

## **Mimimality Effects in Children's Passives**

William Snyder and Nina Hyams

### **Abstract**

Many studies find true verbal passives in English acquired only after age four, but some find three-year-olds fully adultlike. We explain this discrepancy using Relativized Minimality (RM, Rizzi 2004). Collins (2005a) argues the passive involves movement of the logical object across the logical subject (either PRO, or a lexical DP with 'by'), and normally this requires smuggling. We propose smuggling is maturationally unavailable until age four. Three-year-olds succeed only if the intervener is eliminated, as in certain Romance reflexive-clitic constructions; or if +Topic/+WH on the logical object can prevent an RM violation, as in certain studies of the English passive. Following Grillo (2008), we explain the still-later acquisition of non-actional passives by their need for both smuggling and semantic coercion.

Key words: passive, language acquisition, smuggling, maturation, minimality

## 1. Introduction

In many studies of children acquiring English, adultlike performance on clear, unequivocal verbal passives is not reliably present until sometime after age 4;0, with performance on *be*-passives of non-actional verbs sometimes remaining non-adultlike until age 6 or 7 (Bever 1970; Horgan 1978; Maratsos et al. 1985; de Villiers & de Villiers 1985; Borer & Wexler 1987; Meints 1999; Orfitelli 2012b). In contrast, a minority of studies find fully adultlike performance, even on passives of non-actional verbs, in three-year-olds (Crain, Thornton & Murasugi 2009; Pinker, Lebeaux & Frost 1987; O'Brien, Grolla & Lillo-Martin 2006).

In this paper we present a new analysis of children's passives, based on Rizzi's (2004) theory of Relativized Minimality (RM), that can explain why different experimental methods yield different results. Supporting evidence for our analysis comes from children's very early, error-free production of reflexive-clitic constructions in French and Italian, and from a careful re-examination of the literature on passives.

A key proposal will be that children have an adultlike representation of RM, but undergo development with respect to smuggling (Collins 2005a). Our approach will be related to, and in many ways complemented by, the proposals of (Grillo 2008), discussed in Section 5. Our approach is also similar in spirit to certain proposals of Belletti and colleagues in their important work on intervention effects in children's relative clauses (Friedmann et al. 2009; Belletti et al. 2012; Adani et al. 2010). The latter work develops an RM-inspired, grammatical approach to what are sometimes called 'interference' effects in the sentence-processing literature. Despite the conceptual

commonalities, however, the specific features that play a critical role, the precise syntactic configurations that create (or reduce) difficulty, the strength of the effects, and the developmental trajectory all suggest that those phenomena are distinct from the ones to be examined here.<sup>1</sup>

Section 2 lays out our syntactic assumptions about passives, and introduces our general approach to children's performance on passives and related structures. This is followed in Section 3 by our findings on the acquisition of reflexive-clitic constructions (with a focus on 'formally, but not semantically, reflexive clitic constructions', or FRCCs). Section 4 presents the remaining details of our account, and shows how it can explain the findings of the studies where three-year-olds did surprisingly well. In Section 5 we discuss why passives of non-actional verbs are acquired later than passives of actional verbs, and Section 6 concludes the paper.

## **2. A minimality-based approach to passives in children and adults**

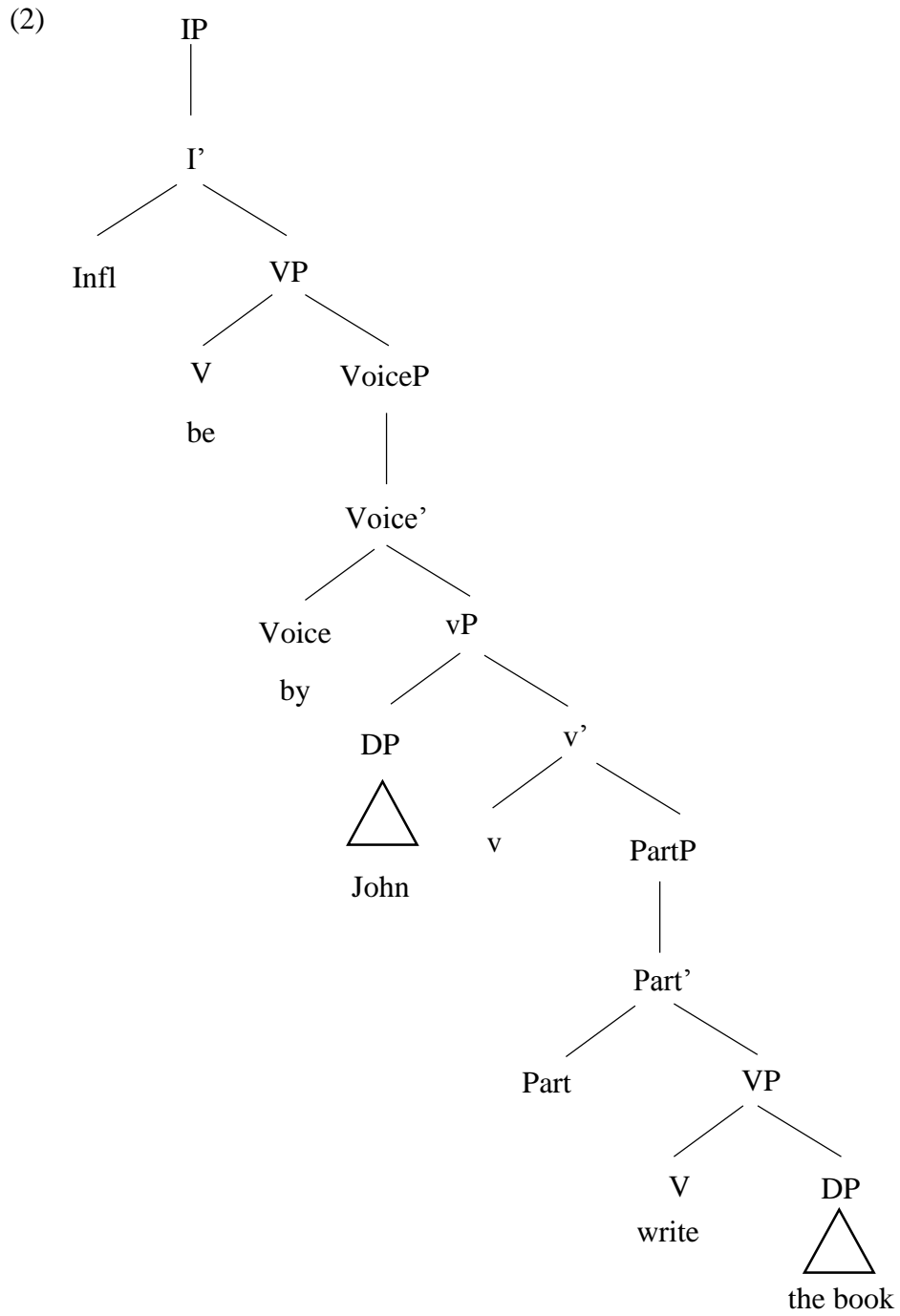
As a point of departure, we lay out our assumptions concerning the structure of the English verbal passive. First and foremost, we follow Collins (2005a) in his view that the underlying object in a passive always needs to move across an intervening argument, namely the logical subject. Collins' account is based on a strict interpretation of Baker's UTAH (Uniformity of Theta-Assignment Hypothesis, 1988:46, 1997:74). In the passive, as in the active, the external theta role is assigned to Spec of v. In the case of a

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<sup>1</sup> For example, according to Belletti et al. (2012), what we are terming *interference effects* can be ameliorated by a simple change in the value of a feature, such as gender or number, as long as the feature is syntactically active. In contrast, the island effects addressed by Rizzi's (2004) system show amelioration only when a feature from a new feature class (argumental, quantificational, modificational, or topical) is added to the moving element. Thus, while the two types of effect are both interesting and important in their own right, a full unification seems unlikely.

