Internal DP heads in Restrictive Relative Clauses

1. Introduction: It has been widely argued (cf. Safir'99, Sauerland'02) that relative clauses (RCs) have a complex internal-head, rather than a phonetically null operator which binds the trace position. It is assumed that these restrictive RCs can have two potential structures, both headed internally by an NP: a raising structure, (1), in which the NP of the DP hosting the RC originates inside the relative clause, and a matching structure, (2), in which the external NP is based-generated outside of the relative clause.

(1) Raising: … [$_{DP}$ every [$_{CP}$ book$_1$ that Mary read t$_1$]].

(2) Matching: … [$_{DP}$ every [$_{NP}$ book [$_{CP}$ book$_1$ that Mary read t$_1$]]].

However, I argue that these internal-heads are not correctly characterized as NPs, but behave syntactically and semantically like full DPs. I show also that these relative clauses have a (modified) matching structure.

2. Evidence for Internal DP heads in Relative Clauses: Borsley'97 argues that relative clauses in English can support extraction out of weak islands and parasitic gaps, signature properties of DP-chains. Using data from German, I extend his paradigm to show that NPs *cannot* support either of these constructions, concluding that relative clauses must have a DP-head.

2.1 Following Rizzi '91,'01, only A'chains involving DPs can cross weak islands, which extends to include a constraint on the extraction of predicates (Baltin'92). I argue that, given a standard analysis of NPs as predicates (Heim&Kratzer '98), these island effects predict that bare NPs cannot extract out of weak islands. This is supported by constraints on Split-NP topicalization in German. In German, both DPs and NPs can be topicalized to the front of the root (SpecCP), (3). However, while *wh*-phrases and DPs, (4), can topicalize out of weak islands, NPs cannot, (5). (Note that the German data uses infinitival factive islands – however, all the judgments given extend to *wh*-islands.)

(3) a. (Nur) ein Haus$_1$ hat er verkauft t$_1$.   *DP topicalization*
     (Only)one house$_1$ has he sold   t$_1$
     'He sold (only) one house.'

    b. Haus$_1$ hat er (nur) eines t$_1$ verkauft.   *NP topicalization*
     House$_1$ has he (only) one t$_1$ sold.
     'He sold one house'

(4) Was$_1$ / (Nur) ein Haus$_1$ hat er (nicht) bedauert verkaufen t$_1$ zu muessen   *DP extraction*
     What / (Only) one house$_1$ has he (not) regretted sell   t$_1$ to must
     'What / Only one house is such that he has (not) regretted having to sell it'

(5) *Haus$_1$ hat er (nicht) bedauert eines t$_1$ verkaufen zu muessen.   **NP extraction*
     House$_1$ has he (not) regretted one t$_1$ sell   to must
     'house is such that he has (not) regretted having to sell one'

This can be used to test RC heads: if a RC head can extract out of a weak island, it cannot be a bare NP. In both English, (6), and in German, (7), relative clause heads support extraction out of weak islands, indicating that the internal copy of the relative clause head is a DP, not an NP.

(6) The book that we regretted that John read t$_1$ …

(7) Das Haus dass er (nicht) bedauert hat verkaufen zu muessen …
     The house that he (not) regretted has sell   to must
     'the house that he didn't regret having to sell…'

2.2 Similarly, Borsley'97 argues that, like DP traces, relative clause heads can license parasitic gaps, (8).

(8) a. Which form$_1$ did Bill fill out t$_1$ without reading __?
    b. The form$_1$ that Bill filled out t$_1$ without reading __ was…

Filling in the same paradigm gap, I present data from German suggesting that, unlike DPs, (9), NPs cannot license parasitic gaps, (10). Finally, (11) shows that RCs in German, like in English, support parasitic gaps.

(9) Dieses Formular$_1$ hat er ohne durchzulesen t$_1$ ausgefuellt __
     That form$_1$ has he without to read through t$_1$ filled out __
     'That form he has filled out without reading.'

(10) *Formular$_1$ hat er keines t$_{12}$ ohne durchzulesen t$_2$ ausgefuellt __
     Form$_1$ has he none t$_{12}$ without to read through t$_2$ filled out __.

