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Notes on stress reconstruction and syntactic reconstruction

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1 Overview

This paper offers a new analysis of the interaction of movement with stress-assignment from Bresnan (1971, 1972), mostly using examples from German. The interaction is analyzed as stress reconstruction, a PF-effect of the copy left behind by movement according to the copy theory of movement in Chomsky (1993) and the later development of internal merge in Chomsky (2008). This paper also offers an analysis of the interaction of this phenomenon with LF-reconstruction such as idiom chunk reconstruction and reconstruction of Condition C effects. The observations support an analysis that integrates stress reconstruction and LF-reconstruction into a coherent picture, with the following properties. (i) First, movement by internal merge leads to a representation of multi-dominance of the moved element (Chomsky 2008). This leads to obligatory stress reconstruction and to the option of LF-reconstruction, the latter as suggested by Chomsky (1993). (ii) Second, topic-comment structures do not tolerate multiple association of the topic with a position inside of the comment; there are two ways of fixing this when it arises: (a) Retaining the topic and converting its copies (i.e. its associations to positions in the comment) to bound empty categories during the syntax. Scrambling, I argue, has only this option, which blocks both LF-reconstruction and stress reconstruction; examples of *wh*-movement that test for Condition C reconstruction are also typically construed this way to avoid a reconstructed Condition C violation; (b) Operator-variable structures in which the operator is a topic seem to additionally allow splitting of multi-dominance structures into a copy for the operator that is a topic and a separate copy for the variable; this allows for a limited amount of LF-reconstruction for *wh*-phrase topics, without stress reconstruction. Topics apart, however, the normal result of movement is multi-dominance, as derived by internal merge; this is confirmed by the application of stress reconstruction.

The paper is structured as follows. Section 2 reviews Bresnan's observation about English. Section 3 discusses the effect in German in the context of a detailed prosodic analysis of German. Section 4 shows the analysis of the effect in the copy

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theory of movement. Section 5 addresses interactions of stress reconstruction with topics, with scrambling, and with idiom chunk reconstruction, among other things. Section 6 addresses the interaction of stress-assignment with reconstruction for Condition C, with some remarks on reconstruction for anaphor binding. Section 7 sums up the results.

2 Bresnan's observation

Bresnan (1971, 1972) employed the Nuclear Stress Rule (NSR) of Chomsky & Halle (1968), which (leaving aside cyclic effects) assigns stress rightmost as in (1a). As Bresnan notes, final pronouns must be exempt from the NSR as in (1b,c). This paper employs the term *sentence stress* (nuclear stress) and marks its position by double underlining.

- (1) a. Mary teaches engineering.
- b. Mary teaches it.
- c. The boy bought some.

Throughout this paper, the concern is with stress-patterns that are not affected by narrow focus, since narrow focus on any of the elements in (1) will attract the sentence stress to the focused item. The sentences in (1) and other sentences we will be concerned with may be thought of as entirely new (Selkirk 2008). They are either focused in their entirety or are not carrying focus at all.

Bresnan's cases involve another class of systematic exceptions to the NSR, next to pronouns. This involves cases of syntactic movement from sentence-final position. She credits (2) to Newman (1946). The a.-examples of (2)–(7) are the exceptions from the NSR. These all involve movement from final position. In Bresnan's analysis the structure before movement involved a lexical object that would receive the sentence stress, for example *to leave plans* in (2a) or *had written what books* in (6a). The (b)-examples are cases for minimal comparison that do not involve this configuration and that show the final stress that is predicted by the NSR. In (2) and (3) the comparison cases do not involve movement from final position. In (4)–(7) the comparison cases are examples with movement of a pronominal element from final position. For example, in (6b) the underlying structure is *had written what*. Here it is plausible that the final pronoun, like the ones in (1b,c), is independently exempt from the NSR. Thus movement only interferes with the NSR if the element that moves from final position would receive sentence stress before movement, as in the (a)-examples in Bresnan's analysis.

- (2) a. George has plans to leave t.
b. George has plans to leave.
- (3) a. Mary liked the proposal that George left t.
b. Mary liked the proposal that George leave.
- (4) a. George found some friends he'd like you to meet t.
b. George found someone he'd like you to meet t.
- (5) a. Let me tell you about something strange I saw t.
b. Let me tell you about something I saw t.
- (6) a. John asked what books Helen had written t.
b. John asked what Helen had written t.
- (7) a. I can't help noticing how serene he is t.
b. I can't help noticing how he is t.

The effect will be cast in terms of stress reconstruction in this paper. The following formulation is a starting point that brings the relevant descriptive generalization into view:

(8) *Stress reconstruction*

For the rules of stress-assignment, stress on an element coindexed with a trace counts as stress in the position of the trace.

The examples (2)–(7) are repeated in (9)–(14) with coindexing and bracketing of the coindexed element. *Op* stands for an empty relative pronoun operator. This is coindexed with the head NP preceding the clause in the relative clause examples (10)–(13). Even though this head NP is outside of the relative clause, its stress reconstructs into the trace position in the relative clause.

- (9) a. George has [[plans]₁ to leave t₁].
b. George has plans to leave.
- (10) a. Mary liked the [proposal]₁ Op₁ that George left t₁.
b. Mary liked the proposal that George leave.
- (11) a. George found some [friends]₁ Op₁ he'd like you to meet t₁.
b. George found [someone]₁ Op₁ he'd like you to meet t₁.
- (12) a. Let me tell you about something [strange]₁ Op₁ I saw t₁.
b. Let me tell you about [something]₁ Op₁ I saw t₁.

- (13) a. John asked [what books]₁ Helen had written t₁.
 b. John asked [what]₁ Helen had written t₁.
- (14) a. I can't help noticing [how serene]₁ he is t₁.
 b. I can't help noticing [how]₁ he is t₁.

As (8) brings out, in all cases of non-final stress, the stress that should be in final position by the NSR is instead found on an element earlier in the clause that is coindexed with the final trace.

Bresnan's analysis of her observation involves a cyclic application of the NSR, which in her time was formulated in terms of weakening of the non-final elements. The NSR thus applied to a fully stressed structure akin to (15a). At that stage there is still a copy of the relevant element in final position. In the first application of the NSR this final element retains its strength while the preceding elements of the first cycle are weakened as in (15b). The final object is made non-overt in (15c), leaving all remaining material from the first cycle with subordinated stress. When the NSR reapplies at the highest cycle in (15d), it reduces everything except for the rightmost element among the strongly stressed elements, and thus derives the correct position of strongest stress.

- (15) a. Helen left directions [for George to follow directions]
 b. Helen left directions [for George to follow directions] NSR 1st cycle
 c. Helen left directions [for George to follow ∅] syntax
 d. Helen left directions [for George to follow ∅] NSR 2nd cycle

Lakoff (1972) and Berman & Szamosi (1972) criticized Bresnan's suggestion. A reply to the criticism can be found in Bresnan (1972). I believe that some of the factors that were difficult to tease apart then can be teased apart today, and that, when we do, Bresnan's observation remains correct; see Truckenbrodt (2013) for discussion. Further, the current paper differs from the authors in the 1970s in not assessing the preferred stress-pattern. Instead, the German judgments below assess the felicity of the reconstructed and the non-reconstructed stress patterns separately. The fact of interest is that the reconstructed stress-pattern is possible (in the absence of givenness of the verb). We will see that it is almost always optionally alternating with the non-reconstructed stress-pattern.

3 Bresnan's effect in German

In this section different aspects of the effect and its analysis in German are established. Section 3.1. shows an analysis of the effect in the context of a general

prosodic analysis of German. Section 3.2. shows a restriction on the effect. Section 3.3. provides an additional argument for stress reconstruction from relative clauses.

3.1 The effect in German in a cross-linguistic prosodic analysis

In German, the effect plays out in the stress placement on the verb. It is here illustrated using the theory of stress-assignment in (16) and (17).¹ The account is a modification of that of Gussenhoven (1983, 1992) which was first applied to German in Uhmann (1991). Stress-XP is from Truckenbrodt (1995).

(16) Stress-XP: Each overt XP must contain a beat of phrasal stress (accent).²

(17) NSR-I: The rightmost phrasal stress (accent) in the intonation phrase is strengthened.

There are two levels of prosody-assignment above the prosodic word. At the lower of these two levels, Stress-XP requires a beat of phrasal stress in each overt XP. This is here marked by single underlining. Consider (18). The arguments and adjuncts contain such XPs, DP and NP (and sometimes PP) as in [_{DP} *die* [_{NP} *Lena*]] ‘Lena’, [_{DP} *ein* [_{NP} *Lama*]] ‘a llama’ or [_{PP} *im* [_{DP} [_{NP} *Januar*]]] ‘in January’. I assume for concreteness that the article is stress-rejecting like a pronoun. In each case stress on the noun satisfies Stress-XP for the NP, it simultaneously satisfies Stress-XP for the DP and for a higher PP. The NSR-I in (17) strengthens the rightmost of these stressed nouns. This is shown by double underlining in (18b).

¹ This account builds on the two-level theory of Selkirk (1984, 1995) and Gussenhoven (1983, 1992) and ties this theory to the use of XPs in the prosodic structure of other languages (Chen 1987, Hale & Selkirk 1987, Selkirk 1986, Selkirk & Shen 1990, Truckenbrodt 1999, 2006, 2007a). The account was previously applied to the interaction of movement and stress in Truckenbrodt & Darcy (2010). Stress-XP is from Truckenbrodt (1995) and was also applied to Italian in Samek-Lodovici (2005) and to English in Féry & Samek-Lodovici (2006). The NSR-I descends from the NSR of Chomsky & Halle (1968) and the understanding of nuclear stress as being relative to the intonation phrase in Pierrehumbert (1980). For the formulation that strengthens the last accent of the intonation phrase, see Uhmann (1991) for German and Selkirk (1995) for English. In its application to German the account builds on, and captures results of early important work like Höhle (1982), Krifka (1984), von Stechow & Uhmann (1986), Uhmann (1991) and Jacobs (1993).

