Some Interface Properties of the Phase

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This squib has two goals: to identify evidence for *(strong) phases* (Chomsky 1999, 2000, 2001); and to use this evidence to investigate the extensional definition of a phase. Chomsky (2000) states that CP is a phase, whereas TP is not, and (transitive) vP is a phase, whereas passive and unaccusative verb phrases (VP) are not.[1] I argue here that unaccusative and passive VPs are phases as well.

Before turning to the arguments for phases, let us consider how they are used in Chomsky's system.[2] A phase is a self-contained subsection of the derivation, beginning with a numeration and ending with Spell-Out. At the point of Spell-Out, the complement of the phase-defining head phase is sent to each of the PF and LF components for interpretation. Thus, after construction of the vP phase, VP undergoes Spell-Out. This results in the *Phase-Impenetrability Condition*, defined in Chomsky 1998 as follows: "In phase α with head H, the domain of H is not accessible to operations outside α, but only H and its edge," where the *edge* includes any specifiers of H and any adjuncts to H. This condition has for effect that any elements in the complement of v that need to undergo movement outside of the phase (e.g. an object wh-phrase) must move to the phase edge before Spell-Out.

Support for this notion of a phase may thus be obtained through evidence for

intermediate traces of moved elements at the phase edge. In the first section of this squib, I consider three diagnostics for such traces, and demonstrate that they equally support passive and unaccusative VPs as phases. In the second section, I identify a test for phases at PF, and demonstrate that this diagnostic also supports the phasehood of passive and unaccusative VPs.

1. Evidence for Movement to the Phase-Edge

1.1 Reconstruction Effects

In this section, we use reconstruction effects as a diagnostic for intermediate traces of wh-movement at the phase edge. The logic of this test is that in order for a wh-word to be visible to movement operations during a subsequent phase, it must move to the edge of its phase, in accordance with the Phase Impenetrability Condition. Thus, successive cyclic wh-movement must leave copies at every intermediate CP and vP. Lebeaux (1988) devises a diagnostic for intermediate copies in CP of successive cyclic wh-movement based on the interaction between binding and reconstruction, a diagnostic that Fox (1998) extends to copies adjoined to vP. Consider (1). Relevant potential reconstruction sites are indicated by underlined asterisks/checkmarks.

(1) a. [Which of the papers that he$_i$ gave Mary$_j$] did every student$_i$ $\underline{\surd}$ ask her$_j$ to read $\underline{*}$ carefully?

b. * [Which of the papers that he$_i$ gave Mary$_j$] did she$_j$ $\underline{*}$ ask every student$_i$ to revise $\underline{*}$? (Fox 1998:157)

These examples are interesting in that the wh-phrase contains both a pronoun, *he*, to be bound by *every student*, and an R-expression, *Mary*, which must not be c-commanded by the coreferent pronoun *her/she*. Thus, the wh-phrase must reconstruct to a position below *every student* and above *her/she*. In (1a), such a position is available, if we assume that the wh-phrase leaves an intermediate copy adjoined to the *v*P *[ask her to read]*, and indeed, the sentence is grammatical. In contrast, (1b) has no such position available. In order for *he* to be bound by *every student*, the wh-phrase must reconstruct to its merged position, and yet in this position *she* c-commands *Mary*, violating binding Condition C. Thus, the sentence is ungrammatical.

This test can be carried over straightforwardly to passives. In (2a) and (2b), Mary keeps being introduced to her own date at parties; (2c) and (2d) involve a charity auction at which dates with bachelors are sold.

(2) a. [At which of the parties that he$_i$ invited Mary$_j$ to] was every man$_i$ $\underline{\surd}$ introduced to her$_j$ $\underline{*}$?

b. * [At which of the parties that he$_i$ invited Mary$_j$ to] was she$_j$ $\underline{*}$ introduced to every man$_i$ $\underline{*}$?

c. [At which charity event that he$_i$ brought Mary$_j$ to] was every man$_i$ $\underline{\surd}$ sold to her$_j$ $\underline{*}$?

d. * [At which charity event that she$_j$ brought John$_i$ to] was he$_i$ $\underline{*}$ sold to every woman$_j$ $\underline{*}$?

