

Deconstructing the Subject Condition: Cumulative constraint violation and tolerance thresholds

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Abstract

Chomsky (1973) attributes the island status of nominal subjects to the *Subject Condition*, a constraint specific to subjects. English and Spanish are interesting languages for the comparative study of extraction from subjects, since subjects in English are preverbal, whereas in Spanish they can be either preverbal or postverbal. In this paper we argue that the islandhood of subject DPs in both English and Spanish is not categorical. The degradation associated with extraction from subjects must be attributed to the effect of a range of more general constraints which are not specific to subjects. We argue that the interaction of these constraints has a cumulative effect whereby the more constraints that are violated, the higher the degree of degradation that results. We also argue that some speakers have a greater tolerance for constraint violations than others (so accounting for widespread inter-speaker judgment variability), and that D-linking can serve to attenuate constraint violations.

¹ We are grateful to Bob Borsley, Will Harwood, Philip Hofmeister and Louisa Sadler for helpful comments on an earlier version of this paper. Authors' names are listed in alphabetical order. Glosses provided for examples from languages other than English are minimal, and do not include information (e.g. about the tense of a verb) that can be directly inferred from the translation. Examples cited from other works are adapted in inconsequential typographical ways to fit in with the style of presentation adopted here. Grammaticality judgments for sentences cited from other works are those given by the linguists who cite them. Our approach is essentially syntactic in nature, and our data come from introspective acceptability judgments: for a defense of the use of the use of introspective (rather than usage-based) data, see Newmeyer (2003, 2005, 2006a, 2006b). Nonetheless, we acknowledge that non-syntactic factors undoubtedly have an important role to play, most notably pragmatic factors (Erteschik-Shir 1973, 2006, 2007; Erteschik-Shir and Lappin 1979; Kuno 1987; Van Valin 1986, 1995; Goldberg 2006), and processing factors (Kluender 1998, 2004, 2005; Kluender and Kutas 1993; Hofmeister 2008; Sag, Hofmeister and Snider 2007; et al. 2007; Hofmeister and Sag 2010; Chaves 2013). We adopt an approach to syntax which presupposes movement operations, but is theory-neutral in the sense that it is not tied to a specific (e.g. Minimalist or Cartographic) implementation. Liliane Haegeman's research is funded by FWO: 2009-Odysseus-Haegeman-G091409.

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1 On the Subject Condition

The ungrammaticality of extraction from subject nominals like those bracketed in (1) has been taken as evidence that in English subjects are islands, i.e. constituents which categorically disallow extraction².

- (1)(a) **Who* did [stories about] terrify John? (Chomsky 1977: 106)
 (b) **Who* did [pictures of] lay on the table? (Postal 1974: 189)
 (c) **Who* was [a picture of] lying there? (Kayne 1981: 114)
 (d) **What* did [the owner of] sneeze? (Chaves 2013: 15)

To capture the island status of subjects Chomsky (1973) postulated the *Subject Condition* which categorically bars extraction out of a subject phrase:

² We do not deal with extraction out of clausal subjects, as in:

- (i) *The teacher *who* [that the principal would fire] was expected by the reporters is a crusty old fizzlebotch
 (Ross 1986: 148, 4.251b)

This is because it has been argued (e.g. by Emonds 1976, Koster 1978, Williams 1980, Stowell 1981, Safir 1986, Bresnan 1994, Postal 1998 and Alrenga 2005) that clausal subjects like that bracketed in (i) do not occupy the canonical subject position in spec-TP, but rather occupy a *topic* position on the edge of the clause periphery. In addition, it is unclear whether clausal subjects are CPs, or (as proposed by Takahashi 2009) DPs.

(2) **Subject Condition**

No rule can involve X , Y in the structure $\dots X \dots [\alpha \dots Y \dots] \dots$ where α is a subject phrase properly containing the minimal major category containing Y , and Y is subjacent to X .

Chomsky's (1973) Subject Condition was stated as a primitive constraint. With the development of the theoretical framework, the condition was subsequently reinterpreted in terms of more general constraints on extraction which were not subject-specific but which blocked extraction out of subjects. For example, Cinque (1977) argued that extraction is permitted only out of complements, i.e. selected constituents, and this restriction had the effect of barring extraction out of subjects, which are not selected. Likewise, Huang's (1982: 505) Condition on Extraction Domains/CED, which permits extraction only from a properly governed domain, had the effect of barring extraction out of the subject in the canonical subject position, spec-TP, since this is a position which is not properly governed. In much the same way, the theory of *Barriers* developed in Chomsky (1986) barred extraction out of a subject in spec-TP, because extraction would involve illicitly crossing two barriers (corresponding to the subject DP node and the TP node), while, thanks to the possibility of VP adjunction, no such violation arose for object extraction. Cinque (1990: 1) proposed that subjects in spec-TP are *strong* islands, i.e. structures out of which no constituent of any kind can be extracted. In more recent proposals (Uriagereka 1999), the island status of the subject in spec-TP has been related to conditions on spellout and linearization: the subject in spec-TP is a non-selected domain, whose interior is inaccessible from the outside (see Agüero-Bautista 2012: 226, Sheehan 2013 for recent summary and discussion). Other examples could be added but the net effect is that the status of the subject in spec-TP as an island for extraction is made to follow from some more general principle. The accounts cited all predict that all extraction from spec-TP is categorically barred³.

Since earlier work, the status of the concept 'Subject' itself has also changed: while the subject was originally defined in terms of a specific position in the representation of the sentence, spec-IP/spec-TP, it has since been 'deconstructed' in terms of multiple subject positions (see McCloskey 1997 for a survey and motivation). Thus it became possible to account for the island status of the subject in spec-TP, a non-selected position, by invoking some general principle on extraction while at the same time allowing extraction from subjects that occupied other (selected) positions.

However, whether phrased as a subject-specific condition or in more general terms, the constraints formulated to ban extraction from subjects run into problems when confronted with the empirical data: even when the subject occupies spec-TP, extraction leads to different judgments, with some cases, such as (1), being strongly degraded and others only mildly deviant. Similar variation also arises with subjects occupying other positions, a point that will become clearer in section 2 when we turn to Spanish data. In addition there is also speaker variation, with one speaker finding examples acceptable which for another speaker are degraded. Based on evidence from English (section 1) and Spanish (section 2), we will address these issues. With respect to extraction from subjects it will turn out that DPs in the canonical subject position in fact pattern with *weak* islands, i.e. structures out of which some but not all types of constituent can be extracted. Thus we must reject any principle that implies a categorical ban on extraction from subjects, however formulated. We take subject islands to be non-categorical in the sense of Bianchi and Chesi (2012), and thus to be weak islands (See Bianchi and Chesi 2012 for a distinction between clear-cut rules and borderline rules; see also Bianchi and Chesi 2006 for the difference between strong and weak islands). With respect to the gradience and the variability of judgments, properties of both subject and extractee will be shown to play a role in determining whether extraction is possible. In the subsections below, we explore some of the relevant factors.

Our paper also illustrates how the development of the theoretical framework leads to a more refined approach to the empirical data, allowing for coarse judgments to be replaced by much more fine-grained grading of sentences.

³ This is also true under the pragmatic account of subject islandhood in Erteschik-Shir (1973, 2006, 2007), if subjects are topics, and extraction never targets topics (though see Frascarelli and Jiménez-Fernández 2012, for the possibility of extraction of focused constituents from what they identify as familiar topics in Spanish and Italian).

Our work is organised as follows: section 1 is a critical review of the different factors influencing the islandhood of DP subjects in English, taking into account both the external and the internal syntax of subjects; section 2 compares the English data with data from Spanish, a language which is more flexible in the possible positions occupied by subjects. We propose that constraints on extraction show a cumulative effect which explains the variation in grammaticality judgments among speakers. In section 3 we argue that the different island-inducing factors identified in the data should be viewed as conditions (Opacity condition, Thematic Extraction condition, Argument condition, Intervention condition and Specificity condition), based on the position and properties of both the extraction site and the extractee. Violation of these conditions can be alleviated by D-linking of the extracted material. In addition, we illustrate in detail the different scenarios that emerge from the cumulative effect of constraint violations: varying grammaticality judgments among speakers can be accounted for by proposing that the more constraints a sentence violates the less acceptable it is. Finally, in section 4 we summarize our main findings.

1.1 The position of the subject

In the literature, the island status of subjects has often been related to what we could call their ‘external’ syntax, i.e. the position of the subject within the clause. As already mentioned, it was originally assumed that the subject nominal (the ‘external’ argument, Williams 1994), was directly inserted (or ‘merged’, to use Minimalist terminology) in the canonical subject position, the specifier of IP or TP. This position is radically different from that of the complements associated with a verb, which are merged VP internally.

According to the VP-Internal Subject Hypothesis, developed in the mid-1980s (by Kitagawa 1986, Speas 1986, Contreras 1987, Zagana 1987, Kuroda 1988, Sportiche 1988 and others), subjects are first merged VP internally, as the highest argument of the verb. If subjects originate within the verb phrase and move to the canonical subject position, spec-TP, the ban on extraction out of a subject in spec-TP need no longer be stated as a primitive: extraction out of a subject in spec-TP is predicted to be barred by the *Freezing Principle* (Wexler and Culicover 1980: 119; see Uriagereka 1999 and Müller 2010: 56, 30, for more recent formulations). For present purposes, this can be summarized as in (3):⁴

(3) Freezing Principle

Subconstituents of a moved constituent are frozen in place and cannot be extracted.

If subjects originate within vP and move to spec-TP, it follows from (3) that no extraction will be possible out of a subject in spec-TP. Thus, the *freezing* account derives the Subject Condition.

However, any account in terms of *freezing* faces a potential problem in relation to the observation due to Ross (1986: 148), according to which passive subjects permit extraction in sentences such as (4), where the PP *of which cars* is extracted from the bracketed nominal in subject position without degradation⁵:

(4) *Of which cars* were [the hoods] damaged by the explosion?

⁴ The Freezing Principle may be derived from independent principles, as discussed, for instance, in Uriagereka (1999) in relation to linearization and spellout and in Rizzi (2012) in relation to labeling. Hofmeister (2012) argues that freezing effects arise from processing problems. Although he deals with extraction out of *extraposed* (rather than preposed) constituents, extraction out of preposed constituents would also be expected to cause processing problems, in that it creates nested dependencies in which a filler is associated with a gap inside another filler associated with another gap.

⁵ Philip Hofmeister (pc) tells us that examples involving Preposition Pied-Piping/PPP (which are acceptable to Andrew Radford) are relatively unacceptable for him, and conjectures that this is a matter of experience, in that speakers who find PPP relatively unacceptable have not been exposed to as many PPP tokens as speakers who accept PPP more readily. Bob Borsley (pc) observes that PPP is more acceptable for him in relative than interrogative clauses; see also Sag (2010).

In a similar vein, Chomsky (2008) observes that wh-extraction is permitted out of passive/unaccusative subjects like that bracketed in (5a), but is barred out of transitive subjects like that bracketed in (5b):

- (5)(a) *Of which car* was [the driver] awarded a prize?
 (b) **Of which car* did [the driver] cause a scandal?

If the italicized wh-phrase were extracted out of the subject in its superficial position in spec-TP, both sentences would be expected to induce a violation of the Freezing Principle (3) and hence to be ungrammatical. (See Hiramatsu 1999, 2000 and Polinsky et al. 2012 for experimental evidence that unaccusative subjects are easier to extract from than unergative and transitive subjects.)

On the basis of contrasts such as that in (5), Chomsky (2008) proposes that wh-extraction can take place successfully from the *base* position of the subject. If transitive subjects originate within vP and passive/unaccusative subjects originate within VP, (5a,b) will have underlying representations along the lines of (6a,b):

- (6)(a) [_{CP} [_C \emptyset] [_{TP} [_T was] [_{vP} [_v \emptyset] [_{VP} the driver of which car [_V awarded] a prize]]]]
 (b) [_{CP} [_C \emptyset] [_{TP} [_T did] [_{vP} the driver of which car [_v \emptyset] [_{VP} [_V cause] a scandal]]]]

For Chomsky, extraction is regulated by a locality condition which can be given the following informal characterisation:

(7) **Edge Condition**

No extraction is possible out of a constituent on the edge of a phase.

Chomsky (2001) takes phases to include CPs, vPs with an external argument, and (referential) DPs⁶. If vPs without an external argument like that in (6a) are not phases, nothing will prevent *of which car* from being extracted out of the underlined subject in (6a) and moving to spec-CP. But if vPs with an external argument are phases, extracting *of which car* out of the underlined subject and moving it to spec-CP in (6b) will be ruled out by Edge Condition (7) because the underlined subject is the specifier of a vP phase. Extraction out of the subject in its superficial position in spec-TP will invariably be barred by the Freezing Principle (3).

