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On the nature of escapable relative islands

Ken Ramshøj Christensen & Anne Mette Nyvad

It is generally assumed that universal island constraints block extraction from relative clauses. However, it is well-known that such extractions can be acceptable in the Scandinavian languages. Kush & Lindahl (2011) argue that the acceptability in Swedish is illusory; relative clauses that allow extraction have a different structure (small clause structure) from those that block extraction (true relatives, CPs). We present data from an acceptability survey of relative clause extraction in Danish. In the survey, extraction significantly decreased acceptability but we found no statistically significant effect of the ability of the verb to take a small-clause complement. We also found no difference between *som* 'that/who/which' and *der* 'that/who/which', both of which can head a relative clause while only *som* can head a small clause. We argue that our results do not warrant the stipulation of a structural contrast between acceptable and unacceptable extractions, and that variation in acceptability stems from processing.

Keywords acceptability, Danish, extraction, island, relative clause, small clause, Swedish, syntax

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1. INTRODUCTION

It is standardly assumed that certain types of syntactic structures are islands in the sense that extraction from them is blocked due to universal syntactic constraints. Classic examples include the Complex NP Constraint and the *Wh*-island Constraint (Ross 1967, Phillips 2013):

(1) Complex NP: Complement clause
  a. She got the [$_{NP}$ idea [$_{CP}$ that he needed a haircut]].
  b. *__What__$_1$ did she get the [$_{NP}$ idea [$_{CP}$ that he needed __$_1$]]?

(2) Complex NP: Relative clause
  a. She wanted to meet [$_{DP}$ the [$_{NP}$ man] [$_{CP}$ who recorded the conversation]]?
  b. *__What__$_1$ did she want to meet [$_{DP}$ the [$_{NP}$ man] [$_{CP}$ who recorded __$_1$]]?

(3) *Wh*-island
  a. He knew [$_{CP}$ where$_1$ she left the car __$_1$].
  b. *__What__$_2$ did he know [$_{CP}$ where$_1$ she left __$_2$ __$_1$]]?

Both the Complex NP Constraint and the *Wh*-island Constraint are subsumed under the notion of subjacency (Chomsky 1973, 1977) and the phase impenetrability condition (Chomsky 2001). In essence (leaving aside details irrelevant for the present paper), subjacency and the phase impenetrability condition both state that any phrasal extraction from an embedded CP must proceed in successive cyclic steps via the local Spec-CP. Extracting, say, a *wh*-element from an embedded clause must stop over at the left edge (i.e. Spec-CP) of the embedded clause. If this structural position is already filled, e.g. by another *wh*-element, as in (3b) above, such extraction is ungrammatical.

However, it has been argued that the Scandinavian languages allow extractions from certain types of islands, including relative clauses and *wh*-questions (e.g. Erteschik-Shir 1973, 1982; Engdahl 1982, 1997). Christensen, Kizach & Nyvad (2013a, b) examined *wh*-movement and extraction from *wh*-islands; short extraction (within the embedded clause), shown in (4a) below, was found to be significantly more acceptable than long extraction (out of the embedded clause to Spec-CP in the matrix clause), illustrated in (4b). In turn, long extraction was significantly more acceptable than extraction across an intervening *wh*-element (a so-called '*wh*-island violation'), see (4c).

(4) a. Ved hun godt [$_{CP}$ **hvad**$_1$ man kan leje __$_1$ dér]?
knows she well what one can rent there
'Does she know what you can rent there?'

b. **Hvad**$_1$ ved hun godt [$_{CP}$ __$_1$ at man kan leje __$_1$ dér]?
what knows she well that one can rent there
'What does she know that you can rent there?'

c. ??**Hvad**$_1$ ved hun godt [$_{CP}$ **hvor**$_2$ man kan leje __$_1$ __$_2$]?
what knows she well where one can rent
'What does she know where you can rent?'

According to Christensen et al. (2013a, b), *wh*-islands do not block extraction (and hence, are not islands) in Danish and the patterns of graded acceptability in long extractions are better explained by a processing account than a syntactic approach with island constraints. Apparent *wh*-island violations are not ungrammatical but, rather, they are degraded due to working memory load, as indeed is long extraction in general. (Working memory load can, for example, be measured in terms of the number of discourse referents between antecedent and trace (Gibson 1998, 2000), or in terms of the number of intervening maximal projections (Hawkins 1994, 2004).)[1] In other words, extraction from an embedded clause is associated with decreased acceptability. Since the apparent degraded acceptability in violations of the *Wh*-island Constraint can be accounted for by working memory load, and since such violations are arguably grammatical in Danish (at least), it is natural to explore whether other cases of island violations can be accounted for in similar ways. Furthermore, since it is argued that syntactic constraints on extraction from islands are universal (e.g. Ross 1967, Kush

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& Lindahl 2011, Phillips 2013), the fact that there is evidence (Christensen et al. 2013a) that extraction from *wh*-islands is possible in Danish, a language which is structurally very similar to English (and Swedish), seriously weakens the basis for universality. In this paper we provide evidence to suggest that extraction from another type of island, namely relative clauses, is indeed also possible in Danish.

