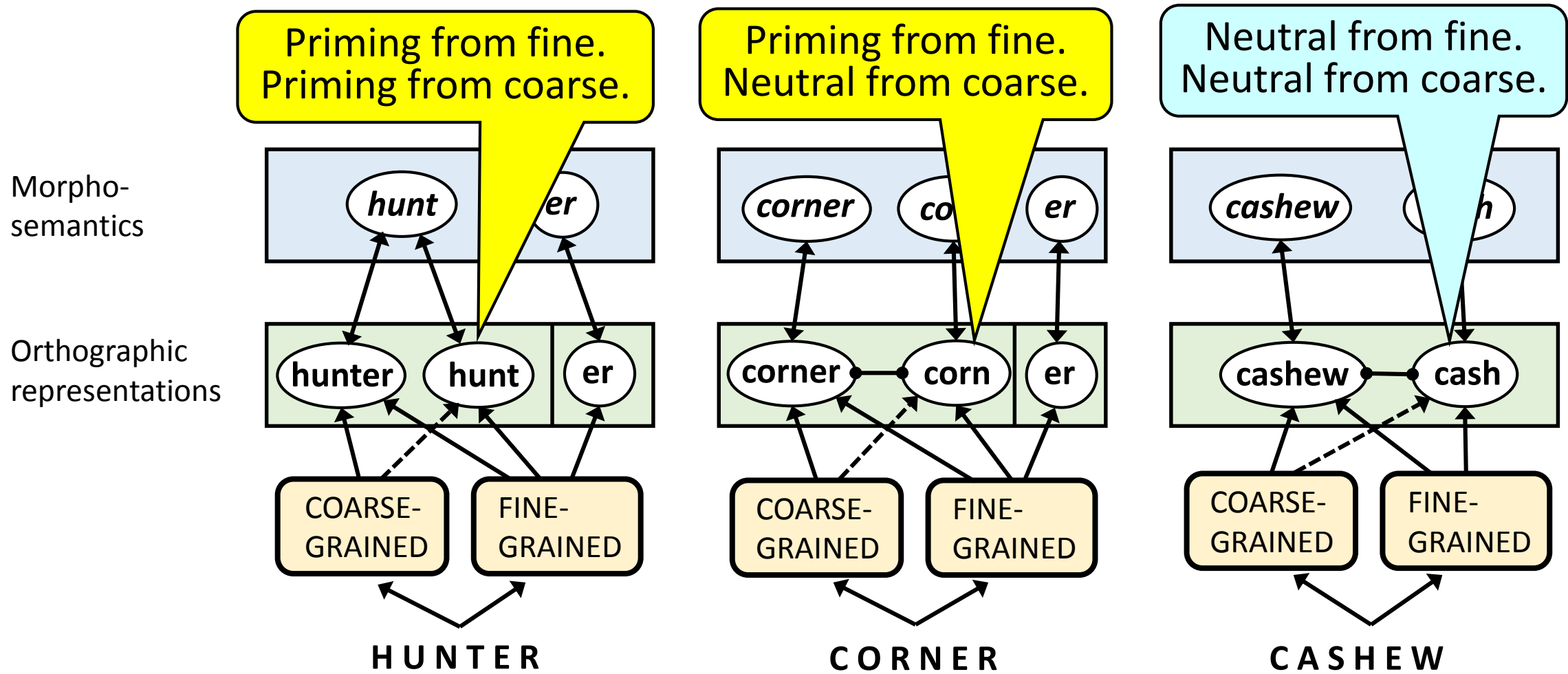


HUNTER

CORNER

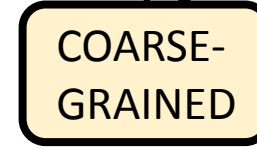
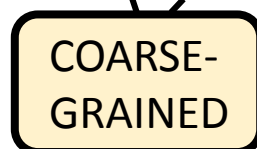
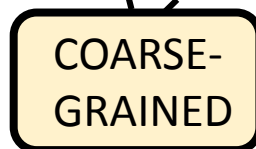
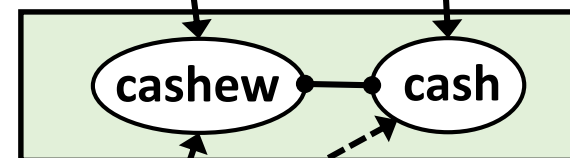
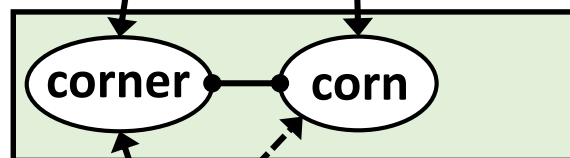
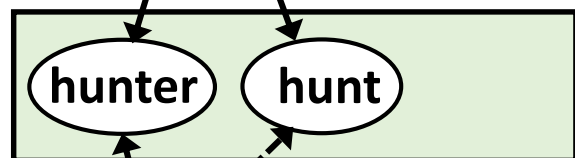
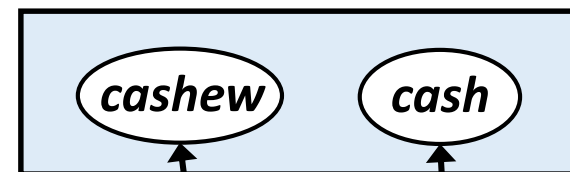
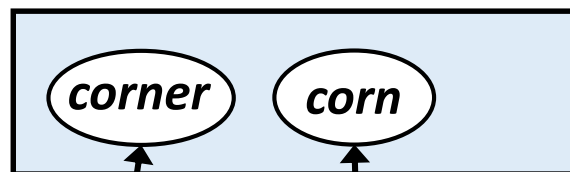
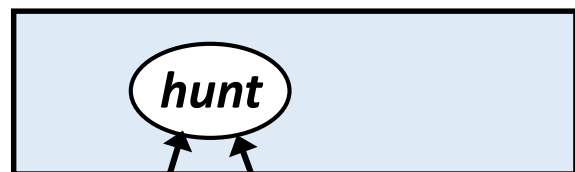
CASHEW