The Freezing Principle runs into further potential problems in relation to examples such as the following (8a,c from Chomsky 2008, ex. 19, and treated as fully grammatical by him):

- (8)(a) *Of which car* is [the driver] likely to cause a scandal?
 (b) *Of which car* was [the driver] reported to have caused a scandal?
 (c) *Of which car* did they believe [the driver] to have caused a scandal?

On Chomsky's assumptions, the DP *the driver of which car* originates as the specifier/subject of the embedded (phasal) vP, and then moves through an intermediate position on the edge of the TP headed by infinitival *to* before reaching its superficial position in the matrix clause in spec-TP as the subject of *is/was* in (8a/b), and in spec-VP as the object of *believe* in (8c)⁷. In its base position, extraction out of the bracketed DP is barred by the Edge Condition, and in its intermediate and superficial positions it is blocked by the Freezing Condition. So how come the relevant sentences are grammatical? For Chomsky the answer to this problem lies in what he refers to as a *generalized inactivity condition* (in effect, a more restrictive version of the Freezing Principle), whereby a constituent becomes inactive for further syntactic operations (and hence disallows extraction) if it occupies a checking position as

⁶ Some linguists (e.g. Abels 2003, Collins 2007, Heck 2009, Drummond et al. 2010) also take PPs to be potential phases. Legate (2003) argues that passive and unaccusative vPs are also phases. Note that there is partial overlap between the Edge Condition and the Left Branch Condition of Ross (1967, 1986).

⁷ We assume that in such Exceptional Case Marking (ECM) patterns, the subject of the infinitive raises into the matrix domain (e.g. to spec-VP), and the ECM verb (*believe*) raises to a position above it (e.g. the head *v* of vP).

the head of an A-chain or A-bar chain in which all its uninterpretable features have been valued and deleted. We can characterise this constraint informally as follows:

(9) **Inactivity Condition**

A constituent which is the head of a movement chain and its subconstituents are inactive and hence inaccessible to a higher probe.

The constraint (9) prevents extraction of the italicised wh-PP in (8) from the DP *the driver of which car* in both its superficial positions, spec-TP in (8a,b) and spec-vP in (8c), because (9) renders it invisible in these positions. In addition, the Edge Condition (7) bars extraction out of the DP in its base position as the specifier of a transitive (phasal) vP. However, if we were to replace the Freezing Principle by the Inactivity Condition, nothing would prevent extraction out of the subject in its intermediate position (at the point where it is the specifier of infinitival *to*) in (8a-c). Consequently, (8a-c) are expected to be grammatical.

However, the Inactivity Condition (9) itself faces an empirical challenge from data such as the following:

- (10)(a) It's a policy *of which* [absolutely no part] would any self-respecting politician be prepared to endorse.
- (b) It's an ancient civilisation *of which* it would seem that [hardly any traces] have archaeologists been able to uncover so far.
- (c) ?These are types of film *which* I don't think that [producers of] parents would feel should target children.
- (d) The 'Satanic Verses' (*of which* I am not sure [precisely how many copies] the publishers sold) caused uproar throughout much of the world when it first appeared.

In (10a), *absolutely no part of which* is a focused argument which moves to the specifier position in a left-peripheral Focus Phrase projection (Rizzi 1997, Radford 2009, Haegeman 2012) and thus is the head of an A-bar movement chain; nonetheless, it allows *of which* to be extracted, in contravention of the Inactivity Condition (9). Likewise, in (10b) the focused argument *hardly any traces of which* moves to a spec-FocP position at the head of an A-bar movement chain, but still allows *of which* to be extracted, in violation of (9). In (10c), the topicalised argument *producers of which* moves to the edge of a Topic Phrase projection at the head of an A-bar movement chain (cf. Rizzi 1997), and yet still allows extraction of *which*, in violation of (9)⁸. Similarly, in (10d), the interrogative phrase *how many copies of which* moves to the edge of the embedded interrogative CP; it heads an A-bar movement chain, and yet it allows extraction of *of which*, once more in violation of (9)⁹. Taken together, the examples in (10) suggest that extraction is indeed possible (in appropriate contexts) out of a constituent which is at the head of an A-bar movement chain.

The problem posed for the Inactivity Condition by sentences such as (10) can be overcome by limiting the condition to barring extraction out of a constituent at the head of an A-chain. This we can do if we replace the Inactivity Condition (9) by the more restricted condition in (11).

(11) **Opacity Condition**

A constituent at the head of a non-trivial A-chain is opaque for extraction

In terms of (11), a *trivial* chain is one which has only one link and hence does not involve movement, and conversely a non-trivial chain is one which has more than one link and so involves movement (see Boeckx 2008 and Lohndahl 2011 for the related idea that a constituent is frozen in place if it moves to a case-checking position). A condition such as (11) would bar extraction out of a subject at the head of an A-chain in spec-TP, while at the same time permitting extraction out of constituents

⁸ Extraction of *which* on its own in (10c) leads to slightly greater degradation than extraction of the PP *of which* in (10a,b,d), in consequence of a preposition stranding constraint discussed in section 1.3.1: see the discussion of (23) in the main text.

⁹ See also the discussion of text examples (12) below.

(like those bracketed in 10a-d) at the head of an A-bar chain. There is conceptual rationale for drawing a distinction between these two types of movement chain, since A-chains involve formal checking of A-features (such as person, number and case), whereas A-bar chains involve criterial checking in the sense that they involve movement of a constituent into a criterial (e.g. topic or focus) position in the clause periphery¹⁰.

In addition to the difficulties raised already, a further problem for Chomsky's account is posed by sentences like (10d), since this type of sentence violates the Edge Condition (7), in that extraction has taken place from a constituent on the edge of CP, a phase. That such extractions are licit has been noted in the literature. For example, Chomsky (1986: 26, 49b) provides Spanish (12a) attributed to Esther Torrego, and Rizzi (2006: 114) gives Italian (12b):

- (12)(a) *¿De qué autora no sabes [qué traducciones] han ganado premios internacionales?*
 'By which author don't you know what translations have won international awards?'
 (b) *Di quale autore ti domandi [quanti libri] siano stati censurati?*
 'By which author do you wonder how many books have been censored?'

Here, the italicised wh-phrase is extracted from within a bracketed wh-phrase, itself located on the edge of a CP phase, in violation of the Edge Condition. (For further discussion of similar structures, see Rochemont and Culicover 1990, Lasnik and Saito 1992, Maeda 2010.)

Now consider how the following contrast can be handled:

- (13)(a) *Of which aspiring actress* did they believe [compromising photos] to have been sold to a national newspaper?
 (b) *?Of which aspiring actress* did they intend **for** [compromising photos] to be sold to a national newspaper?
 (c) *?*Of which aspiring actress* did he wonder **if** [compromising photos] would be sold to a national newspaper?

In the ECM structure (13a), the subject *compromising photos of which aspiring actress* has moved to a checking position in the matrix domain (spec-VP), and hence extraction is barred from the superficial position of the subject by the Opacity Condition (11), but extraction remains possible from an intermediate position of the subject such as the spec-TP of the infinitival clause, which is not the head of the A-chain; consequently, (13a) is expected to be grammatical. (13b) violates the Opacity Condition because wh-extraction takes place from a subject [*compromising photos of which aspiring actress*] that has moved to a checking position (spec-TP) at the head of an A-chain. Similarly in (13c), the subject *compromising photos of which aspiring actress* has moved to a checking position in spec-TP at the head of an A-chain, so extraction again violates the Opacity Condition. However observe that while both violate the Opacity Condition, (13b) and (13c) differ in status, (13c) being more degraded than (13b).

With respect to the latter point, observe that in (13c) extraction takes place from within an embedded *yes-no* question. If we follow Radford (1997: 295-7) and Haegeman (2012) in supposing that the complementiser *if* is associated with a null *yes-no* question operator in spec-CP, the presence of this operator will interfere with successive-cyclic wh-movement, forcing the wh-PP *of which aspiring actress* in (13c) to undergo long movement. Such movement will violate locality conditions on movement such as the Subjacency Condition of Chomsky (1973), or the Phase Impenetrability Condition of Chomsky (2000 and subseq.) and should lead to ungrammaticality. As noted below, accounts of intervention effects that rely on Relativized Minimality (Rizzi 1990) do not make the same radical prediction: in such accounts the intervention of the operator is selective: it only blocks

¹⁰ A potential complication arises, however, if (as proposed by Rizzi and Shlonsky 2007) preverbal subjects move to a criterial position as the specifier of a peripheral Subject Phrase projection (and not to spec-TP). However, this assumption can be reconciled with our analysis if we suppose that Spec-SubjP is an A-position (a view which is arguably compatible with Rizzi and Shlonsky's treatment of it as a hybrid position). Jurka et al. (2011) reduce the Opacity Condition to a freezing constraint and a subject constraint. As we will show, the picture is not that simple.

movement of constituents which share the feature composition of the operator (see section 1.3.3) and thus will not uniformly block all extractions.

The differing degrees of degradation found in (13a-c) lead us to a further point which we will expand on in more detail in sections 2 and 3. Following the proposal elaborated above, (13a) has a derivation which violates no constraint, and so is fully grammatical. (13b) violates one constraint (Opacity), and so is marginal. (13c) by contrast violates two constraints (Opacity and Locality), and consequently is more degraded than (13b). This suggests that constraints on extraction are multi-factorial and cumulative: the more constraints that are violated, the less acceptable the result is. We consider further factors that contribute to determining the status of extraction in English in the next few sections. In section 2 we will see that the same factors are at work in Spanish.

1.2 Properties of the subject

In addition to being affected by the external syntax of the subject, i.e. its position in the clause, extraction out of subjects is also affected by their internal syntax, i.e. the syntactic *properties* of the subject itself. Two such properties are discussed here: the thematic status of the subject and its specificity.

1.2.1. The Thematic Hierarchy.

There is evidence that extraction from a subject is influenced by the thematic role of the subject, as can be illustrated by sentences such as (14):

- (14) (a) *Of which books* did [the authors] receive a prize? Chomsky (2008: fn.35)
 (b) *Of whose memoirs* would [publication] cause a scandal?

In both examples, extraction of the italicised wh-PP out of the bracketed DP in its superficial (checking) position in spec-TP should be barred by the Opacity Condition (11). Moreover, extraction out of the subject in its base position as the subject of the verb *receive/cause* would also be expected to be barred. This is because *receive/cause* are transitive, and for Chomsky (2007, 2008) transitive subjects originate in spec-*vP* and transitive *vPs* are phases (by virtue of projecting an external argument). Hence, extracting the italicised wh-PPs out of the bracketed transitive subjects in their base position on the edge of the *vP* phase in (14) should be barred by the Edge Condition (7). Noting the problematic difference in grammaticality between (5b) and (14a), Chomsky (2008: 193) comments that ‘difference among theta roles might be relevant’, but does not elaborate.

Chomsky’s observation is in line with a body of research arguing that the accessibility of constituents is determined by their thematic properties. It is well known that the argument structure of a predicate determines the relative prominence of its arguments: the higher the position which a constituent occupies on the Thematic Hierarchy in (15) below, the higher its canonical position is in the syntactic structure, for instance. AGENTS are canonical external arguments occupying the highest argument position within the *vP* in which they originate, viz. spec-*vP*. (see Grimshaw 1990, Choi 1996 and Alexiadou, Haegeman and Stavrou 2007: 503-4 for a survey of the literature).

- (15) **Thematic Hierarchy** (cf. Choi 1996)
 AGENT > BENEFICIARY > EXPERIENCER/GOAL > CAUSE/INSTRUMENT > PATIENT/THEME >
 LOCATIVE

The Thematic Hierarchy plays a role in determining extractability from DPs: the presence of a thematically more prominent argument (i.e. one occupying a higher position on the Thematic Hierarchy) has been shown to block the extraction of a less prominent one (See Alexiadou, Haegeman and Stavrou 2007: 585-591 for references). In addition, to capture the contrast observed between (5b) and (14), we formulate the following hypothesis according to which the theta role carried by a constituent determines how readily it permits extraction.

(16) **Thematic Extraction Condition/TEC**¹¹

The more prominent a constituent is on the Thematic Hierarchy (15), the greater structural integrity it has, and the more resistant it is to extraction.