Kush & Lindahl (2011) assume that the constraints that bar extractions from islands are universal, and that any violations are only apparent (see also Kush, Omaki & Hornstein 2013). Specifically, Kush & Lindahl argue that Swedish relative clauses that allow extraction have a structure different from otherwise parallel ones that block extraction. According to Kush & Lindahl, verbs such as *träffa* 'meet', as in (5), take a normal DP object containing an NP modified by a CP relative clause, which is a 'true relative' that blocks extraction.

(5) *De blommorna **träffade/kysste** jag [$_{DP}$ en man [$_{CP}$ [$_{C^\circ}$ som] sålde __]].
those flower.PL.DEF met/kissed I a man who sold
'Those flowers I met/kissed a man who sold.'
(Kush & Lindahl 2011: ex. (4); our translation)

This is the standard analysis for relative clauses. Verbs such as *känna* 'know', as in (6), on the other hand, are argued to select a small clause (SC), that is a Predicate Phrase (PredP) complement headed by the relative complementizer *som* with the DP *en man* 'a man' in its specifier.

(6) De blommorna **känner** jag [$_{PredP}$ en man [$_{Pred^\circ}$ som] säljer __].
those flower.PL.DEF know I a man who sells
'Those flowers I know a man who sells.'
(Kush & Lindahl 2011: ex. (3a); our translation)

A small clause (PredP) is not assumed to block extraction. This analysis makes it possible to maintain a universal account of islands: escapable islands are not really islands, they are small clauses (see also Kush et al. 2013). However, Kush & Lindahl (2011) tested only two verbs, namely, *se* 'see' and *träffa* 'meet', a fact that significantly weakens their argument to begin with.[2]

In Danish, as in Swedish, *som* is ambiguous. It can either introduce a subject relative clause (SUBJ REL) or an object relative clause (OBJ REL; *som* in C°), as in (7) below, or head a small clause (SC), a PredP with *som* in Pred° and the subject in Spec-PredP, as in (8).

(7) a. Jeg har aldrig mødt manden [$_{CP}$ **som** kender dig]. (SUBJ REL)
I have never met man.DEF that knows you
'I have never met the man that knows you.'
b. Jeg har aldrig mødt manden [$_{CP}$ **som** du kender __]. (OBJ REL)
I have never met man.DEF that you know
'I have never met the man that you know.'

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(8) Vi har altid anerkendt [$_{SC}$ manden **som** lingvist]. (SC)
we have always recognized man.DEF as linguist
'We have always recognized the man as a linguist.'

Furthermore, small clauses with *som* are often ambiguous with respect to scope (narrow scope: modifying the NP in the object DP, wide scope: modifying the entire VP), as in (9), where the SC *som lingvist*(*er*) 'as (a) linguist(s)' is a free predicative.

(9) a. Vi har aldrig mødt [$_{DP}$ manden [$_{SC}$ **som** lingvist]]. (Narrow scope)
we have never met man.SG.DEF as linguist.SG
'We have never met the man (in his capacity) as a linguist.'
b. Vi har aldrig [$_{VP}$ mødt manden] [$_{SC}$ **som** lingvister]. (Wide scope)
we have never met man.SG.DEF as linguist.PL
'We have never met the man (in our capacity) as linguists.'

Kush et al. (2013:254) argue that the lexical ambiguity of *som* (or rather, the syncretism between *som* as C° and *som* as Pred°) has an ameliorating effect on acceptability. In Danish, subject relative clauses can also be introduced by *der* instead of *som* (Vikner 1991); that is, *der* can replace *som* in (7a), but not in (7b), (8) or (9). Subject relative clauses with *der* are more frequent than those with *som*. A corpus search in the Danish online corpus *KorpusDK* (which consists of 56 million words) resulted in 7,937 hits for *som ikke* 'that not' and 13,086 for *der ikke* 'that not'; *som*/*der* + *ikke* is unambiguously the beginning of a subject relative clause. As illustrated in (10a) below, both *som* and *der* may introduce a subject relative.

(10) a. Det er [$_{DP}$ manden [$_{CP}$ **som/der** **ikke** fik jobbet]]. (SUBJ REL)
it is man.DEF that not got job.DEF
'It is the man that didn't get the job.'
b. Det er [$_{DP}$ manden [$_{CP}$ **som/*der** hun **ikke** kan lide]]. (OBJ REL)
it is man.DEF that she can not like
'It is the man that she doesn't like.'
c. *Det er [$_{DP}$ manden [$_{CP}$ **som/der** **ikke** hun kan lide]]
it is man.DEF that not she can like

The example in (10b) shows that *der* is ungrammatical as the head of an object relative. In embedded clauses, sentential adverbials, e.g. negation as shown in (10b), intervene between the subject and the verbs.[3] As shown in (10c), placing negation before the subject is ungrammatical.