Identically to (1), the sentences in (2) contain a wh-phrase which must reconstruct below *every man/woman* in order for *he/she* to be bound, and above *Mary/John* for the construction to obey binding Condition C. Again, in (2a) and (2c) such a position exists, if one assumes that the wh-phrase leaves a copy adjoined to the VP.[3] The fact that (2a) and (2c) are grammatical, thus strongly supports the claim that successive cyclic wh-movement proceeds through passive VPs, as well as transitive vPs. In (2b) and (2d), no reconstruction site exists that will satisfy both binding conditions at once, and the sentences are ungrammatical, as predicted.

To apply this test to unaccusatives, we need an unaccusative verb with two internal arguments; *escape* meaning 'forget' is a possibility.[4]

(3) a. Every winner$_i$'s name escaped Mary$_j$ at the ceremony he$_i$ invited her$_j$ to.

b. * Every winner$_i$'s name escaped her$_j$ at the ceremony he$_i$ invited Mary$_j$ to.

c. [At which ceremony he$_i$ invited Mary$_j$ to] did every winner$_i$'s name $\underline{\surd}$ escape her$_j$ $\underline{*}$?

d. [At which ceremony he$_i$ invited Mary$_j$ to] did her name $\underline{*}$ escape every student $\underline{\surd}$?

The surface subject of *escape* must be an abstract concept, which complicates the examples. (3a) demonstrates that *every winner* can bind *he* from within the DP *every*

winner's name. (3b) illustrates the Condition C violation between *her* and *Mary* resulting when the adjunct appears in its merged position. (3c) is the crucial example. The grammaticality of (3c) demonstrates that there must be a position available for reconstruction of the wh-phrase between the surface subject *every student* and the object *her*. Such a position exists if we assume that the unaccusative VP forms a phase. Unfortunately, we cannot complete the paradigm as we did in previous examples with an ungrammatical sentence, since *she* is not an appropriate surface subject of *escape* 'forget', and *her name* does not induce the required Condition C violation. However, the grammaticality of (3c) indicates a reconstruction site at the level of the unaccusative VP. Thus reconstruction effects support the phasehood of unaccusative as well as passive VPs.

1.2 Quantifier Raising in Antecedent Contained Deletion

In this section we consider quantifier raising (QR); either of two possible conceptions of QR renders it a diagnostic for movement to the phase edge. The first is that QR is covert, and covert movement must obey cyclicity just like overt movement. Since the phase is the minimal unit sent to LF for interpretation, the phase edge is the only possible target for QR. The second follows work claiming that covert movement is actually overt movement with pronunciation of a lower copy (Bobaljik 1995, Groat & O'Neil 1996, and Pesetsky 1998). Fox & Nissenbaum (1999) and Fox (to appear) argue specifically that QR is overt in this sense. Since QR is not motivated by

the morphological agreement needs of a particular head, we may assume that (like the intermediate steps of wh-movement) it is motivated by convergence requirements which allow positing an EPP feature on the phase edge. A quantificational object, of type $<<e,t>,t>$, must move in order to be interpreted, since in situ it results in a type mismatch with the verb, of type $<e,<e,t>>$ (see Heim & Kratzer 1998).

The examples in (4) use antecedent contained deletion (ACD) to force QR (see Bouton 1970, Sag 1976, Chomsky & Lasnik 1993, Fox 1995, inter alia), and scope--bearing elements to ensure QR is targetting the the edge of the vP rather than CP phase.

