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Reviewed by NORBERT HORNSTEIN, *University of Maryland, College Park,* and ANDREW NEVINS, *Harvard University*

This provocative and original book covers much interesting territory. Our allotted space requires us (sadly) to restrict our attention to two themes that representation theory (RT) explores: shape conservation and embedding.

SHAPE CONSERVATION. RT divides syntax into multiple levels of representation which map to each other according to global principles, some of which may conflict. Many theories share the view of syntax as a set of interrelated levels: witness lexical functional grammar, which maps f-structure and c-structure (with some optimality-theoretic variants); government and binding theory, which maps d-structure and s-structure; Ray Jackendoff's recent theories, which map syntax, semantics, and phonology onto one another with global matching principles; and minimalism, which maps syntax to both PF (phonetic form) and LF (logical form) through a locally deterministic set of operations on lexical items. These views assume that each level of representation has different principles and constitutes a distinct 'sublanguage' that codes specific kinds of information. RT differs from these in a few important respects: There are seven levels (theta structure, case structure, predicate structure, surface structure, quantifier structure, focus structure, and accent structure), and in principle 'the limiting case is an RT with exactly the same number of levels as there are functional elements in the structure of the clause in the corresponding Checking Theory' (58). The levels are not related to one another by transformations of movement but rather by mapping principles, whose central principle is shape conservation. Global shape conservation requires that two levels within a REPRESENTATION RELATION maximally correspond, modulo the introduction of functional material. Thus, the grammar privileges mappings that conserve the linear and hierarchical relations between 1 and 2, and hence, exceptional case-marking constructions 3 and 4 constitute a bracketing paradox.

(1) Theta structure: [Agent [Predicate Theme]]
(2) Case structure: [Nominative [Case-Assigner Accusative]]
(3) Theta structure: [believe [Mary to be alive]]
(4) Case structure: [believe Mary [to be alive]]

Shape conservation is global in nature. One instance can be seen in Anders Holmberg's (1985, 1999) generalization, where the order of phrases within the verb phrase (including verb, one or more objects, and particles) must be preserved if scrambled or head-moved within the middle-field. For RT, Holmberg's generalization results from a single principle of shape conservation rather than as the conspiracy of different independent movements as occurs with localist theories such as minimalism. In the latter, when more than one dependency occurs for a single lexical item, the transformation is modeled as movement subject to principles of locality or relativized minimality. In RT, only WH-movement is so analyzed (though at certain points, e.g. p. 31, English topicalization is suggested to be as well). All other apparent cases of displacement (e.g. heavy NP shift, topicalization, scrambling, passivization, raising, object-shift) result from a mismapping between two independently generated levels of representation, not transformationally. RT has no movement for passives: Case and theta structures simply happen to be nonisomorphic. One reason for this is that surface structure must map faithfully onto both topic structure and case structure, creating a conflict resolved by ranking. Shape conservation is thus a violable principle. Crosslinguistic variation results from different ranking of relative representational faithfulness: for example, English surface order allows ambiguous quantifier scope, but disallows scrambling because for s-structure to map case structure is more important than for s-structure to map quantifier structure. German has the reverse ranking.

Though the global formulation of shape conservation captures generalizations about 'conspiracies' of independent movements that preserve linear order, we believe (pace Edwin Williams) that a principle like shape conservation need not imply a new architecture, one that employs RT-like sublanguages (1). For example, Fox and Pesetsky (2003) propose a derivational mechanism of phrase structure building, with intermediate levels of representation ('phases') that require consistent linear orderings across the derivation. Here, intermediate levels of representation are governed by a consistency principle and do not assume autonomous sublanguages at each stage.