The prediction of TEC is that an AGENT subject like that bracketed in (5b) will show greater resistance to extraction than a GOAL subject like that bracketed in (14a) or a CAUSE subject like that bracketed in (14b), because an AGENT is positioned higher on the hierarchy (15) than a GOAL or CAUSE.¹²

Observe that our hypothesis that an argument higher on the hierarchy is harder to extract from than a lower one is not specific to subjects, but is relevant for all DPs. It generalises to other constituents and consequently also accounts, for instance, for the observation that extraction is less degraded out of the bracketed THEME object in (17a) than out of the bracketed GOAL object in (17b)¹³:

(17)(a) ?*Which film* did the Queen reward [_{THEME} the director of] with a knighthood?

(a) ??*Which film* did the Queen award [_{GOAL} the director of] a knighthood?

Our earlier discussion showed that the Edge Condition (7) is problematic because it wrongly predicts that sentences like (10d) are ungrammatical, and that the Opacity Condition is also problematic because it wrongly predicts that sentences like (14) are ungrammatical. An alternative analysis in terms of the Thematic Subject Condition enables us to account for the relative acceptability of such sentences; extraction is out of a THEME argument in (10d), out of a GOAL argument in (14a), and out of a CAUSE argument in (14b). None of these occupies a prominent position on the hierarchy in (15), so none induces a strong TEC violation.

However, a complication which arises with the implementation of the TEC is the following. In order to account for the ungrammaticality of a sentence like (5b), we need to ensure that TEC excludes the possibility of extracting *of which car* out of the bracketed subject both in its base position (spec-*v*P) and in its superficial position (spec-TP). Clearly we could not do this if the scope of the TEC were restricted to *v*P-internal thematic positions, since this would allow extraction out of an AGENT subject in its superficial *v*P-external position in spec-TP. A possible way of overcoming this problem would be to conceive of TEC as a global constraint barring extraction out of constituents carrying specific thematic properties at any stage of derivation, irrespective of their positions. One way of implementing this would be to assume (following proposals made by Rizzi 1990, Starke 2001, Bagchi 2007 etc.) that thematic roles are part of the featural composition of DPs; the relevant theta feature will then be carried along with the relevant DP when it undergoes movement. If a constituent with an AGENT feature bars extraction, this will prevent *of which car* from being extracted out of the subject *the driver of which car* either in spec-*v*P or in spec-TP in (5b).

Such a proposal would also have the important consequence that we no longer need to handle contrasts such as the following by assuming that extraction is possible out of the base position of the subject:

(5)(a) *Of which car* was [the driver] awarded a prize?

(b) **Of which car* did [the driver] cause a scandal?

This is because, if the subject retains its theta-feature throughout the derivation, extraction out of the subject in its superficial position in spec-TP will be barred by TEC in (5b) where the subject is an

¹¹ Chaves (2013: 26) conjectures that AGENT subjects resist extraction because an extracted phrase has to be relevant to the phrase out of which it is extracted and to the main assertion, and it is harder for any phrase inside an AGENT subject to be relevant for the main assertion. We leave open the precise nature of TEC here and hope to return to it in future work.

¹² We draw a distinction here between an AGENT (a typically animate instigator of an event as in *John rolled the ball along the road*) and a CAUSE (a typically inanimate entity as in *The wind rolled the ball along the road*), following Pylkkänen (2008) and Tubino (2011): see Schäfer (2012) for a structural characterisation of the difference, in terms of whether the relevant argument originates as the specifier of a VoiceP or ApplicativeP. But see also Ramchand (2008) for a uniform analysis of AGENT and CAUSE.

¹³ The marginal status of (17a) is attributable to the fact that both examples in (17) also violate the Specificity Condition (21) discussed in section 1.2.2, and the Preposition Stranding constraint discussed in section 1.3.1.

AGENT, but not in (5a) where the subject is a GOAL. This outcome has interesting theoretical implications, since allowing extraction from a moved subject in its base position amounts to a violation of the Strict Cyclicity Condition (Freidin 1978, Chomsky 1981: 267).

However, any such account proves too strong, wrongly predicting that sentences such as the following are as ungrammatical as (5b):

(8)(a) *Of which car* is [the driver] likely to cause a scandal?

If *the driver of which car* carries an [AGENT] theta-role throughout the derivation, and if TEC is a global constraint preventing extraction out of a high-ranking (e.g. agentive) nominal at any stage of derivation, TEC will bar extraction out of the subject at every stage of derivation, including at the point where the subject *the driver of which car* has reached a specifier position in the domain of a higher predicate (here *likely*). To capture the data in (5), (8) and (14) we propose that the TEC (16) be seen as a *local* constraint, and accordingly we revise it as follows:

- (18) **Thematic Extraction Condition** (*revised*)
A θ -prominent argument occupying a θ -local A-position resists extraction

A θ -prominent argument is one occupying a high position on the Thematic Hierarchy (15); the more prominent the theta-role, the greater the resistance to extraction. A constituent occupies a θ -local A-position if it occupies an A-position within its local theta-domain (i.e. within the *extended projection* of its theta-marking predicate, in the sense of Grimshaw 1991, 2000, 2005 – hence within the minimal TP containing the predicate); consequently a subject occupies a θ -local A-position if it is in situ within ν P, or in the specifier position of the TP within which it is theta-marked.

The revised version of TEC in (18) will bar extraction from the agentive subject in spec-TP in (5b). This is because the subject is locally assigned an AGENT theta-role by the predicate of its own clause (= *cause*), and AGENT is the most prominent argument on the hierarchy (15), hence the most resistant to extraction. TEC will therefore bar extraction out of the agentive subject either in its base position in spec- ν P or in its superficial position as spec-TP which is the extended projection of ν P. However, TEC will permit extraction from the agentive subject in its superficial position (as the subject of *is*) in cases like (8a), where the subject ends up in a position outside an extended projection of the ν P in which it originates. Likewise TEC will permit extraction from the subject in its superficial position in cases like (8c) because the subject ends up in the matrix VP headed by *believe*, hence outside its local theta domain. TEC will also allow for extraction from subjects, including AGENTS, that have undergone A-bar movement and end up in a left peripheral position as in (10c).

Our assumption that TEC is a local constraint has a conceptual rationale¹⁴ because thematic roles involve a relation between an argument and its predicate: it is plausible to suppose that TEC only operates within the extended projection of the relevant predicate. Furthermore, if TEC is a local constraint, we can handle cases such as the following by positing that extraction always takes place out of the superficial position of the subject, without the need to posit that extraction is possible from either its base or intermediate position:

- (19)(a) Of which car was [the driver] arrested?
(b) Of which car is [the driver] thought to have caused an accident?

We can account for the relative acceptability of both sentences by positing that there is no TEC violation in (19a) because even though extraction has taken place from a subject in its local θ -domain, the subject is a low-ranked THEME argument and therefore does not induce a TEC violation; likewise, there is no TEC violation in (19b) because even though extraction has taken place out of a high-ranked AGENT subject, the superficial position of the subject is outside its local θ -domain.

¹⁴ It may be that processing factors are at work here, as suggested by Bob Borsley and Philip Hofmeister. When informants judging the acceptability of sentences like (8a) first encounter the Subject/SU and identify that it contains a gap for which *of which car* is an appropriate filler, SU is the subject of *likely* on first encounter rather than the subject of *cause*, and this may be the reason why they don't sense any TEC violation.

Our conclusion that extraction is always from the superficial position of a subject is welcome from a theoretical point of view, since it allows us to maintain the Strict Cyclicity Condition¹⁵. Accordingly, in this paper we henceforth assume (contra Chomsky 2008) that extraction from a moved subject always takes place from its superficial position.

1.2.2. Specificity

A second internal property of DPs which affects extractability is *specificity*. Among others, Horn (1974), Hornstein (1977), May (1977) and Chomsky (1977, 1981) have observed that extraction is barred out of a *specific* nominal introduced e.g. by a demonstrative like *that* or a possessive like *your*, but not out of a non-specific nominal introduced e.g. by the indefinite article *a* or a quantifier like *several*. The following examples show that extraction is more readily permitted out of non-specific nominals like the bracketed object in (20a) or the bracketed subject in (20c) than out of specific nominals like those bracketed in (20b) and (20d):

- (20)(a) *Of what* did he want [a picture ---]?
 (b) ?*Of what* did he want [that picture ---]?
 (c) ??*Of what* did [pictures ---] upset him?
 (d) **Of what* did [those pictures ---] upset him?

Fiengo and Higginbotham (1981) propose the *Specificity Condition*, which can be formulated within the spirit of their proposal as follows:

(21) Specificity Condition

Specific nominals are opaque domains and hence are barriers to extraction.¹⁶

As should be obvious, the *Specificity Condition* is again not specific to subjects, but holds of all DPs: specificity of the DP makes extraction more difficult.

There are a number of accounts available to derive the *Specificity Condition*; for the sake of succinctness, we present only one here. Campbell (1996) posits that specific/referential nominals contain an abstract specificity operator in spec-DP which blocks extraction through this specifier position. On this view, the DP bracketed in (20d) would have the structure (22) below, where OP is an abstract specificity operator:¹⁷

- (22) [_{DP} OP [_D those] pictures *of what*]

¹⁵ The proposal that extraction from a moved constituent is only permitted from its superficial position rules out the possibility that in a sentence like (13b) ?*Of which aspiring actress did they intend for compromising photos to be sold to a national newspaper?* the wh-PP could have been extracted from its base position in the passive VP *sold compromising photos of which aspiring actress to a national newspaper*, in which case the sentence would (wrongly) have been expected to be fully grammatical. Note that both sentences in (19) involve Opacity and Specificity violations, but these are offset by the use of a D-linked wh-phrase, in ways which we will look at in section 1.3.3.

¹⁶ See Enç (1991) for arguments that specificity rather than definiteness is the factor responsible for creating opaque domains. We leave open here the possibility that the Specificity Condition may be pragmatic in nature. If so, the unacceptability of sentences like (20d) **Of what did those pictures upset him?* would arise (in part) because using *those pictures* implies that the speaker is familiar with the pictures and therefore knows what they depict, and this being so, it makes little sense to ask what they are pictures of. See Frascarelli and Jiménez-Fernández (2012) for an analysis of specificity effects as derived from the information structure of the relevant DP.

¹⁷ (22) is simplified, *inter alia*, by not showing the launch site of the operator which moves to spec-DP: see Campbell (1996) and Aboh (2004) for evidence of movement internally within DP. Haegeman and Ürögdi (2010a,b) extend the null specificity operator analysis to factive complement clauses and claim that the operator is what renders the clause ‘referential’. The assumption that an Operator in spec-DP makes DP a barrier to extraction raises interesting questions about why DP loses its barrierhood when its head is extracted (Stepanov 2012).

In (22) long extraction out of the DP (without transiting through spec-DP) would be barred by a locality condition (like Subjacency, or Phase Impenetrability). For example, if specific nominals are DPs (Chomsky 2001, fn.10) and DPs are phases (Chomsky 2001, fn.28, Heck and Zimmermann 2004, Radford 2004, Svenonius 2004, Matushansky 2005, and Heck, Müller, and Trommer 2008, Jiménez-Fernández 2009, 2012), long extraction out of DPs will be blocked by the Phase Impenetrability Condition of Chomsky (2000), which bars a probe from attracting a goal in the domain of a phase head (like D). Because spec-DP is occupied by the operator, successive cyclic extraction of the PP *of what* via spec-DP is also impossible.

Observe that in terms of Campbell's (1996) operator account sketched above, long extraction from specific subjects will not be categorically barred if minimality is cast in terms of the more selective versions of locality such as Relativized Minimality (Rizzi 1990, Starke 2001, Rizzi 2004, Haegeman and Ürögdi 2011, Haegeman 2012): in such an approach, intervention effects depend on the feature class to which the operator in spec-DP and the extractee belong (see Starke 2001, Rizzi 2004, and the discussion in section 1.3.3).¹⁸

1.3 Position and properties of the extractee

In addition to being sensitive to the position (external syntax) and properties (internal syntax) of the constituent out of which it takes place, extraction is also sensitive to the external syntax and the internal syntax of the extractee itself. We have already seen that the Thematic Hierarchy plays a role in extraction from DP. We examine some additional properties here.

1.3.1. Pied piping

In relation to the external syntax of the extractee, consider the following contrast (noted in Chomsky 1986: 31-32):

- (23)(a) ??He is the footballer *of whom* [pictures] appeared on the internet.
 (b) *He is the footballer *who* [pictures of] appeared on the internet.