(4) a. Mary didn't $_{VP1}$[introduce John to $_{DP}$[anyone you did $_{VP2}$[e]]]

b. Some woman $_{VP1}$[gave John $_{DP}$[every message you did $_{VP2}$[e]]]

In (4a), for the the negative polarity item *anyone* to be licensed, the DP containing it must have undergone QR to a position no higher than negation, thus to to the edge of vP.[5] Similarly, in order to obtain the most salient reading of (4b), in which the existential has scope over the universal, the DP must have undergone QR to a position below the subject: to the edge of vP.

(5) replicates these tests with passive and unaccusative VPs.

(5) a. Mary wasn't $_{VP1}$[introduced to $_{DP}$[anyone you were $_{VP2}$[e]]].

b. Some woman was $_{VP1}$[given $_{DP}$[every message you were $_{VP2}$[e]]].

c. The road didn't $_{VP1}$[go by $_{DP}$[any of the scenic spots you expected it to $_{VP2}$[e]]].

d. Some train $_{VP1}$[arrived in $_{DP}$[every city you expected it to $_{VP2}$[e]]].

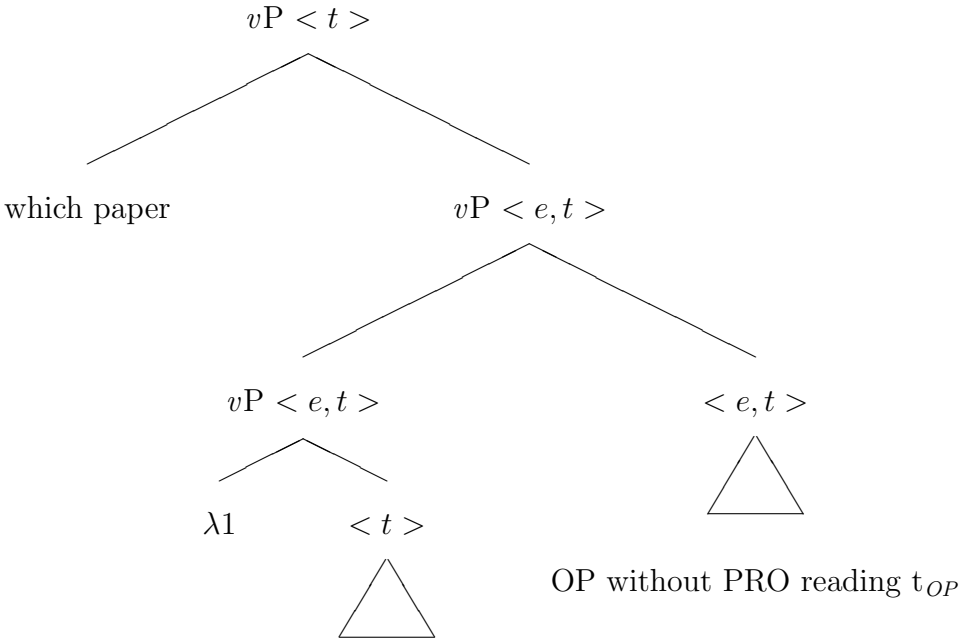
For the licensing of the NPI in (5a) and (5c), and for the reading of (5b) and (5d) with wide scope of the existential, QR must target the passive/unaccusative VPs. QR thus also supports the phasehood of passive and unaccusative VPs.

1.3 Parasitic Gaps

Our next diagnostic for movement to the phase-edge is the parasitic gap construction (PG). Nissenbaum 1998 argues for an analysis of PGs whereby a vP-level wh-trace is crucial for the interpretation of these constructions. The normal composition of a vP-adjoined adjunct and its host vP,[6] uses Predicate Modification to create a conjoined interpretation (see Heim & Kratzer 1998). However, the operator movement in an adjunct containing a PG creates a lambda abstract, which results in a type mismatch between the vP, of type $< t >$, and the adjunct, of type $< e, t >$

Nissenbaum's idea is that the structure would be interpretable if: (i) a wh-phrase from the main vP moved to adjoin to vP, creating a lambda abstract; and (ii) the adjunct clause containing the PG merged counter-cyclicly just below the root. (See Nissenbaum 1998 for details and supporting arguments.)