² The reason that Stress-XP applies only to overt XPs will become apparent below. I have elsewhere used the formulation that the XPs in question need to be lexical as opposed to functional. I here generalize Stress-XP to functional projections, including *v*P, which will be crucial below. One of the main reasons to exclude functional projection earlier, the lack of stress on pronouns, is better handled by a separate statement that function words are stress-rejecting, I believe, as suggested by Bresnan (1971), Kratzer & Selkirk (2007) and Truckenbrodt (2007a).

- (18) a. Die Lena will dem Werner im Januar ein Lama malen.
 b. Die Lena will dem Werner im Januar ein Lama malen.
 the Lena wants the Werner in January a llama paint
 ‘Lena wants to paint a llama for Werner in January.’

Here and throughout this paper, stress in the English translation, where indicated, shows the stress assigned by the same rules and same analytical assumptions, rather than word-by-word transfer of stress from the German example. Stress-XP and NSR-I (like Gussenhoven’s account on which they build) are intended to also work for English, without parameterization. Stress reconstruction applies in both languages. Stress effects of focus and givenness are likewise comparable.

In German, an unmarked rendition of (18b) shows typically rising (L*+H) accents on non-final syllables with phrasal stress, as in Figure 1.³

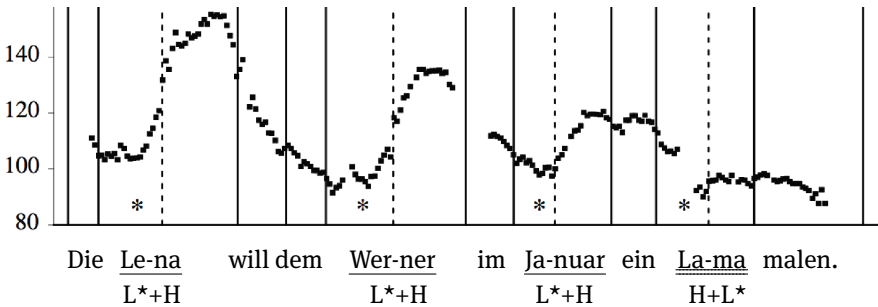


Fig. 1: F0 contour for *Die Lena will dem Werner im Januar ein Lama malen*, ‘Lena wants to paint a llama for Werner in January.’ Speaker TL from Baden-Württemberg. The sentence was read as an answer to the question *Was gibt’s Neues?* ‘What’s new?’. Adapted from Truckenbrodt (2007b).

The claim that the final accent is the strongest of the sentence is based primarily on the intuitions of native speakers and connects this account to earlier reports of sentence stress that did not employ the two-level model (e.g. Höhle 1982, Cinque 1993).

The crucial issue for stress reconstruction is when the verb receives stress. Let us therefore begin by establishing in some detail when it receives stress independently of stress reconstruction. The verb is typically final in the German head-final VPs. The verb does not receive stress when preceded by an (unscrambled) direct object, as in (19a). However, it receives stress when preceded by an adjunct as

³ The successive phonetic lowering among the peaks (downstep) is a phonetic process that does not reflect relative strength of stress, see e.g. Truckenbrodt (2007b).

in (19b). See Gussenhoven (1983, 1992), Krifka (1984) and Jacobs (1993) on the argument-adjunct contrast.

- (19) a. sein Fahrrad putzen
 one's bicycle clean
 'to clean his/one's bicycle'
 b. am Wochenende putzen
 on-the weekend clean
 'to clean on the weekend'

In (20a), I adopt the classical analysis of the word-order between the adjunct and the argument: The adjunct is not genuinely inside of VP, the direct object is genuinely inside of VP for reasons of theta-role assignment, and must therefore be closer to the verb. A structure with only the object is therefore as in (20b), a structure with only the adjunct is as in (20c).

- (20) a. am Wochenende [_{VP} sein Fahrrad putzen]
 b. [_{VP} sein Fahrrad putzen]
 c. am Wochenende [_{VP} putzen]
 on-the weekend one's bicycle clean
 'to clean (one's bicycle) (on the weekend)'

The stress contrast between arguments and adjuncts is captured in the application of Stress-XP to VP. In (20a,b) the object receives phrasal stress independently on [_{NP} Fahrrad]. Now, this phrasal stress also has the effect that the VP satisfies Stress-XP, since the word *Fahrrad* is within the VP. Therefore the VP contains phrasal stress in (20a,b) and there is no need to assign phrasal stress to the verb. (It is not detrimental that the same phrasal stress satisfies Stress-XP for NP and VP, and the effect is also not cumulative in this account.) In (20c), however, the phrasal stress assigned on the adjunct is not genuinely within the VP.⁴ The application of Stress-XP to VP requires phrasal stress genuinely inside of VP, which is therefore assigned to the verb. (The effects of the subsequently applying NSR-I are not shown in (20). It strengthens the object in (20a,b) and the verb in (20c).) Another way of putting this analysis of the argument-adjunct asymmetry is that the verb does not invoke Stress-XP in (20a,b) where it is just a syntactic head, but that the verb invokes Stress-XP in (20c), where it is a VP, hence an XP.

A further relevant observation is discussed in Kratzer & Selkirk (2007) and Truckenbrodt (2012). In the configuration [*argument pronoun verb*] in wide focus

⁴ The account assumes that theta-role assignment and Stress-XP use the same strict standard for inclusion in the VP. Assuming that the adjunct is adjoined to VP, it counts as outside of VP for both theta-role and stress assignment.

contexts, the verb always requires stress in addition to stress on the argument. In other words, an argument separated from the verb by an overt pronoun cannot exempt the verb from requiring stress. (21) shows this for indefinite pronouns:

- (21) a. dass vorhin ein Kind etwas essen wollte
 b. # dass vorhin ein Kind etwas essen wollte (unless *essen* is given)
 that earlier a child something eat wanted
 ‘that a while ago a child wanted to eat something’
 c. dass du einem Kind etwas vorgelesen hast
 d. # dass du einem Kind etwas vorgelesen hast (unless *vorgelesen*
 that you a child something read have is given)
 ‘that you have read something to a child’

The analysis of this restriction requires a syntactic structure like (22) in which the direct object and the verb are joined in a VP that excludes higher arguments. (These are in higher verbal projections.) In such a structure the stressed argument is outside of the VP that contains the pronoun and the verb. Stress on that higher argument is not stress inside of the lowest VP. Satisfaction of Stress-XP for the lowest VP requires phrasal stress in this VP. It is assumed here, as in Bresnan’s account, that pronouns are inherently stress-rejecting. The phrasal stress of the VP is then assigned to the verb.

- (22) dass vorhin ein Kind [_{VP} etwas essen] wollte
 that earlier a child something eat wanted

We will refine this picture in considering the interaction of verb raising with stress reconstruction below.

A further relevant case is that of multiple final verbs. A stressed object of the inner verb exempts all following verbs from requiring accent as in (23a). Where no such stressed object is present, as in (23b), the lowest verb receives phrasal stress. The current analysis assumes successively embedded VPs.

- (23) a. [_{VP₁} [_{VP₂} ein [_{NP} Fahrrad] reparieren_{V₂}] wollen_{V₁}]
 a bicycle fix want
 ‘to want to fix a bicycle’
 b. [_{VP₁} [_{VP₂} etwas reparieren_{V₂}] wollen_{V₁}]
 something fix want
 ‘to want to fix something’

[_{NP} Fahrrad] receives stress by Stress-XP in (23a). Stress on Fahrrad satisfies Stress-XP also for VP₂ and for VP₁, since both contain the word Fahrrad. VP₂ in particular (and the word Fahrrad with it) is contained in VP₁ as the complement of V₁. Therefore the verbs do not separately receive stress in (23a). In (23b) reparieren receives

the phrasal stress of VP₂. This being the case, *reparieren* also satisfies Stress-XP for VP₁ since VP₁ then also contains the stressed word *reparieren*.

With the basics of this stress-account in place, let us turn to the interaction of stress-assignment and movement in German. The effect is found with wh-movement as in (24) and with relative clauses as in (25). Note that all German relative clauses have an overt relative pronoun.

- (24) a. Ich frage mich [was für Bücher₁ sie t₁ geschrieben hat].
 I ask myself what for books she written has
 ‘I wonder what books she has written.’
- b. Ich frage mich [was₁ sie t₁ geschrieben hat].
 I ask myself what she written has
 ‘I wonder what she has written.’
- (25) a. Ich kenne alle Bücher₁ [die₁ sie t₁ geschrieben hat].
 I know all books which she written has
 ‘I know all the books she has written.’
- b. Ich kenne alles [was₁ sie t₁ geschrieben hat].
 I know all which she written has
 ‘I know everything she has written.’

In all four preceding examples, the VPs are [_{VP₁} [_{VP₂} t₁ geschrieben_{V₂}] hat_{V₁}]. We find the expected stress-pattern for these VPs in (24b) and (25b): Both VP₂ and VP₁ require stress by Stress-XP and they both satisfy this condition by assignment of phrasal stress on the lower verb *geschrieben*.

The unexpected cases are (24a) and (25a). They show interaction with syntactic movement. We expect stress on the inner verb by Stress-XP; empirically, however, it is not required. In both cases *Bücher* is related to the trace in the VPs [_{VP₁} [_{VP₂} t₁ geschrieben_{V₂}] hat_{V₁}]. It is as though the stress on *Bücher* counts as stress in the position of the trace. In other words, stress in the structure (26) counts as though *Bücher* was in the position of the trace as in (27). In (27) the VPs contain stress on *Bücher* and Stress-XP is satisfied without stress on the verb.

- (26) [... Bücher]₁ (...) sie [_{VP₁} [_{VP₂} t₁ geschrieben_{V₂}] hat_{V₁}]
 books she written has
- (27) sie [_{VP₁} [_{VP₂} [... Bücher] geschrieben_{V₂}] hat_{V₁}]
 she books written has

In that sense we can think about this phenomenon as a case of stress reconstruction.

Notice that the argument cannot be undermined by postulating that the expression containing *Bücher* can have this effect from its surface position, without the

mediating effect of the trace. Informally, as we have seen, such a stress-exempting effect is not normally possible across a pronoun. Formally, it is also ruled out: In (24a), for example, the *wh*-phrase is in Spec,CP and thus clearly outside of the VP to which it contributes its stress.