In both cases, the italicized WH-constituent *of whom* is extracted out of a subject in spec-TP. Such examples should be degraded because the Opacity Condition (11) bars a probe from penetrating a constituent which has reached a checking position at the head of an A-chain. However, the difference in degradation between (23a) and (23b) suggests that (23b) violates an additional constraint.

What seems to make (23b) worse than (23a) is the fact that the preposition is *stranded* inside the bracketed subject in spec-TP. In this connection, consider the contrast below:

- (24)(a) *Who* were there [pictures of] in the paper?
 (b) *Who were [pictures of] in the paper?

Although the preposition *of* can be stranded inside the *in situ* nominal bracketed in (24a), it cannot be stranded inside the *ex situ* nominal bracketed in (24b). This suggests that sentences like (23b) and (24b) violate a (parameterized) constraint against Preposition Stranding, which for present purposes we can formulate as follows:

- (25) **Preposition Stranding Condition/PSC**
 No preposition can be stranded (% inside a moved constituent).

The % diacritic in (25) means that the parenthesized movement condition (essentially a freezing effect) holds in some languages (e.g. English), but not in others (e.g. Spanish, as we will see later). PSC is violated in (24b) because the bracketed subject has moved from spec-*vP* to spec-TP, and

¹⁸ Based on French, Baunaz (2012: 37-38) offers a more fine-grained analysis of DPs in which three degrees of extractability are distinguished. We refer the interested reader to her work.

leaving a preposition stranded inside a moved constituent violates (the English variant of) PSC¹⁹. PSC seems to be a relatively *strong* constraint, in the sense that violating it typically leads to higher level of degradation than (say) violating the Specificity Condition.

1.3.2. Argument vs. adjunct.

Consider (26). In both examples extraction takes place from a specific DP in a checking position at the head of an A-chain. Hence (26a) and (26b) lead to Specificity and Opacity violations. If these conditions were absolute then they would wrongly predict both examples to be ill-formed. (See Starke 2001: 34-5 for a similar contrast from French.)

- (26)(a) ??*Which dress* did [the designer of] cause a scandal?
 (b) **Which dress* did [the woman in] cause a scandal?

It has long been known that the semantic properties of the extractee play a role in regulating extraction. The relevant factors claimed to play a part in determining extractability include theta roles (Rizzi 1990), case (Manzini 1992), individuation (Frampton 1991, Cresti 1995) and richness of internal semantic structure (Szabolcsi and Zwarts 1997). For instance, Rizzi (1990: 86) observed that only constituents with a ‘referential’ theta-role (e.g. one like AGENT, THEME, GOAL referring to a participant in the event described by the verb) can be extracted out of weak islands. The effect of this constraint can be illustrated by the following examples involving extraction of an (italicised) constituent out of a (bracketed) weak wh-island:

- (27)(a) **How* did he wonder [whether to fix the car]?
 (b) ??*What* did he wonder [whether to fix]?
 (c) ?This is the car *which* he wondered [whether to fix].
 (d) ?*Which car* did he wonder [whether to fix]?

The adjunct *how* in (27a) has no referential theta-role or case and so is more difficult to extract than the argumental extractees in (27b-d), which all have a referential (THEME) theta-role and (accusative) case. Since only arguments carry a referential theta-role and case, it is predicted that adjuncts will not be so easily extracted, hence the contrast in (27). For present purposes we can formulate the relevant constraint as follows:

(28) **Argument Condition**

Extraction out of an island is degraded when the extractee is not an argument.

In terms of Rizzi’s approach the adjunct/argument asymmetry may ultimately also follow from intervention effects, since arguments are associated with a referential theta role, a point which may be related to their featural composition and perhaps to their internal syntax (see section 1.3.3.). We refer to Starke (2001) for discussion²⁰. As we see from (27a), the Argument Condition is a relatively strong constraint, and violating it leads to heavy degradation.

¹⁹ In English the stranding effect seems to be even stronger when the preposition is orphaned – i.e. left on its own inside a moved PP, as in *preposition dangling* cases like (i), discussed in Postal (1972):

(i) *Max is the only person *who* I think [_{PP} to] (that) Mary talked

Chaves (2013: 30) offers a processing account of contrasts like that in (24), suggesting that PP extraction is more helpful to the processor than extraction of the wh-object of the preposition alone. However, we are sceptical of this claim. While extracting the PP *of whom* in (24a) facilitates identifying *whom* as the complement of the preposition *of*, it makes it more difficult to identify *of* as the head of the complement of the noun *pictures*. Chaves notes that prosodic factors can also play a role in alleviating stranding violations, by helping identify the extraction site. Thus, a sentence such as (ii) below is ameliorated with the prosodic phrasing indicated by the brackets, where prosodic cues facilitate identification of the extraction site:

(ii) [Which problem] [will a solution to] [never be found]? (Chaves 2013: 17, 31c).

²⁰ Hofmeister (2008) and Hofmeister and Sag (2010) report experimental evidence that extraction of adjuncts from islands is significantly facilitated if the adjunct is syntactically and semantically complex (e.g. *for what period of time after the crash*), in conformity with the *Memory Facilitation Hypothesis* of Hofmeister (2008: 4).

1.3.3. Internal properties of the extractee

With respect to the discussion in the preceding section, it should be noted that extraction of *which* in (27c) and of *which car* in (27d) leads to lesser degradation than extraction of *what* in (27b). This is not unexpected. Pesetsky (1989) has shown that D-linking plays a major role in ameliorating extraction out of weak islands; a similar observation is reported *inter alia* in Chomsky (1986), Cinque (1990), Comorovski (1996), Starke (2001), Jiménez-Fernández (2009), Haegeman and Ürögdi (2010), and Bianchi and Chesi (2012). In keeping with the spirit of this work, let us posit that D-linking has the following effect on extraction:

(29) **D-linking Generalisation**

Extraction is ameliorated when the extractee is D-linked.

Since the relative pronoun *which* and the interrogative DP *which car* are D-linked but the interrogative pronouns *how* and *what* are not (at least in the default case – but see Starke 2001), it follows that extracting *which/which car* (27c,d) will result in greater acceptability than extracting *how/what* in (27a,b). If *whether* is in spec-CP (or is in C but associated with a null operator in spec-CP cf. Radford 1997: 295-7, Haegeman 2012), *which (car)* can only be extracted if it undergoes long-distance movement; this means that (27c,d) will result in a locality violation, leading to degradation.

We do not limit the effect to extraction out of islands in (29), since Hofmeister (2007, 2008, 2011), Hofmeister, Jaeger, Arnon, Sag and Snider (2007, 2011) and Hofmeister and Sag (2010) produce experimental evidence that extraction out of non-islands is also ameliorated by D-linking. They maintain that D-linking effects are reducible to independently motivated cognitive mechanisms in that D-linked constituents are syntactically and semantically rich, and therefore less prone to memory decay, and this facilitates their retrieval downstream in hard-to-process structures. We leave this issue open here.²¹

To represent the impact of the semantic properties of the extracted constituent such D-linking, referentiality, specificity, *etc.*, Starke (2001) develops a feature-based *intervention* analysis of extraction which provides a principled account of the interaction between the semantic properties of the extractee and those of the constituent out of which it is extracted. (See also, among others, Obenauer 1994, Rizzi 2004, Friedmann, Belletti and Rizzi 2009, Haegeman 2012). He elaborates a feature-based version of the Relativised Minimality Condition of Rizzi (1990), which can be characterised informally as follows (where we use the term *i-features* to denote intervention-sensitive features):

(30) **Intervention Condition**

No constituent with *i-features* can cross (or be extracted out of) an intervening constituent carrying a richer set of *i-features*.

Starke (2001: 5) takes *i-features* to include negation, quantification²², *wh*-ness, focalisation and specificity (so that the Intervention Condition can be said to subsume the Specificity Condition 21). See also Rizzi (2004, 2012), and Baunaz (2011) for a precise implementation in the French DP.

The Intervention Condition can account for the specificity effect in sentences such as (31a,b):

²¹ Other factors can also ameliorate extraction out of subjects, including prosodic cues (see fn.19) and the presence of a parasitic gap, in structures like:

(i) Who did [the rivals of ---] shoot ---? (Chaves 2013: 7, 8a)

Such parasitic gap sentences become more acceptable, Philip Hofmeister observes, the greater the distance between the two gaps.

²² For Starke, quantificational adverbs like *why/when/how/whether/often* are intervention-sensitive, but ‘most items traditionally referred to as quantifiers (*every, some, most, two, etc.*)’ ‘appear to fall outside’ the Intervention Constraint (2001: 6).

Hofmeister, Jaeger, Arnon, Sag and Snider (2011) account for the intervention effect in processing terms, adducing experimental evidence that extraction of argument phrases which are syntactically or semantically richer can offset potential intervention effects.

- (31)(a) ?*Who did you want to buy [a certain picture of]? (Starke 2001: 26; 65b)
 (b) ?*Who did you want to buy [the picture of]? (Starke 2001: 26; 64b)

Let us assume that specificity is encoded syntactically by an S-feature. In the above examples, the extractee *who* carries a Q-feature (i.e. quantificational feature) but it does not carry an S-feature (i.e. specificity feature). The DPs introduced by *a certain*, *the* and *my* carry both a Q-feature and an S-feature. Since the extractee *who* carries fewer i-features than the intervening specific Q+S quantifier *the/a certain/my* heading the bracketed nominal, the Intervention Condition (30) bars extraction in cases like (31).²³ In Starke's approach, the D-linking Effect (29) is simply an artefact of the more general Intervention Condition (30).

The examples in (31) illustrate the role of specificity for extraction out of complements. As shown in (32) the same factors constrain extraction out of subjects, as the following contrasts illustrate:

- (32)(a) ??Which famous royal personage did [intimate pictures of] appear in *The Sun*?
 (b) ?*Who did [intimate pictures of] appear in *The Sun*?
 (c) ?*Which famous royal personage did [a certain picture of] appear in *The Sun*?
 (d) *Who did [a certain picture of] appear in *The Sun*?

All four examples violate the Opacity Condition (11) because the subject is the head of a non-trivial A-chain, and they also violate (the English instantiation of) the Preposition Stranding Condition (25), because the preposition *of* is stranded inside a bracketed constituent which has moved (from the edge of vP to the edge of TP). (32b) also violates the Intervention Condition/IC, since the only *i*-feature carried by *who* and the bracketed subject out of which it is extracted is a Q-feature, with the result that the extractee is no richer in *i*-features than the subject. (32a) does not violate IC because the extracted wh-nominal is D-linked and so has a δ -feature (i.e. a discourse feature: see Haegeman 2012) in addition to a Q-feature, and therefore carries a richer set of *i*-features than the subject out of which it is extracted. (32c) again violates IC, because the extracted nominal (carrying Q- and δ -features) is no richer in *i*-features than the subject (carrying Q- and S-features) – at least if δ - and S-features belong to the same feature class in the sense of Rizzi (2004). (32d) involves a stronger IC violation: the extracted wh-pronoun *who* carries only a Q-feature, whereas the subject (by virtue of being specific) carries both Q and S-features.

The examples in (32) illustrate three important points: (i) D-linking of an extractee can ameliorate weak constraint violations; (ii) the D-linking Generalisation (29) can be subsumed under the Intervention Condition (30) if D-linked constituents carry an *i*-feature [δ]; and (iii) constraint violations are cumulative, in that the more constraints that are violated, the greater the unacceptability of the resulting sentence.

1.4. Variability

One important additional observation which needs to be made at the conclusion of our discussion of English in this section is that the judgments reported in the literature and the judgements obtained from informants are far from uniform, with different speakers assigning differing degrees of degradation to the same types of structure (see fn.5 for an example of this type of inter-speaker variation). This point is also underlined by Starke (2001: 60), who observes that 'speakers report

²³ The intervention account needs to be worked out in full. For instance, the relation between what we have called 'specificity' and what we call D-linking needs to be clarified. We refer to Baunaz (2011).

Chaves (2013) argues that *relevance* is a further (pragmatic) factor which facilitates extraction, in that an extracted phrase must bear some relevance to the phrase from which it is extracted. This accounts for the relative acceptability of an example like (i), where brackets mark prosodic phrasing (See fn.19):

(i) [Which problem] [will the solution to] [impress everyone]?

This is relatively acceptable, Chaves maintains, because a solution necessarily presupposes the existence of a corresponding problem, so the wh-phrase in (i) is relevant for the subject and for the predicate.

contradictory judgments’ about extraction. In section 2, we will see that similar judgment variability is found in Spanish, and in section 3 we will offer a principled account of this variability.