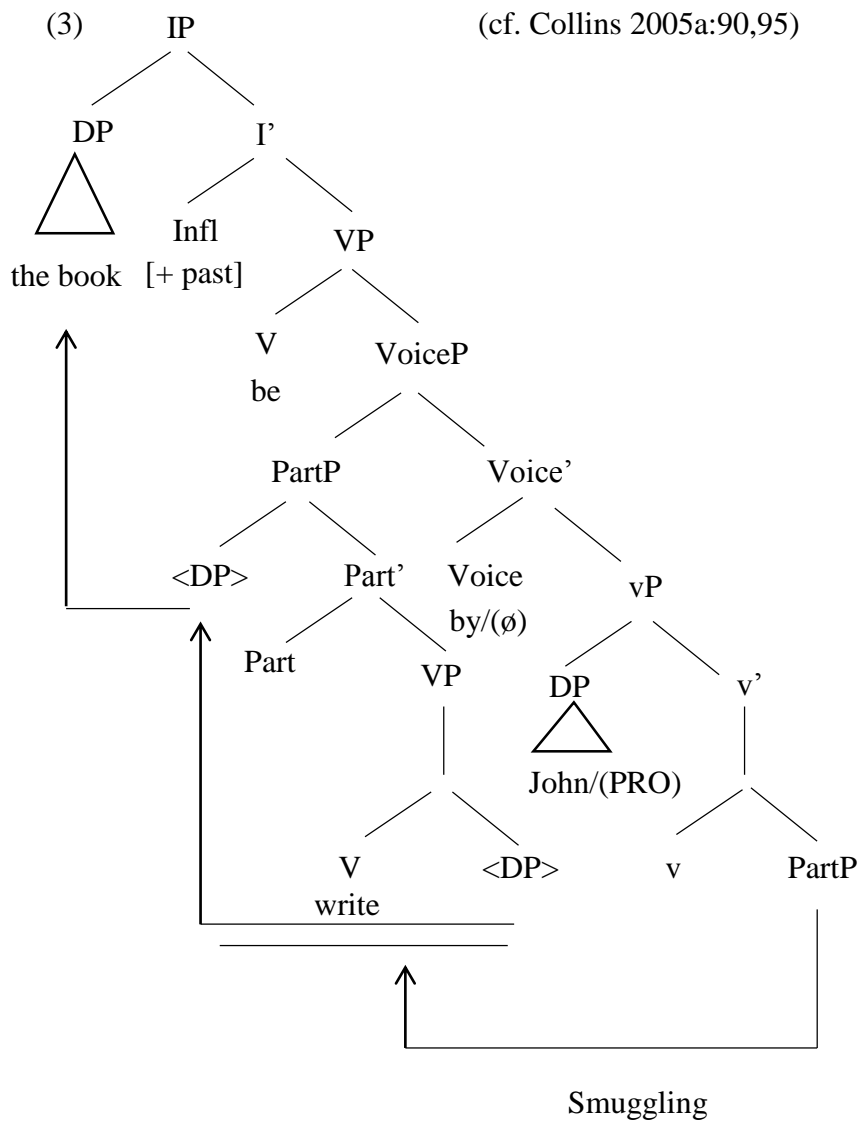
short passive, the external theta role is assigned to a PRO. The underlying structure of a long passive such as (1) is taken to be approximately as in (2).

(1) The book was written by John



On this account the apparent object of *by*, the agent *John*, is actually the specifier of the vP complement of *by*. The complement of *v* is a Participle Phrase, which in turn contains the VP.

In (2), raising the object to Spec of I across the specifier of vP would violate minimality (both RM, as in Rizzi 1990, 2004; and the Minimal Link Condition, MLC, as in Chomsky 1995). The solution, according to Collins, is to ‘smuggle’ the object past the verb’s external argument, as illustrated in (3).



Here, the V (*written*) raises to the head of the Participle Phrase, and V's object (*the book*) raises to Spec of Part. Smuggling occurs when the entire PartP moves up to Spec of Voice. This movement itself obeys minimality, and succeeds in smuggling the DP up to a position from which it can safely move to Spec of I.

The smuggling proposal relies crucially on the assumption that the Freezing Principle (originally proposed in Wexler and Culicover 1980:119)) fails to apply in certain environments (Collins 2005b: 292). One formulation of the Freezing Principle, from Müller (1998: 124), is given in (4).

(4) \* X [Y ... <X> ...] <Y>

In (3), movement of the DP out of the PartP, after the PartP has already undergone movement, is a direct violation of the Freezing Principle. Hence, Collins is led to conclude that the Freezing Principle allows certain exceptions, although it remains to be determined exactly where these occur. In summary, for Collins the English verbal passive relies on smuggling followed by raising, and this combination is possible only in contexts where the Freezing Principle fails to apply.

### *2.1 Are children frozen? The UFH and the AIH*

As in Hyams & Snyder 2005, 2006, we build directly on Collins' (2005a) analysis of English passives, including the central role of smuggling. Specifically, we propose that children's general difficulty with passives is due to a fundamental syntactic difference

from adults. For adults there are exceptions to the Freezing Principle – cases where a promoted object can be smuggled across an intervening DP, as outlined above. For children, however, there are no exceptions. In other words, young children are completely ‘frozen’. We termed this proposal the Universal Freezing Hypothesis.

- (5) *Universal Freezing Hypothesis (UFH)*. For the immature child (at least until age four), the Freezing Principle *always* applies: No subpart of a moved phrase can *ever* be extracted.

The general consequence of the UFH is that ‘immature’ children do not have access to the smuggling+raising strategy that adults use, and so for them the intervening argument reliably blocks object promotion in the passive.<sup>2</sup>

Importantly, the UFH does not entail that children lack A-movement. It therefore contrasts with Borer & Wexler’s seminal (1987) Maturation of A-Chains Hypothesis, as well as revised versions like Borer & Wexler’s (1992) A-chain Deficit Hypothesis (ACDH). In our view it is quite difficult to maintain that young children have trouble with A-movement across the board. As we will argue in Section 3, children seem to do quite well with structures that require A-movement, as long as there is no need to jump over an intervening A-position.

