Nuclear Stress in English Unaccusatives

Introduction*

1. Goal: To account for nuclear stress in English sentences; in particular sentences with unaccusative verbs.

2. What is nuclear stress?

    a. The most prominent stressed syllable at the sentence/clause level.

3. Stress interacts with focus: A focused constituent contains the nuclear stress.

    a. Speaker A: What happened?
       Speaker B: [The boy ran to the STORE]_F   #The BOY ran to the store

    b. Speaker A: Who ran to the store?
       Speaker B: [The BOY]_F ran to the store   #The boy ran to the STORE

    c. Speaker A: Where did the boy run to?
       Speaker B: The boy ran to [the STORE]_F   #The BOY ran to the store

4. Case (3a), when the entire clause is focused, is the case under investigation. Examples are elicited in response to "What happened?" This will be the case in all examples below, except where noted.

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* I would like to thank Jane Grimshaw, who has contributed greatly to this research.

Generalization

5. Unergative verbs: Nuclear stress final (on verb)

    a. The <u>boy</u> RAN   #The BOY <u>ran</u>

6. Transitive verbs: Nuclear stress final (on object)

    a. The <u>boy</u> climbed the TREE   #The BOY climbed the <u>tree</u>

7. Unaccusative verbs: Nuclear stress *initial* in (7a) (on subject); final in (7b) (on object)

    a. The ICE broke   #The ice BROKE

    b. The <u>boy</u> broke the ICE   #The BOY broke the <u>ice</u>

8. Note the minimal pair formed by the unergative (5a) and the unaccusative (7a).

9. I will propose an OT account that predicts the nuclear stress in all three cases above. It will capitalize on the fact that nuclear stress is assigned to p-phrases only, and that unaccusative VP's are not p-phrases, while unergative VP's are.

Analysis

10. Assumptions on prosodic constituency: Phonological phrases (p-phrase) are aligned with lexical syntactic XP's (NP, VP, AP) via the Optimality Theoretic (Prince & Smolensky, 2004) alignment constraints:

    a. ALIGN-XP,R: The right edge of each XP is right-aligned with the right edge of a p-phrase (Selkirk, 2005).

    b. ALIGN-XP,L: The left edge of each XP is left-aligned with the left edge of a p-phrase (Selkirk, 2005).

11. ALIGN-XP,R, ALIGN-XP,L dominates a constraint *P-PHRASE, which is violated once for each p-phrase.

12. I assume that a constituent at a given prosodic level contains at least one head constituent on the tier directly below it. This head constituent will be said to be stressed at the level above it.

a. At the level of the p-phrase, this stress will be referred to as a phrasal stress (the head prosodic word at the level of the p-phrase).

b. At the level of the intonational phrase, this stress is the nuclear stress (the head p-phrase at the level of the intonational phrase).

c. Heads percolate upwards: The head syllable of the head foot of the head prosodic word of the head p-phrase of the intonational phrase receives nuclear stress.

13. Evidence that phrasal stress exists (Truckenbrodt, 2006: 446):

a. [What does he do?]   He [teaches LINGUISTICS]$_{Focus}$

b. [What does he do?]   He [<u>teaches</u> in GHANA]$_{Focus}$

c. There is a contrast in the level of stress on "teaches" where it is receives a greater degree of stress in (14b) than in (14c).

d. In neither case, does it receive the nuclear stress though.

e. This is analyzed as a difference in phrasal stress: The head prosodic word in a p-phrase receives phrasal stress.

f. The verb and adjunct in (14b) are in separate p-phrases.

g. On the other hand, in (14a) the verb and argument are in the same p-phrase.

h. Truckenbrodt derives this difference via the constraint STRESS-XP:

  STRESS-XP: Each XP must contain a beat of stress on the level of the p-phrase (Truckenbrodt, 2005: 446).

i. In (14a), the verb is not part of its own XP, while in (14b) it is:

14. Within a p-phrase, the head prosodic word is selected via one of the following constraints:

a. ALIGN-HEAD,R (P-PHRASE): The head prosodic word (p-word) of a p-phrase is aligned with the right edge of the p-phrase (adapted from Kager's (1999: 167) RIGHTMOST).

b. ALIGN-HEAD,L (P-PHRASE): The head prosodic word (p-word) of a p-phrase is aligned with the left edge of the p-phrase (adapted from Kager's (1999: 167) LEFTMOST).

c. STRESS-XP: Each XP must contain a beat of stress on the level of the p-phrase (Truckenbrodt, 2006: 446).

15. Within an intonational phrase, the head p-phrase is selected via one of the following constraints:

j. ALIGN-HEAD,R (I-PHRASE): The head p-phrase of the intonational phrase is aligned with the right edge of the p-phrase (adapted from Kager's (1999: 167) RIGHTMOST).

k. ALIGN-HEAD,L (I-PHRASE): The head prosodic word (p-word) of a p-phrase is aligned with the left edge of the p-phrase (adapted from Kager's (1999: 167) LEFTMOST).

d. STRESS-CLAUSAL XP: Each clause-level XP (TP or CP) must contain a beat of stress on the level of the intonational phrase.