The complementizer *der* unambiguously introduces a subject relative clause, whereas *som* is (locally) ambiguous between introducing either a subject or object relative, and a small clause. Hence, any apparent ameliorating effect (i.e. increased acceptability) due to the ambiguous nature of *som* should not be found with *der*, because only *som* can be the head of a small clause. Furthermore, if extraction is indeed possible only from small clauses ('apparent' relative clauses) headed by *som*,

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then otherwise parallel examples with *der* should be significantly less acceptable because they must be 'true' relative clauses. In other words, sentences that differ only with respect to the presence of either *som* or *der* should have significantly different acceptability ratings.

This paper presents data from a survey of the acceptability of extractions from Danish relative clauses with both *som* and *der*. In order to avoid potential artifacts of lexical idiosyncrasies of particular verbs, we included 16 different matrix verbs. We made the following three main predictions:

Prediction 1. Extraction from an embedded clause reduces acceptability
Based on prior findings, we predict extraction to be a significant predictor of acceptability. Sentences with extraction, [+Extraction], from relative clauses are less acceptable than corresponding examples without extraction, [–Extraction]. (Note that this prediction is independent of the choice of any particular syntactic theory because the asymmetry also follows from, e.g., linearization requirements, word order preference, frequency, derivational complexity, working memory, etc.).

Prediction 2. The acceptability of extraction from a relative clause is not dependent on the SC-selecting ability [±SC] of the matrix verb
From a processing point of view, when comparing a number of different verbs, we predict that there is no significant interaction between [±Extraction] and [±SC]. Individual differences between particular verbs may stem from idiosyncratic semantic or pragmatic differences, as well as from differences in frequency of occurrence. (All things being equal, more frequent items, sentence types as well as words, are more acceptable than less frequent items, assuming that acceptability, just like response time, reflects processing cost, see Fanselow & Frisch 2006; Christensen et al. 2013a, b).

Prediction 3. The acceptability of extraction from a relative clause is not dependent on the choice of complementizer COMP
All things being equal, we predict that there is no significant difference in acceptability between sentences with *som* and with *der*, because they introduce otherwise identical relative clauses. On the other hand, if *som* introduces a small clause instead of a relative clause, as argued by Kush & Lindahl (2011), sentences with *som* should be significantly more acceptable than corresponding sentences with *der* (which is incompatible with a small-clause reading).

2. NORMING STUDY

In order to ensure that the matrix verbs in our stimuli were categorized correctly as either SC-selecting ([+SC]) or not SC-selecting ([–SC]), we conducted a norming study prior to the actual acceptability study. Thirty-two participants

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[+SC]	Frequency	Rating	[–SC]	Freqency	Rating
behøve 'need'	133	4.84	*modarbejde* 'oppose'	40	3.29
foretrække 'prefer'	215	6.55	*tilgive* 'forgive'	152	2.90
beholde 'keep'	486	5.90	*kysse* 'kiss'	235	3.06
mistænke 'suspect'	424	4.65	*drille* 'tease'	202	3.26
anmelde 'report'	644	5.42	*genere* 'bother'	324	1.77
udnytte 'exploit'	769	6.23	*myrde* 'murder'	891	2.42
kende 'know'	7,909	6.06	*træffe* 'meet'	1,621	3.06
se 'see'	25,778	6.06	*møde* 'meet'	2,762	4.45
Mean	4,545	5.71	Mean	778	3.03

Table 1. Verbs included in the target stimuli, their respective [±SC] classification, frequency (number of occurrences in the Danish online corpus, *KorpusDK*, consisting of 56 million words), and mean acceptability rating (on a seven-point Likert scale). Verbs on the same row were subsequently paired in the stimulus for the acceptability survey and appeared as matrix verbs in the stimulus in otherwise identical sentences.

(all native speakers of Danish) answered a questionnaire on Google Drive (https://drive.google.com) in which they were asked to rate sentences on a Likert scale, ranging from 1 (*ugrammatisk* 'ungrammatical') to 7 (*helt OK* 'perfectly OK'). The list of sentences contained 36 target sentences and 44 unrelated fillers in randomized order.