Given that the idea of smuggling is somewhat controversial in the syntax literature, it may be useful to clarify exactly what parts of the idea are essential. In this spirit, Orfitelli (2012a,b) has proposed a variant of UFH, the ‘Argument Intervention

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<sup>2</sup> A very similar idea was proposed independently in Nevins (2002).

Hypothesis' shown in (6), which abstracts away from specifics such as smuggling and freezing.

- (6) *Argument Intervention Hypothesis* (AIH): Children are delayed in acquiring those structures which require A-movement across a structurally intervening argument.

Orfitelli retains Collins' (2005a) (and our own) view that there is an implicit, syntactically represented, external argument in short passives (cf. also Roeper 1987; Roberts 1987; Jaeggli 1986; Baker, Johnson & Roberts 1989), leading to delayed comprehension of short passives (7a) as well as long passives (7b).

- (7) a. Bart was seen.  
b. Bart was seen by Lisa.

### 2.3 *The role of maturation*

Kenneth Wexler and associates, from the late 1980s up to the present, have been trying to relate children's difficulties with English passives to a biologically timed, maturational delay that affects grammar. Over the years, this has been formulated as a delay in the ability to form A-chains, a delay in the ability to tolerate the absence of an external argument (in vP), or a delay in the availability of defective phases (in the context of a theory that requires defective vP in passives and unaccusatives).

Importantly, the UFH and the AIH share with Wexler's proposals the assumption that children's difficulties in English verbal passives have a maturational basis. In our



view this might be understood as a maturational change in the grammar itself, as proposed by Wexler and colleagues, or as a change in the systems for language production and comprehension. A number of arguments in favor of a maturational approach are outlined in Orfitelli (2012b): the delay in acquisition is observed across a wide swath of (Germanic, Romance, and Slavic) languages in which comprehension tasks have been conducted; a leap in comprehension of non-actional, psychological passives occurs between ages 6 and 7 (Hirsch & Wexler 2006); identical twins are better correlated in the age at which they comprehend verbal passives than fraternal twins (Ganger, Dunn & Gordon 2005); and acquisition is not predicted by environmental factors such as parental socioeconomic status and level of education, nor amount of reading time (either to the child or by the child) (Hirsch, Modyanova & Wexler 2006).<sup>3</sup>

More precisely, we believe there are two maturational changes that are relevant to passives. The first takes place around age four, and mainly affects actional verbs. This is when the child acquiring English becomes fully adultlike in her ability to produce and comprehend true verbal passives, whether short or long, of actionals. The second change takes place around six to seven, when the child begins to produce and comprehend true verbal passives, both short and long, of non-actional verbs including psychological predicates, provided the verb is one that adults allow to passivize, and provided the child has received sufficient input to know this. In the following two sections we focus on the

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<sup>3</sup> Of relevance here is Belletti's (2009) finding that Italian-speaking children age 6 and older produce passive object relatives (PORs) in elicitation tasks targeting object relatives (ORs). According to Belletti, PORs obviate the need to move across an intervening subject, as normally required in active ORs. (By producing the passive - involving smuggling by hypothesis - the child avoids what we are here terming an *interference effect* - which seems to be stronger for him than for the adult (Friedmann, Belletti and Rizzi 2009). Belletti's POR results are consistent with findings from various languages showing passive acquisition by age 6 (See Orfitelli 2012b for review of relevant studies). We assume, along with Belletti, that by this age children fully control smuggling. (See also Belletti & Contemori 2010).

first maturational change – the UFH going off-line. In Section 5 we return to the second maturational change.

### 3. Formally reflexive clitic constructions in French and Italian

In this section we examine children's performance on a construction involving A-movement but no intervener – what we call 'formally (but not semantically) reflexive clitic constructions' (FRCCs). In French and Italian, FRCCs provide an excellent test case for the UFH / AIH. In these languages many transitive verbs can be combined with a reflexive clitic to obtain a *middle* or *inchoative/anticausative* meaning. As argued by Sportiche (2010, et seq.), such FRCCs are clearly unaccusative, and therefore resemble the verbal passive, except that the logical subject is not represented in the syntax.<sup>4</sup>

Using French to illustrate, (8a) is formally reflexive but is interpreted as a middle. The DP *les pommes* 'the apples' clearly denotes the Patient, not the Agent, of the selling event, as expected if it is underlyingly a direct object. Furthermore, as illustrated in (8b), which receives an anticausative interpretation, all FRCCs in these languages take the BE (not HAVE) auxiliary in the present perfect form (which is frequently used to express a simple-past meaning), and they all mark the perfect

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<sup>4</sup> In his 2010 paper Sportiche revises his earlier position regarding French reflexive-clitic constructions that express *genuinely* reflexive actions. In previous work (Sportiche 1998, 2008) he gave these an unaccusative analysis, just like the FRCCs, but more recently he has argued that the semantically reflexive examples (and *only* those) involve a surface subject that is underlyingly a subject, not an object. This change was motivated by very interesting data concerning focus-related readings in sentences with a reflexive clitic. Yet, as Sportiche acknowledges, his newer approach makes it much more difficult to explain why the truly reflexive, genuinely transitive uses of reflexive clitics should take the BE auxiliary in the perfect (which is otherwise a hallmark of unaccusativity), and to explain why the perfect participle agrees in gender and number with an underlying subject (whereas elsewhere it can only agree with underlying objects).

Given Sportiche's more recent position, we focus on children's use of FRCCs, where the evidence for an unaccusative analysis remains compelling, and we set aside any semantically reflexive examples. Like Sportiche, we continue to regard both the BE auxiliary and the presence of object agreement on the participle as hallmarks of unaccusativity – except in the case of the semantic reflexives.

participle for agreement in gender and number with the logical object. Both the BE auxiliary and this type of participial agreement are likewise found with lexical unaccusatives (8c) and true verbal passives (8d). Note too that when the verb *dispenser* ‘disperse’ in (8b) or *vendre* ‘sell’ in (8d) is used transitively, as in (8e), it takes the auxiliary HAVE, and the participle shows no gender or number agreement.

- (8) a. Les pommes se vendent bien ces jours-ci  
 the-Pl apple-PL REFL sell-Pres.3.Pl well these days-here  
 ‘Apples are selling well these days’
- b. Les nuages se sont dispersés  
 the-Pl cloud-Pl REFL BE-Pres.3.Pl disperse-Perf.M.Pl  
 ‘The clouds dispersed’ (lit. ‘The clouds REFL are dispersed.’)
- c. Les filles sont tombées dans la piscine  
 the-Pl girl-Pl BE-Pres.3.Pl fall-Perf.F.Pl in the pool  
 ‘The girls fell in the swimming pool’ (lit. ‘The girls are fallen ...’)
- d. Les pommes ont été vendues  
 the-Pl apple-Pl HAVE-Pres3Pl BE-Perf sell-Perf.F.Pl  
 ‘The apples have been sold’
- e. Pierre a vendu des pommes  
 Peter HAVE-Pres3Sg sell-Perf.M.Sg of-the-Pl apple-Pl  
 ‘Pierre sold some apples’

The FRCCs (8a,b) form a near-minimal pair with the verbal passive (8d). In both cases the surface subject is underlyingly an internal argument, and the logical subject is either

absent or expressed in a *by*-phrase. In the perfect, both passives and FRCCs take the BE auxiliary, and the participle agrees with the derived subject in gender and number (see note 4).