2. Extraction out of subjects in Spanish

In section 1, we concentrated principally on extraction from subjects in English. We recapitulate our main findings briefly here. The acceptability of extraction out of subjects in sentences like (4, 5a, 8, 12) suggests that subject DPs in English are weak rather than strong islands, and hence allow selective extraction.

The discussion of the English data in section 1 also leads to the conclusion that multiple factors determine the possibility of extraction from the subject in languages like English, specifically (i) internal and external properties of the subject DP such as its specificity and theta role on the one hand and its position in the clause on the other, (ii) internal and external properties of the extractee, and (iii) specific intervention effects constraining the interaction between subject and extractee. Cumulative constraint violation leads to an increasingly degraded outcome, but D-linking the extractee can lead to some amelioration of constraint violations (as indeed can prosodic phrasing – see fn.20).

In this section, we examine extraction from subjects in Spanish and we investigate to what extent the different conditions constraining the transparency of subjects with respect to extraction observed for English extend to Spanish. We will show that as was the case for English, both the internal syntax and the external syntax of DP subjects, as well as the properties of the extractee and locality constraints on movement influence extraction possibilities.

2.1. Properties of the subject affecting extraction

One point that we have largely set aside so far concerns cross-linguistic variation in extraction from subjects. According to Starke (2001), languages are classified into the two types below:

Type I: French/Italian: both pre- and postverbal subjects permit extraction.

Type II: Czech/Slovak: postverbal subjects permit extraction but preverbal subjects do not.

(33) illustrates Italian, a type I language. Extraction out of a DP subject is possible irrespective of the syntactic position occupied by the DP subject:

- (33)(a) *Di che autore credi che hanno causato tanta polemica [molti libri]?*
Of which author believe-2SG that have-3PL caused such controversy many books?
(b) *Di che autore credi che [molti libri] hanno causato tanta polemica?*
Of which author believe-2SG that many books have-3PL caused such controversy?
‘By which author so you believe that many books have caused a lot of controversy?’
(Jiménez-Fernández 2009: 130, 61)

By contrast, Czech and Slovak are type II languages; extraction from postverbal subjects as in (34a) yields acceptable results, whereas extraction from preverbal subjects as in (34b) is systematically banned:

- (34)(a) *Kolik myslis ze prislo [dopisu]*
how-many you-think that came letters
(b) **Kolik myslis ze [dopisu] prislo?*
how-many you-think that letters came
‘How many letters do you think came?’ (Starke 2001: 56)

In this section we examine Starke’s claim that Spanish is a type II language and we survey some of the factors which play a role in determining the possibility of extraction from subjects.

A point which needs to be clarified from the outset of the discussion is the following. Spanish has a categorical ban on preposition stranding, as we can see from examples such as the following:

- (35)(a) ¿**Con** *quién* hablaba Juan?
 With whom was speaking Juan?
 ‘With whom was Juan speaking?’
 (b) *¿*Quién* hablaba Juan **con**?
 Who was speaking Juan with
 ‘Who was Juan speaking with?’

As (35b) illustrates, Spanish differs from English in not allowing a preposition to be stranded inside an *in situ* PP: this is a very strong constraint, resulting in severe degradation. In our earlier formulation of the Preposition Stranding Constraint in (25), we attributed this to the two languages having different parameterised settings for the constraint, Spanish barring all P-stranding, and English doing so only for prepositions stranded inside a moved constituent. The global ban on preposition stranding in Spanish means that a prepositional object can only be extracted out of a subject in Spanish if the preposition is itself pied-piped along with its object, not if the preposition is stranded. We illustrate this in (36), in which extraction takes place from a postverbal subject which, as we will see presently, is more accessible to extraction than a preverbal subject. As illustrated in (36a), a prepositional object cannot be extracted on its own from within a subject DP, even if the subject is postverbal. Instead, the whole PP has to be extracted, as in (36b):

- (36)(a) *¿*Qué príncipe* fueron publicadas [varias fotos comprometedoras de]?
 which prince were published several photos compromising of?
 ‘Which prince were several compromising photos of published?’
 (b) ¿*De qué príncipe* fueron publicadas [varias fotos comprometedoras]?
 of which prince were published several photos compromising?
 ‘Of which prince were several compromising photos published?’

We will take this property of Spanish for granted in subsequent discussion, so that all examples involving extraction of a prepositional object out of a subject will illustrate fronting of the containing PP. Anticipating the discussion below, (36a) shows that the constraint is categorical and that the PSC cannot be overcome by D-linking.²⁴ Since violation of PSC alone leads to ungrammaticality, we assume it is a strong constraint.

2.2. External syntax

2.2.1. Preverbal subjects vs. postverbal subjects and the subject condition

Based on (37), taken from Martí (1999)²⁵, Starke concludes (2001: 57) that Spanish is a type II language; preverbal subjects like that bracketed in (37a) are opaque, whereas postverbal subjects like that bracketed in (37b) are transparent²⁶.

²⁴ Unlike violations of PSC in English examples like (ii) in fn.19, (36b) cannot be rescued by prosodic means.

²⁵ We note, however, that (contrary to Martí’s judgments) most of our informants didn’t consider (37a) markedly worse than (37b), so it would seem that for more liberal speakers, the constraint against extraction from a (non-specific) preverbal subject in Spanish is a mild one. We will attempt to account for inter-speaker judgment variability in section 3. It may be that the wh-phrase is D-linked in (37), ameliorating extraction. The interrogative quantifier *qué* in Spanish corresponds to either ‘what’ or ‘which’ in English, with the discourse setting determining whether it is D-linked. Spanish also has the interrogative quantifier *cudl*, and this is unambiguously D-linked and so always corresponds to English ‘which’, but is used much less frequently than *qué*. We will assume that in the examples (37) *qué* is D-linked and hence corresponds to English *which*. See note 22 for a processing perspective on the nature of D-linking.

²⁶ An interesting processing perspective on this issue (which we hope to pursue in subsequent research) is that subjects containing gaps cause processing problems, and speakers prefer to position hard-to-process structures

- (37) (a) ??*¿De qué autor crees que [varios libros] han recibido premios internacionales?
 of which author believe-2SG that several books have-3PL received awards international-PL
 (b)? ¿De qué autor crees que han recibido premios internacionales [varios libros]?
 ‘By which author do you think several books have received several international awards?’
 (Starke 2001: 57, ex. 135 a-b)

Adopting Uribe-Etxebarria’s (1992) claim that Spanish subjects are generated in spec-VP and are subsequently moved to spec-TP, Martí (1999) holds, after Takahashi (1994), that extraction from a subject DP in spec-TP in a sentence like (37a) violates the Subject Condition (2), which is taken to be a consequence of the *Freezing* Principle (3) discussed earlier. By contrast, she assumes that postverbal subjects like that bracketed in (37b) are merged in spec-vP, which is not a freezing position, and hence *in situ* subjects allow extraction. Martí (1999) concludes that extraction is allowed only if the subject remains in situ in spec-vP. Observe, though, that Martí judges (37b) to be slightly marginal, which is unexpected on her account.

However, a number of complications arise with Martí’s account if (as argued in subsequent work by Chomsky 2008) extraction is in principle possible from moved constituents at any stage of derivation. If the subject in (37a) originates on the edge of vP, and if extraction is permitted from a subject on the edge of vP as in (37b), then (37a) should be just as good as (37b). The fact that (37a) is more degraded than (37b) suggests that any extraction out of a subject must take place from the superficial position of the subject. Since we argued this to be the case for English as well in section 1.2.1, we shall henceforth assume that moved subjects in English and Spanish alike only allow extraction from their final derived position in spec-TP.

If the subject in spec-vP in (37b) allows for extraction then this is once again a counterexample to the Edge Condition (7) barring extraction from a constituent on the edge of a phase, unless one proposes that the vP headed by *recibido* ‘received’ is not a phase. See also the discussion of phases in the next section, and of the Thematic Hierarchy in section 2.5.

2.2.2. Phases and phase sliding

Adopting the Minimalist framework in general and Phase theory in particular, Gallego and Uriagereka (2007) posit that extraction from a constituent on a phase edge is barred by the Edge Condition (7). More specifically, phases are uniform cross-linguistically, and CP and v*P (i.e. a vP with an external argument) are phases. Thus constituents on the edge of CP and v*P disallow extraction. However, phasehood is not immutable: a phase may lose its status as a phase and as a consequence its edge will allow extraction. When v*P loses its phasehood, extraction from the edge of v*P becomes licit.

According to Gallego and Uriagereka, in Spanish v-to-T movement results in *Phase Sliding*, by which TP inherits phasehood from v*. As a result of Phase Sliding, TP becomes the phase and v*P is no longer phasal. Consequently, the Edge Condition (7) will bar extraction from a preverbal subject on the edge of TP, but it will not bar extraction from a postverbal subject on the edge of vP. For Spanish, a language with v-to-T movement, they propose that in consequence of Phase Sliding, extraction from a subject is permitted from the edge of vP but barred from the edge of TP (Gallego and Uriagereka 2006).

Accordingly, based on Spanish data originally from Uriagereka (1988), extraction is banned in (38b) because the subject is in spec-TP, whereas it is permitted in (38a) because the subject is in situ in the specifier position of a vP which has lost phasehood as a result of the verb *impresionar* raising to some functional head position above vP:

toward the end of the sentence, in order to reduce the burden on memory resources (see e.g. Yngve 1960; Hawkins 1994; Wasow 1997, 2002; Gibson 1998). This would account not only for why extraction is easier out of postverbal rather than preverbal subjects, but also for why it is easier out of subjects in VOS structures than in VSO structures – as we will show in section 2.1.4.

- (38)(a) *¿De qué conferenciantes_i te parece que me_z van a impresionar_v [_{v*P} [_{DP} las propuestas t_i] t_z t_v]?
 of what speakers you appears that me go to impress the proposals*
 (b) **¿De qué conferenciantes_i te parece que [_{DP} las propuestas t_i]_j me_z van a impresionar_v [_{v*P} t_j t_z t_v]?
 ‘Which speakers does it appear to you that the proposals by will impress me?’*

If TP is a phase in Spanish, the Edge Condition (7) correctly bars extraction out of the preverbal bracketed subject DP in (38b), since the subject is a specifier on the edge of a TP phase.²⁷

However, Jiménez-Fernández (2009, 2012) has argued at length against Gallego and Uriagereka’s analysis. One of the main empirical shortcomings of their analysis is that their claim that the Spanish TP is a phase and that vP is not wrongly predicts that, at least for transitive verbs, extraction will be permitted from postverbal but not from preverbal subjects. (38) is in line with this prediction but the data are far from uniform. In particular, where the subject is non-specific, extraction is permitted from both pre- and post-verbal subjects, as shown in (39):

- (39)(a) *¿De qué cantante te parece que me van a escandalizar [varias fotos]?
 of what singer you appears that me go to shock several photos*
 (b) ? *¿De qué cantante te parece que [varias fotos] me van a escandalizar?
 ‘Of which singer does it appear to you that several photos will shock me?’*

If TP were a phase, extraction out of the preverbal subject in spec-TP in (39b) should be uniformly barred by the Edge Condition (7). However, extraction out of a subject in spec-TP is not uniformly bad, as shown by the contrast between (38b) and (39b). In both examples the extraction targets the subject in spec-TP: (38b) is ungrammatical, but (39b) is fine. The difference between the two examples is that in (38b) the subject *las propuestas de qué conferenciantes* is specific, whereas that in (39b), *varias fotos de qué cantante* is not. The specificity of a constituent makes extraction harder. The slight degradation detected in (39b) is due to the Opacity Condition, according to which extraction is illicit from the head of an A-chain.

A further problem posed by Gallego and Uriagereka’s analysis is that it would seem to make incorrect predictions about extraction out of subjects of mono-argumental clauses with unaccusative, passive and raising predicates. If (as standardly assumed), in such clauses vP is not a phase²⁸, it follows that TP cannot inherit phasehood from vP. If so, the prediction is that extraction should freely be permitted out of either preverbal or postverbal subjects in intransitive clauses. However, this prediction is not borne out by the following (passive) examples:

- (40)(a) ?*¿De qué coches parece que fueron arrestados [los conductores]?
 of which cars seems that were arrested the drivers*
 (b) ??*¿De qué coches parece que [los conductores] fueron arrestados?
 of which cars seems that the drivers were arrested
 ‘Of which cars does it seem that the drivers were arrested?’*

In these two sentences the subject of the passive predicate *arrestados* ‘arrested’ originates as complement of VP. In (40a) extraction of the PP takes place from this original position; since a passive vP is not a phase, there is no phase-based violation and yet the sentence is degraded. In (40b) extraction takes place from spec-TP, which in this case is not a phasal edge, predicting full grammaticality. However, example (40b) is even more degraded than (40a). In other words, regardless of the non-availability of phase sliding, extraction may yield a degraded outcome, which indicates that some other constraint has been violated.