The complete system



Morpho-
semantics

Orthographic
representations

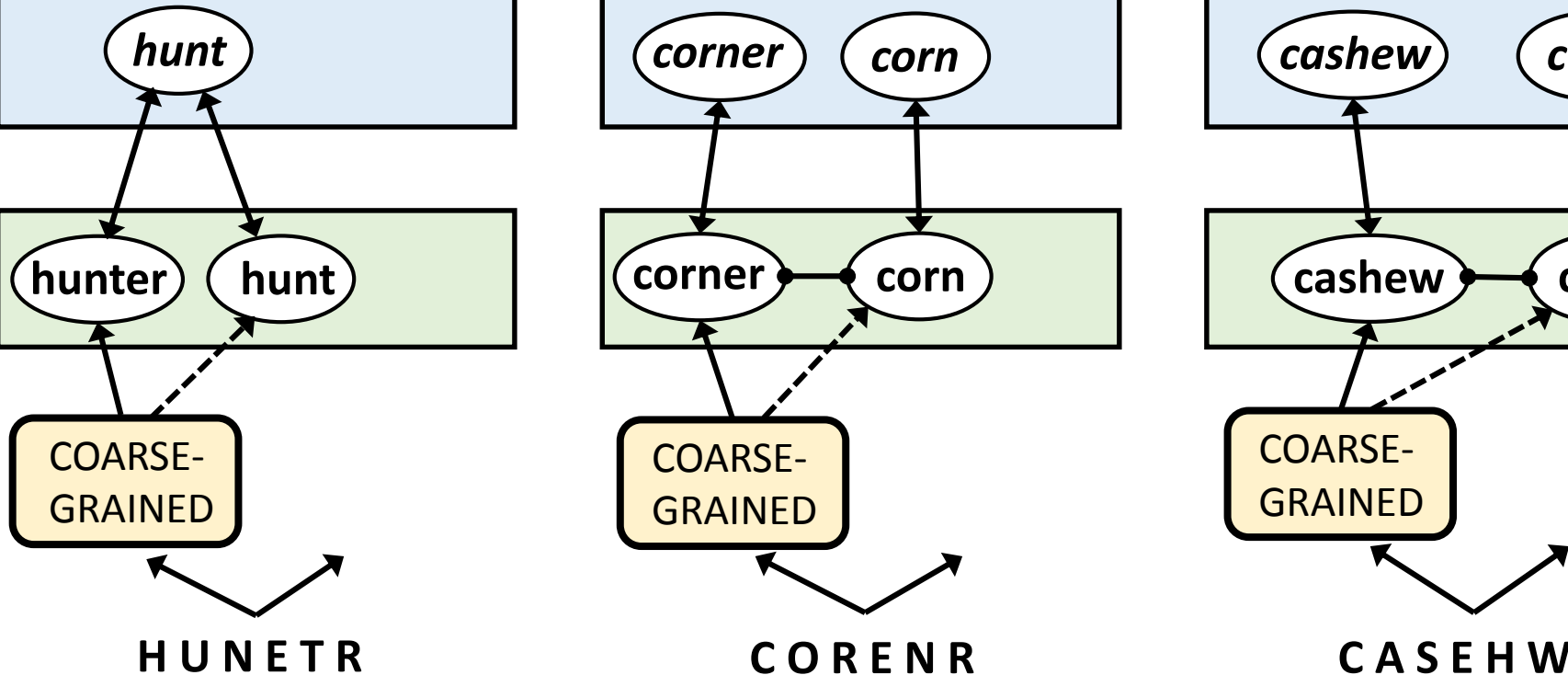


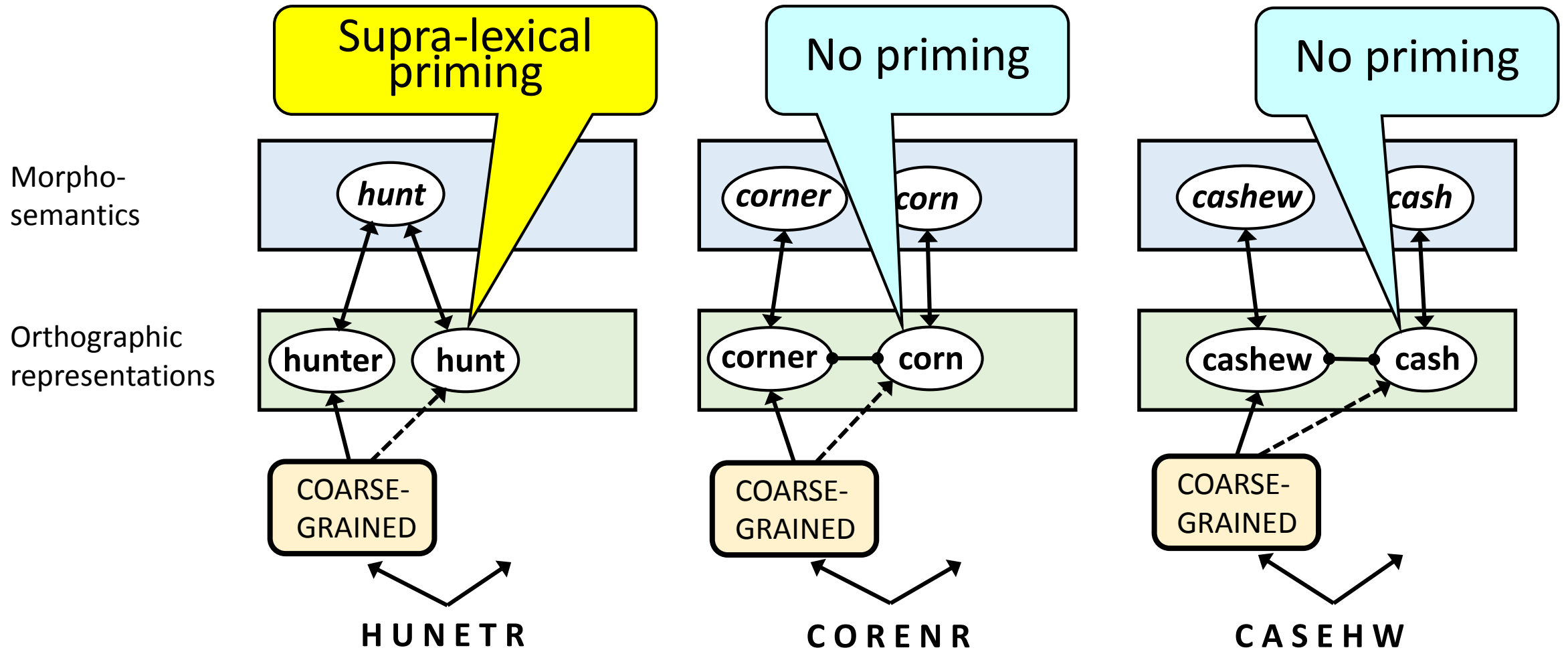
HUNETR

CORENR

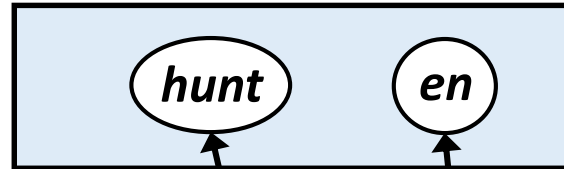
CASEHW

TL pseudowords

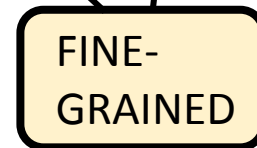
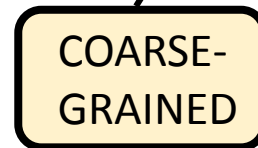
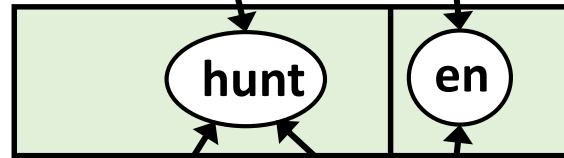