The crucial difference between passives and FRCCs is that the latter never have any form of overt or implicit representation of the logical subject. Thus, in contrast to passives (9a,b), FRCCs never take a *by*-phrase (10a) or control into a purpose clause (10b).

- (9) a. La branche a été cassée *par les chasseurs*  
‘The branch was broken by the hunters’  
b. La branche a été cassée *pour marquer l'endroit*  
‘The branch was broken to mark the location’
- (10) a. La branche s'est cassée (\* *par les chasseurs*)  
‘The branch (SE) broke (by the hunters)’  
b. La branche s'est cassée (\* *pour marquer l'endroit*)  
‘The branch (SE) broke (to mark the location)’

We therefore expect children to perform quite differently on (9) versus (10): In (9a,b) the derived subject has to move past an overt or implicit (PRO) subject, and without the benefit of smuggling, this should violate RM. In contrast, object-to-subject movement in (10) does *not* cross over an implicit (PRO) subject, because there is none, hence even younger children should be fine. The next section will show that even two-year-olds produce fully adultlike FRCCs.

### 3.1 Children's early use of reflexives (FRCCs) in Italian and French

The HAVE / BE alternation illustrated in (11) provides a perfectly controlled probe to investigate children's knowledge of reflexives, including FRCCs, in French and Italian. If young children know the syntax, they should select BE (*essere/être*) in FRCCs (11a), and HAVE (*avere/avoir*) elsewhere (11b).

- (11) a. Maman s' est assis-e  
Mom REFL IS seated-Fem  
'Mom sat down'
- b. Maman l' a assis-(e)  
Mom HIM/HER HAS seated-(Fem, if person seated is female)  
'Mom seated him / her'

Analysis of spontaneous-speech data from two-year-olds acquiring Italian or French provides strong support. Snyder, Hyams and Crisma (SHC) (1995) (cf. also Hyams & Snyder 2005) examined the longitudinal corpora of spontaneous speech from four children in the CHILDES database (MacWhinney 2000): three Italian children (Diana, Guglielmo, Martina) recorded by Cipriani et al. (1989), and one French child (Philippe) recorded by Suppes, Smith and Léveillé (1973). The ages (given as Y;MM,DD) covered by these corpora were as follows: Diana 1;08,05-2;06,13, Guglielmo 2;02,01-2;11,14, Martina 1;07,18-2;07,15, and Philippe 2;01,19-3;03,12.

We first ran a computer search for any child utterance containing a clitic, and then hand-coded the results in light of their discourse context. Findings are shown in Table 1. (For present purposes we re-counted the data and excluded all examples that

were plausibly true, semantic reflexives. Hence, the numbers are slightly lower than those reported in SHC.) The  $p$ -values are from two-tailed Fisher Exact Tests. For Diana, Guglielmo and Philippe the contingency between reflexivity and HAVE/BE was robustly significant. For Martina the result was less robust, due to the small number of examples, but it nevertheless reached statistical significance, and the choice of HAVE/BE was 100% correct in the examples she produced.

Table 1: Children’s choice of auxiliary with reflexive and non-reflexive clitics

(based on Snyder, Hyams and Crisma 1995)<sup>5</sup>

	Diana (It)			Guglielmo (It)			Martina (It)			Philippe (Fr)	
	HAVE	BE		HAVE	BE		HAVE	BE		HAVE	BE
NREF	23	1		35	0		4	0		104	2
REFL	0	11		0	14		0	3		1	19
	$(p<.001)$			$(p<.001)$			$(p=.029)$			$(p<.001)$	

More recently, we performed the same analysis on a number of additional French and Italian corpora in the CHILDES database, from French-speaking Max and Léa (De Cat and Plunkett 2002); and Italian-speaking Elisa (Tonelli collection, MacWhinney

<sup>5</sup> The original Table 1 (in SHC) contained a typographical error, in which the NREF-HAVE and REFL-BE numbers were transposed. That error has been corrected in the table provided here.

2000) and Raffaello (Cipriani et al. 1989). The ages covered by these corpora are as follows: Max 1;09-3;02, Léa 2;08-3;05, Elisa 1;05-2;01, and Raffaello 1;07-2;11.

Table 2: Children’s choice of auxiliary with (formally) reflexive and non-reflexive clitics

	Max (Fr)		Léa (Fr)		Elisa (It)		Raffaello (It)	
	HAVE	BE	HAVE	BE	HAVE	BE	HAVE	BE
NREF	17	0	45	0	15	0	10	0
REFL	1	3	1	13	0	2	0	2
	$(p=.003)$		$(p<.001)$		$(p=.007)$		$(p=.015)$	

Results are presented in Table 2. (Once again, the counts exclude all utterances that were plausibly true, semantic reflexives.) The  $p$ -values are from two-tailed Fisher Exact Tests. The contingency is statistically significant in all four children, and in absolute terms, only four of 114 utterances contained an error. Hence, we have replicated the findings of SHC: The level of success observed here would have been extremely unlikely if the children lacked the adult grammar for reflexive clitics.<sup>6</sup> Some examples of child utterances (from Elisa) are provided in (12).

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<sup>6</sup> While there was a statistically significant contingency for each of the four children examined (Table 2), in absolute terms the number of relevant examples for the two Italian children was low overall, and very low for FRCCs. This is similar to the problem noted earlier for Martina’s data, and would have been

- (12) a. Mi sono bagnata (age 2;1)  
 myself am bathed  
 ‘(I) bathed myself’
- b. L’ho mangiata (age 1;11)  
 it have eaten  
 ‘(I) have eaten it’ (la pappa = the food)
- c. Si è spor[c]cata (age 2;1)  
 herself is dirtied  
 ‘(She) dirtied herself’
- d. L’ho buttata lì dentro (age 2;1)  
 it have thrown there inside  
 ‘(I) threw it inside’

In summary, every two-year-old we checked was extremely successful at FRCCs, with nearly perfect command of the BE / HAVE alternation for (formally) reflexive versus non-reflexive clitics. This level of success is extremely unlikely to have occurred by chance, or through the use of any non-grammatical strategy (cf. SHC 1995). The

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a concern were it not for the children who produced large numbers of relevant examples, including FRCCs (Guglielmo and Diana for Italian, Philippe and Léa for French). All four of these children showed near-perfect performance.



results are precisely what we expect, however, if children's difficulties with A-movement result from moving past another argument.<sup>7,8,9</sup>

#### 4.0 Children's passives: the role of discourse features

We have proposed that the reason children under four normally fail on passives is that they lack smuggling. But what about the studies (O'Brien et al. 2006; Crain et al. 1987/2009; Pinker et al. 1987) finding that three-year-olds are already adultlike? Here we offer a new proposal: The studies where younger children succeeded on verbal passives are precisely those in which the experimental task introduced a discourse-related or quantificational feature, typically +Topic or +WH, on the derived subject. The presence of such a feature enables the child to raise an underlying object past the logical subject without incurring a minimality violation. Our general idea, which we term the 'Pure Minimality Hypothesis' (PMH), is that children obey RM but do not have smuggling (or any other mechanism that adults might use to dodge RM). Hence, they