In sum, we account for the assignment of phrasal stress and sentence stress in German in terms of Stress-XP and NSR-I (rightmost strengthening). Narrow focus may override their effects (though this is not discussed here). As in Bresnan's English cases, syntactic movement creates a class of exceptions to this default stress pattern. These exceptions can be looked upon in terms of stress reconstruction: Stress-XP is satisfied for a VP (allowing a stressless verb) when there is a trace in direct object position that is coindexed with a stressed element earlier in the structure. For the purpose of Stress-XP, it is as though this earlier stress was within the VP.

Notice that Bresnan's English examples are analyzed in very similar terms in the current account. In *Mary teaches engineering*, Stress-XP assigns stress to the two NPs *Mary* and *engineering* and NSR-I strengthens the rightmost of these. In *Mary teaches* or *Mary teaches it*, stress on the verb is required by the application of Stress-XP to the VP. Likewise for the interaction with movement. In [*what books_i she has written t_i*] the unexpected observation is that the VP [*written t*] does not show the stress expected due to Stress-XP. Stress reconstruction is observed insofar the stressed *what books* acts prosodically as though it was still inside of that VP, allowing a stressless verb.

Notice also that the stress pattern that shows stress reconstruction is typically optional (Truckenbrodt & Darcy 2010). What is interesting about it is that it is available at all in the presence of a contextually new VP. However, a stress-pattern that looks like stress is not reconstructing is typically available in addition. This is true both for *wh*-questions and relative clauses. For example, next to (25a), the stress-pattern in (28) is also possible.

- (28) Ich kenne alle Bücher_i [die_i sie t_i geschrieben hat].
 I know all books which she written has
 'I know all the books she has written.'

This additional option is analyzed in connection with topics in section 5.

3.2 A restriction on the effect

The effect shows an interesting prosodic restriction, which is mentioned here for completeness. The restriction is that *stress reconstruction is blocked by an intervening element with phrasal stress*. In Bresnan's cases stress reconstruction

obtains in (11a), (12a) and (14a) across intervening unstressed pronouns and unstressed verbs. In (10a) and (13a) it obtains across a name, which, being an NP, would normally carry phrasal stress by Stress-XP. As mentioned by Selkirk (1995), stress reconstruction in the sense of the current paper only works in these cases if the name is contextually given and thus stressless. Also the detailed observations of Gussenhoven (1983, 1992), who seeks an account without interaction with movement, show that the effect only obtains in the absence of intervening stressed (accented) material. The examples in (29) illustrate the blocking effect. In (29a) we see stress reconstruction across an unstressed pronoun. In (29b) there is an intervening stressed element, *am Wochenende* ‘on the weekend’. It receives phrasal stress by Stress-XP and it is stressed by NSR-I. If there was an unobstructed effect of stress reconstruction, the stress on *was für Fahrräder* should still reconstruct into the VP and license stressless final verbs. Empirically, however, this stress-pattern is not a neutral stress-pattern. It is possible only where *am Wochenende* ‘on the weekend’ is contrastive or where *gemietet* ‘rented’ is contextually given. (29c) is the only possible neutral stress-pattern in this case. It is a stress-pattern without stress reconstruction: The VP contains stress on the verb, as required by Stress-XP and regardless of the trace it contains.

- (29) a. Ich frage mich [was für Fahrräder ihr t₁ gemietet habt].
 I ask myself what for bicycles you rented have
 ‘I wonder what bicycles you rented.’
- b. # Ich frage mich [was für Fahrräder ihr am Wochenende t₁
 I ask myself what for bicycles you on.the weekend
 gemietet habt].
 rented have
 ‘I wonder what bicycles you rented on the weekend.’
- c. Ich frage mich [was für Fahrräder ihr am Wochenende t₁ gemietet
 habt].

Cases like these motivate the conclusion that an intervening stressed element like *am Wochenende* ‘on the weekend’ in (29b) block the effect of stress reconstruction.

An analysis of this blocking effect is developed in Truckenbrodt and Büring (in preparation). The analysis is compatible with, and orthogonal to the current paper. It involves (a) an effect of stress reconstruction and (b) additional restrictions on the syntax-prosody mapping, which are not crucial in other ways for the current paper. The relevance of this restriction for this paper is thus only that we need to choose examples in which the intervening material is stressless.

3.3 An argument for stress reconstruction from relative clauses

The examples in (30a) and (31a) are here analyzed in terms of stress reconstruction in relative clauses. The b.-examples employ pronominal heads of the relative clauses that are not assigned any stress that could be reconstructed into the relative clause. Of particular interest are then the c.-examples. In these examples sentence stress reverts to the closest non-pronominal element preceding the relative clause. This element, however, is here not part of the nominal head that might be reconstructed into the relative clause. A ‘reconstructing’ stress-pattern is empirically not available for these examples, as shown.

- (30) a. Hier ist eine Liste einiger Bücher [die ich t verkauft habe].
 here is a list some books' which I sold have
 ‘Here is a list of some books I sold.’
- b. Hier ist eine Liste von dem [was ich verkauft habe].
- c. # Hier ist eine Liste von dem [was ich verkauft habe].
 here is a list of that which I sold have
 ‘Here is a list of that what I sold.’
- (31) a. Hier ist eine Liste der Gäste [die ich t gewinnen konnte].
 here is a list the guests which I win could
 ‘Here is a list of the guests I could to win.’
- b. Hier ist eine Liste derer [die ich t gewinnen konnte].
- c. # Hier ist eine Liste derer [die ich t gewinnen konnte].
 here is a list those which I win could
 ‘Here is a list of those that I could win.’

This shows that the VP in the relative clause, for containing a new yet unstressed verb, really requires a stressed XP that can be reconstructed into the VP of the relative clause.

4 Analysis of stress reconstruction

Section 4.1. provides an analysis of stress reconstruction in wh-questions using the copy theory of movement. Section 4.2. extends the analysis to relative clauses.

4.1 Stress reconstruction in the copy theory

Consider reconstruction for reflexive binding as in (32). Chomsky (1993: 34ff) suggested to analyze reconstruction of wh-movement in terms of a *copy theory (of movement and reconstruction)*. An underlying structure for the embedded question before movement is shown in (33a). Movement creates a copy of the wh-phrase in clause-initial position as in (33b), the structure at spell-out (the branching point to LF and PF). The lower copy is deleted at PF as in (33c). At LF, the operator *which* is separated as in (33d) and either the lower copy is retained as in (33e) or the upper copy as in (33f). The sentence in (32) allows two options of binding the reflexive as shown. Binding theory applies at LF, so that a lower copy at LF in (33e) leads to *Bill* as the antecedent of *himself*. Retention of the upper copy as in (33f) leads to *John* as the antecedent of *himself* in (32).

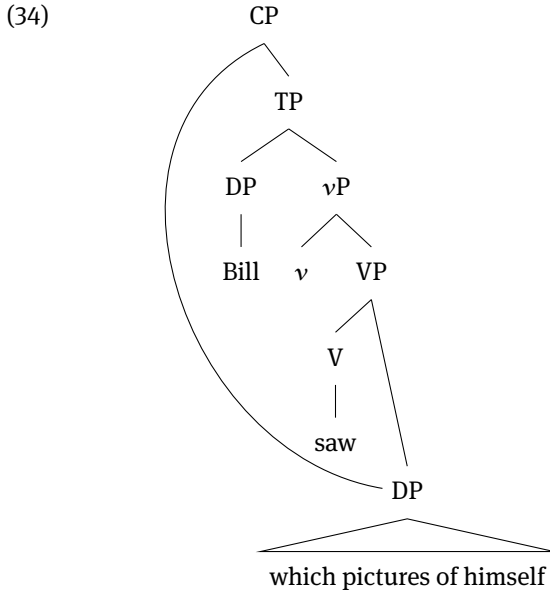
(32) John₁ wondered [which picture of himself_{1/2}] Bill₂ saw

- (33) a. Bill saw [which pictures of himself]
 b. [which picture of himself] Bill saw [which pictures of himself]
 c. PF: [which picture of himself] Bill saw
 d. LF: *which* *x* [*x* picture of himself] Bill saw [*x* pictures of himself]
 e. → *which* *x* Bill₂ saw [*x* pictures of himself₂]
 or f. → *which* *x* [*x* picture of himself₁] Bill₂ saw *t*

The copy theory of movement and reconstruction is appealing insofar as it makes reconstruction sit comfortably in the theory of syntax. It is assumed for independent reasons that the wh-phrase originates in object position (in this case). The copy theory retains a silent copy of this original structure and employs it to account for ‘reconstruction’ effects of different kinds like reflexive binding in the example (32). The syntactic account of reconstruction is strengthened by phenomena in which reconstruction for one phenomenon entails reconstruction for another phenomenon, as shown in Chomsky (1993), Heycock (1995), Fox (1999) and others.

Let us employ the development of this theory in the form of Chomsky (2000, 2001, 2008): rather than two separate copies, there is in fact only one copy that is merged in different positions: first in object position and then again, as part of the formalization of movement, in Spec,CP. This is shown in the simplified structure in (34).

Let us assume that the multi-dominance structure is interpreted at LF and in the semantics along the lines of the suggestions of Chomsky (1993) illustrated in (33). At spell-out, then, where the structure is transferred to LF and PF, the multiply linked structure is intact and is the input to the mapping to PF. In the terms of Chomsky (1993: 35), the lower copies are deleted at PF. In the terms of Fox & Pesetsky (2005), linearization at PF will spell out the highest copy only.



I here put aside some details of how this plays out in a cyclic derivation. There may be an additional link with which the *wh*-phrase is also adjoined to **VP**. This is orthogonal to the following discussion.