In each target sentence, in order to prevent a wide scope reading of *som*, as in (9b) above, the subject was plural while the SC predicate was singular:

(11) Kammeraterne har **kendt** [$_{SC}$ Troels som barn].
friend.PL.DEF have known Troels as child.SG
'His friends have known Troels as a child.'
(Prediction: Acceptable, *kendt*: [+SC])

(12) Pigerne har **kysset** [$_{SC}$ prinsen som frø].
girl.PL.DEF have kissed prince.DEF as frog.SG
'The girls have kissed the prince as a frog.'
(Prediction: Not acceptable, *kysse*: [–SC])

The verbs in sentences with a mean rating ≤ 3.5 (eight verbs) were categorized as [–SC], and those with a mean rating ≥ 4.5 (12 verbs), were categorized as [+SC]. Seven of these eight [–SC] verbs were then pseudo-matched with seven [+SC] verbs based on the frequency of occurrence of each of the verbs (the exact word form) in the Danish online corpus *Korpus.dk*, see Table 1. (The verb *overtale* 'convince', [–SC], freq. = 245, rating = 2.39, was excluded from the final set because there is a strong preference for it to occur as a ditransitive verb.) Because *møde* 'meet' is the natural Danish translation of the Swedish *träffa*, which is one of the two verbs tested by Kush & Lindahl and which they categorized as [–SC], we included *møde* in the [–SC] category, and paired it with a [+SC] verb, even though it received an

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intermediate acceptability rating. Below we also test the effects of placing *møde* in the [+SC] category and of leaving it out.

3. ACCEPTABILITY SURVEY

On the basis of the results of the norming study, we constructed a number of sentences similar to the examples cited in Kush & Lindahl (2011), keeping constant sentence length (11 words), matrix tense (present) and aspect (perfect), and animacy of subject and object ([+Animate]). We chose to use the present perfect in the matrix clause in order to avoid potential subject/object ambiguities that might influence acceptability. Our stimuli consisted of 16 sets of four sentences as in (13), eight sets with *som* and eight sets with *der*, i.e. 64 test sentences in total plus 18 unrelated fillers (nine simple, grammatical fillers and nine clearly ungrammatical, complex fillers).

(13) a. [+SC, –EXTR]
Pia har engang **set** en pensionist [**som/der** havde sådan en hund].
Pia has once seen a pensioner COMP had such a dog

b. [+SC, +EXTR]
Sådan en hund har Pia engang **set** en pensionist [**som/der** havde __].
such a dog has Pia once seen a pensioner COMP had

c. [–SC, –EXTR]
Pia har engang **mødt** en pensionist [**som/der** havde sådan en hund].
Pia has once met a pensioner COMP had such a dog

d. [–SC, +EXTR]
Sådan en hund har Pia engang **mødt** en pensionist [**som/der** havde __].
such a dog has Pia once met a pensioner COMP had

In each [+Extraction] sentence the extracted object was compatible with being temporarily attached as the object of the matrix verb (matrix verb compatibility, see Christensen et al. 2013a, Kizach, Nyvad & Christensen 2013). Keeping this factor constant is important because matrix verb incompatibility would otherwise lower acceptability. In addition, semantic cohesion between matrix and embedded clause was kept constant to ensure that potential reductions in acceptability would not be due to lack of semantic cohesion. For example, *She'll get totally drunk if she drinks that whisky before the game* is significantly more acceptable in English than *She'll get totally drunk if she loses that comb before the game*; for Danish data, see Poulsen (2008). In our stimuli, all sentences were cohesive (e.g. both *se* 'see' ([+SC]) and *møde* 'meet' ([–SC] cohere with *a pensioner who had such a dog*). Similarly, the well-formedness of the information structure is kept constant. According to Engdahl (1997), the possibility of extracting from so-called islands in the Scandinavian languages is due to a preference for utterance structures that involve the fronting of either contrastive or continuous topics. Thus, in order for an extraction

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	Estimate	Std. Error	*p*-value	
(Intercept)	4.6726	0.6718	.0000	***
Frequency	0.0001	0.0000	.0000	***
COMP	1.1138	0.8583	.1944	
Trial	0.0594	0.0296	.0451	*
SC	0.4890	0.9584	.6099	
Extraction (EX)	−2.9073	0.8537	.0007	***

*** $p < .001$; * $p < .05$

Table 2. Summary of fixed effects. 'Estimate' indicates the relationship between acceptability rating (the output) and each of the predictors (Trial, Frequency, Extraction, SC, COMP, and possible interactions).

to be acceptable, two pragmatic factors have to be respected: (i) topicalization must be motivated by the context, and (ii) the remainder of the utterance has to be an appropriate (i.e. coherent and relevant) comment on the fronted topic. In other words, if a sentence is pragmatically ill-formed without extraction, it will also be ill-formed with extraction. (See also the point about semantic cohesion above.) For example, in ??*Den teorin känner jag mannen som tror på* 'That theory, I know the man who believes in', the embedded predicate *tror på* 'believes in' denotes a 'many-to-one relation', which, according to Engdahl (1997:28), makes the sentence odd out of context (usually there are more than one believers of a theory), whereas *Den teorin känner jag ingen som tror på* 'That theory, I do not know anyone who believes in' is pragmatically more appropriate (see also Allwood 1982). In our experiment, all sentences were presented without context, but all of them conformed to the requirement that the comment must be appropriate.