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<sup>7</sup> Orfitelli (2012a,b) provides strong support for the same conclusion, but from a different source. In Subject-to-subject Raising (StSR), the English raising verb *seem* always has an experiencer argument, either implicit or overtly expressed with a lexical DP marked with dative *to*. Collins (2005b) has argued that either way, the English-speaker relies on smuggling to avoid an RM violation. In contrast, the raising predicates *be likely to* and *tend to* are semantically incompatible with an experiencer argument, and therefore do not call for smuggling. As expected under the UFH/AIH, *seem* gives young children problems, but Orfitelli shows that the problems vanish in StSR with *be likely to* or *tend to*. See also Hirsch, Orfitelli & Wexler (2007, 2008) and Hirsch (2011) for substantial evidence that children do poorly with *seem*. For a different perspective on StSR in children see Becker (2006), and also Froud, Tsakali & Wexler (2010) who found that English-speaking children (ages 3-6) were able to understand *seem* sentences when the experiencer was implicit but failed at raising past an overt experiencer.

<sup>8</sup> Other studies finding early mastery of unaccusativity (hence A-movement) in contexts where minimality is not at issue include Friedmann (2007), Friedmann & Costa (2011, 2012), Lorusso (2003), and Lorusso et al. (2005).

<sup>9</sup> English *get*-passives, we suspect, may be similar to the Romance FRCCs, in the sense of involving A-movement but containing no syntactic representation of the logical subject. If so, there is no risk of an RM violation, and our account predicts that *get*-passives will be well within the capabilities of a three-year-old. Consistent with this prediction, children younger than four make reasonably frequent use of *get*-passives.

will do well on A-movement structures precisely when there is no RM violation to be concerned about. Before discussing these studies we briefly review the version of RM we assume.

In current work on Relativized Minimality (RM; Rizzi 2001, 2004; Starke 2001; Grillo 2008), the core idea is that RM works in terms of *feature classes*:

(19) Relativized Minimality:

In ...X...Z...Y, a local relation cannot hold between X  
and Y if Z belongs to the *same structural type* as X.

In defining ‘same structural type’, Rizzi (2004) distinguishes among *Argumental* features {person, number, gender, case}, *Quantificational* features {WH, focus, ...}, and *Modificational* features {evaluative, epistemic, ...}, as well as *Topics*, which he treats as a category unto itself. Thus, in this framework, if the mover bears features from the Argumental class, for example, and the intervener bears no feature from that class, then RM is satisfied.

Examples are provided in (20).

- (20) a. ? What (+WH, +ARG) do you know how (+WH) John fixed \_\_\_?  
b. \* How (+WH) do you know what (+WH, +ARG) John fixed \_\_\_?

In (20a), *what* can move past *how* (modulo the subjacency violation, hence the ‘?’) because *what* bears features from the Argumental class (person, number, case), in addition to a +WH feature from the Quantificational class. The intervener *how* bears no feature from the Argumental class. In contrast, in (20b) *how* bears only the

Quantificational feature +WH, and this is insufficient to distinguish it from the intervener *what*. Hence, the sentence is a minimality violation, and is perceived as severely degraded.

This version of RM has a number of potential implications for the English verbal passive, in both adults and children. First, it suggests a possible alternative to the smuggling account of (adult) passives: Perhaps the logical object bears some *feature* that serves (for the adult) to distinguish it from the logical subject. And perhaps the child does not yet recognize this feature as being distinctive for purposes of RM. For example, perhaps two feature classes, along the lines of ‘Quantificational’ and ‘Topic’, are initially regarded by the child as constituting a single feature category, and become two distinct categories only at a later developmental stage.

Second, regardless of whether adults use smuggling or some other strategy, RM will be satisfied *automatically* (for both the adult and the child) if the moved argument bears a feature that both adults and children recognize as belonging to a class not present on the intervener. This idea (i.e., the ‘PMH’) is our working hypothesis for understanding children’s vastly better performance in the Crain et al., Pinker et al., and O’Brien et al. studies. Specifically, as suggested in Snyder & Hyams (2008), we find that in these studies a Quantificational feature of +Topic or +WH on the moved argument serves to distinguish it from the intervener. Let us briefly consider each study in turn.

#### 4.1 Crain, Thornton & Murasugi (2009): +WH Feature

In Crain et al. (2009), the feature that prevents an RM violation is +WH. These authors tested children's knowledge of passives using a question-elicitation format. They state:

“[W]e designed a simple experiment to elicit full verbal passives from preschool children. Thirty-five children participated in the experiment, which involved them in a game in which *one experimenter asked them to pose questions to another experimenter*. The child was asked to help teach one of the experimenters English, and to test her understanding of various ‘stories’ which were acted-out with toys. The methodological innovation in this study was to control the pragmatic context in such a way that a question with a full passive would constitute a felicitous response.”  
[Crain et al 2009: 126]

The following are examples of two protocols illustrating the basic elicitation technique:

(21) A. Exp.: OK, there is this big heavy bus, and it's coming along and it crashes into one of the cars. You ask Keiko which car.

Child: Which car gets crashen by the big bus?

B. Exp.: In this story, there are two soldiers and an alligator. And the soldiers are standing in the water and they can't see the alligator. And the alligator goes up and bites one of the soldiers. You ask Keiko which one.

Child: Which one is getting bited by the alligator?

The authors note that these simple contexts were often sufficient to evoke a response in the passive, but if not, they introduced a more complex context requiring a *by*-phrase.

This second type of protocol is illustrated in (22).

(22) Exp.: See, the Incredible Hulk is hitting one of the soldiers. Look over here. Darth Vader goes over and hits a soldier. So Darth Vader is also hitting one of the soldiers. You ask Keiko which one.

Child: Which soldier is getting hit by Darth Vader?

Crain et al. report that with these techniques, they were able to elicit full verbal passives from nearly every child tested, including those as young as 3;04.<sup>10</sup> The crucial point for UFH / AIH is that *every* single item of Crain et al.'s question-elicitation task required a +WH feature on the derived subject, and provided no Quantificational feature whatsoever on the logical subject. This means that in terms of the (Rizzi 2004) version of RM, there was never any risk of RM blocking the child's use of a passive.<sup>11</sup>

#### 4.2 Pinker, Lebeaux and Frost (1987) -- Topic Feature

Pinker et al. used an elicited production task based on a design by Turner & Rommetveit (1967), who had shown that even fairly young children are sensitive to information

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<sup>10</sup> Unlike the next two studies we will examine, Crain et al. do not discuss performance on nonactional verbs. Hence, a possible concern is that they were not using the most trustworthy diagnostic for mastery of the English passive. Yet, English-learning children below the age of 4;0 typically perform badly on all tests of the verbal passive, regardless of the verbs' actionality. The nine children below 4;0 in Crain et al.'s sample all performed as well as the older children in producing long passives. Another possible concern is the frequent use of *get* rather than *be* as the passive auxiliary, but the use of a *by*-phrase suggests that the children were producing true verbal passives. Moreover, of the nine *youngest* children (below 4;0), three produced at least one *be*-passive.