²⁷ As will be apparent, the grammaticality judgments given by Uriagereka differ from those of Martí. For Martí, extraction from a subject always induces some sort of degradation, whereas for Uriagereka degradation arises only when the subject is preverbal, hence in spec-TP. A confounding factor is that extraction takes place out of a *specific* subject in (38), incurring an additional (*specificity*) violation – and this may well be why most of our informants found both examples in (38) degraded. Such divergences in judgments raise the general problem of dealing with inter-speaker variability in judgments. We return to this point in section 3.

²⁸ However, see Legate (2003) for a contrary view.

A final problem for Gallego and Uriagereka's analysis is more general: their proposal is heavily dependent on the viability of the Edge Condition. However, as already pointed out in section 1.1, the descriptive adequacy of the Edge Condition is called into question by English examples like (10d) and Spanish examples like (12a) and (12b), where one *wh*-phrase is extracted from within another *wh*-phrase located on the edge of a CP phase.

Gallego (2011) goes back on the earlier analysis of Gallego and Uriagereka (2006, 2007); he draws a distinction between freezing and non-freezing positions to account for the contrast in (38), and follows a well-established tradition (Ormazábal *et al.* 1994; Takahashi 1994; Boeckx 2003; Rizzi 2006; Stepanov 2007; Chomsky 2008) in claiming that spec-TP is a freezing position, but spec-*v*P is not. For him extraction from the postverbal subject in (38a) is licit in Spanish because the subject remains in spec-*v*P, a non-freezing position. Conversely, if the subject moves to spec-TP extraction is banned, as in (38b), because spec-TP is a freezing position. However, this alternative proposal runs into problems similar to those encountered above, since it again wrongly predicts that sentences like (38b) are categorically ungrammatical in Spanish, whereas in fact the pattern is more complex: such extractions are mildly degraded out of a non-specific subject as in (39b) but they become more severely degraded when extraction is out of a *specific* subject as in (38b).

From the data discussed above it emerges that, as was the case for English, in Spanish extraction from a subject DP gives rise to varying degrees of acceptability. This is due to the interplay of different conditions. Extraction from a subject in spec-TP will systematically yield a violation of the Opacity Condition (11), and will lead to additional degradation if the subject is specific, since there will be concomitant violation of the Specificity Condition (21). Recall that, for reasons outlined earlier, we assume that extraction is only possible out of a superficial position, not out of a base position or an intermediate position.

As we saw in our earlier discussion of English (4-6) in section 1.1, the Edge Condition (7) leads to the prediction that extraction is possible out of an intransitive subject on the edge of a non-phasal *v*P, but not out of a transitive subject on the edge of a phasal *v**P. This means that extraction out of a transitive subject on the edge of *v**P should invariably lead to ungrammaticality because it violates the Edge Condition. This prediction is incorrect: again extraction out of a postverbal non-specific transitive subject, as in (39a), is relatively acceptable. Why should this be? This is a question we address in the next section.

2.2.3. *A'*-positions vs. *A*-positions: postverbal subject position in Spanish

In this section we turn to a contrast that has so far not been taken into account in determining the extent to which a constituent allows extraction. With respect to the discussion of English data we have mainly been looking at preverbal subjects in spec-TP, since this is the default position for subjects in that language. Postverbal subjects are marked in English and we will not go into their syntax here.

However, as already shown, Spanish subjects may be postverbal and this is not a marked pattern. Moreover, postverbal subjects may either precede or follow the object, resulting in VSO and VOS order respectively. Rather than assuming that a postverbal subject is invariably on the edge of the *v**P phase (Ordóñez 1998, Zubizarreta 1998, Ortega-Santos 2006, Jiménez-Fernández and İşsever 2012), we follow Belletti (2001, 2004) and posit that postverbal subjects in pro-drop languages like Spanish can also occupy the specifier position of a Focus Phrase in the low *v*P-periphery. We propose that the two word orders VSO and VOS arise in Spanish by two different mechanisms. VSO is the result of moving V to a higher functional head (Suñer 1992) and leaving the subject in its base position (spec-*v*P). By contrast, VOS comes about when V moves to the higher functional head and the subject itself is displaced to the specifier of a Focus head in the low periphery (between TP and *v*P); subsequently, departing slightly from Belletti (2004), we assume that O moves to become the specifier of a low peripheral TopP projection below TP but above FocP, so accounting for why O precedes S.²⁹

²⁹ Belletti (2004) proposes remnant VP movement to this low spec-TopP in Italian. She uses binding effects as evidence in favour of her analysis:

- (i) a. Chi ha salutato Gianni?
Who greeted Gianni?
- b. *Hanno salutato Gianni_i i propri_i genitori

Evidence that in VSO patterns the subject remains *in situ* comes from quantifier binding. As noted by Ordóñez (1998), a sentence-final quantified indirect object cannot bind a pronominal possessor inside a postverbal subject in the VSO structure in (41a), but when the subject occupies final position as in (41b), the bound reading is licensed: in (41a) *su amigo* ('his friend') cannot be bound by the quantifier *cada* ('each') in the direct object that follows it; by contrast, in (41b), where the indirect object precedes, this binding is licit.

- (41)(a) *Este libro se lo regaló su_i amigo [a cada niño]_i.
 this book him it gave-3sg his friend to each boy
 'This book, his friend gave to each boy'
 (Ordóñez 1998: 318, ex. 9c)
- (b) Este libro se lo regaló [a cada niño]_i su_i amigo.
 'this book him it gave-3sg to each boy his friend
 'This book, his friend gave to each boy'
 (Ordóñez 1998: 319, ex. 10c)

Assuming with Belletti that binding can be established at any stage of the derivation, the grammaticality of (41b) with the order VOS can be accounted for by supposing that the subject *su amigo* ('his friend') moves to spec-FocP, and that the Indirect Object *a cada niño* ('to each boy') moves to the specifier position of a Top projection above FocP. This means that the Indirect Object ends up in a position from where it c-commands (and can bind) the pronoun *su* contained within the subject on the edge of a vP-peripheral FocP projection. By contrast, in (41a), with the order VSO, both subject and indirect object remain *in situ* within vP throughout the derivation, with the result that at no stage does the indirect object c-command (or bind) the subject.

Belletti (2004) provides further evidence that postverbal subjects occupy spec-FocP in VOS structures from the observation that postverbal subjects follow adverbs (if present) that are low on the Cinque (1999) hierarchy. The same pattern holds in Spanish, as shown by examples such as (42), where the low adverb is bold-printed.

- (42)(a) ¿De qué pintor causaron **literalmente** un gran escándalo [varios dibujos]?
 of which painter caused-3pl literally a big scandal several paintings?
- (b) *¿De qué pintor causaron un gran escándalo [varios dibujos] **literalmente**?
 'Of which painter did several paintings literally cause a big scandal?'

The conclusion we draw from sentences such as (41) and (42) is that Spanish VOS subjects occupy an A-bar position in spec-FocP, whereas VSO subjects remain *in situ* in spec-vP.

In the light of the Opacity Condition (11) and the Thematic Extraction Constraint (18), the analysis of VOS and VSO word orders outlined above has interesting implications for extraction out of postverbal subjects. Extraction out of a thematically prominent (e.g. agentive) subject *in situ* in spec-vP in VSO structures does not violate Opacity (because the subject is not at the head of a non-trivial A-chain), but it does violate TEC (because the subject is thematically prominent and positioned within its local theta domain). But if Spanish postverbal subjects in VOS structures move to the

have greeted Gianni the his own parents (Belletti's examples 46)
 The object *Gianni* in (ib) does not c-command the subject, and thus the anaphoric subject *i propri_i genitori* ('their own parents') is unbound thereby violating Principle A.

With respect to binding and postverbal subjects, Spanish patterns differently. In (ii) postverbal *a Juan* can bind the anaphoric *sus_i padres* ('his parents'):

- (ii) Han saludado a Juan_i sus_i padres.
 have greeted to Juan his parents
 'His parents have greeted Juan.'

If Belletti's remnant VP movement were extrapolated to Spanish, we would expect sentence (ii) to induce a Principle A violation, contrary to fact. If, on the other hand (as we claim), it is just the object that moves to the low spec-TopP in Spanish, we can account for the binding effects in (ii), since the object c-commands and so can bind the subject. Note incidentally that moving the object to a higher functional phrase is within the spirit of work by Ordóñez (1998) and Ortega-Santos (2006).

specifier position within a Focus Phrase position in the low periphery, such postverbal subjects occupy an A-bar position, and so there should be no violation of TEC or Opacity. This leads us to expect that (if no other constraints are violated) extraction out of subjects in VOS structures should be more easily available than extraction out of VSO structures.³⁰

2.3. The internal syntax of the subject: specificity

Gallego and Uriagereka's (2007) and Gallego's (2011) proposals discussed in section 2.2 are based on the assumption that a constituent in spec-TP is invariably opaque in Spanish, which is then accounted for by the Edge Condition or the Freezing Condition. However, as already pointed out above, this assumption is problematic: we repeat the relevant examples in (43).

- (43)(a) ?¿De qué cantante te parece que [varias fotos] me van a escandalizar?
 'Of which singer does it appear to you that several photos will shock me?'
 (b) *¿De qué conferenciantes_i te parece que [_{DP} las propuestas t_i]_j me_z van a impresionar_v [_{v*P} t_j t_z t_v]?
 'Which speakers does it appear to you that the proposals by will impress me?'

While Gallego and Uriagereka's (2007) analysis accounts for both sentences being degraded (because subjects in spec-TP are opaque domains for extraction), it does not explain why (43b) is more degraded than (43a). As argued by Jiménez-Fernández (2009), the contrast between (43a) and (43b) suggests that whether subjects permit extraction or not in Spanish also depends on whether the subject is specific/referential as in (43b), or non-specific/non-referential as in (43a). So it turns out that, as was seen to be the case in English (section 1.2.2), not only the external syntax of the subject DP, i.e. whether it is located in spec-TP or in a lower position (say spec-*v*P or spec-FocP), but also its internal make-up plays a role. In particular, when they occupy the same position, indefinite and non-specific DP subjects will allow extraction more easily than specific DP subjects.

2.4. Cumulative constraint violation

In order to capture the variation in extractability observed for Spanish, we continue to explore the hypothesis adopted in section 1 that there is a cumulative effect in the way that constraints operate and determine extractability. This idea is familiar from earlier research by Keller (2000) which argued that the acceptability of a structure is determined by the weighted sum of the constraint violations it incurs (See Jäger and Rosenbach 2006, and Adli 2011 for refinements). We shall adopt this idea here, although we will not attempt to attach precise numerical weightings to constraints: instead, we will simplify what is in reality a more complex situation by assuming a binary *strong/weak* contrast. Our hypothesis is that each violation of a weak constraint leads to degradation and the more weak constraints that are violated, the more degraded the resulting structure is (unless the degradation is attenuated in some way – e.g. by D-linking the extracted constituent).

³⁰ One potential problem for moving a wh-operator from a focus position is raised by data from Italian. According to Belletti (2004: 21), extraction from a postverbal subject DP is barred in Italian. The reason she gives is that postverbal subjects move to spec-FocP, and that extraction out of a subject in a non-argument position leads to a violation of CED:

- (i) ??Il giornale di cui ha telefonato [il direttore] al presidente.
 The newspaper of which phoned the director to the president
 'The newspaper whose director phoned the president'

However, Bianchi and Chesi (2012) provide examples of relative clauses where extraction takes place out of a postverbal subject:

- (ii) il personaggio di cui mi ha scandalizzato [un'intervista]
 the personality of whom me scandalized an interview
 'the personality who an interview with scandalized me'

(Bianchi and Chesi 2012: 4, ex. 6c)

In our terms, the degradation in (i) is attributable to the Thematic Extraction Constraint, since extraction in (i) is out of a thematically prominent AGENT subject, whereas extraction in (ii) is out of a thematically less prominent CAUSE subject (see the Thematic Hierarchy in (15)).

Let us illustrate this cumulative effect of constraints on the basis of Spanish. As we have seen, the internal and external syntax of the subject both play a role in determining the capacity for extraction. The Specificity Condition blocks extraction out of a specific DP (hence extraction out of a specific subject), but it is a weak constraint and so (on its own) leads to relatively mild degradation (= ?). Similarly, the Opacity Condition (barring extraction out of a subject in spec-TP which is at the head of a non-trivial A-chain) is also a weak constraint which in itself leads to relatively mild degradation (= ?). However, when both constraints are violated by extraction out of a specific subject in spec-TP, this results in double degradation (= ??). Consequently, (40a) shows mild degradation (= ?) because it involves only a Specificity violation, whereas (40b) shows more marked degradation (= ??) because it involves both a Specificity and an Opacity violation.