The stimuli were distributed over four lists such that each participant saw each matrix verb only once, and such that [±SC], [±Extraction] as well as COMP (*som*/*der*) were distributed evenly. The same 18 fillers occurred on all four lists, such that each list consisted of 34 sentences in randomized order. The four lists were presented as online surveys using Google Drive. The task consisted of acceptability judgments on a seven-point Likert scale (1 = *helt uacceptabel* 'completely unacceptable, 7 = *helt acceptabel* 'completely acceptable').

The online survey was sent to staff and student forums on Aarhus University's intranet. In total, 112 people (all native speakers of Danish) participated in the survey (22 male, 90 female; participants per list: 22, 32, 28, 30), mean age 26.07 years (range = 18–71, SD = 7.57).

The results were subjected to a linear mixed-effects analysis using the *lme4*-package for R (R Development Core Team 2009; Bates, Maechler, & Bolker 2011). The model included random intercepts and slopes for items and participants (Barr et al. 2013). The results of the analysis are presented in Table 2.

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As shown in Table 2, when extraction increases by one unit (i.e. from [–Extraction] to [+Extraction], acceptability decreases (the estimate is negative) by 2.9073 units (when the other factors are kept constant), which is a significant change ($p = .0007$). Likewise, when SC increases by one unit (i.e. from [–SC] to [+SC]), acceptability increases by 0.4890 units, a non-significant change, $p = .6099$. Trial refers to the order of presentation, the position of a sentence on the randomized list; a positive effect of Trial on acceptability, as evidenced by the positive estimate value, 0.0594, indicates a significant repetition effect ($p = .0451$). All things being equal, the more sentences the participants saw, the higher their acceptability ratings.

As outlined in Section 1 above, we made three predictions about extraction from relative clauses. Prediction 1, that extraction from an embedded clause reduces acceptability; Prediction 2, that the acceptability of extraction from a relative clause is not dependent on the SC-selecting ability [±SC] of the matrix verb; and Prediction 3, that the acceptability of extraction from a relative clause is not dependent on the choice of complementizer COMP (*som*/*der*). As the statistical analysis in Table 1 above shows, all three predictions were borne out: While the effect of [±Extraction] was significant ($p = .0007$) (Prediction 1), there were no significant effects of [SC] (Prediction 2) or COMP (Prediction 3). In addition, none of the potential (two-, three-, or four-way) interactions between Trial, Extraction, SC, and COMP factors was significant ($p \geq .1811$) indicating that the participants did not change their judgments as a function of exposure. That acceptability was more or less stable is also illustrated in Figure 1. From mere visual inspection it is clear that there was not even a (non-significant) trend or consistent [±SC] contrast across the individual participants (the slopes of the lines are very flat and go in different directions), whereas the effect of Extraction had a very stable (and statistically significant) effect across participants (a steep negative slope).

As explained above, we included the verb *møde* 'meet' as [– SC] (see Table 1) even though it received an intermediate acceptability rating in the norming study. The reason for this was that it corresponds to one of the two verbs examined in Kush & Lindahl (2011). To see if the [±SC] status of *møde* affected the overall results, we ran the mixed-effects model again, with *møde* categorized as [+SC]. The results were basically the same – Trial (i.e. the structural repetition effect): $p = .0041$, Frequency and Extraction: $p < .0001$, and all the other effects $p > 0.05$.

We also ran the model with both *møde* 'meet' and *se* 'see' left out (since they form a pair in Table 1), but again, the results were essentially the same – Trial: $p = .0008$, Frequency and Extraction: $p < .0001$, and all other effects $p > .33$. However, in this model, the Trial × Extraction interaction was significant (estimate = –.0556, $p = .0405$), which renders the main effects of Trial and Extraction uninterpretable. The effect of [±SC] was still not significant, $p = .6524$. Since changing the [SC] value of *møde* did not change the overall results and since we have no theoretical or other reason to exclude *møde* and *se* (the two verbs tested by Kush

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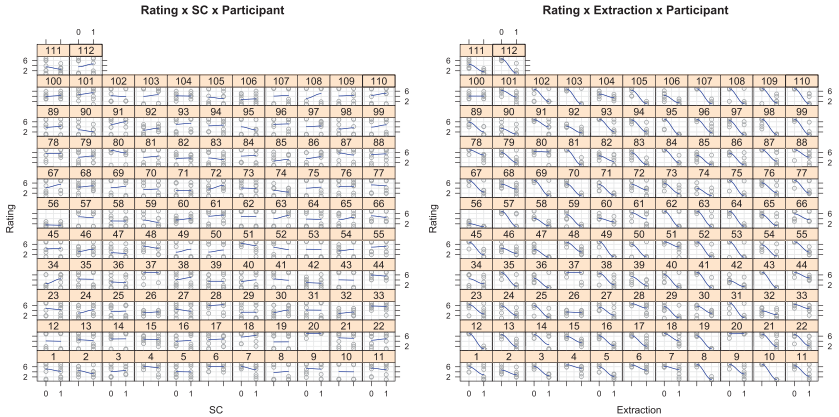