<sup>11</sup> Additional evidence that a +WH feature on the moved DP enables children to succeed at A-movement comes from a study by Hirsch & Wexler (2004), in which children showed much improved performance when tested on StSR with *seem* in interrogatives such as 'Who seems to Bill to be dancing?'

structure, at least to the extent that (like adults) they prefer for any ‘topical’ material (i.e. old information, such as a discourse topic) to be located in sentence-initial position. Hence, when the direct object happens to be the discourse topic, there is a strong bias to describe the event in the passive voice, so that the +Topic argument ends up in subject position.

In a series of experiments Pinker et al. taught children novel verbs in either the active or the passive voice, and then elicited production of the other voice. As they argue, the most persuasive evidence concerning children's mastery of verbal passives comes from production data, especially when the verb tested is a novel verb introduced by the experimenter (so that the verb's meaning and its input frequency in each voice are perfectly controlled). Moreover, the ability to change the voice correctly in *either* direction (active-to-passive OR passive-to-active) provides strong evidence for mastery of the adult syntax: a surface subject has to be related (abstractly and systematically) to an underlying object position.

Exploiting the information-structural preference noted above, Pinker et al. used the following protocol to elicit passives:

- (23) Exp.: Here's the elephant. Nothing's happening to the elephant. Now something is going to happen to the elephant. I want you to tell me what's happening.

The experimenter then acted out the meaning of the newly taught verb (e.g. *doke*, *pell*, *kale*) with the toys. Crucially, the toy that had been established as the discourse topic (in this case, the elephant) played the role of the patient or perceived stimulus, and hence

was very likely to be taken as the logical object in the child's sentence. The desire to get this +Topic argument into sentence-initial position created a strong motivation to use passive voice.

(24) Child: (target response) The elephant is being pelled by the bear.

The youngest subjects tested (in Pinker et al.'s Experiment 2) were 3-4.5 years old (mean 3;10). In one of the conditions in Experiment 2, children were taught a novel spatial verb in the passive voice, and the verb was then elicited using a prompt that favored the active voice (although it did not exclude the passive voice). Each child received only one such item during the experiment. In this condition even the youngest children converted the passive to the active voice 38% of the time, and a slightly older group of subjects, age 4;06 - 5;06 (mean 5;01), did so 62% of the time. Put differently, in the youngest group six out of 16 children successfully converted a novel non-actional verb from the passive to the active voice; in the older group, ten out of 16 children did so. As a comparison, the same elicitation technique (in the same children) used with a highly familiar action verb, *kick*, successfully elicited the active 25% of the time in the younger group (i.e., from four of 16 children), and 50% of the time in the older group (8 of 16 children).

For both groups, *the dominant 'error' was using the passive voice* (which was also a perfectly acceptable response). This pattern accounted for 44% of the responses from the younger group, and 50% of the responses from the older group. The results of a second novel-verb experiment (Pinker et al.'s Experiment 1), with a new group of 16 four-year-olds, were even stronger. Each child received two opportunities (rather than

just one) to produce the active form of a novel perceptual verb that had been taught in the passive. In addition, substantially more time was spent establishing a suitable discourse context for each item elicited (as described above). In this experiment the four-year-olds successfully converted a novel perceptual verb from the passive to the active voice 88% of the time.<sup>12</sup> In sum, every time Pinker et al. elicited a passive they were careful to set up a discourse context that made the logical object a clear discourse topic. Hence, in every case, the moved DP bore a +Topic feature, while the logical subject bore no such feature. In Rizzi's 2004 system, this means there was never any minimality violation for the child to overcome.

#### 4.3 O'Brien, Grolla & Lillo-Martin (2006) -- Topic Feature

We turn finally to O'Brien et al. (2006), who report that the three- and four-year-old children in their study succeeded on a comprehension test (TVJT) of English long passives, even with non-actional verbs, *provided* the experimental materials satisfied certain 'pragmatic felicity conditions' for having a *by*-phrase. Specifically, the authors note that a *by*-phrase is felicitous only if there is at least one alternative person who *could* have been the logical subject, but was not. Moreover, O'Brien et al. show that the

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<sup>12</sup> One way that children do differ from adults is that they are (presumably) more reluctant to passivize novel verbs that have been taught to them in the active voice. (We say *presumably* because remarkably few studies of the passive in children actually provide data from adult controls). In each of Pinker et al.'s novel-verb experiments, children converted novel verbs from the passive to the active voice more frequently than from active to passive. This pattern makes sense on learnability grounds. Languages vary considerably in which verb classes participate in an active/passive alternation: Gaelic is more liberal than English, Hebrew less so (Maratsos et al. 1985). Moreover, the frequency of passivized verbs – especially non-actional verbs – in child-directed English is exceedingly low (Gordon & Chafetz 1990, Brown 1973; Stromswold et al. 1985). For a verb taught in the active, the child still needs to decide whether its verb-class makes it compatible with the English passive, and the experiment itself does not provide this information. If the verb is taught in the passive, however, it will definitely be compatible with the active voice.



same children who succeeded when this felicity condition was satisfied, failed when it was not.

Following are two examples of O'Brien et al.'s protocols. In the first (Condition 1), the story does not satisfy the felicity condition for use of a *by*-phrase, but in the second (Condition 2) it does.

(25) (OGL 2006:447 = Condition 1: No felicity)

Exp.: In this story we have Santa and a naughty elf. The elf took a plate of goodies left for Santa and hid behind a wall so Santa would not see him.

Elf: Hee, hee. Santa won't see me behind this wall, and I can have these treats all for myself.

Exp.: What the elf forgot, though, is that Santa has super vision. That's how he can see who is naughty and who is nice. He can see through anything, even a wall. So, right away, Santa saw the elf.

Santa: Aha! I see you elf. I see you!!

Exp.: Gobu, can you tell me something about that story?

Gobu: Well, let's see. In that story, the elf was seen by Santa

(26) (OGL 2006:447 = Condition 2: Felicity)

Exp.: Oscar is very grouchy. He doesn't like anybody. I wonder if someone likes him, though? Here's a Fancy Lady and a parrot. I wonder if the Fancy Lady likes Oscar?

Fancy Lady: Ew! Oscar stinks. I don't like him because he lives in a  
garbage can.

Exp.: Well, I wonder if the parrot likes him?

Parrot: Oh, yes, I like you Oscar. I don't mind that [you live] in a  
garbage can. I like you, Oscar.

Exp.: Gobu, can you tell me something about that story?

Gobu: Well, let's see. Oscar was liked by the parrot.

Children performed at chance in Condition 1, but significantly above chance in  
Condition 2 (even when the verb was non-actional, as in (26)).