(6) Which paper did John file [OP [PRO without reading t_{OP}]]



Therefore, PGs require wh-movement to the edge of the vP phase to be interpreted, and so can serve as a diagnostic for such movement.

Applying this test to passives requires use of an overt subject in the subordinate clause, since PRO in these adjuncts, with or without a PG, seems to strongly resist being controlled by a passive subject, instead prefering to be coindexed with an external argument of the host verb phrase. This change makes PGs with transitive vPs slightly marginal; the PGs with passive VPs are correspondingly marginal.[7]

(7) a. ? Which house did John buy [OP [before we had a chance to clean t_{OP}]]?

b. ? Which house was John sold [OP [before we had a chance to clean t_{OP}]]?

c. ? Which book did John buy [OP [for his wife to have a look at t_{OP}]]?

d. ? Which book was John sold [OP [for his wife to have a look at t_{OP}]]?

PGs with the unaccusative verb *escape* are also slightly marginal:

(8) ? Which answer escaped John [OP [before he wrote t_{OP} down]]?

The ability of passive and unaccusative VPs to host PGs thus also supports their status as a phase.

2. Evidence for Phases at PF

In this section we consider a test for the phasehood of vPs at PF: the Nuclear Stress Rule (NSR). The exact formulation of this rule is immaterial here (see for e.g. Cinque 1993); it suffices to observe that primary stress in English is assigned to the final stress-bearing element in the VP: *Mary fixed the bike*^{1}*/Mary fixed it*^{1}.

Bresnan (1972) argues on the basis of (9) that the NSR applies cyclically.

(9) a. Mary liked the proposal that George leave^{1}.

b. Mary liked the proposal^{1} that George left. (Bresnan 1972:75)

(9a) illustrates normal application of the NSR assigning primary phrasal stress to final *leave*. In (9b), on the other hand, the primary stress appears on the non-final *proposal*. Bresnan's intuition was that the NSR applies normally in (9b), but that its application is cyclic. Thus, assuming that *proposal* in (9b) is moved from the object position of the embedded clause,[8] it receives primary phrasal stress on the first application of the NSR, before it has moved from object position.

The relevance of phases becomes apparent when we consider the data in (10).

(10) a. I'll look up Mary[1], when I'm in Toronto.

b. I'll look her/?Mary up[1], when I'm in Toronto.

c. Please put away the dishes[1].

d. Please put them/?the dishes away[1].

In these examples, the object undergoes short movement within the verb phrase. As functional categories, prepositions resist bearing primary stress; however, in (10b) and (10d), primary stress on the preposition seems possible. Thus, the NSR assigns primary stress to the preposition in these examples, and this stress may shift due to the prosodically light status of the preposition. These examples thus contrast with those in (9), in that the NSR does not assign primary stress to the shifted object.

I propose that the crucial distinction between (9) and (10) is that in (9) the object moves out of the phase, whereas in (10) the object moves within the phase. Thus, the input to PF on the first phase of (9b) is *[left the proposal]*, whereas the input to PF on the first phase of (10d) is *[put the dishes away the dishes]*.

Let us assume that the PF operation that deletes non-initial copies in a chain treats each phase as a separate unit, as expected. In (9b), the DP *the proposal* is a copy, this DP having moved to the phase edge to be visible for movement during a later phase. However, the phase contains only one occurrence of this DP, and thus the PF operation which deletes non-initial copies in a chain cannot apply to it. The

phase proceeds to the application of the NSR unaltered, and primary phrasal stress is assigned to *the proposal*. At a later phase, this occurrence of *the proposal* will be deleted in favour of a higher occurrence, with the primary phrasal stress realized on the higher occurrence.[9] In (10d), on the other hand, the input to PF contains two occurrences of *the dishes*. Thus, the PF operation deleting non-initial copies applies, and deletes the lower copy. In the input to the NSR, *away* is the rightmost element in the verb phrase, and receives primary phrasal stress accordingly.