Figure 1. (Colour online) By-subject plots of acceptability (Rating) as the function of [±SC] (left) and [±Extraction] (right). On the *x*-axis, 0 = [–SC/Extraction], 1 = [+SC/Extraction]. The numbers (1–112) above each sub-plot refer to individual participants.

& Lindahl), we kept both in the model. Below we thus only refer to the results in Table 2.

To explore the relative distribution of the acceptability of the 16 individual verbs, we plotted the mean acceptability of each verb along [–Extraction], the *x*-axis in Figure 2, and [+Extraction], the *y*-axis. From mere visual inspection, it is clear that [±SC] does not manifest itself as distinct categories, whereas [±Extraction] does.

4. DISCUSSION

According to Kush & Lindahl (2011), extractions from (apparent) relative clauses under verbs that are [+SC] should be significantly more acceptable than extractions from clauses under [–SC] verb. However, our results do not support Kush & Lindahl's hypothesis for Danish. As shown in Table 2, there is a significant main effect of extraction independent of [±SC], COMP and Trial: [+Extraction] is associated with a significant decrease in acceptability ($p < .0001$), recall Prediction 1. This result is exactly what is predicted from a processing perspective (Christensen et al. 2013a, b).

As is also evident from Table 2, neither [±SC] nor COMP, nor any of the interaction effects involving these factors, are statistically significant. Hence, our Predictions 2 and 3 are also borne out. As observed, there is no significant difference between sentences headed by [+SC] and [–SC] verbs, and there is no difference between extractions from relative clauses headed by *som* and those headed by *der*. Even though there was a main effect of Trial (all things being equal, the more sentences the participants saw, the higher their acceptability ratings), the absence of

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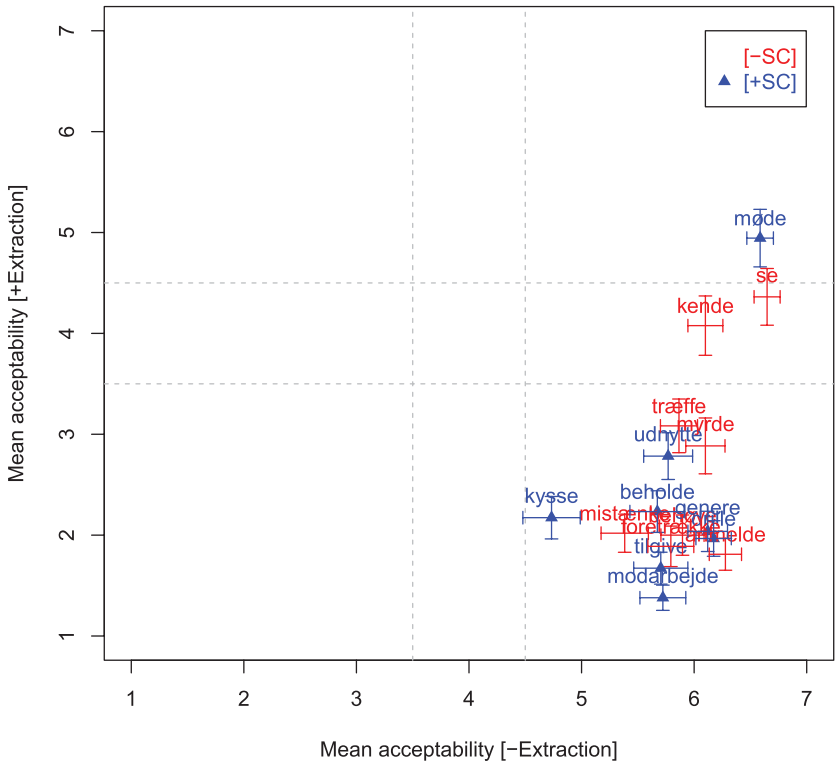

Figure 2. (Colour online) The 16 matrix verbs plotted against the mean acceptability rating without extraction (*x*-axis) and with extraction (*y*-axis). Red circles indicate [–SC] verbs, blue triangles [+SC] verbs. Error bars ±1 standard error. The grey dotted lines correspond to the cut-off points for acceptability used in the norming study.

any significant interaction between Trial and SC also shows that the participants' acceptability judgment of [+SC] versus [–SC] did not change over time as a result of repeated exposure. Figure 1 also shows that acceptability is stable across participants when it comes to extraction, whereas [±SC] did not show any consistent contrast or trend.