16. The constraint STRESS-XP prefers stress on a complement over a head, within a given XP, regardless of linear order (examples are from Truckenbrodt (2006: 446) in response to "What does he do?"):

a. English (head-initial):

(1)

He [teaches [linguistics] NP]VP	STRESS-XP	ALIGN-HEAD,R (P-PHRASE)	ALIGN-HEAD,L (P-PHRASE)
☞ a. He [teaches LINGUISTICS]			*
b. *He [TEACHES linguistics]	*!(NP)	*	

b. German (head-final):

      Er soll   linguistik unterrichten
      he MODAL linguistics teach
      'He is said to teach linguistics.'

(2)

Er soll [[linguistik]NP unterrichten]VP	STRESS-XP	ALIGN-HEAD,R (P-PHRASE)	ALIGN-HEAD,L (P-PHRASE)
☞ a. Er soll [LINGUISTIK unterrichten]		*	
b. *Er soll [linguistik UNTERRICHTEN]	*!(NP)		*

17. Multiple p-phrases: In unergatives and transitives, the rightmost stress on the level of
the p-phrase is strengthened on the level of the intonation phrase (Truckenbrodt,
2005: 446; Kahnemuyipour, 2009: 119).

    a. A constraint ALIGN-HEAD,R (I-PHRASE) would enforce this as long as it
dominates ALIGN-HEAD,L (I-PHRASE).[1]

(3)

The [boy]NP [ran]VP	ALIGN-HEAD,R (I-PHRASE)	ALIGN-HEAD,L (I-PHRASE)
☞ a. The [boy] [RAN]		*
b.*The [BOY] [ran]	*!	

    b. However this predicts the unaccusative example (7a) should also receive
rightmost stress, contrary to fact.

(4)

The [ice]NP [broke]VP	ALIGN-HEAD,R (I-PHRASE)	ALIGN-HEAD,L (I-PHRASE)
☠ a. The [ice] [BROKE]		*
b. The [ICE] [broke]	*!	

    c. Prosodic alignment constraints cannot account for this fundamental difference
between unergatives and unaccusatives.

18. A syntactic difference must exist:

    a. Legate (2003) posits a phase-based account to explain why unaccusatives and
passives have nuclear stress on the subject.

    b. The unaccusative subject is base-generated as a complement to the verb and is
later re-merged in subject position.

    c. Nuclear stress is assigned within a phase domain.

    d. Following Chomsky (2001), Legate posits the complement of the phase-head
to constitute the phase domain.

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[1] STRESS-XP is satisfied in both cases since both XP's have a phrasal stress, as indicated
by the underlining.

e. Departing from Chomsky (2001), Legate argues that unaccusative v-heads are phase-heads: For her, the unaccusative nuclear stress pattern is evidence of their phasehood.

f. At the time the phase domain is shipped off to PF, the subject is still in its base position, the rightmost XP, and thus receives nuclear stress.

19. Current proposal: Constraints that refer to syntactic constituents (ALIGN-XP,R and STRESS-XP) can see syntactic objects that are phonologically null. No reference to phases is made in this proposal.

a. ALIGN-XP,R is satisfied as long as a p-phrase is right-aligned with each lexical XP.

b. In an unaccusative structure, there is a DP copy at the right edge of the VP, which is linked to the DP subject.

c. The NP subject "ice" receives stress straightforwardly, satisfying ALIGN-XP,R and STRESS-XP for the NP.

d. However, the NP subject "ice" also satisfy both ALIGN-XP,R and STRESS-XP with respect to the lower VP, since its lower copy is right-aligned within this VP.

e. The verb "broke" does not receive stress at the level of the p-phrase then, since it is not right-aligned with any p-phrase.

f. STRESS-XP is satisfied as long every XP contains a beat of stress at the p-phrase, *or contains a copy of a constituent that contains a beat of stress at the p-phrase.*

(5)

The [ice]_{NP1} [broke <the [ice]_{NP1}>]_{VP}	STRESS-XP	ALIGN-XP,R	*P- PHRASE
a. The [ice] [BROKE] <the ice>		*!	**
☞ b. The [ICE] broke <the ICE>			*
c. The [ICE] [broke <the ICE>]			**!
d. The ice [BROKE] <the ice>	*!		*

20. STRESS-XP requires that the NP "ice" receive a beat of stress at the p-phrase level. Candidate (d) violates STRESS-XP because "ice" is not stressed at the p-phrase level.

   a. The remaining three candidates satisfy STRESS-XP because they all assign stress to the NP "ice" at the p-phrase level.

   b. Candidate (a) attempts to form a p-phrase on the verb alone. This violates ALIGN-XP,R since the lower DP copy is part of the VP and so the VP isn't right-aligned with the p-phrase.

   c. Candidate (c) attempts to include the lower copy within the p-phrase. However, it does not improve on candidate (b) on any of the alignment constraints (none violate any alignment constraints), and incurs an extra violation of *P- PHRASE.

   d. Candidate (b), which does not parse the verb "broke" in a p-phrase at all is selected optimally. Instead "broke" would constitute a prosodic word that is linked directly to the intonational phrase.

   e. Therefore, in unaccusative verbs, the rightmost p-phrase is assigned nuclear stress: The VP simply does not constitute a p-phrase and so the NP constitutes the rightmost p-phrase.

