

GERMAN *WH*-INFINITIVES: RESTRUCTURING AND CYCLIC MOVEMENT

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ABSTRACT

This thesis investigates *wh*-infinitive constructions and other elements of infinitival clause structure in German. These include the size of restructuring infinitives, long *wh*-extraction from an infinitive, and the acquisition of *wh*-infinitives.

A *wh*-infinitive is a clause where a *wh*-phrase occurs in the left periphery of an infinitival clause. An example of this is the English sentence *I don't know [what to buy]*. A *wh*-phrase has moved to a left periphery position in the infinitival clause, indicated by brackets, in this sentence. While some Germanic languages, namely English and Dutch, allow for *wh*-infinitives, the construction is ungrammatical in modern German and mainland Scandinavian languages.

Past proposals in the literature argue that a doubly-filled COMP violation prevents *wh*-infinitives from being grammatical in German. These proposals argue that the German infinitival marker, *zu*, is a complementizer. I present evidence from restructuring infinitives that suggests this cannot be the case – *zu* appears in infinitives smaller than CP. Instead, I argue in favor of Abraham's (2004) proposal, which analyzes *zu* as an infinitival preposition.

Another theoretical issue raised by languages with ungrammatical *wh*-infinitives concerns long *wh*-extraction. In these languages, why is it that cyclic *wh*-movement targets Spec,CP of an embedded infinitival clause, but terminal *wh*-movement is unable to? I instead suggest that Rackowski & Richards's (2005) or Bošković's (2008) proposals for cyclic A'-movement provide a better account of long *wh*-extraction in languages with ungrammatical *wh*-infinitives. The former proposes that Spec,νP, not Spec,CP, is used for cyclic movement, while the latter argues that intermediate movement to Spec,CP does not involve feature checking or agreement. These proposals show that it is not necessary for a *wh*-phrase to Agree with an intermediate infinitival C in languages like German.

Lastly, there is the question of what syntactic parameters can be used to infer whether or not *wh*-infinitives are grammatical in a given language. Sabel's (2015) *Wh-Infinitive Generalization* (WHIG) argues that, for a language to have grammatical *wh*-infinitives, it must have an overt, base-generated infinitival complementizer. Possible counterevidence for the WHIG comes from Swedish. Using Christensen's (2007) proposal, I argue that the Swedish complementizer, *att*, is not base-generated and does not violate the WHIG. I then present evidence from Chacón et al's (2015) acquisition model of *that-trace* effects to support Sabel's hypothesis that overt infinitival complementizers play a role in acquisition. I propose that language learners use overt infinitival complementizers as a cue to infer whether or not their target language permits *wh*-infinitive constructions.

1. INTRODUCTION

A *wh*-infinitive is a construction where a *wh*-phrase occurs in the left periphery of an infinitival clause. The grammaticality of *wh*-infinitives is subject to a large degree of cross-linguistic variation: there is a remarkable amount of variance even within Germanic. Observe the examples in (1). Brackets indicate the boundaries of an embedded clause.

- (1) a. I do not know [what to buy]
- b. *Ich weiß nicht [was zu kaufen] (German)
 I know not [what to buy.INF]
 'I do not know what to buy'
- c. Ik weet niet [wie te bezoeken] (Dutch)
 I know not [who to visit.INF]
 'I do not know who to visit'
- d. *Han har glömt [vad att köpa] (Swedish)
 He has forgotten [what to buy.INF]
 'He has forgotten what to buy'
- e. *Det er uklart [hva å gjøre] (Norwegian)
 It is unclear [what to do.INF]
 'It is unclear what to do'
- f. *Han har glemt [hvad at købe] (Danish)
 He has forgotten [what to buy.INF]
 'He has forgotten what to buy'
- (Sabel 2015: 2)

Languages without *wh*-infinitives may still have embedded *wh*-questions in complement clauses. The clause must, however, be finite.

- (2) a. Ich weiß nicht [was ich kaufen sollte] (German)
 I know not [what I buy.INF should]
 'I do not know what to buy'
- b. Har du redan glömt [vad fröken sa] (Swedish)
 Have you already forgotten [what the teacher said]
 'Have you already forgotten what the teacher said?'

- c. Vores tid har glemt, [hvad blasfemi er] (Danish)
 Our time has forgotten [what blasphemy is]
 'Our time has forgotten what blasphemy is'
- d. Så nå veit jeg ikke helt [hva skal (Norwegian)
 So now know I not quite [what should
 gjøre]
 do.INF]
 'So now I do not know quite what I should do'

(Google searches)

The contrast between (1) and (2) suggests that some quality of infinitival clauses is responsible for the ungrammaticality of *wh*-infinitives. This is what I hope to account for in this thesis, particularly for German *zu* 'to' infinitives.

This thesis addresses three aspects of ungrammatical *wh*-infinitives in German: the status of the infinitival marker *zu*, long *wh*-movement from infinitives, and the reason *wh*-infinitives are ungrammatical.