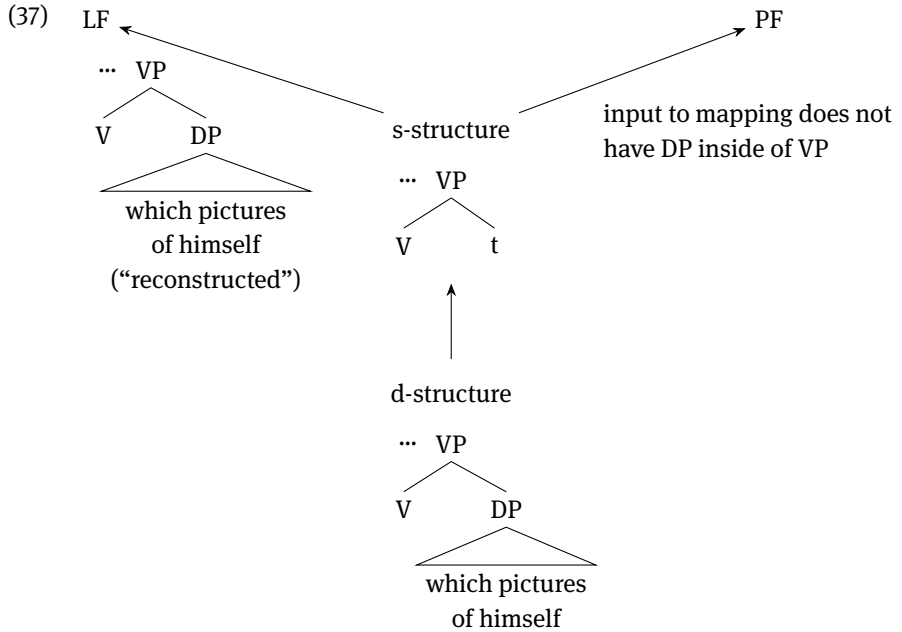
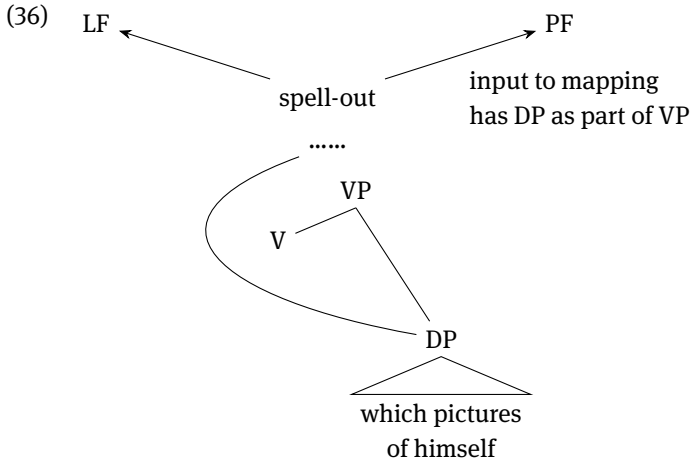
What is crucial is that when the structure in (34), or a part of it such as *vP* or *VP*, is subject to the syntax-prosody mapping, the object *DP* is still also dominated by *VP*. We want to maintain that this allows that stress on the *DP* still allows satisfaction of *Stress-XP* for the *VP*. I employ the more precise formulation of *Stress-XP* in (35), revised from (16), which derives this result quite explicitly.

- (35) *Stress-XP*: Each overt *XP* must dominate an element α in the syntax such that the correspondent of α in the phonology carries a beat of phrasal stress.

Since the *VP* in (34) dominates the word *picture* in the *DP* object, stress on *picture* will count as stress in the *VP* for *Stress-XP*.

Apart from this more precise formulation of *Stress-XP*, we do not need to add any assumptions to the account. The copy-theory correctly predicts Bresnan's effect of movement on stress in *wh*-questions. Crucial to this result is the presence of the copy at spell-out, as shown in (36).

On accounts of *LF*-reconstruction before the copy-theory, it was not possible to derive this result. As shown in (37), the *DP* was inside of *VP* at *d*-structure (it originates there) and it is put back at *LF*, but it was no present there at *s*-structure. The input to the mapping to *PF* did not contain a copy of *DP* inside of *VP*.



In that sense stress reconstruction provides support for the copy-theory. Stress reconstruction provides evidence that the object wh-phrase is not only in the VP underlyingly and at LF (“reconstructed” into the position of the trace), but also in between at spell-out, as postulated in the copy theory.

4.2 Approach to stress reconstruction in relative clauses

Consider the following two theories of the syntax of relative clauses:

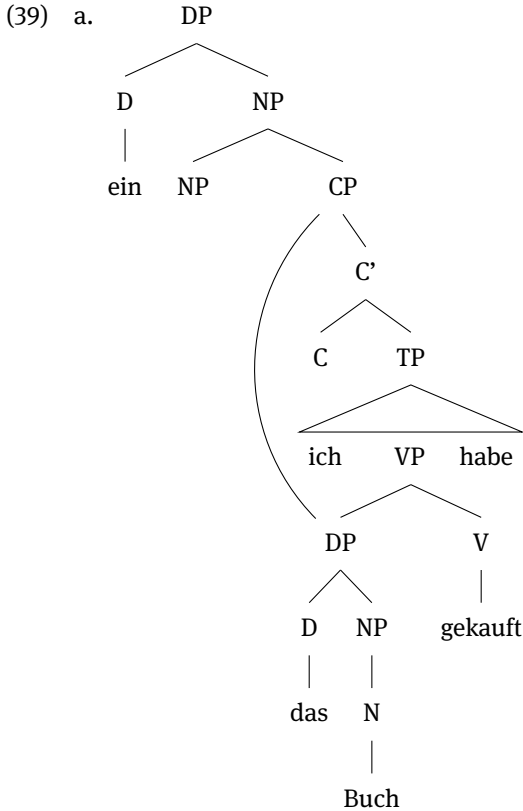
- (38) a. *head-external analysis*:
 Buch [das₁ ich das₁ gekauft habe]
- b. *matching analysis*:
 Buch₁ [[das Buch]₁ ich [das-Buch]₁ gekauft habe]
- NP-matching DP-movement

(a) The head-external analysis assumes that a relative pronoun moves alone and semantically forms a predicate that is set-intersected with the head NP, in (38a) *Buch* ‘book’ (see e.g. Heim & Kratzer 1998). As Salzmann points out, this does not lead to a theory of syntactic reconstruction in relative clauses. It is, however, compatible with a semantic account of reconstruction as shown in Krifka (this volume) and Grosu & Krifka (2007).

(b) The matching analysis goes back to Lees (1960, 1961) and Chomsky (1965). Its modern version in Munn (1994), Citko (2001), Hulsey & Sauerland (2006), and Salzmann (2006, this volume) is illustrated in (38b). The relative pronoun is an article with an NP complement, i.e. a regular DP that fronts in the relative clause. A matching relation (originally: deletion under identity) is established between the external head NP (here *Buch* ‘book’) and the NP of the fronted DP (here likewise *Buch* ‘book’).

A modification of the matching analysis was argued for by Vergnaud (1974). In the modernized version considered here, this analysis is essentially like the matching analysis in (38b); however, the NP-matching relation is replaced by movement of the NP. Thus, in (38b), the NP *Buch* ‘book’ moves from within the specifier of CP to the initial position that is external to the relative clause. Similarly to the matching analysis, this requires identity of the two instances of the NP and has the consequence that the lower instance of that NP is not pronounced.

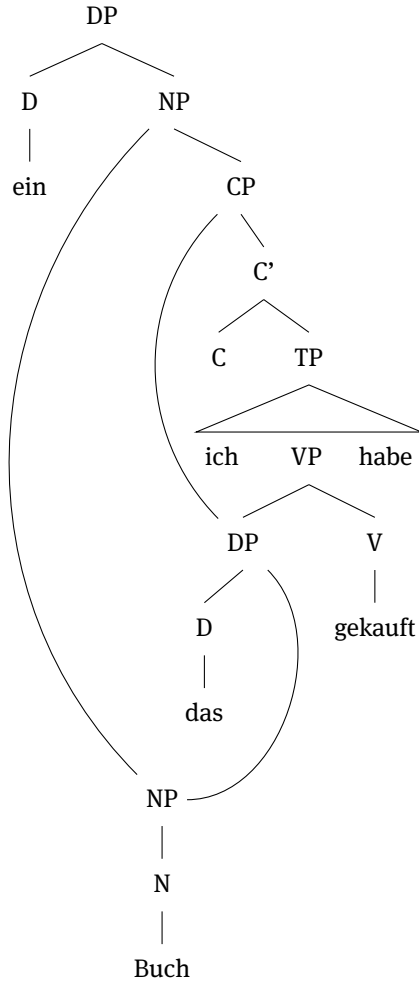
It turns out that stress reconstruction supports the analysis in (38b). Furthermore, matters come out most straightforwardly if Vergnaud raising of the NP *Buch* is assumed. This is shown in two steps in the following. First, (39a) shows movement of the DP *das Buch* ‘the book’ internal to the relative clause.



The second step is illustrated in (39b) on the following page. In this second step, the NP *Buch* ‘book’ is raised out of the relative clause. As a result, the relative clause external head *Buch* has an attachment inside of the VP of the relative clause. Stress on this NP thus constitutes stress on an element dominated by the VP of the relative clause as relevant to Stress-XP in (35).

If we employed the head external analysis in (38a), we would not be able to account for stress reconstruction in relative clauses. If we employed the matching analysis without Vergnaud raising, we would need to require that the matching procedure includes matching for stress, so that the elided lower instance of the NP carries stress. This raises questions about whether an empty category can carry stress. In section 5.4, a case is discussed where it is useful to assume that this is not possible.

(39) b.



5 Syntactic restrictions on stress reconstruction

This section addresses the interaction of stress reconstruction with LF-reconstruction (primarily idiom chunk reconstruction) and with topics and scrambling. Section 5.1 introduces the prosodic effect of topics. Section 5.2 shows the absence of LF and PF reconstruction for scrambling, using idiom chunks for LF-reconstruction. Section 5.3 discusses the stress-pattern of idioms in situ. Section 5.4 addresses LF- and stress-reconstruction under *wh*-movement and relativization, for idiom chunks, reflexive binding and scope reconstruction.

higher position that topics plausibly have in German. This higher position is assumed here as well. In the current account, however, when the topic moves to a higher position as in (42), stress reconstruction will still exempt the verb from being stressed. We thus require an account over and above a higher topic position of why stress does not reconstruct in a topic-comment structure.