O'Brien et al. (2006) interpret this finding as support for their view that children  
(from age 3 up) have adultlike comprehension of English long passives, provided the  
experimental materials satisfy the pragmatic felicity condition on use of a *by*-phrase. An  
alternative explanation, however, is that pragmatic felicity (in O'Brien et al.'s materials)  
corresponds almost perfectly to the presence of a +Topic feature on the derived subject.  
This feature would suffice to prevent an RM violation.

O'Brien et al. kindly shared their experimental materials with us. In examining  
their stories, we operationalized 'discourse topic' as an element that is mentioned in all  
the possible answers to the story's 'Question Under Discussion' (QUD; cf. Roberts  
2011; Gualmini et al. 2008). For example in (26), we take the QUD to be 'Who likes  
Oscar?', and the possible answers to have the form '\_\_\_likes Oscar', where the  
underscore is replaced by a contextually relevant individual or group of individuals.

Every possible answer mentions Oscar, so by our definition Oscar is a discourse topic and the DP *Oscar* in Gobu's statement 'Oscar was liked by the parrot' will bear the feature +Topic (while the logical subject, *the parrot*, will not). Hence, no RM violation is expected.

In contrast, in (25) we take the QUD to be 'Will Santa see the elf?', and the possible answers to be {'Santa will see the elf', 'Santa will not see the elf'}. By our working definition, Santa and the elf are equally topical, so (if anything) we expect there to be a +Topic feature on both DPs, *Santa* and *the elf*. Hence, in Gobu's statement 'The elf was seen by Santa', the derived subject and the logical subject have features from exactly the same two categories (Argumental and Topic). Straightforward movement of the derived subject across the logical subject creates an RM violation, and we expect children's performance on the TVJT to be poor (as a result of relying on either a non-grammatical strategy or random guessing).

Our examination of O'Brien et al.'s materials revealed that *every* story classified by the authors as making a *by*-phrase felicitous was also a story where the derived subject (and not the logical subject) bore the feature +Topic.<sup>13</sup> Every story classified by

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<sup>13</sup> O'Brien et al.'s Experiment I additionally tested children (N=11, 4;0-4;10, mean=4;4) on short passives. The short-passive stories did not motivate a +Topic feature on the derived subject, but children reportedly did well on both actional and non-actional items. Yet, Experiment I suffered from certain problems (as the authors acknowledge): Children in fact performed quite poorly with one of the non-actional verbs tested (*hear*), and the authors chose to exclude all items with that verb from analysis. There was only one remaining non-actional verb (*see*), and the stories for *see* used it in an actional sense (*discover* or *find*, as in the game of hide-and-seek). Given that four-year-olds normally pass tests of the English passive that are based entirely on actional verbs (hence the view in the literature that one needs evidence from non-actional verbs to get an accurate picture of four-year-olds' mastery), we have greater faith in the results from O'Brien et al.'s Experiment II, which tested younger children (three-year-olds), employed (and counted data from) a second non-actional verb (*like*, used non-actionally), and contrasted children's performance with and without 'felicity' (hence, with and without +Topic). Unfortunately, Experiment II did not test short passives.

the authors as making a *by*-phrase *infelicitous* was also a story where the derived subject and the logical subject were equally topical. Therefore, our account based on RM, as developed in (Rizzi 2004), can account (in very fine detail) for the findings of O'Brien et al., just as it can for the findings of the previous two studies discussed.<sup>14,15</sup>

What about all the studies of English passives where three-year-olds' performance was poor? Our approach leads us to expect that in most (if not all) cases, the experimental materials did not ensure that the derived subject was distinguished from the logical subject by a relevant feature (+Topic, +WH, +Focus, or any other feature that would have prevented an RM violation in Rizzi's 2004 system). What makes this plausible, in our view, is that extremely few of the experiments reported in the

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<sup>14</sup> Such methodological effects are not limited to English. For example Volpato and colleagues found that Italian-speaking children (under four) can produce and comprehend the *essere* ('be') passive – cf. English *be* passive – and the *venire* ('come') passive, which they argue is unambiguously eventive (hence verbal), both with and without *by*-phrases. Comprehension reached 82% correct in 3-year olds, with no statistical difference between long and short passives (Volpato et al. 2013). In elicited production the children provided passive responses 14% of the time (compared to adults' 82%) (Volpato et al. 2012). Though not a preferred response, children could form passives. Elicitation went as follows:

“The experimenter's question asked what was happening to the patient in one of the two pictures. In such a context, in which the patient was the discourse topic, children were forced to start the sentence with it, and a passive sentence was therefore expected” (Volpato et al.2012:377).

For the comprehension study, “appropriate discourse conditions” were met, though the authors do not give further details. In both studies the scenarios included 3 characters, to make a *by*-phrase felicitous (cf. O'Brien et al. 2006). It appears these studies, like the English ones described in the text, obtained vastly improved performance by manipulating discourse features of the experimental materials. Starkly different results are reported by Gavarró & Parramon (2011), who used picture selection to test three-, four- and five-year-olds on short/long periphrastic passives in Catalan. Even at five, children failed to understand long passives of actional verbs. The use of picture selection may have been a contributing factor, but by five we would expect children to control actional passives well enough to succeed even on a task with no discourse context. Another possibility is that the outcome reflects input frequency, to the extent that the reflexive-clitic construction may be replacing the periphrastic passive in spoken Catalan, as it has in spoken Spanish.

<sup>15</sup> Manetti (2012) finds that Italian-speaking children (ages of 3;5-4;6) can produce passives under experimental priming (no discourse context provided). These children are on the cusp of the age at which we assume smuggling matures and hence these results are not inconsistent with our hypothesis. This said, the results of the priming study are somewhat suspect for two reasons. First, the adult controls did not show a priming effect, but rather produced actives over 88% of the time in response to passive primes (see also Manetti & Belletti 2013). Second, many of the ‘passive’ responses had passive morphology but with the argument arrangement of an active sentence. These findings suggest that the children were attempting some sort of pattern matching with the primes, rather than producing true passives.

literature provided a separate discourse context for each experimental item. (The three studies we just reviewed were exceptional in this regard.)

In the existing literature, the single most widely used method to study passives is the picture selection task, where the child sees two pictures side by side, hears a sentence, chooses a picture, and moves on to the next item. It seems highly unlikely that an experimenter would have (accidentally) established any discourse-related features, like Topic or Focus for example, within a ‘discourse’ of one declarative sentence.

On the other hand, as pointed out to us by a reviewer, many languages (including English) treat the sentential-subject position itself as a preferred location for [+Topic] DPs. Why then wouldn’t every passive sentence in English automatically have a [+Topic] feature on the derived subject? Our answer is that in English, unlike many Bantu languages for example, the subject position is not *necessarily* [+Topic], and therefore a DP cannot possibly gain a Topic feature *simply* by being located in subject position. One good indication that English subjects are not automatically [+Topic] is that English allows subject questions. Assuming that a question word is used to request, not

provide, information, it should be unable to denote any specific answer to the question, and hence unable to bear a Topic feature.<sup>16,17</sup>

## 5.0 Passives of non-actional verbs

Up to this point we have focused on the change around age four, when UFH fades out and smuggling becomes possible. There remains the change around age six, when children begin to succeed at passives of non-actional verbs, including psych verbs. On this topic, some very interesting proposals can be found in Grillo (2008), Chapter 5.