Section 2 focuses on the infinitival marker *zu*. Many scholars have argued *zu* is responsible for causing *wh*-infinitives to be ungrammatical. Wilder (1988), Reis (2003) and Biskup (2014) argue that it is a complementizer – *wh*-infinitives are then ungrammatical due to a doubly-filled COMP violation. Others, like Giusti (1986, 1991), Sabel (1996), and Reis (2003) argue *zu* indicates the presence of a null declarative complementizer. Giusti (1986, 1991) further argues that *zu* is a functional tense head.

I argue against these proposals by referring to Wurmbrand's (2001) work on mono-clausal restructuring. *Zu* is required in infinitives that lack CP and TP layers, which casts doubt on its relation to the C domain. I instead propose that it is a VP-internal infinitival preposition, as Abraham (2004) does.

Section 3 reviews arguments for and against cyclic movement through Spec,CP. In languages like German where *wh*-infinitives are ungrammatical, it is not immediately apparent why a *wh*-phrase may move through non-finite Spec,CP, but may not be spelled out there.

I refer to two alternative proposals of cyclic A'-movement devised by Rackowski & Richards (2005) and Bošković (2008). Rackowski & Richards argue that cyclic A'-movement proceeds through specifiers of *v* instead of C. A *wh*-phrase only Agrees with a [+*wh*] C, and the movement is always terminal. Bošković's system is quite similar to this, although it still makes use of Spec,CP as a site of cyclic movement.

Section 4 discusses Sabel's (2015) *Wh*-Infinitive Generalization (WHIG) as a possible explanation for the ungrammaticality of *wh*-infinitives. The WHIG states that languages require an overt, base-generated infinitival complementizer in order to have grammatical *wh*-infinitives. I discuss potential counter-evidence to the WHIG and ultimately defend it: both German and Swedish appear to have complementizers that satisfy the WHIG, despite the ban on *wh*-infinitives in these languages. Finally, I expand on Sabel's notion that infinitival complementizers are necessary to language learners' acquisition of *wh*-infinitives by referring to Chacón et al's (2015) indirect learning hypothesis.

2. THE GERMAN INFINITIVAL MARKER 'ZU'

2.1 Introduction

The ungrammaticality of *wh*-infinitives is often attributed to the German infinitival marker *zu*. A one-to-one comparison of *zu* to English *to* seems appealing, yet *zu* differs significantly in its distribution. In fact, the differences are pronounced enough that some scholars argue *zu* interacts with the complementizer domain in some fashion, whether it be as a complementizer (Wilder 1988, Reis 2003, Biskup 2014) or as a functional tense head inserting a null complementizer (Giusti 1986, 1991, Sabel 1996, Reis 2003).¹ If either hypothesis is correct, *wh*-infinitives are ungrammatical due to a doubly-filled COMP violation.

I will argue against the notion that *zu* is responsible for this effect throughout this chapter. I demonstrate that *zu* is not associated with the complementizer domain. It is just as licit in reduced, restructured clauses that do not contain a CP layer. Likewise, I argue on the same grounds that *zu* is not a functional tense head. Since past proposals of *zu* as a complementizer are supported by certain syntactic phenomena, such as the ungrammaticality of *zu* in complements to ECM verbs, I will argue these are explainable by other means.

I then offer my own account of *zu* as a grammaticalized infinitival preposition, as has been argued by Abraham (2004). Abraham (2004) proposes that infinitives have an inherent aspectual property, and that Aspect selects for a verb with *zu* morphology. I confirm, following Wurmbrand's (2001) discussion of irrealis tenseless infinitives, that aspect is indeed the highest functional projection in restructuring infinitives.

2.2. Is *zu* a complementizer?

A lingering question in the *zu* literature is whether a convincing comparison can be drawn to the English infinitival marker *to* or the infinitival complementizer *for*. Wilder (1988) and Biskup (2014) adopt a *for* analysis. Both compare *zu* to French *de* and Italian *di*, which Kayne (1981) argued are infinitival complementizers similar to *for*. Their core arguments are that *zu* (i) prevents *wh*-infinitives, (ii) cannot appear in ECM constructions, and (iii) blocks the V2 property. Where *zu* merges as a complementizer is yet another concern. German is a language with only head-initial complementizers, and *zu* is affixed to the most deeply embedded predicate.² As I will argue in this section, evidence from restructuring infinitives demonstrates *zu* is present in clauses lacking CP and TP layers. I will additionally argue that concerns (i-iii) may be explained by other syntactic features of German infinitives.

2.3 *Zu* in restructuring infinitives

The appearance of *zu* in restructuring infinitives is the strongest evidence against Wilder and Biskup's complementizer proposals. Infinitives in restructuring configurations lack higher

1 Reis's (2003) discussion of bare *wh*-infinitives offers both possibilities as reasons for why *zu wh*-infinitives are ungrammatical.