Notice then that it will not do to add the overwriting stress-requirement in (43).

(43) *Topic-stress* (rejected)

In a topic-comment structure the topic must not contain stronger stress than the comment.

In (42), this will require that stress is added to the comment. The problem with this account is that it wrongly predicts that stress could be added to either of the two verbs, *gezeigt*, or *hat*. However, stress on *hat* is possible only with verum focus, not otherwise. The problem cannot be circumvented by postulating that the auxiliary *haben* is stress-rejecting because it is functional. There is no independent evidence for such a distinction among the German verbs in their stress-behavior. Also, similar examples with a bona fide full verb still show the same behavior: *dass [ein Mann]_{TOP} singen gesehen wurde* ‘that a man was seen sing’, but not #*dass [ein Mann]_{TOP} singen gesehen wurde* or (apart from verum focus) #*dass [ein Mann]_{TOP} singen gesehen wurde*. This wrong prediction arises because the stress on the subject would, on this account, still be reconstructed into the lowest vP, where it satisfies Stress-XP for both the lowest VP and the higher VP. Since Stress-XP is thus satisfied, it would have no influence on the distribution of the stress among the verbs. (43) would then enforce additional stress on either of the verbs, wrongly with no preference for the lowest verb. The fact that this stress obligatorily occurs on the lowest verb is evidence that Stress-XP is still at work: Placing the stress on the lowest verb satisfies Stress-XP for the lowest VP as well as for higher VP, which also contain the stress on the lowest verb, since they contain the lower VPs. We have evidence, then, that in topic-comment structures, the default stress is not overwritten by a statement like (43), but that, instead, stress fails to reconstruct. If it fails to reconstruct, Stress-XP, in its application to the VPs, will require stress on the VPs, and will correctly choose stress on the lowest among the verbs. This intermediate result is highlighted in (44).

(44) In topic-comment structures, stress fails to reconstruct. It seems not to be the case that stress reconstruction is overwritten by a stress-constraint relating to the topic-comment structure.

We are thus led to hypothesize a structural distinction that sets apart topic-comment structures. The particular suggestion developed here for this is motivated in connection with idiom chunk reconstruction in the following sections.

5.2 No idiom chunk reconstruction with scrambling

There is a complex literature on the syntactic properties of scrambling in German, including suggestions about reconstruction in scrambling. I will address some of their results on binding reconstruction in section 6.2. In the current section I take my cue from the behavior of idioms under scrambling.

In German, scrambled idiom chunks do not reconstruct.

- (45) a. dass der Peter *Eulen nach Athen trägt*
 that the.NOM Peter owls.ACC to Athens carries
 ‘that Peter is doing something unnecessary’
 b. dass *Eulen* der Peter *nach Athen trägt* (no idiom-reading)
- (46) a. dass die Maria *einen Frosch im Hals hat*
 that the.NOM Maria a.ACC frog in.the neck has
 ‘that Maria has difficulties speaking’
 b. dass *einen Frosch* die Maria *im Hals hat* (no idiom-reading)
- (47) a. dass der Peter *in einen sauren Apfel gebissen* hat
 that the.NOM Peter in a sour apple bitten has
 ‘that Peter has swallowed a bitter pill’
 b. dass *in einen sauren Apfel* der Peter *gebissen* hat (no idiom-reading)
- (48) a. dass Marias Leben *an einem seidenen Faden hängt*
 that Maria’s life.NOM on a silken thread hangs
 ‘that Maria’s life is in danger’
 b. dass *an einem seidenen Faden* Marias Leben *hängt* (no idiom-reading)
- (49) a. dass wir der Maria *einen Bären aufgebunden* haben
 that we the.DAT Maria a.ACC bear tied.onto have
 ‘that we lied to Maria as a prank’
 b. dass wir *einen Bären* der Maria *aufgebunden* haben (no idiom-reading)

In fact, where the idiom consists of a subject and a verb, a non-idiomatic accusative or dative object is required to scramble across the subject:

- (50) a. dass den Peter *der Hafer sticht*
 that the.ACC Peter the.NOM oat stings
 ‘that Peter feels up to something’
 b. dass *der Hafer* den Peter *sticht* (no idiom-reading)

- (51) a. dass der Maria eine Laus über die Leber gelaufen ist
 that the.DAT Maria a.NOM louse across the liver walked is
 ‘that Maria is in a bad mood’
 b. dass eine Laus der Maria über die Leber gelaufen ist (no idiom-reading)

Following Jäger (2001), I assume that scrambled constituents are always topics. I will work with the hypotheses in (52) and (53).

- (52) A topic must not have an additional link into the comment (the scope of the topic) as part of a multiply linked structure.
 (53) A way of changing a multiply linked structure into one compatible with (52) is to transform the lower links into bound empty categories.

Notice that the reduction of the lower copy by (53) may be viewed as the anticipation, during the syntax, of the PF-deletion of the lower copy suggested as part of the copy theory by Chomsky (1993).

For the idiom chunks, I furthermore adopt the suggestion of Chomsky (1993) in (54).

- (54) An idiom needs to be a unit at LF (Chomsky 1993: 39)

We can now derive the observations above. First, if an idiom chunk is scrambled, it cannot be syntactically reconstructed to satisfy (54) because of delinking following (52) and (53). Second, for the idiom to be a unit at LF, non-idiomatic accusative and dative objects need to scramble above a subject that is part of the idiom. They will leave behind a bound empty category by (52)/(53), which we may take to be not interfering with (54).

The account has the correct consequences for stress reconstruction: Scrambling does not reconstruct for stress-assignment. Consider for example scrambling across the adverb *oft* ‘often’ in the following examples. Without scrambling the stress on the object *den Peter* is sufficient to satisfy Stress-XP for the VP in (55). The stress-pattern in (56) is possible only if the verb *besucht* is contextually given. If stress-reconstruction of the scrambled object *den Peter* were an option, then (56) should be the regular stress-pattern, with stress reconstruction of the stress on object back into the VP. The verb would not then need to be given in this stress-pattern. This is not the case. Instead, (57) is the regular stress-pattern for such scrambled constituents: There is no stress-reconstruction and therefore Stress-XP, applying to the VP, requires a stressed verb.

- (55) dass sie oft [_{VP} den Peter besucht] hat
 that she often the.ACC Peter visited has
- (56) dass sie den Peter oft [_{VP} besucht] hat (only if *besucht* is given)
- (57) dass sie den Peter oft [_{VP} besucht] hat (regular stress pattern)

Parallel stress-patterns are found systematically in the examples of Diesing (1992): LF-Interpretation inside of VP corresponds to a stressless verb, LF-interpretation outside of VP (here: scrambling) corresponds to a stressed verb. In the current account, the absence of stress reconstruction follows from (52) and (53), which also prevent LF-reconstruction of scrambling: VP no longer dominates a scrambled DP after the requirement (52) is fulfilled as in (53).

We can now also account for the stress-pattern in (42). The subject is a scrambled topic, so that (52) leads to reduction of the link of the subject in the VP to a bound empty category. There is therefore no stress reconstruction. The stress required by Stress-XP for the VP is assigned to the verb.

Before turning to the stress in idiom chunks with wh-movement, it is useful to establish the baseline for this discussion: the stress pattern of the idioms without wh-movement.

5.3 Stress on idioms in situ

The preceding account has the correct consequence that the idioms show the stress derived by Stress-XP unobstructed by scrambled topics, i.e. the idiom chunks always show VP-internal behavior for stress. For example, a non-idiomatic example like (58) has the standard stress-option in (58a) with the VP-internal object, but also the topic-comment stress-option in (58b), here derived by string-vacuous scrambling: the object is a topic.

- (58) a. Ich glaube, dass sie den Peter gesehen hat.
 I think that she the.ACC Peter saw has
- b. Ich glaube dass sie den Peter gesehen hat.

This second option is not available for idioms, since it would require (string-vacuous) scrambling of an idiom chunk:

- (59) a. Ich glaube, dass sie mit ihm noch ein Hühnchen zu rufen hat.
 I believe that she with him still a chicken to pluck has
 ‘I believe that she will want to have a serious conversation with him.’
- b. # Ich glaube, dass sie mit ihm noch ein Hühnchen zu rufen hat.

- (60) a. Ich glaube, dass sie dir *einen Bären aufgebunden* haben.
 I believe that they you a bear tied.onto have
 ‘I believe they have lied to you as a prank.’
- b. # Ich glaube, dass sie dir *einen Bären aufgebunden* haben.

This logic extends to other instances of stress-assignment in idioms, and in fact the idioms help us sort between default stress and topic-induced stress in some other cases. For example, in a non-idiomatic sentence in which the object of a transitive verb has moved across the subject, stress on the subject has the consequence that no stress on the verb is required (where the verb is not given), see Kratzer & Selkirk (2007).

- (61) Ich weiß, dass dieses Haus₁ [Maffiosi e₁ besitzen].
 I know that this house Maffiosi own
 ‘I know that Maffiosi own this house.’

Using different examples, Truckenbrodt (2012) pointed out that this stress-pattern is often optional and that stress on the verb is also possible. The idioms now confirm the assessment of Kratzer & Selkirk (2007) that there is only one default stress pattern, the one with stress on the subject. Thus, an idiom only allow this stress-pattern, as in (62).

- (62) a. Ich glaube, dass dich *der Hafer sticht*.
 I think that you.ACC the.NOM oat stings
 ‘I think you are feeling up to something.’
- b. # Ich glaube, dass dich *der Hafer sticht*.

The additional option of stressing the verb in this configuration, discussed by Truckenbrodt (2012), must thus be derived by the subject being a topic (e.g. by string-vacuous scrambling of the subject below the moved object), with the consequences defined in (52) and (53).