As is clear from Figure 2, the verbs cluster in the high end (towards the right) of the [–Extraction] acceptability scale (*x*-axis), whereas acceptability is distributed on a continuum along the [–Extraction] (vertical) acceptability scale (*y*-axis). This distribution is fully compatible with a processing model, while it seems incompatible with the absolute model of Kush & Lindahl (2011) without additional stipulations. Interestingly, the three most frequent verbs, *se* 'see', *kende* 'know', and *møde* 'meet', also have the highest ranking, while they do not seem to form a distinct category that separates them from the other verbs. It should also be noted that the [–SC] verb *møde*

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	møde [–SC]	*træffe* [–SC]	*kysse* [–SC]	*kende* [+SC]	*se* [+SC]
Møde [–SC]	—	***	***	**	n.s.
Træffe [–SC]	***	—	***	**	***
Kysse [–SC]	***	***	—	***	***
Kende [+SC]	**	**	***	—	n.s.
Se [+SC]	n.s.	***	***	n.s.	—

*** $p < .001$, ** $p < .01$; n.s. = not significant ($p > .05$)

Table 3. Summary of post hoc mixed-effects models fitted to the [+Extraction] condition with verb as predictor. The table shows only five verbs, but the rest of the 16 verbs were included in the analysis.

received the highest mean rating, which contrasts with Kush & Lindahl's results from Swedish.

To see whether the acceptability of [+Extraction] of the individual verbs was significantly different, we fitted post hoc mixed-effects models to the [+Extraction] (the *y*-axis in Figure 2) subset and focused on the differences between the four individual verbs corresponding to those mentioned in Kush & Lindahl (2011), *se* 'see', *kende* 'know', *møde* 'meet', and *kysse* 'kiss', as well as *træffe*, which also means 'meet' (*møde* and *træffe* differ in style and may or may not differ in [SC] value).[4] The results are summarized in Table 3.

As the results in Table 3 show, *se* and *møde* do not differ significantly from each other though they have different [SC] values, and *kysse* differs from the others regardless of [±SC]. In other words, had we chosen to include only two verbs with opposite [SC] values, as Kush & Lindahl (2011) did, such as *kysse* and *kende*, we would have found a significant result, but this result would probably have been due to the selection of verbs alone, not to a real contrast in [±SC]. Overall, our results strongly suggest that Kush & Lindahl's claims about Swedish do not hold for Danish and that the result in Kush & Lindahl (2011) may be an artifact of the particular choice of verbs (i.e. selection bias).

There are at least two possible interpretations of the data presented here. The first interpretation (to be dismissed) is that all the sentences with extraction are actually ungrammatical – they all involve a violation of the Complex NP Constraint; nevertheless, the exceptionally high frequency of the matrix verbs has a positive effect on the overall acceptability of the sentences in which they occur. That is, frequency (not the lexical ambiguity of *som*) has an ameliorating effect on acceptability. However, it seems unlikely that high frequency alone would make an ungrammatical sentence grammatical; such an effect would presumably only be possible with grammatical strings (as Sprouse 2007 argues for priming/repetition effects). As far as we can ascertain, frequency has no ameliorating effect on the ungrammaticality of the examples in (14) (*se* is highly frequent, frequency in *KorpusDK* = 25,778,

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whereas *kysse* is not, frequency = 235, see Table 1), as both examples are starkly ungrammatical:

(14) a. *Jeg gad vide hvem hvorfor hun har **set**.
I would.like know.INF who why she has seen
'*I would like to know who why she has seen.'

b. *Jeg gad vide hvem hvorfor hun har **kysset**.
I would.like know.INF who why she has kissed
'*I would like to know who why she has kissed.'

Frequency can be interpreted as a type of repetition effect that does not ameliorate ungrammaticality, as illustrated in (14) above. Similarly, Christensen et al. (2013a) report that extractions from *wh*-islands, such as (4c) above, showed a repetition effect (the acceptability of particular structures increased slightly as a result of repeated exposure during the experiment), whereas ungrammatical fillers showed no such effect. Following Sprouse (2007:124), who argues that repetition effects on acceptability are only possible with grammatical structures, Christensen et al. (2013a) argue that island extractions are indeed grammatical, though highly degraded.

The second interpretation is that extractions from relative clauses are in fact grammatical with varying degrees of acceptability. The factor/feature that separates examples with a high acceptability rating from those with a low acceptability rating remains to be discovered (our results clearly suggest that [±SC] is not the crucial factor). This interpretation is also compatible with the amelioration effect of frequency, since amelioration presumably only works with grammatical strings. However, there is no need to stipulate a different type of structure in order to enable extraction. In Danish, extraction from, e.g., embedded interrogatives, which are normally taken to be islands (for example in English), is also possible, which independently suggests that there is an 'escape hatch', see (15).