Consider one particularly interesting effect of RT's proposed architecture. Within the division of labor between many distinct levels of representation, W is able to posit that certain grammatical relationships (such as binding) occur only at a particular level. Hence all 'subsequent' levels (with subsequence equated to 'larger' or 'later') cannot alter the relations established at a previous level. On this view, reconstruction effects become generalized to any instance of interlevel

mapping. For instance, RT postulates that binding theory is part of the sublanguage of predicate structure, that short-distance scrambling occurs before predicate structure, and that long-distance scrambling occurs after predicate structure. W poses this as a solution to 'why the possibility of reconstruction should correlate positively with the distance moved' (122). As a consequence of this arrangement, long-distance scrambling will always 'reconstruct' for binding theory, since long-distance scrambling in RT is simply a representation at surface structure which fails to preserve isomorphism with earlier levels. In this implementation, in which a 'movement' at level *n* that 'reconstructs' for relation R is simply a mismapping from level *n-k* to *n,* W is able to generalize reconstruction effects beyond the A/A' binary distinction: Any pair of levels can be mismapped in this way. To summarize, then: The set of possible interlevel mappings in RT is not constrained by economy of distance (i.e. shortest move) or of valuing features on lexical items (i.e. greed), but rather by shape conservation. When shape conservation is violated, apparent reconstruction effects will obtain.

EMBEDDING. An interesting component of RT is the way that embedding takes place: Following the general tradition of van Riemsdijk & Williams 1981, W orders all NP movement before all WH-movement. However, the picture is much more general: All embeddings take place in order of complement type, rather than in a bottom-to-top (or vice-versa) fashion. Consider the construction of 5 in 6–8.

(5) Mary thinks that John saw Fido.
(6) Level of theta structure: [Mary thinks that]$_{VP}$ [John saw Fido]$_{VP}$
(7) Level of predicate structure: [Mary *v* thinks that]$_{IP}$ [John *v* saw Fido]$_{IP}$
(8) Level of surface structure: [Mary *v* thinks [that John *v* saw Fido]$_{CP}$]$_{CP}$

The two clauses are built in parallel, and all of the action happens at surface structure, where CP-embedding is defined to take place. Embedding of the second clause occurs only within the sublanguage of surface structure, and no earlier (8). As W notes (183), 'verbs only select for C' and not for any other material (including finiteness) in the embedded clause, hence the theta structure in 6 is assumed for propositional complementation. W proposes the following architectural axiom: Embedding takes place only at the relevant level for which it is defined, regardless of the ultimate hierarchical constituency of its parts (the 'level embedding conjecture', p. 63). Within the general spirit of RT, the proposal is generalized to all types of embedding so that serial verb constructions, for example, represent embedding within theta structure and before case structure.

This architecture, of essentially parallel cyclicity until the point of clause union, leads to some interesting conclusions. The first regards improper movement, the descriptive generalization that although a phrase can move from an A position to an A' position, it cannot move from an A' position to an A position (though see the discussion of *tough*-movement in Brody 1993). In RT (or indeed, in any framework that orders all A movement before all A' movement), improper movements are excluded by a 'timing explanation'. Consider 9, where the embedded object is topicalized and then raised to the subject of an athematic verb.

(9) *John seems [t [Bill has seen t]$_{IP}$]$_{CP}$

Although in bottom-up theories of embedding 9 can be derived (and must be ruled out by asymmetric stipulations on 'uniform chains'), in RT it cannot. All raising occurs at predicate structure, and all topicalization occurs at surface structure. There is thus no way a predicate structure can be in a representation relation with a topicalized structure because it does not exist yet. Similarly, there is no way that a surface structure with an embedded topicalization can be in a representation relation with a matrix raising structure unless there is downward movement. Downward movement is ruled out in one of two ways in RT: If it is 'real' movement, as W maintains for WH-movement (despite its sometime shape-conserving character), then the extension condition is needed (however, this may prevent successive-cyclic WH-movement at the edge of the verb phrase, which has some empirical support). If it is misrepresentation because s-structure favors quantifier structure over predicate structure, then there must be a limit on how much misrepresentation is tolerated (opening the door for gradient degrees of violation within an

optimality-theoretic implementation). Thus, while the precise details are left open for 9, the general spirit of the proposal can be summed up as in 10.

(10) GENERALIZED BAN ON IMPROPER MOVEMENT (GBOIM): A movement operation that spans a matrix and embedded clause cannot move an element from position X_n in the embedded clause to X_{n-k} in the matrix clause. (72)

This formulation does not capture everything, however. Essentially, RT aims to rule out any instance of level n operations happening after level $n+k$ operations. Superraising (11) is thus ruled out because raising operations cannot take place after CP structure building operations.