Morpho-
semantics



Orthographic
representations



HUNTEN

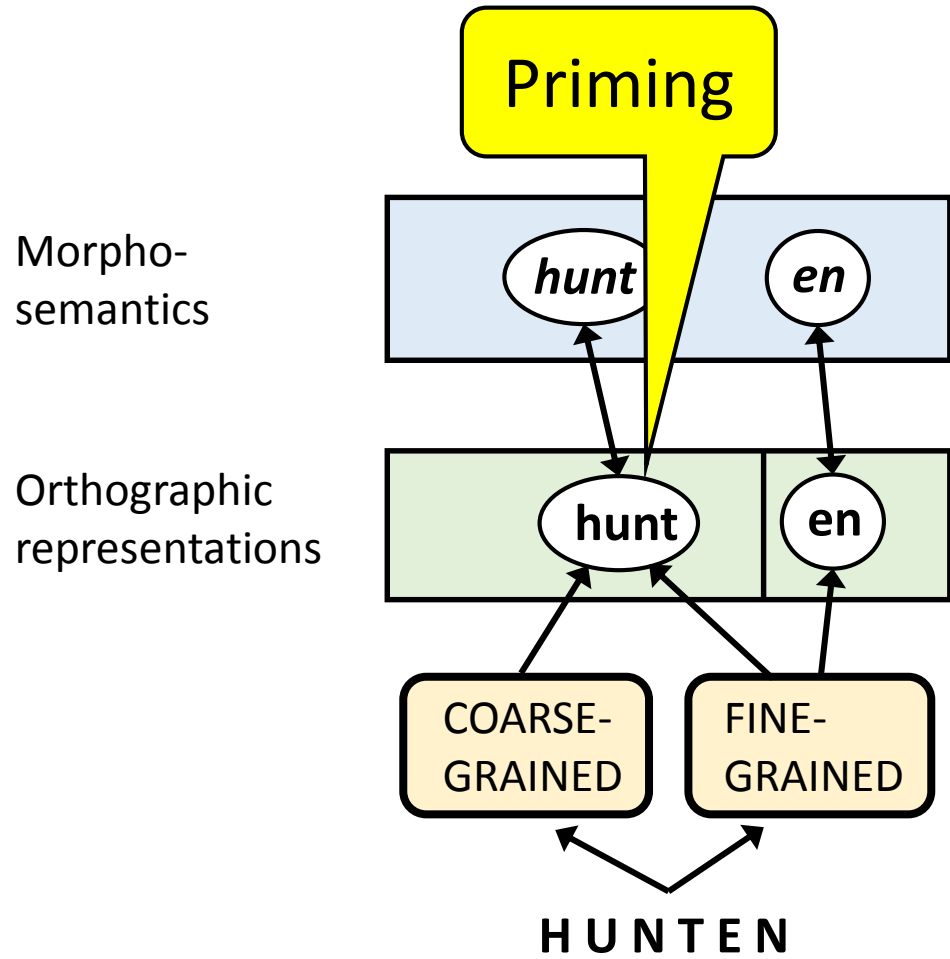
Suffixed pseudoword

hunt *en*

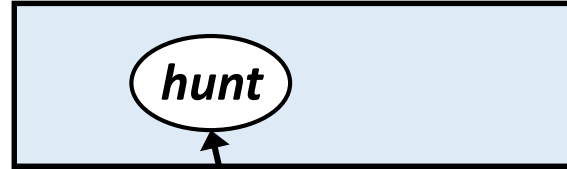
hunt **en**

**COARSE-
GRAINED**

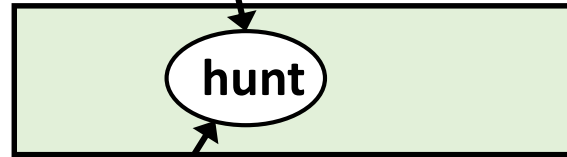
**FINE-
GRAINED**



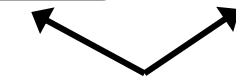
Morpho-
semantics



Orthographic
representations



COARSE-
GRAINED

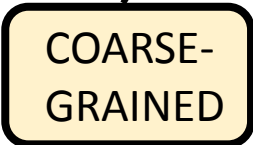
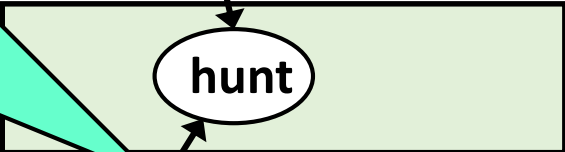
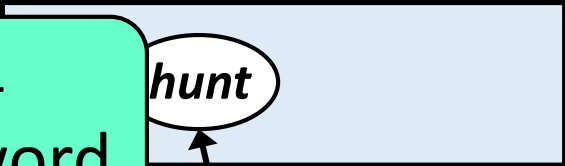


HUNETN

TL Suffixed pseudoword