'He has not filled out a form without reading'

(11) Das Formular$_1$ dass er ohne durchzulesen t$_1$ ausgefuellt __ hat …
     The form   that he without read through t$_1$ filled out __   has …
     'The form that he filled out without reading ....'

2.3 Finally, I argue, based on Koster-Moeller&Hackl '08, that the full host DP of a RC is semantically active in Antecedent Contained Deletion (ACD), and thus must be part of the RC's internal derivation. In standard RCs, both surface and inverse scope seem to be available for a matrix subject (*a professor*) and the host object-DP (*every book…*), regardless of the scopal properties of the embedded subject, (12).

(12) A professor read every book that a student/Mary wrote.
     Surface Scope: A single professor read every book that a student/Mary wrote
     Inverse Scope: Every book that a student/Mary wrote is such that some professor or another read it

However, in ACD constructions, there seems to be additional restrictions on scope. Specifically, in (13), we observe that inverse scope of the DP *every book that Mary did* over the matrix subject *a professor* is difficult compared to (12), (this is marked by #). When considering the indefinite *a student*, however, the availability of inverse scope seems to be as in (12).

(13) A professor read every book that a student / #Mary / #every student did.

The difficulty of inverse scope for the RC subject *every student* supports a generalization that the driving force behind the inverse scope restriction is whether the host DP *every book* is scopally commutative with the RC subject, giving rise to the following ACD-Scope Generalization (Koster-Moeller&Hackl,'08):

> In a sentence of the form [… Op$_1$ ….[DP … Op$_2$ …<VP>]], where Op$_1$ is a matrix operator, the DP is the host DP containing a relative clause with an ACD site, and Op$_2$ an operator inside the relative clause, the DP can have inverse scope over Op$_1$ only if the DP and Op$_2$ are scopally non-commutative.

This generalization hinges on the fact the host DP interacts scopally with the embedded operator, something that can only happen if the entire DP (not just the NP, which is not scopally active) originates inside of the RC. Thus the ACD-Scope Generalization, taken with the data from weak islands and parasitic gaps, is a strong argument for internally DP-headed relative clauses.

3. The Syntax of DP-Headed Relative Clauses: No currently endorsed analysis of relative clauses includes the determiner of the host DP inside the relative clause. However, both the raising and matching analyses might be modified to accommodate an internal DP head:

(14) Amended D-raising: … [$_{DP}$ every [$_{CP}$ ~~every~~ book$_1$ that Mary read t$_1$]].
(15) Amended Matching: … [$_{DP}$ every [$_{NP}$ book [$_{CP}$ ~~every book~~ that Mary read t$_1$]]].

I argue that only the modified matching analysis makes the correct empirical predictions. Following Hulsey&Sauerland '06, I apply a series of tests distinguishing raising RCs from matching RCs. In (17)-(21), I illustrate one of these tests, extraposition, which is argued to be compatible with only a matching structure. Contrast these with (16), an idiomatic raising structure, which is not compatible with extraposition. RCs with parasitic gaps and island extraction can undergo extraposition, indicating that they have a matching, not raising, structure.

(16) John praised the head way (*last year) that Mary made.   *Idiomatic RC*
(17) Mary found the form (yesterday) that Bill filled out without reading.   *Parasitic Gaps*
(18) Mary purchased a book (yesterday) that Sue regretted that John read.   *Factive Islands*
(19) Sue purchased the book (yesterday) that John wondered how to read.   *Wh-Islands*

Similarly, extraposition does not change the grammaticality or scope judgments of RCs with ACD, indicating they too have a matching, not raising structure.

(20) A girl read every book (yesterday) that John did   *Inverse
(21) A girl read every book (yesterday) that a boy did   Inverse

This test strongly supports an analysis of internally DP headed RCs as matching, not raising. I present additional tests (e.g. idiom, variable binding, condition-A violation tests) that point to the same conclusion.

4. Conclusion: In this paper, I present three arguments showing that restrictive relative clauses can be internally headed by a DP, not, as is standardly assumed, an NP. I go on to show that these relative clauses require a modified matching analysis, such that a full copy of the DP hosting the relative clause originates inside the relative clause itself.