Our hypothesis then is that (sub)extraction is ‘multi-factorial’: the more constraints that are violated, the less acceptable the result will be. Thus our proposal captures the gradience of judgments in terms of the proposal that at least some constraints are inherently weak and do not in themselves lead to ungrammaticality, combined with the assumption that there is a cumulative effect of constraint violation. We will expand on the cumulative effect displayed in extraction in section 3.

2.5. The Thematic Hierarchy

In our discussion of English in section 1.2.2, we formulated the Thematic Extraction Condition/TEC (18), specifying that the more prominent a constituent is on the Thematic Hierarchy (15), the more structural integrity it has and the more resistant it is to extraction when it occupies an A-position in its local θ -domain. Since AGENTS are the highest types of constituent on the Thematic Hierarchy (15) and (in accordance with TEC) show the greatest degree of structural integrity, it follows that extraction from an AGENT is more difficult than from other types of constituent.

Contrasts like that in (44) illustrate the relevance of the TEC for Spanish.

- (44)(a) ?* ¿De qué electrodoméstico parece que [el inventor] causó tanta conmoción?
 ‘Of which electrical appliance does it seem that the inventor caused a big stir?’
 (b) ?? ¿De qué electrodoméstico parece que [el invento] causó tanta conmoción?
 ‘Of which electrical appliance does it seem that the invention caused a big stir?’

In both sentences extraction induces an Opacity violation and a Specificity violation. In (44a) the subject *el inventor* (‘the inventor’) is the local AGENT argument of the verb *causó* whereas in (44b) the subject *el invento* (‘the invention’) is a local CAUSE argument. Since an AGENT occupies a higher position on the Thematic Hierarchy (15) than a CAUSE, it follows from TEC that extraction is more degraded in (44a) than in (44b) because the AGENT subject out of which extraction takes place in (44a) is more thematically prominent than the CAUSE subject in (44b).³¹

In section 1.2.1 we showed how TEC accounts for data from English involving extraction from preverbal subjects. Spanish allows us to illustrate the effect of the TEC on postverbal subjects.

- (45)(a) ?* ¿De qué electrodoméstico parece que causó [el inventor] tanta conmoción?
 ‘Of which electrical appliance does it seem that the inventor caused such a stir?’
 (b) ?? ¿De qué electrodoméstico parece que causó tanta conmoción [el inventor]?
 ‘Of which electrical appliance does it seem that the inventor caused such a stir?’

³¹ Observe that the position of CAUSE in the Thematic Hierarchy (15) entails that extraction from a GOAL subject is more acceptable than extraction from a CAUSE subject. When contrasting (37a) with a GOAL subject (repeated in (i)) and (44b) with a CAUSE subject, we observe that GOAL subjects are indeed more reluctant to allow extraction than CAUSE subjects.

(i) ??* ¿De qué autor crees que [varios libros] han recibido premios internacionales?
 of which author believe-2sg that several books have received awards international
 ‘By which author do you think several books have received several international awards?’
 (Starke 2001: 57, ex. 135 a)

This contrast lends support to CAUSE being positioned below GOAL in (15).

In a VSO structure like (45a), the subject is in situ in spec-*v*P. Because it occupies an A-position within its local theta domain and it has a prominent (AGENT) theta-role, extracting the wh-PP *de qué electrodoméstico* out of the AGENT argument *el inventor* in (45a) induces a TEC violation. Because the subject is specific, the extraction also induces a Specificity violation (resulting in the greater degradation signaled in the ??* acceptability judgment). In (45b), the subject moves to spec-FocP. Because it occupies an A-bar position, there is no TEC violation; however, the subject is specific, and so extraction induces a Specificity violation³².

2.6. Properties of the extractee affecting extraction

2.6.1. Adjunct/argument asymmetries

As discussed in section 1, the properties of the extractee also play a role in determining the possibility of extraction. In the present section we briefly review to what extent the properties uncovered for English are relevant for Spanish.

One factor which was shown to influence the possibility of extracting from subject DPs is whether the extractee itself is an argument or adjunct (see section 1.3.2). As the contrast below illustrates, Spanish also shows this argument/adjunct asymmetry:

- (46)(a) *¿De qué político crees que han causado tanta conmoción [algunas propuestas]?*
 by which politician think-2SG that have caused a stir some proposals?
 ‘By which politician do you think that some proposals have caused a stir?’
 (b) **¿Con cuántos rotos crees que han causado tanta conmoción [unos vaqueros]?*
 with how.many holes think-2SG that have caused such a stir some jeans
 ‘With how many holes do you think that some jeans have caused a stir?’

This contrast follows from the Argument Condition (28), which (as we saw in section 1.3.2) can ultimately be taken to follow from locality constraints on movement (Rizzi 1990, Starke 2001).

2.6.2. D-linking

We have seen that D-linking of the extractee facilitates extraction out of weak islands in English, in the sense that it attenuates constraint violations. In Spanish this is also the case. In relation to the adjunct/argument asymmetry noted in section 2.5.1, we observe that extraction of an adjunct out of a nominal is substantially ameliorated when the extractee is D-linked (and relatively long or heavy), as can be seen by comparing (46b) above with (47) below:³³

- (47) *¿Con cuál de los tres tipos de cintura crees que están causando tanta conmoción*
 with which of the three types of waist think-2.SG that are causing such a stir
 [unos vaqueros]?
 some jeans
 ‘With which of the three types of waist do you think jeans are causing a stir?’

³² There may well be a further constraint violation in (45b), caused by the fact that the extracted wh-PP crosses a fronted argument *tanta conmoción* (which, under our analysis, moves to spec-TopP). Rizzi (1997: 306, 70a) gives the following example to illustrate that degradation results from moving an (italicised) constituent across a (bold-printed) fronted argument in the left periphery:

(i) ??The man to whom **that book** I gave

See Baltin (1982), Lasnik and Saito (1992) and Haegeman (2012) for discussion of this type of argument intervention effect.

³³ Extraction from adjuncts is generally taken as degraded in the relevant literature (Stepanov 2007). However, Chaves (2012), Truswell (2007, 2009, 2011), Fábregas and Jiménez-Fernández (2012) and Starke (2001: 40, fn.10), report that extraction out of certain types of adjunct is acceptable in English, German, Spanish and Swedish.

As before, D-linking can be reinterpreted in terms of a feature-based implementation of Relativized Minimality (Starke 2001, Rizzi 2004). D-linking a constituent makes it featurally richer and hence may circumvent an intervention effect. Alternatively, D-linking can be seen in processing terms.

2.7. A cumulative effect.

Once again the discussion above leads to the conclusion that the nature of subject DP ‘islands’ in Spanish is multi-factorial and that both factors pertaining to the extractee and factors relative to the internal or external syntax of the subject play a role. In addition, judgments are gradient, reflecting the combined effect of the different constraints: the more constraints that are violated, the less acceptable the result is. However, intervention violations can be ameliorated by D-linking the extractee.

3. The complex nature of subject islands

3.1. Summary of key constraints

The data presented in sections 1 and 2, from both English and Spanish, show that licensing of extraction out of a subject involves the complex interplay of multiple constraints and conditions, key instances of which are listed and renumbered below, and in some cases slightly reformulated. (48, 49) are positional constraints:

- (48) **Preposition Stranding Constraint/PSC** (= 25)
No preposition can be stranded (%inside a moved constituent).
- (49) **Opacity Condition** (= 11)
Extraction from a constituent at the head of a non-trivial A-chain is degraded.

(50, 51) are thematically based constraints relating to argument structure:

- (50) **Thematic Extraction Condition** (= 19)
A θ -prominent argument occupying a θ -local A-position resists extraction.
- (51) **Argument Condition** (= 28)
Extraction out of an island is severely degraded when the extractee is not an argument.

Other interpretive properties of the constituent out of which extraction take place are also relevant:

- (52) **Specificity Condition** (= 21)
Extraction out of a specific nominal is degraded.

The Stranding, Opacity, Thematic and Specificity constraints are relatively weak and so create weak islands for extraction. However, the Argument Condition is much stronger and so results in a much higher degree of degradation. Even stronger is the (Spanish counterpart of) PSC in (48), which makes PPs strong islands for extraction of their object in Spanish.

D-linking of a constituent enhances its extractability from a weak island in certain contexts, in accordance with the generalisation below:³⁴

- (53) **D-linking Generalisation** (=29)
Extraction is ameliorated when the extractee is D-linked.

³⁴ (53) could be given a converse formulation as ‘Extraction is degraded when the extractee is not D-linked’, to bring it into line with the degradation constraints in (48-53). It should be noted in passing that (52) and (53) might be taken to follow from a specific implementation of the Intervention Condition (30), given the assumptions made in Starke (2001) and Haegeman (2012).

Sentences which do not violate any constraints are expected to be readily accepted by all speakers. But violation of a single constraint does not in itself lead to full ungrammaticality, unless this is a strong constraint such as the Argument Condition (51) and the PSC (for Spanish). Rather, the effect of constraint violations is cumulative and the ensuing degradation is proportionate to the number (and strength) of constraints violated. In addition, the perceived level of degradation may vary from one speaker to another. We account for this by supposing that speakers have differing *tolerance thresholds* (in the sense that some speakers may be more tolerant of particular constraint violations than others).

Sentences which violate only one of the weak constraints above will produce a relatively low degree of unacceptability: more sensitive speakers will detect some degree of awkwardness, whereas more tolerant speakers may simply accept them (so accounting for inter-speaker variation in judgments). The more constraints a sentence violates, the higher the degree of unacceptability which results, but as before, the perceived degree of acceptability may vary from one speaker to another, depending on their tolerance threshold. It should be acknowledged, however, that the scenario outlined here is somewhat idealized, because two additional factors have to be taken into account. The first is that some constraints are relatively strong (e.g. the Argument Condition, and the Preposition Stranding Condition in Spanish), whereas others are relatively weak (reflecting to some extent the traditional distinction between strong and weak islands). The second is that there is inter-speaker variation in respect of how tolerant of particular constraint violations speakers are. Both of these provisos need further investigation.

As Philip Hofmeister (pc) observes, inter-speaker variation and the level to which individual informants tolerate constraint violations can arguably also be attributed to a variety of performance factors, such as the cognitive load at the time informants gave the judgment, or some external distraction, or an inability to imagine a context in which the sentence would be appropriate, or a limitation in working memory resources that makes it difficult to create complex filler-gap dependencies. Conversely, in cases where informants seem to accept examples that display constraint violations, it may be because someone with more resources can actually extract the meaning out of them more easily.

Reinterpreting traditional acceptability notations in the light of our findings, let us provisionally propose that (as far as violation of weak constraints is concerned) a sentence is judged ? if involving violation of a single constraint, ?? if involving a double constraint violation, ?* if involving a triple violation, and * if involving a quadruple violation. Ultimately, it would be desirable of course to make this concept of graded judgments more precise and to devise an accurate notation that reflects the cumulative effect of constraint violations. We hope to return to this in future work. Also, it would be interesting to explore to what extent such graded judgments can be analysed experimentally (see for instance: Alexopoulou and Keller 2007, Haddican 2010, also Haddican and Plunkett to appear and references cited there). Finally, it is clear that in the same way that the Subject Condition has ‘dissolved’ into a set of more primitive constraints with a wider range of application, some (or all) of the conditions whose impact we discuss here may also end up being seen as the result of the interaction of more primitive conditions. Needless to say, this would not change the general line of our argumentation.

3.2 Extraction from subjects in Spanish

In the light of the assumptions made above, let’s take another look at the varying degrees of degradation resulting from extraction out of subjects in pre- and postverbal positions in Spanish. An important point to be borne in mind is the following. Chomsky (2007, 2008) argued that extraction out of a moved constituent can be launched from any position in the relevant movement chain (whether the base position, an intermediate position, or the superficial position). However, in this paper we depart from this position and have argued for the more traditional *strict cyclicity* account under which extraction out of a moved constituent is only possible from its final derived superficial position. We continue to adhere to this position throughout our discussion of English and Spanish in the remainder of the paper.

3.2.1 Structures which violate no constraint

Consider sentence (36b), repeated below:

- (36)(b) *¿De qué príncipe fueron publicadas [varias fotos comprometedoras]?*
of which prince were published several photos compromising?
'Of which prince were several compromising photos published?'