For deriving the default pattern of this case, let us follow Kratzer & Selkirk (2007) and Truckenbrodt (2012) in assuming raising of the verb to *v*: *dieses Haus₁ [_{vP} Maffiosi [_{VP} e₁ t_V] besitzen]*. Stress-XP is then satisfied for *vP* by stress on the subject *Maffiosi*. In its formulation in (16) and (35), Stress-XP need not be satisfied for categories that do not contain overt material like the VP in this structure.

Notice that these assumptions also correctly derive the related but different case of a pronominal object intervening between the subject and the verb in (21)–(23). Here we have *dass [_{vP} ein Kind [_{VP} etwas essen] essen] wollte* with raising of *V* to *v* by internal merge. In this case, the VP is overt because of the presence of the overt pronoun. The VP therefore invokes Stress-XP by its formulation in (35). The VP must thus contain stress. This is satisfied if the raised verb is stressed,

since technically, the VP still dominates the raised verb. Put differently, Stress-XP is satisfied for VP by a stressed raised verb with the help of stress reconstruction of that verb.

A further case of interest concerns locative or directional PPs that are predicated over the internal argument. These can be stressless even if they are not contextually given, as in (63) (see Uhmann 1991, Kratzer & Selkirk 2007, Truckenbrodt 2012).

- (63) Maria hat einen Nagel *in ein Brett* geschlagen.
 Maria has a nail into a board hit
 ‘Maria hit a nail into a board.’

The account in terms of Stress-XP here requires the assumption of untypical syntax, in particular it requires treating the PP as pseudo-incorporated into the verb (Truckenbrodt 2012). This, together with the assumption that the verb (with the pseudo-incorporated PP) strives to be a prosodic word, provide an approach to the stressless nature of these PPs. See Kratzer & Selkirk (2007) for a different account not invoking untypical syntax for this case, but with therefore more complex assumptions about the mapping, than Stress-XP. The point of interest here is that the default rules derive only a stressless option for the PP according to Kratzer & Selkirk (2007) while this stress-pattern is treated as optional in Truckenbrodt (2012). The following stress-pattern of the words in (63) is also allowed:

- (64) Maria hat einen Nagel *in ein Brett* geschlagen.
 Maria has a nail into a board hit

Once again, the idioms confirm the assessment of Kratzer & Selkirk (2007): When it is part of an idiom, such a PP is obligatorily stressless. This is shown in (65) and (66) for a direct object preceding the PP and in (67) for a subject preceding the PP where the direct object of the idiom is obligatorily scrambled.

- (65) a. Ich glaube, dass du Eulen *nach Athen* trägst.
 I believe that you owls to Athen carry
 ‘I believe that you are doing redundant things.’
 b. # Ich glaube, dass du Eulen *nach Athen* trägst.
- (66) a. dass Maria einen Frosch *im Hals* hatte
 that Maria a frog in.the neck had
 ‘that Maria had difficulties speaking’
 b. # dass Maria einen Frosch *im Hals* hatte

- (67) a. Ich glaube, dass ihm eine Laus über *die Leber* gelaufen ist.
 I believe that him a louse across the liver walked is
 ‘I believe that he is in a bad mood.’
- b. # Ich glaube, dass ihm eine Laus über *die Leber* gelaufen ist.

Thus, the optional alternative in (64) must be derived by topic-status of the direct object (e.g. by string-vacuous scrambling of the direct object), which is not available for idiom chunks.

In sum, idioms show the default stress-pattern (here derived by Stress-XP) that cannot be distorted by a topic-comment structure derived by scrambling. This allows us to separate default stress-assignment from scrambling/topic-induced stress in a number of cases, confirming the way Kratzer & Selkirk (2007) separate default stress from topic-induced stress. The discussion also established the stress patterns of idioms as a baseline for the discussion of idioms in the following section.

5.4 Wh-movement and topics

Wh-movement and relativization of idiom chunks require a minimal amount of transparency of the idioms to begin with, so as to allow questioning or relativizing of an idiom chunk. Some idioms do not have this minimal amount of transparency and thus do not allow wh-movement or relativization:

- (68) a. Sie haben ihm *den Garaus gemacht*.
 they have him the “Garaus” made
 ‘They killed him.’
- b. * Ich frage mich, welchen *Garaus* sie ihm *gemacht* haben.
 I ask myself which “Garaus” they him made have
- c. * der *Garaus*, den sie ihm *gemacht* haben, ...
 the “Garaus” that they him made have

Let us call these *absolutely opaque idioms*. Many other idioms have this minimal amount of transparency and allow wh-movement and relativization, sometimes with a small amount of markedness as indicated, which is here tolerated in the discussion. As far as the stress-pattern, the idioms here fall into two classes. (Speakers may differ which class they assign an idiom to.)

In one class of idioms, here called *more opaque idioms*, stress obligatorily reconstructs under wh-movement and relativization:

- (69) a. ? Ich frage mich, welcher Hafer dich *sticht*.
 b. ??/* Ich frage mich, welcher Hafer dich sticht.
 I ask myself which oat you stings
 lit. ‘I wonder which oat is stinging you.’

- (70) a. Wir kennen alle den Hafer, der dich sticht.
 b. ?? Wir kennen alle den Hafer, der dich sticht.
 we know all the oat which you stings
 lit. 'We all know the oat that stings you.'
- (71) a. Ich frage mich, was für eine Laus ihm über die Leber gelaufen ist.
 b. ?? Ich frage mich, was für eine Laus ihm über die Leber gelaufen ist.
 I ask myself what for a louse him across the liver walked is
 lit. 'I wonder what kind of louse walked across his liver.'
- (72) a. Wir wundern uns über die Laus, die dir über die Leber gelaufen ist.
 b. ?? Wir wundern uns über die Laus, die dir über die Leber gelaufen ist.
 we wonder ourselves about the louse which you across the liver
 gelaufen ist.
 walked is
 lit. 'We are wondering about the louse that walked across your liver.'
- (73) a. Es gibt da noch ein Hühnchen, das ich mit ihm zu rupfen habe.
 b. ?? Es gibt da noch ein Hühnchen, das ich mit ihm zu rupfen habe.
 it exists there also a chicken that I with him to pluck have
 lit. 'There is still a chicken that I have to pluck with him.'
- (74) a. Wir staunen alle über die Eulen, die du nach Athen trägst.
 b. ?? Wir staunen alle über die Eulen, die du nach Athen trägst.
 we maze all about the owls which you to Athens carry
 lit. 'We are all amazed about the owls you are carrying to Athens.'
- (75) a. Nicht von ungefähr kommt der Frosch, den du im Hals hast.
 b. ?? Nicht von ungefähr kommt der Frosch, den du im Hals hast.
 not from broadly comes the frog which you in-the neck have
 'No accident is the frog you have got in your neck.' (dictionary translation)

In the second class of idioms, here called *less opaque idioms*, stress reconstruction is not obligatory. While the structure with stress reconstruction is an option, stress on the verb is also a possibility:

- (76) a. ? Ich frage mich, in welchen sauren Apfel er gebissen hat.
 b. ? Ich frage mich, in welchen sauren Apfel er gebissen hat.
 I ask myself in which sour apple he bitten has
 lit. 'I wonder in which sour apple he has bitten.'
 'I wonder which bitter pill he swallowed.'

- (77) a. Ich frage mich, was für einen Bären sie ihm aufgebunden haben.
 b. [?] Ich frage mich, was für einen Bären sie ihm aufgebunden haben.
 I ask myself what for a bear they him tied.onto have
 lit. ‘I wonder what bear they tied onto him.’
 ‘I wonder what lie they told to him.’
- (78) a. Sehr dünn ist der seidene Faden, an dem das hängt.
 b. Sehr dünn ist der seidene Faden, an dem das hängt.
 very thin is the silken thread on which this hangs
 lit. ‘The thread if silk on which this hangs is very thin.’
 ‘This might easily go wrong.’

Before accounting for the idioms, let us return to the optionality of stress reconstruction that was illustrated in (28) for a relative clause. It is illustrated with wh-movement in (79) and (80). Alongside the reconstructing stress-pattern (79) (repeated from (24a)) the non-reconstructing stress-pattern in (80) is also possible. The original site of the wh-phrase is here marked with “__”.

- (79) Ich frage mich [was für Bücher sie __ geschrieben hat].
 I ask myself what for books she written has
 ‘I wonder what books she has written.’
- (80) Ich frage mich [was für Bücher sie __ geschrieben hat].
 I ask myself what for books she written has

This non-reconstructing alternative in (80) is now analyzed in terms of a topic-comment structure as in (81).

- (81) Ich frage mich [[was für Bücher]_{TOP} sie __ geschrieben hat].
 I ask myself what for books she written has

Following Krifka (this volume) I assume that a wh-phrase can be a topic. I analyze the non-reconstructed stress-pattern in (81) in terms of the topic-hood of the wh-phrase. It may be derived by first scrambling the wh-phrase or it may be derived by making the wh-phrase into a topic in Spec,CP. In the account as developed up to here, (52) will require dismantling the multi-dominance structure, making stress-reconstruction into the VP impossible. Stress-XP will need to be satisfied for VP by stressing the verb. Let us now refine this picture with the help of the observations about the idioms we saw.

First, for all idioms in wh-movement and relativization, stress reconstruction is an option, as expected: The structure derived by internal merge leads to stress reconstruction and allows idiom chunk reconstruction at LF.

Second, the non-reconstructing stress-pattern is now analyzed in terms of topic-comment structures. The more opaque idioms are the expected case: topic-comment structures do not reconstruct for idiom chunks or for stress due to (52) and (53) in the account formulated so far.

The less opaque idioms are the unexpected case: they do not allow idiom chunk reconstruction under scrambling, but they allow idiom chunk reconstruction where the *wh*-phrase (or relative clause operator) is a topic that does not reconstruct for stress. We can represent this if *wh*-movement (and relativization) have an additional way of satisfying (52), as formulated in (82).

- (82) An additional option for satisfying (52) in operator-variable structures is that operator and variable are turned into separate but split copies, no longer multiply linked.