If this analysis is on the right track, the NSR applies to the phase, and so serves as evidence for the existence of phases. Furthermore, it can test for the phasehood of a phrase: an element moving from a position final in the verb phrase out of the phase should bear primary phrasal stress, while an element moving from a position final in the VP to a position within the same phase should not.

Turning to unaccusative and passive VPs, the prediction is clear. If these VPs are not phases, and so movement of the object to subject position is within a phase, the subject of unaccusative and passive VPs should not bear primary phrasal stress. If unaccusative and passive VPs are phases, on the other hand, movement from object to subject position will be movement out of a phase.[10] Therefore, if the object was final in the VP before movement to subject position, it should bear primary phrasal stress. The data in (11) demonstrates that this latter prediction is borne out.

(11) a. (What happened yesterday?) My bike[1] was stolen.

(*cf* # John[1] stole my bike.)

b. (What happened yesterday?) My bike was sent to John[1].

c. (What happened this morning?) The train[1] arrived.

In a neutral context, primary stress on the subject of a passive sentence is natural, whereas primary stress on the subject of the corresponding active is odd, as expected. (11b) illustrates that if the lower copy of the passive subject is not final in the VP, the element final in the VP receives primary stress instead. (11c) demonstrates that the subject of unaccusative VPs also receives primary phrasal stress in a neutral context, as predicted by the proposed analysis.

In this section, we have seen that the NSR distinguishes movement within a phase from movement out of a phase. We then used the NSR as a diagnostic to demonstrate the phasehood of passive and unaccusative VPs.

3. Conclusion

This squib has identified four pieces of evidence for *v*P phases: wh-reconstruction effects, quantifier raising, parasitic gaps, and the Nuclear Stress Rule. In all cases, I have demonstrated that the diagnostic equally supports the phasehood of unaccusative and passive VPs. Therefore, analyses which crucially require unaccusative and passive VPs to not be phases (e.g. Chomsky 1999's analysis of case licensing of participial passives) should be rethought.

[1] I use VP as a traditional term, remaining agnostic about the phrasal category of passive and unaccusative verb phrases, noteably whether they involve a (defective) v head. The question of the phasehood of these phrases is independent from the question of their categorical label.

[2] For simplicity of presentation I will be ignoring differences among Chomsky 1999. 2000, and 2001, as well as any details that are not directly relevant to the argument.

[3] This assumes a "cascade" structure in which *at DP* phrases are merged as the lowest argument in the VP. See Pesetsky 1995.

[4] Thanks to David Pesetsky for suggesting this verb.

[5] Assuming that the licensing of NPIs happens at LF rather than S-Structure, the latter no longer a relevant level in the theory. See Urribe-Etxebarria 1996.

[6] Nissenbaum shows that the tests which support a cascade structure for certain adverbials, argue for a right-adjoined, or "layered", structure for those found in PGs.

[7] Thanks to Jon Nissenbaum for assistance with the examples. A few speakers I consulted found the passive (and unaccusative) examples worse than the vP. I can only suggest that the as yet ill-understood thematic requirements of the adjuncts in PGs results in a difference for these speakers.

[8] See Vergnaud 1974, Kayne 1994, and much subsequent work.

[9] This analysis requires that phonology be able to modify previous phases. This must be the case independently, however, since there exist prosodic units larger than the phase–e.g. intonational phrases (see, for example, Selkirk 1980)

[10] In fact, the movement to subject position will require an intermediate position at the phase edge, as discussed in the previous section. Since this position is also out of the domain of the phase which serves as the input to PF, this intermediate position is not relevant to the discussion here.

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