In this example, extraction is launched from within a postverbal passive THEME subject, which might either be positioned in situ in spec-*vP*, or have raised to spec-FocP (see section 2.1.4). In neither case will there be a violation of TEC (50): this is because if the subject occupies an A-bar position in spec-FocP it will not be subject to TEC; and if it occupies an A-position in spec-*vP* it will not violate TEC either, because THEME arguments are not prominent on the Thematic Hierarchy (15). Since the subject has not raised to spec-TP there is no Opacity violation either. Furthermore, since the subject is non-specific, no Specificity violation arises. And since the italicized extracted wh-PP is an argument, there is no violation of the Argument Condition either. Finally, since the preposition is not stranded, there is no violation of the Preposition Stranding Constraint (48). Accordingly, since no extraction constraints are violated in (36b), the resulting sentence is fully grammatical.

3.2.2 Structures violating a single constraint

Structures which violate a single constraint are severely degraded if the relevant constraint is a strong one, and weakly degraded if it is not. Consequently, a structure which violates the (strong) constraint against P-stranding in Spanish will lead to severe degradation in the case of structures like our earlier example (36a):

- (36)(a) **¿Qué príncipe fueron publicadas [varias fotos comprometedoras de]?*
which prince were published several photos compromising of?
'Which prince were several compromising photos of published?'

By contrast, structures which violate a weak constraint will lead to weak degradation, as can be illustrated in relation to (54):

- (54) *¿De qué coche han ganado dos carreras [los pilotos]?*
of which car have won two races the drivers
'Of which car have the drivers won two races?'

Extraction here takes place from a *vP*-final subject in a VOS pattern. Under our analysis in section 2.1.4, such a postverbal subject occupies an A-bar position as the specifier of a Focus projection in the low periphery, with the object in a higher (Topic) position. Accordingly, extracting a wh-PP out of the subject will not induce any Thematic or Opacity violation. Since no preposition has been stranded, there is no PSC violation either. However, the subject is specific; accordingly, extracting the italicized wh-PP from it leads to violation of the Specificity Condition. Speakers with a low 'acceptability threshold' will reject such examples in which just one constraint is violated, but more tolerant speakers (including many of our informants) find (54) acceptable.

Now consider (55) in which the postverbal subject *varios pilotos* ('several drivers') is followed by the object:

- (55) *¿De qué coche han ganado [varios pilotos] dos carreras?*
of what car have-3PL won several drivers two races
'Of which car have several drivers won two races?'

Following our discussion in section 2.1.4, we assume that in such examples the bracketed subject in the VSO structure remains in its initial merger position, spec-*vP*. Hence there is a Thematic violation in (55) by virtue of extracting the italicised wh-PP out of a thematically prominent (AGENT or perhaps BENEFICIARY) argument in a θ -local A-position. But there is no Opacity violation (because the subject

does not head a non-trivial A-chain), there is no Specificity violation (because the subject is not specific), and there is no Argument violation (because the extractee is an argument). The violation of a single constraint results in only mild degradation.

Now contrast (55) with (56):

- (56) *¿*Con cuántos rotos* han causado [unos vaqueros] tanta conmoción?
 with how.many holes have caused such a stir some jeans
 ‘With how many holes have some jeans have caused a stir?’

As in (55), the postverbal subject occupies its original spec-vP position. Thus, there is no Opacity violation. Its θ -role is that of CAUSE, which is relatively low on the Thematic Hierarchy (15). Consequently, there is no Thematic violation. Moreover, since the subject is non-specific, there is no Specificity violation either. However, the extracted constituent is an adjunct, so extraction induces violation of the Argument Condition (51).

Observe once again that the ensuing level of degradation in (56) is more severe than would be expected if all constraint violations contributed equally to unacceptability. This would seem to suggest that, as noted in section 3.1, constraints are of differing degrees of strength, with violation of the (strong) Argument Condition leading to a more severe violation than violation of the (weak) Thematic, Specificity or Opacity constraints³⁵.

3.2.3 Structures violating multiple constraints

Now consider (40b), repeated below:

- (40)(b)??¿*De qué coches* parece que [los conductores] fueron arrestados?
 of what cars seem-3sg that the drivers were arrested
 ‘Of which cars does it seem that the drivers were arrested?’

The subject has moved to the embedded spec-TP, where it heads a non-trivial A-chain, so that extracting the italicised wh-PP out of the subject leads to an Opacity violation. Since the subject is specific, there is an additional Specificity violation. However, since the subject is a low-ranked THEME argument, there is no Thematic violation. And since the extracted wh-PP is an argument, there is no Argument violation either. (40b) violates two constraints: it is doubly degraded and so it is rated as ??.

The same effect is seen in (57), which differs from (55) in that the quantifier *varios* (‘several’) has been replaced by the specific determiner *los* (‘the’).

- (57) ??¿*De qué coche* han ganado [los pilotos] dos carreras?
 of what car have-3PL won eth drivers two races
 ‘Of which car have the drivers won two races?’

The bracketed AGENT subject is in spec-vP. Hence there is a Thematic violation, but no Opacity violation, and no Argument violation either (because the extractee is an argument). In contrast with (55), the subject is specific, resulting in a Specificity violation. Sentence (57) is more degraded than (55), resulting in a double constraint violation.

More degraded still is our earlier example (44b):

³⁵ This assumption is equivalent to importing into the system the concept of constraint-ranking familiar from Optimality Theory (Prince and Smolensky 1993; Sells 1997; Dekkers et al 2000; Bresnan 2001): see also Keller (2000), Jäger and Rosenbach (2006), and Adli (2011). However, as noted earlier, we are simplifying a complex situation by assuming a binary (weak/strong) contrast, familiar from work on strong and weak islands. It could be argued that the constraint-ranking approach of OT is extensionally equivalent to a system in which constraints have potentially infinitely varying relative strengths.

- (44)(b) ?* ¿De qué electrodoméstico parece que [el inventor] causó tanta conmoción?
 Of which electrical device seem-3.sg that the inventor caused-3.sg such a stir
 ‘Of which electrical appliance does it seem that the inventor caused a big stir?’

Here, the italicized argumental PP is extracted out of a specific, thematically prominent AGENT subject in spec-TP at the head of an A-chain, so incurring a triple (TEC, Opacity and Specificity) violation, and leading to severe degradation.

(58) below is even more degraded:

- (58) *¿Con qué tipo de cicatriz en la cara dijiste que [el hombre] asesinó a una señora anciana?
 with what type of scar on the face said_{2.SG} that the man murdered to a lady old
 With what kind of scar on his face did you say that [the man] murdered an old lady?

This is because, by virtue of extracting an adjunct out of a specific, agentive subject at the head of an A-movement chain, (58) involves a quadruple (TEC, Opacity, Specificity, and Argument) violation, so leading to extremely severe degradation (especially as the Argument Constraint is a strong one).

3.2.4 D-linking and constraint repair

In accordance with the D-linking Generalisation (54), D-linking can serve to ameliorate certain weak island violations. In this connection, let’s take another look at the contrast between (46b) and (47):

- (46)(b) *¿Con cuántos rotos crees que han causado tanta conmoción [unos vaqueros]?
 With how.many holes think-2sg that have caused such a stir some jeans
 ‘With how many holes do you think that jeans have caused such a stir?’
 (47) ? ¿Con cuál de los tres tipos de cintura crees que están causando tanta conmoción
 with which of the three types of waist think-2sg that are causing such a stir
 [unos vaqueros]?
 some jeans
 ‘With which of the three types of waist do you think some jeans are causing such a stir?’

In (46b) an adjunct is extracted out of a postverbal subject which we take to be in spec-FocP, leading to violation of the (strong) Argument Condition. The relevant violation is substantially ameliorated in (47) where the extracted adjunct is D-linked. This example shows that D-linking can lessen the degradation arising from certain constraint violations.³⁶

3.3 Extraction from subjects in English

In this section, we return to extraction out of subjects in English. Our discussion will be brief, partly to avoid unnecessary repetition, and partly because (as noted earlier), the possibilities for extracting out of subjects are more limited in English than in Spanish, because English subjects canonically raise to spec-TP. We continue to assume that extraction is not possible from the intermediate or base position of a moved subject. From this, it follows that extraction out of moved subjects in English will always induce an Opacity violation.

As illustrated in section 3.3 for Spanish, each additional constraint violation leads to further degradation. In this connection, consider the contrast below:

- (59)(a) ?Of whom were [compromising pictures] published?
 (b) ??Who were [compromising pictures of] published?

³⁶ Thus while the Argument Condition and the (Spanish variant of the) Preposition Stranding Constraint are strong, the former can and the latter cannot be overcome by D-linking, suggesting that the nature of the conditions is fundamentally different. We also note that the English variant of PSC seems to be weaker than its Spanish counterpart. We leave these observations for future work.

(59a) involves a single (Opacity) violation and so is rated as ?³⁷, whereas (59b) involves a double (Opacity and Preposition Stranding) violation and so is rated as ??

We find further degradation in sentences such as:

(60) **What* was [the owner of] arrested?

Since the subject is specific, (60) involves a triple (Opacity, Specificity, P-Stranding) violation and so is severely degraded.

The degradation is even more severe in:

(61) ***What* did [the owner of] damage the painting?

Here, there is not only violation of the same three (Opacity, Specificity, and P-Stranding) constraints as in (60), but also a further TEC violation, since extraction takes place out of an AGENT subject. This quadruple constraint violation therefore leads to extremely severe degradation.

As noted in section 3.2.4, D-linking the extracted constituent can serve to ameliorate constraint violations. We illustrate this in (62):

(62)(a) *Of which famous footballer* were [compromising pictures] published?

(b)?*Which famous footballer* were [compromising pictures of] published?

(c)??*Of which famous football club* was [the owner] arrested?

(d)**Which famous football club* did [the owner of] fire the manager?

(62a) is structurally parallel to (59a), and yet (62a) is relatively acceptable, whereas (59a) is marginal (= ?). Likewise, (62b) is parallel in structure to (59b), and yet (62b) is only slightly marginal (= ?), whereas (59b) is very marginal (= ??). Similarly, (62c) is rated as very marginal (= ??), whereas the parallel structure in (60) is rated as severely degraded (= *). Finally, (62d) is severely degraded (= *), whereas the parallel structure in (61) is even more severely degraded. The systematic disparity between the examples in (62) and their structural counterparts in (59-61) follows from the D-linking Generalisation (54): the use of a D-linked extractee in (62a-d) serves to ameliorate the constraint violations which occur in the corresponding examples in (50-61).

4. Conclusions

In this paper we have discussed the complex nature of extraction from subjects and have shown how, in the light of theoretical developments over the last 40 years, the effect of Chomsky's (1973) Subject Condition can be reinterpreted as resulting from the cumulative effect of distinct interacting factors that contribute to the degradation of extraction from subjects. Properties of both the subject and the extractee have been shown to play a role in the licensing of extraction. We have presented evidence that extraction is governed by the following constraints:

(48) **Preposition Stranding Constraint/PSC** (= 25)

No preposition can be stranded (% inside a moved constituent)

(49) **Opacity Condition** (= 11)

Extraction from a constituent at the head of a non-trivial A-chain is degraded

(50) **Thematic Extraction Condition** (= 19)

A θ -prominent argument occupying a θ -local A-position resists extraction

³⁷ Note, however, that for informants who have a constraint against preposition pied-piping (see fn.5), (59a) will also involve a double constraint violation and a lower acceptability rating.

(51) **Argument Condition** (= 28)
Extraction out of an island is severely degraded when the extractee is not an argument

(52) **Specificity Condition** (= 21)
Extraction out of a specific nominal is degraded

We also showed that D-linking of a constituent enhances its extractability, in accordance with (54):

(53) **D-linking Generalisation**
Extraction is ameliorated when the extractee is D-linked

In the execution of our analysis, we also argued against the assumption (Chomsky 2007, 2008) that extraction out of a moved constituent is possible from any position in a movement chain, arguing instead in favour of a *strict cyclicity* account on which extraction out of a moved constituent is only possible from its final derived position.

Decomposing the Subject Condition into a set of subconditions whose effect is cumulative allows a more fine-grained scale of judgments: the more conditions which are violated the more degraded the outcome is. To account for inter-speaker variation reported in the literature we postulated that different speakers have different tolerance thresholds.

It is to be hoped (and expected) that future theoretical developments will lead to further decomposition of constraints like those in (48-53), so that even the principles we have listed here end up being decomposed into primitive constraints. Any such development will be beneficial and will make a more refined account of grammaticality judgements possible.

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