(15) a. *Ved hun ikke [$_{CP}$ **hvad** om Lars har fundet __]
knows she not what if Lars has found
'*Does she not know what if Lars has found?'

b. **Hvad** ved hun ikke [$_{CP}$ __ om Lars har fundet __]?
what knows she not if Lars has found
'What does she not know if Lars has found?'

(Christensen et al. 2013b:248)

This 'escape hatch' is an optional specifier position that can only contain an empty category, such as a silent copy/trace of movement. In other words, this escape hatch is independently motivated (see Nyvad, Christensen & Vikner 2014 for a detailed account of stacked complementizers, embedded V2, and island extractions). As shown in (15a) above, in Danish as in English, clause-internal (short) *wh*-extraction is ungrammatical in an embedded interrogative clause headed by *om* 'if'. However, as shown in (15b), Danish is different from English when it comes to long extraction:

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in Danish, extraction from an embedded interrogative clause headed by *om* 'if' is perfectly grammatical.

There is no structural contrast because escapable and inescapable islands (i.e. acceptable and unacceptable extractions from relative clauses) both have the same structure with the available escape hatch. Similarly, extraction from an embedded *wh*-question, as in (4c) above, repeated here as (16b), also requires an 'escape hatch', an additional Spec-CP that is incompatible with an overt operator, as illustrated in (16a):

(16) a. *Ved hun godt [$_{CP}$ **hvad**$_1$ **hvor**$_2$ man kan leje $\_\__1$ $\_\__2$]?
knows she well what where one can rent
'Does she know what where you can rent?'

b. ??**Hvad**$_1$ ved hun godt [$_{CP}$ $\_\__1$ **hvor**$_2$ man kan leje $\_\__1$ $\_\__2$]?
what knows she well where one can rent?
'What does she know where you can rent?'

The factors that make extraction possible/acceptable are presumably extra-syntactic, e.g. definiteness (Allwood 1982, Engdahl 1982), semantic dominance (Erteshik-Shir 1973, 1982), or pragmatic salience (Deane 1991) – all of which are fully compatible with a processing account.

Whatever factor separates the verbs that facilitate extraction from relative clauses from those that do not, it cannot be the lexical ambiguity of *som*; in our results, there was no difference between the potentially ambiguous *som* and the unambiguous *der*.

The null hypothesis must be that two strings that on the surface appear to have the same structure, indeed do have the same structure. Our data show that there is insufficient evidence to support the alternative hypothesis, namely, that there is a structural contrast between acceptable and unacceptable extractions from subject relative clauses, in particular, that some 'apparent' relative clauses are small clauses (PredPs headed by *som*), whereas 'real' relative clauses are full clauses (CPs headed by *som*). Consequently, all the relative clauses, at the very least the ones investigated here, are in fact CPs, which is also the standard analysis.

Finally, we would like to emphasize that our results are compatible with a parameterized approach as well as with a universalist approach. In certain cases, such as Danish *wh*-islands, locality effects (and reduced acceptability) arise due to working memory load, not due to a grammatical filter or a *wh*-constraint. It is perfectly possible for the principle of locality in syntax as well as cyclic derivation to be universal; in that case, the fact that the Scandinavian languages allow extractions from islands is most likely due to recursive CP-structures in embedded clauses, a structural feature that may be subject to parametric variation (Nyvad et al., 2014). In other words, some islands have bridges that allow elements to escape, and this seems to be the case in the Scandinavian languages in particular.

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NOTES

1. According to Gibson (1998:12), a discourse referent is 'an entity that has a spatio-temporal location so that it can later be referred to with an anaphoric expression, such as a pronoun for NPs, or tense on a verb for events … Thus processing an NP which refers to a new discourse object eventually leads to a substantial integration cost increment, as does processing a tensed verb, which indicates a discourse event'.
2. In fact, Kush & Lindahl also tested the verb *vara* 'to be' using cleft sentences. We did not include the Danish verb *være* 'to be' because it would not add anything. Relative clauses are possible in clefts sentences as well as other complex (i.e. biclausal) sentences. More importantly, comparing clefts and other complex sentences is not a minimal contrast, and as a consequence any potential differences could be due to a number of different factors.
3. Danish is a V2 language, which means that in main clauses, the finite verb moves to C°. In embedded clauses, C° is filled by the complementizer, and all the verbs remain inside VP.
4. An anonymous reviewer informs us that in Swedish, *möta* is punctual, whereas *träffa* can be punctual but also durative. However, in Danish, *møde* and *træffe* are both punctual, as shown by the ungrammaticality of the following example:

   (i) *Jeg mødte/traf min nabo hele eftermiddagen i går
   I met my neighbor all afternoon.DEF yesterday
   '*I met my neighbor all afternoon yesterday.'

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