No subordination in coarse-grained pathway from longer word

Orthographic representations



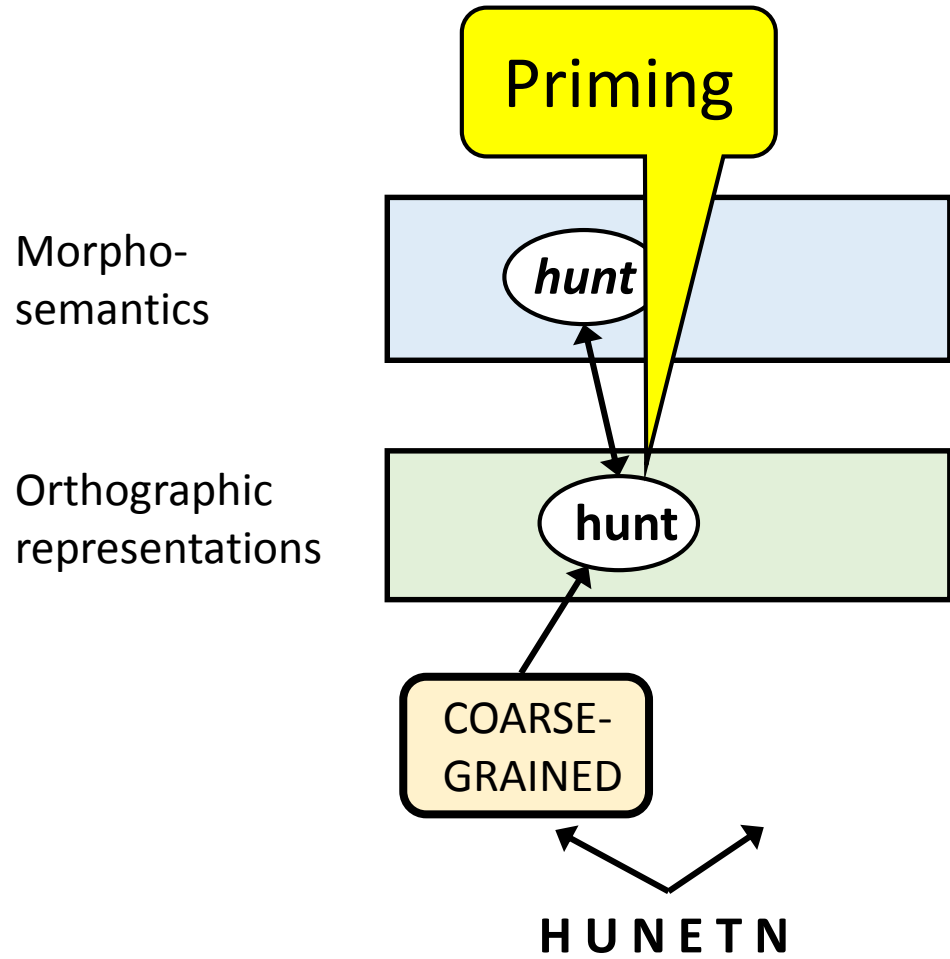
TL Suffixed pseudoword

hunt

hunt

COARSE-GRAINED

HUNETN



TL Suffixed pseudoword

CONCLUSION

- If the findings of Experiment 1 hold up, a single-pathway obligatory decomposition account is untenable.
- A model that separates the locus of decomposition from the locus of transposed letter effects seems necessary, hence requiring dual pathways in the recognition of polysyllabic words.