(11) *John seems that it was seen *t*

In contrast to 11, raising from nonfinite clauses can occur because nonfinite clause union subject-to-subject raising occurs at the same level of representation (predicate structure). An important question in W's explanation of 11 is: What blocks clause-to-clause raising at the level of predicate structure, followed by development of the embedded CP structure later, at surface structure? In other words, what prevents 'late insertion' of the complementizer in the embedded clause? A possible answer can be found over 100 pages later in discussion of unrelated phenomena: 'to prevent correspondence under Shape Conservation where the categories are not homogenous: $[[]_{IP} \ldots]_{CP}$ cannot be a representation of $[\ldots]_{IP}$. The only ''growth'' that is allowed is growth that preserves the category, essentially adjunction. This would be a feature of the Shape Conservation algorithm, which is unfortunately still under development' (185). We return to this point below. Within derivational theories, late insertion of an embedded complementizer is ruled out by the extension condition on merge (see e.g. Boskovic & Lasnik 1999), which is still a stipulation, of course, but one with quite general coverage. In any event, the GBOIM is also generalized, and W shows its application to restrictions on movement in other domains. In fact, one interesting prediction strikes us. Suppose that anaphora is simply the result of movement into theta positions, as proposed by Hornstein (2000). Such movement would involve recursion of theta structures. Now consider the ban on nominative anaphors. If, as W suggests, nominative case is assigned at predicate structure (109), then no item that has been assigned nominative case can move on to another theta position, as dictated by the GBOIM. Other important predictions of the GBOIM involve restrictions on remnant movement, that is, disallowing A movement of a remnant containing an A' trace. We leave these to the interested reader and turn finally to a more general discussion of this architecture.

In RT, embedding consists of one structure being represented in another. Thus, for example, case structure (CS) embeds theta structure (TS) in virtue of CS asymmetrically representing TS. Given this, it is now clear why it is important that the representation relation be asymmetric; W, like everyone else, accepts that there is a straightforward sense in which TS structures are smaller than CS structures, which are smaller than surface structure (SS) structures (63ff.). And herein lies a potential conceptual oddity for RT.

Recall that for the standard conception, relations among domains proceed via successive complementation. From this it follows that theta domains are 'smaller' than case domains (and so on for the other levels W discusses) as theta structures are PARTS of case structures, given that case-assigning heads (e.g. AgrO or *v*) take VP as complements. However, this container/contained relation need not hold given an RT conception. There is no reason why, for example, CS represents TS and not vice versa. After all, as W insists, these structural levels are INDEPENDENT of one another (2). But if so, why need the structures grow across levels? The answer lies much later, in an axiom of phrase structure theory (181) that adopts the Pollock 1989/Cinque 1998 proposal that a fixed functional hierarchy places restrictions on the form of all embedding.

In fact, the actual RT account that W develops mimics the standard story by stipulating that levels are distinguished by the addition of 'new lexical or functional material' (61). Clearly, this means that it is ADDED to previous material. This caveat sits oddly with the contention that autonomous structures represent different kinds of information and that they interrelate by homomorphic mappings that preserve shape. In fact, it codes the more conventional idea that complementation is the central mechanism for building structure, and this echoes the 'regions'-based

notions that RT aims to displace. If this is correct, then RT suffers from a conceptual disadvantage in that it does not substitute novel notions for more conventional ones but adds to them. Nonetheless, many of the empirical insights about embedding that W develops can be incorporated into any theory without adopting autonomous levels of representation in correspondence relations. For example, we see no reason why the idea of 'parallel cyclicity', should it prove useful, could not be implemented in more conventional derivational accounts.

Framing syntactic problems within representation theory can lead to analyses that are conceptually novel and empirically rich. Though we have discussed only two large architectural issues here, it is important to point out that there are quite challenging analyses of focus, superiority, head-movement, and inflectional morphology within the book as well. In fact, many of these do not crucially depend on the two principles discussed above. The fact that readers are also offered a reasonably well-worked-out alternative worldview, endlessly provoking reconsideration of one's favorite shibboleths, makes it a somewhat unique and important read for serious syntacticians.

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Hornstein
Department of Linguistics
1401 Marie Mount Hall
University of Maryland
College Park, MD 20742
[nhlo@umail.umd.edu]

Nevins
Department of Linguistics
317 Boylston Hall
Harvard University
Cambridge, MA 02138
[nevins@fas.harvard.edu]