This plays out in the less opaque idioms as follows: First, their lesser opacity allows the idiom chunk *wh*-phrase to be a topic in Spec,CP. Furthermore, if their topic-representation is derived as allowed in (82), there are then two split copies, one for the *wh*-phrase topic, one for the position inside of the VP in situ. The copy in the VP allows for a reconstructed idiom interpretation. However, since the representation is split into two separate copies, there is conceivably no stress reconstruction: the upper, overt, copy can be stressed, but is not dominated by the VP. Let us assume that stress is not shared among split copies, but is a property only of the overt copy. Stress-XP will then need to be satisfied for the *vP* or VP by stress on the verb.

This picture is compatible with the division between the more opaque idioms and the less opaque idioms. Consider the structure now assumed for a less opaque idiom in (83), in which the two bracketed instances of the idiom chunk should be taken to be separate copies:

- (83) [*in welchen sauren Apfel*]_{TOP} er [*in welchen sauren Apfel*] *gebissen* hat
 in which sour apple he in which sour apple bitten has
 ‘what unpleasant event happened to him’

We can make sense of this semantically as follows. The idiom chunk in question in (76)–(78) has a metaphorical meaning in which it stands for another referent and in this regard the idiom is more transparent: the sour apple in (76) transparently stands for something that happened to the referent of *er* ‘he’. The bear in (77) transparently stands for the lie that was told to the referent of *ihm* ‘him’. The silken thread in (78) may transparently stand for what keeps the referent of *das* ‘that’ from breaking. If we allow these metaphorical idiom chunks to refer to such actual referents, it is not unreasonable that they can constitute topics: the comment is about the non-metaphorical referent of these metaphorical idiom chunks.

For the more opaque idioms, this is, by hypothesis, not an option:

- (84) * [der Hafer]₁ ... dich [der Hafer]₁/e₁ sticht
 the oat you the oat stings
 ‘you feel compelled to do something’

Here we are led to take the position that the idiom chunk does not have the possibility of metaphorically referring in a way that allows it to serve as a topic. This is not unreasonable for the more opaque idioms. However, we are postulating a subtle division: these idiom-chunks must be transparent enough to be questioned or relativized, yet not transparent enough for serving as topics. More extensive research on idiom chunks, beyond of the scope of this paper, would be useful for substantiating the right kind of analysis of this divide. For now, the analysis just formulated appears to be reasonable.

The picture we arrive at, then, is that there is a simple standard case, multiple linking by internal merge with stress reconstruction and the possibility of LF reconstruction as discussed in section 4. This option is available to the more and the less opaque idioms. In addition, topics require not to be multiply linked with a position in the comment. For *wh*-movement and relativization, split copies are a way of satisfying the topic requirement. This allows idiom chunk reconstruction without stress reconstruction for the less opaque idioms. The more opaque idioms do not allow the separate copy of an idiom chunk. For scrambling topics, by assumption not operator-variable structures, the only available **options** is the reduction of the lower link to a bound empty category. This blocks LF-reconstruction, so that the more and the less opaque idioms do not allow scrambling.

Let us then also consider the stress-patterns of some other phenomena of LF-reconstruction. Reconstruction for anaphor binding allows both stress patterns:

- (85) a. Ich frage mich was für Bilder von sich sie mag.
 b. Ich frage mich was für Bilder von sich sie mag.
 a. ‘I wonder what pictures of herself she likes.’
 b. ‘I wonder what pictures of herself she likes.’

Reconstruction for anaphor binding will be briefly addressed in section 6.2. The account there correctly predicts that there is no interaction with whether the moved element is a topic or not.

Consider then also scope reconstruction. Heycock (1995) pointed out reconstruction effects in connection with verbs of creation, which are further discussed by Fox (1999); see also Heycock (this volume). I employ examples that provide a test case for stress assignment below. While (86) has the two scope readings shown, only one of them is possible with a verb of creation as in (87). The a.-paraphrases render readings in which *n-many* scopes over *want*. In the b.-paraphrases *want* scopes over *n-many*. Heycock and Fox argue with the help of interaction of this

phenomenon with Condition C that there is obligatory reconstruction in readings involving creation as in (87).

(86) Wie viele Geschichten will sie erzählen?

how many stories wants she tell

‘How many stories does she want to tell?’

What is the number n such that

a. there are n -many stories and she wants to tell them. (n -many > want)

b. she wants to tell n -many stories. (want > n -many)

(87) Wie viele Geschichten will sie sich ausdenken?

how many stories wants she herself invent

‘How many stories does she want to invent?’

What is the number n such that

a. * there are n -many stories and she wants to invent them.

($*n$ -many > want)

b. she wants to invent n -many stories

(want > n -many)

However, we do not see obligatory stress reconstruction entailed by this syntactic reconstruction:

(88) a. Ich frage mich, wie viele Geschichten sie sich ausdenken will.

b. Ich frage mich, wie viele Geschichten sie sich ausdenken will.

a. ‘I wonder how many stories she wants to invent.’

b. ‘I wonder how many stories she wants to invent.’

The analysis of these examples with stress reconstruction is as in section 4: multiple dominance at spell-out allows stress reconstruction as well as LF-reconstruction. The analysis of these examples without stress reconstruction invokes a topic as the higher copy, with splitting of the copies for operator and variable by (82). Thus, putting aside details of the resulting LFs, it seems that the current account correctly allows a representation employing LF reconstruction of scope with or without stress reconstruction.

Let us then finally turn to reconstruction for Condition C effects.

6 Condition C effects and stress reconstruction

6.1 Stress-assignment and Condition C reconstruction

I begin with *wh*-movement. There are predicates that reconstruct for Condition C like the typical example from the English literature in (89a), here in its German

translation. Other predicates as in (90a) and (91a) do not seem to reconstruct for Condition C as readily. As noted in Krifka (this volume) we will normally judge these on stress-patterns and contextual assumptions that ameliorate the judgments as much as possible. Such stress-patterns are employed in these a.-examples. Even the bad ones are far from reaching the unacceptability we find with Condition C violations that do not involve reconstruction as in (92)–(94). As we shift the sentence stress to the offending r-expression and employ a pattern of stress reconstruction, as in (89b), (90b) and (91b), we get a strong Condition C effect, comparable to (92)–(94). The c.-examples are controls that show that the problem with the b.-examples is really a Condition C violation.

- (89) a. *?(?) Ich frage mich welche Bilder von Maria₁ sie₁ mag.*
 b. * *Ich frage mich welche Bilder von Maria₁ sie₁ mag.*
 c. *Ich frage mich welche Bilder von Maria₁ du₂ magst.*
 I ask myself which pictures of Maria she/you like(s)
 a. ‘I wonder which pictures of Mary₁ she₁ likes.’ (?(?))
 b. ‘I wonder which pictures of Mary₁ she₁ likes.’ (*)
 c. ‘I wonder which pictures of Mary₁ you₂ like.’
- (90) [Let us return to the case of Vischnevsky₁]
 a. *Wir müssen rauskriegen, welche Bilder von Maria₁ sie₁ gesehen hat.*
 b. * *Wir müssen rauskriegen, welche Bilder von Maria₁ sie₁ gesehen hat.*
 c. *Wir müssen rauskriegen, welche Bilder von Maria₁ er₂ gesehen hat.*
 we must find-out which pictures of Maria she/he seen has
 a. ‘We must find out which pictures of Mary₂ she₂ saw.’
 b. ‘We must find out which pictures of Mary₂ she₂ saw.’ (*)
 c. ‘We must find out which pictures of Mary he₁ saw.’
- (91) a. *Ich frage mich, welche von Marias₁ Bildern sie₁ mag.*
 b. * *Ich frage mich, welche von Marias₁ Bildern sie₁ mag.*
 I ask myself which of Marias pictures she likes
 a. ‘I wonder which of Mary’s pictures she likes.’
 b. ‘I wonder which of Mary’s pictures she likes.’
- (92) * *Sie₁ mag alle Bilder von Maria₁.*
 ‘She₁ likes all pictures of Maria₁.’ (*)
- (93) * *Sie₁ hat alle Bilder von Maria₁ (schon) gesehen.*
 ‘She₁ (already) saw all pictures of Maria₁.’ (*)

- (94) * Sie₁ hat alle von Marias₁ Bildern gesehen.
 ‘She₁ saw all of Maria₁’s pictures.’ (*)

A similar, though weaker, effect obtains in (95) and (96). Here stress reconstruction is favored by an element in the NP that is different from the r-expression. These seem to still be degraded, even though the same sentences without a reconstructing stress pattern in (90a) and (91a) are acceptable.

- (95) (??) Wir müssen rauskriegen, welche Bilder von Maria₂ sie₂ gesehen hat.
 we must find-out which pictures of Maria she seen has
 ‘We must find out which pictures of Mary₂ she₂ has seen.’
- (96) ?? Ich frage mich, welche von Marias₁ Bildern sie₁ mag.
 I ask myself which of Maria’s pictures she likes
 ‘I wonder which of Mary’s pictures she likes.’

I turn to a first conceivable explanation. Safir (1999) has argued that a mechanism of *vehicle change* affects reconstructed representations. In applying this, Safir assumes that the upper copy and the lower one are retained at LF. Vehicle change is an independently motivated analytical device due to Fiengo & May (1994). Applied to reconstruction, it allows that an r-expression is replaced by a pronoun in the reconstructed copy. This goes a long way towards explaining the difference in acceptability between, on the one hand, (89a), (90a), and (91a), and on the other (92)–(94). For example, after reconstruction with vehicle change in (91a), we obtain, *sie_i mag welche von ihren_i Bildern* ‘she likes which of her pictures’, which, due to vehicle change (*Marias Bildern* → *ihren Bildern*), is not a violation of Condition C. However, vehicle change fails to account for the strong ill-formedness of the b-examples in (89)–(91): Here, too, we expect that vehicle change can deflect the Condition C effect, yet it cannot. The effects in the b-examples are as strong as the regular Condition C effects without reconstruction in (92)–(94). Vehicle change is therefore not adopted here.