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21. In an unergative structure, the VP does constitute a p-phrase:

(6)

The [boy]_{NP} [ran]_{VP}	STRESS-XP	ALIGN-XP,R	ALIGN-HEAD,R (I-PHRASE)	*P- PHRASE
☞ a. The [boy] [RAN]				**
b. The [BOY] ran	*!	*		*
c. The [BOY] [ran]			*!	**
d. The boy [RAN]	*!	*		*

22. STRESS-XP requires that the NP "boy" and the VP "ran" receive a beat of stress at the p-phrase level. Candidates (b) and (d) violates STRESS-XP because "ran" and "boy" are not stressed at the p-phrase level.

   a. The remaining two candidates (a and c) satisfy STRESS-XP because they all assign stress to the NP "boy" and the VP "ran" at the p-phrase level.

   b. Candidate (c) places the nuclear stress on the initial p-phrase, violating ALIGN-HEAD,R (I-PHRASE).

   f. Candidate (b), satisfies ALIGN-HEAD,R (I-PHRASE) by placing the nuclear stress on the final p-phrase (the VP). It is selected optimally as a result.

g. Therefore, in unergative verbs, the rightmost p-phrase is assigned nuclear stress as well: The VP *does* constitute a p-phrase and since it is rightmost, it receives nuclear stress.

23. A syntactic account of nuclear stress is more problematic (Kahnemuyipour, 2009: 119):

   a. This account would need to assign nuclear stress in one phase only, while subsequent phases would not alter this nuclear stress.

   b. Kahnemuyipour suggests that the "lowest" (most deeply embedded) phase be given this special status, but notes that "lowest" is a global notion: How does a given phase know if it's going to be the lowest at a given point in the derivation?

   c. This problem can be bypassed by positing a phonological constraint responsible for the assignment of the head p-phrase within an intonational phrase (rightmost).

Issues and Future Research

24. A class of exceptions include unaccusatives with manner adverbs (Kahnemuyipour 2009: 104):

   The ice slowly MELTED.   # The ICE slowly melted.
   cf. The ICE melted.   #The ice MELTED.

25. The addition of a manner adverb between the subject and verb shifts the nuclear stress onto the verb, as is the case with unergatives.

26. Kahnemuyipour (2009) assumes that these manner adverbs are introducing a phase boundary, that is otherwise not present in unaccusatives.

   a. Evidence: Generally, unergatives undergo –er nominalization (see (i) below), unaccusatives do not (see (ii) below) (Kahnemuyipour, 2009:106).

      i. runner, jumper, rioter, jogger, shopper, actor

      ii. *comer, *arriver, *riser, *developer, *bloomer, *grower

   b. For at least some unaccusatives, inclusion of a manner adverb allows –er nominalization:

        iii. newcomer, latecomer, late arriver, early riser, late developer, late bloomer, low grower (= a shrub)

27. It is not clear why an adverb should introduce a phase boundary.

    c. One possibility is that there is a phonological constraint that is violated when the nuclear stress would be "too far" from the right edge.

28. The prosody of the verb matters:

    a. When an unaccusative verb has four or more syllables, it is stressed rather than the subject:

        i. The drink ACIDIFIED.   #The DRINK acidified.

        cf. The ICE broke.   #The ice BROKE.

        ii. The lamp SHORT-CIRCUITED.   #The LAMP short-circuited.

        iii. a nonse verb: "kittikutten"

        The boy kittikuttened the ICE.   #The BOY kittikuttened the ice.

        iv. The ice KITTIKUTTENED.   #The ICE kittikuttened.

    b. When an unaccusative verb has three syllables and initial stress, it is stressed rather than the subject:

        i. The group QUIETENED.   #The GROUP quietened.

    c. When the verb is trisyllabic with final stress, the subject is stressed:

        ii. The TIN decomposed.   #The tin DECOMPOSED.

29. One possibility is that there is a maximal size on the p-phrase: Manner adverbs can't constitute their own p-phrase and would have the same effect as increasing the number of syllables on the verb.

30. Further questions: What constitutes a lexical XP? Do PP's count? Do AdverbP's count?

Conclusion

31. Nuclear stress is predicted to occur on the subject in unaccusative verbs but on the verb in unergative verbs via constraint interactions where deleted XP copies are visible.

32. The prosodic difference between unergatives and unaccusatives is argued to follow from a difference in the base position of the subject.

33. When the subject DP is linked to a null copy that is the complement to a VP, as in the case of unaccusatives, the VP does not form a p-phrase and thus is not a candidate for nuclear stress.

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