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<sup>16</sup> Demuth (1990) reports that, unlike English, the Bantu language Sesotho requires every subject to be +Topic. Hence, a subject *wh*-question has to be paraphrased, and often a passive is used. This greatly increases the frequency of passives in the child-directed speech of adults. Based on longitudinal spontaneous-speech samples from four Sesotho-speaking children (spanning ages 2;01- 4;01), Demuth found passives as early as age two. Crawford (2004) has questioned whether the child utterances were necessarily true passives, but if we accept the evidence as Demuth interprets it, an explanation for the Sesotho/English difference is readily available under the PMH: The +Topic feature on the derived subject will allow it to cross the logical subject without incurring any RM violation, as long as the logical subject is non-topical. Hence, Sesotho passives should require smuggling far less often than English passives, and be accessible to children under four. See also Demuth et al. (2010), who found successful comprehension of passives in Sesotho-speaking three year olds; but see also Crawford (2012), who found poor comprehension in somewhat older Sesotho-speaking children.

The PMH may also explain the early production of passive in Zulu, another ‘topic-oriented’ Bantu language (Suzman 1985).

<sup>17</sup> A reviewer has questioned whether our approach to the Sesotho findings (previous note) might ‘overgenerate’, and lead us to expect equally early success on passives in every language where the subject position is associated with Topics. In particular, the reviewer notes that subject position in French is more or less incompatible with non-specific subjects, as in (i.a), and that a circumlocution like (i.b) is used instead:

- (i) a. ?? Un homme est venu  
      ‘A man came’
- b. Il y a un homme qui est venu  
      ‘There’s a man who came’
- c. Qui veut le faire ?  
      ‘Who wants to do it?’

Yet, if we apply the subject-question test, French (unlike Sesotho) allows these questions readily (i.c). Hence, we assume the marginality of (i.a) must have some other explanation than obligatory topichood of subject position.

Grillo adopts the version of smuggling in Gehrke and Grillo (2008), based on Travis's (2000) theory of event structure in which a typical actional predicate has a VP<sub>1</sub>, comparable to vP in other theories, that expresses a causing sub-event and introduces an external argument. V<sub>1</sub> in turn selects a VP<sub>2</sub> that expresses a consequent sub-event (or sub-eventuality, if stative), and introduces an internal (Theme) argument. In a passive, VP<sub>2</sub> serves as the 'container' in which the logical object is smuggled past the logical subject.<sup>18</sup>

Crucially, a non-actional verb is stative, and a state has no internal event-structure, hence (perhaps) no VP-shell structure. For Grillo, a non-actional verb can still be passivized through semantic coercion, where a type-shifting rule gives it a related, eventive meaning. Specifically, the basic meaning can sometimes be reconceptualized as the consequent state of an event. For example, the stative 'John owns that house' can be coerced into 'John has gained ownership of that house.' Likewise, 'Mary fears bankruptcy' yields 'Mary has come to fear bankruptcy'. In contrast, 'The solution escapes John' resists construal as 'The solution has come to escape John'.

For adults, the impossibility of semantic coercion seems to entail the impossibility of passivization: (?) Bankruptcy is feared by Mary; \*John is escaped by the solution. Grillo proposes that semantic coercion first becomes possible around age six. From this point on, the child can both coerce a stative psych-verb into an eventive verb, and then smuggle the logical object past the logical subject.<sup>19</sup>

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<sup>18</sup> In Gehrke and Grillo's system, VP<sub>2</sub> undergoes feature-driven movement to Spec VoiceP, where Voice then situates the event time of the clause within VP<sub>2</sub>'s subportion of the event.

<sup>19</sup> As Grillo (2008) notes, even when coercion becomes available to the child, some predicates may be more difficult to coerce than others, and this might explain why children often fail on *hear* even when they succeed on *see* (cf. O'Brien et al. 2006:444 fn.1, and references therein).

We find Grillo's proposal attractive, but we need to modify it slightly to account for additional data. In O'Brien et al.'s study, as long as there was a +Topic feature on the derived subject, even three-year-olds succeeded at non-actionals like 'Oscar is liked by the parrot'. To generate a sentence with *liked* before *by the parrot*, the smuggling accounts need a 'shell' (i.e., a portion of the VP) to raise into Spec VoiceP. If the three-year-old can build a structure that generates the right word order, she must already have a shell available.

We therefore suggest that the effect of coercion (starting around age six) is not to add an extra shell, but rather to make an existing, 'stative' shell 'eventive'. Moreover, we propose that even when UFH is no longer operative, the Freezing Principle still applies selectively, blocking movement out of a moved constituent. Our idea is that a 'stative' shell has to obey the Freezing Principle, but an 'eventive' one does not.

If the child tries to move the logical object from its base position up to Spec TP prior to movement of the VP shell, she will need to overcome the RM intervention of the logical subject. A feature like [+Topic] or [+WH] will make this possible. Around age four the child will get a second option: smuggle the logical object past the subject in a VP shell, and then raise it from the shell into Spec TP. This will work, but only for actionals. At about age six, the child gains the ability to coerce a non-actional so as to have an eventive VP shell, and only then will smuggling be possible in the passive of a non-actional. Note, however, that even for the three-year-old there will always be a shell available to carry the verb up to Spec VoiceP, as required by passive Voice, yielding correct word order.



Note too that coercion will be needed not only in certain passives, but also in raising past an experiencer. As detailed in Collins (2005b), the English raising verb *seem* always has an overt or implicit experiencer argument, and moving the derived subject across it directly would violate RM. Therefore smuggling is needed. Given that *seem* is clearly a non-actional verb, using one of its VP shells for smuggling will be possible, according to our proposal, but only after semantic coercion.

These ideas are admittedly speculative, but they receive support from a striking finding of Orfitelli (2012b): In a study that tested children on both non-actional passives (without any special discourse features) and RPE (again, without any special features), she found a perfect correspondence, child by child, between success or failure on non-actional passives, and success/failure on RPE. This is exactly what our analysis leads us to expect. Once coercion becomes available to a child its effects are found across the board – in passives and RPE alike.

## **6.0 Summary and conclusion**

We have proposed a ‘Pure Minimality’ theory of children’s passives. Children under four lack smuggling, and obey RM strictly. One consequence is that children of this age should do well on A-movement without an intervener. Our findings from two-year-olds’ spontaneous production of FRCCs in Italian and French show this is correct.

A second consequence, based on Rizzi (2004), is that children under four should do far better on verbal passives when the derived subject bears a feature from a class (i.e. Argumental, Quantificational, etc.) that is not represented on the logical subject. We

have shown that three well-known studies finding adultlike performance in three-year-olds all used materials triggering a ‘distinctive’ feature (+WH or +Topic) on the derived subject. Naturally there remain many possibilities for follow-up studies to test all the further predictions one can derive.

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