Consider then a second approach. Krifka (this volume) argues in some detail that topic-status of a moved wh-phrase removes or ameliorates Condition C violations relating to the reconstruction of the wh-phrase. This descriptive point is adopted here. It follows from the account of the current paper: Where the wh-phrase is a topic, it must not retain its link into the comment due to (52). If this link is removed in the way that (53) allows, the original position of the wh-phrase contains only a bound empty category and there is then no reconstruction for Condition C effects. This now predicts that the a-examples of (89)–(91) do not show reconstruction for Condition C, since the wh-phrase has topic intonation here. It further predicts that the b-examples of (89)–(91) are deviant since the wh-phrase is not a topic here: the wh-phrase shows a reconstructing stress-pattern

which is a cue for the presence of multiple linking of the original position of the wh-phrase and its derived position. In these cases, then, Condition C is violated, since the pronoun c-commands the coreferent name via the lower link of the multiply linked structure. These consequences are adopted here. I return to the deviance of (89a) in section 6.2. Furthermore, we also predict some deviance for (95) and (96): Since their stress-patterns do not support topic-hood of the moved wh-phrase but stress reconstruction, we expect multidominance and hence a Condition C effect. Concerning the partial amelioration in (95) and (96), I follow related remarks in Krifka (this volume). I hypothesize that the contextual givenness of *Maria* that is compatible with these stress-patterns (see e.g. Féry & Samek-Lodovici 2006, Ladd 1983) may help with marginally assigning topic-status to the wh-phrase after all.

Krifka (this volume) sees the amelioration of Condition C reconstruction by topic-status of the wh-phrase in different terms. Krifka uses the competition account of Condition C by Reinhart (1983), which I adopt here as well. Krifka sees the competition between an r-expression and a pronoun as becoming less important inside of a topic in connection with the link that the topic has to the preceding discourse. I think that a problematic aspect of this approach is that it predicts that the topic-effect is not specific to reconstruction and should also occur without movement and reconstruction in examples like (92)–(94). However, this does not seem to be the case. This is shown in more detail in (97). Here the r-expression is discourse anaphoric and the object containing it is discourse-anaphoric, and both are destressed accordingly. However, the Condition C effect is fully in force and not ameliorated.

(97) Wir haben mit Maria über die Bilder von ihr gesprochen. Ich finde, dass sie nochmal aufgenommen werden sollten. Aber ...

* sie₁ mag die Bilder von Maria₁.

‘We talked with Maria about the pictures of her. I think they should be redone. However,

she₁ likes the pictures of Maria₁.’

On the other hand, in the current implementation of Krifka’s observation, topic-status of the wh-phrase is relevant only where reconstruction is at issue, since topic-status interferes with multi-dominance.

What, then, of the deviance of examples like (89a)? This is addressed in the following section.

6.2 Reconstruction for anaphor binding and apparent Condition C effects

The remarks in this section are tentative. I begin by backing up a bit. I will work my way to an outline of an account in a number of steps.

Müller & Sternefeld (1994) showed that anaphor binding reconstructs under scrambling. This is shown in (98).

- (98) dass [Bilder von sich₁] (nur) die Maria₁ aufgehängt hat
 that pictures of herself (only) the.NOM Maria put.up has
 ‘that (only) Maria₁ put up pictures of herself₁’

I here reconcile this with the idiom chunk facts and the current account as follows. Let us construe anaphor-binding as a syntactic process before spell-out. This move shares elements with the suggestion of Kuno (1987, 2006) that Conditions A and B apply cyclically while Condition C applies postcyclically. This move will allow anaphor-binding to precede scrambling in (98). Anaphor binding, on this account, may apply early or late. If it applies early, it shows apparent reconstruction effects. However, they do not relate to the retention of a lower copy. They simply reflect early application of anaphor binding. This kind of reconstruction effect is now taken to be different from reconstruction for idiom interpretation, for Condition C, and for stress assignment. These processes apply late – at LF for idiom interpretation and for Condition C, as is standardly assumed, and at spell-out for stress-assignment, likewise a standard assumption. This late application requires the retention of a low copy for reconstruction. Consequently, scrambling, which does not retain a low copy, does not reconstruct for idiom interpretation, Condition C or for stress-assignment. However, scrambling reconstructs for anaphor binding, since anaphor binding may simply apply before scrambling.

Second, Frank, Lee & Rambow (1996) show that Condition C effects with picture nouns do not reconstruct under scrambling, except where binding from the subject position is at issue (see (100) and (101) below). To accommodate this, let us adopt a comparison-based account of anaphor- and pronoun-binding (Safir 2004, Rooryck & Wyngaerd 2011): an anaphor (rather than a pronoun or an r-expression) must be used where it can be bound. Observe that picture nouns with anaphors also accord a special place to the subject: they are obligatory and fully natural only where the subject is their antecedent:

- (99) a. Die Maria₁ hat [Bilder von sich₁/??ihr₁] aufgehängt.
 the.NOM Maria has pictures of herself/her put.up
 ‘Maria put up pictures of herself.’

- b. Ich habe der Maria₁ [Bilder von ihr₁/*sich₁] gezeigt.
 I have the.DAT Maria pictures of her/herself shown
 'I showed Maria pictures of her.'
- c. Ich habe die Maria₁ [einigen Fans von ihr₁/*sich₁] vorgestellt.
 I have the.ACC Maria some fans of her/herself introduced.to
 'I introduced Maria to some fans of her.'

We can now analyze the apparent effects of Condition C reconstruction with scrambling of Frank, Lee & Rambow (1996) in (100) as follows: One must not use an r-expression instead of the anaphor *sich*. This is because doing so would be skipping the opportunity to use a bound anaphor, as in the alternative (98) with the structure before scrambling as in (99a). This is prohibited by the competition account of anaphor- and pronoun-binding.

- (100) * dass [Bilder von Maria] die Maria aufgehängt hat
 that pictures of Maria the.NOM Maria put.up has
 'that Maria has put up pictures of Maria'

Different facts obtain with binding to an object. If the bracketed constituents in (99b,c) are scrambled across *die Maria*, the pronoun *ihr* in them can be replaced with an r-expression as in (101).

- (101) ? dass ich [Bilder von Maria₁] der Maria₁ gezeigt habe
 that I pictures of Maria the.dat Maria shown have
 'that I showed pictures of Maria to Maria'

The current account is that in these cases, there is no alternative with a bound anaphor, as shown in (99b,c).

In the preceding analysis, we analyzed what appears to be Condition C reconstruction for scrambling in (100) in different terms, namely in terms of the missed chance to use an anaphor, using an r-expression instead. We find reconstruction under scrambling because the anaphor, had it been used, would have had the option of undergoing anaphor binding before scrambling.

Let us then extend this account to (89a). An anaphor could have been used instead of the r-expression *Maria* (cf. also (85)) and could have been bound during the syntax under our assumptions. This approach is confirmed by the absence of a similar reconstruction effect in (91a): In German, as in English, possessive pronouns do not have a reflexive alternative in the lexical inventory of pronouns. The competition with the use of an anaphor does not arise in this case and the structure is predicted to be fine.

(90a) is a case of the well-known variability in judgements about Condition C reconstruction. It is structurally similar to (89a), though without the apparent

Condition C reconstruction. The context here supports a referentially independent reading of the *wh*-phrase topic, which also makes the use of an anaphor instead of *Mary* more marked than in (89a).

In sum, we obtain a coherent picture that integrates stress reconstruction with Condition C reconstruction. Where the *wh*-phrase is not a topic, we find both stress reconstruction and Condition C reconstruction. Where the *wh*-phrase is a topic, the account requires neither stress reconstruction nor Condition C reconstruction. For the most part, this leads to the correct results. A remaining apparent Condition C effect was analyzed as an interaction with anaphor binding. In the tentative account of anaphor binding employed here, anaphor binding is a syntactic process that can apply before the putatively reconstructed movement, thus showing a different kind of reconstruction effect. It can interact with the deployment of names if the use of a name amounts to a missed opportunity to use a bound anaphor.

7 Summary

The discussion in this paper supports the following points.

First, stress-assignment shows effects of reconstruction, as first shown in different terms by Bresnan (1971, 1972). This phenomenon occurs both in *wh*-questions and in relative clauses.

Second, when we consider stress reconstruction side by side with syntactic reconstruction effects, a coherent picture emerges: scrambled constituents do not reconstruct for idiom chunks, for Condition C (interaction with anaphor binding apart), or (importantly) for stress, while *wh*-movement with a non-topic *wh*-phrase reconstructs for idiom chunks, for Condition C, and, crucially, for stress.

Third, stress reconstruction provides a new source of evidence for the copy left behind by moving elements in the copy theory of movement and reconstruction, here adopted in the form of the theory of internal merge: The copy of the moved element at spell-out will trigger these effects in the mapping to PF, during which stress is assigned. These effects are interesting support for the copy theory (or its successor in terms of internal merge), as previous accounts of LF-reconstruction would not derive stress reconstruction.

Fourth, topics (including all scrambled constituents) require the destruction of the multi-dominance representation. One alternative that they seem to generally allow is the conversion of the lower links of multi-dominance into bound empty categories (akin to the classical traces) during the syntax. Scrambling seems to have only this option, thus blocking both idiom chunk reconstruction at LF and stress reconstruction in the mapping to PF. Operator-variable structures in which

the operator is also a topic seem to have the further option of representing operator and variable as separate, split, copies. This allows for an understanding of why operator topics allow for some amount of LF-reconstruction in the absence of stress reconstruction with weakly opaque idioms and in scope reconstruction.

Fifth, it was shown that the account is compatible with specific assumptions about anaphor binding, i.e. the local binding of reflexives. Their binding reconstructs in scrambling, though neither idiom chunks nor Condition C nor stress reconstruct in scrambling. This suggests that anaphor binding is a syntactic process that may apply prior to the putatively reconstructed movement and does not depend on the lower “copy” for reconstruction later in the derivation. It is thus different from the other phenomena, which require the lower “copy”: idiom chunks are interpreted at LF, Condition C applies at LF, and stress is assigned to the structure at spell-out. Further, the account is compatible with the assumption that anaphor binding can interfere with the use of a name if the use of a name is a missed opportunity to use a bound anaphor instead.

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