2 IPP constructions can be an exception to this rule. See Koopman & Szabolsci (2000) for more information.

functional projections, such as CP. Table (3) summarizes a few properties of mono-clausal restructuring infinitives in Wurmbrand's (2001) four-way typology, and I will discuss these wherever relevant.³

(3)

Class of restructuring infinitive	Lexical	Functional	Reduced non-restructuring	Non-restructuring
Clause size	VP	vP	TP	CP
Tense	*	*	✓	✓
Negation	*	*	✓	✓
Long object movement	✓	✓	*	*
Clausal pied-piping	*	*	*	✓

Sentence (4a) represents a long object movement (LOM) configuration, which is only possible under a lexical restructuring predicate like *versuchen* 'try.' LOM requires that the infinitive verb *reparieren* 'repair' does not introduce its own syntactic subject. Restructuring infinitives cannot assign accusative case. *Traktor* 'tractor' must receive nominative case from a matrix case assigner in (4a). An infinitive selected by a non-restructuring verb, such as *planen* 'plan' in (4b), remains able to assign accusative case.

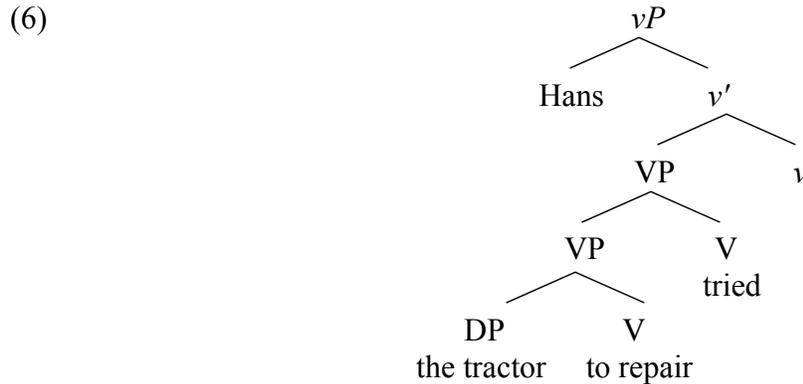
- (4) a. daß [der Traktor zu reparieren] versucht wurde (German)
that [the tractor.NOM to-repair.INF] tried was
'That they (implied) tried to repair the tractor'
(Wurmbrand 2001: 19)
- b. daß [den Traktor zu reparieren] geplant wurde
that [the tractor.ACC to-repair.INF] tried was
'That they (implied) planned to repair the tractor'
(Wurmbrand 2001: 36)

Take a sentence with an external argument as another example. *Traktor* has accusative case in (5), but as LOM in (4a) has already shown, *reparieren* does not have structural accusative case. The structure of (5) must be as represented in (6). *Hans* receives nominative from a matrix case assigner, and *versuchen* 'try,' rather than *reparieren* 'repair,' assigns accusative case to *Traktor*. If *Traktor* had nominative case, there would be a significant reason to believe that the infinitive had its own nominative case assigner.

3 The bi-clausal approach to restructuring requires that functional projections are deleted as part of a restructuring mechanism.

- (5) weil Hans [den Traktor zu reparieren] versuchte (German)
 since Hans [the tractor.ACC to-repair.INF] tried
 'since Hans tried to repair the tractor'

(Wurmbrand 2001: 17)



That *v* in LOM assigns no structural case and does not introduce an external argument motivates Wurmbrand's (2001) claim that lexical restructuring infinitives have no *vP* layer. Top-down stripping further indicates that it is not possible for the infinitive to lack *vP*, but retain a TP or CP layer.⁴ Instead, the infinitives in (4) and (5) are merged as bare VP complements.

- (7) a. Hans hat beschlossen [(morgen) zu verreisen] (German)
 Has has decided [(tomorrow) to-go on a trip.INF]
 'Hans decided to go on a trip (tomorrow)'
- b. Hans hat versucht [(**morgen*) zu verreisen]
 Hans has tried [(**tomorrow*) to-go on a trip.INF]
 'Hans tried to go on a trip (**tomorrow*)'

(Wurmbrand 2001: 73)

The ungrammaticality of future adverbials in restructuring infinitives confirms this suspicion. An infinitive must have tense to license a future adverbial. These are grammatical in a non-restructuring infinitive, as shown with *beschlossen* 'decide' in (7a). Meanwhile, *versuchen* 'try' cannot license *morgen* 'tomorrow,' lending additional support to the structure depicted in (6).

The difference between (8a) and (8b) makes tenselessness even more apparent. The future adverbial *morgen* 'tomorrow' is ungrammatical in an unambiguously restructured sentence: see the LOM example (8a). On the other hand, *morgen* is grammatical in a non-restructured short-passive.

4 If a clause lacks a functional projection X, it must also lack all functional projections higher than X. If a clause is missing the *vP* layer, it may not have a CP or TP layer.

- (8) a. Dem Kind wurden [nur Kekse (*morgen) zu essen] (German)
 the child.DAT were [only cookies (*tomorrow) to-eat.INF]
 erlaubt
 allowed
 'The child was only allowed to eat cookies tomorrow'
- b. Dem Kind wurde erlaubt [(?morgen) einen Kuchen zu
 The child.DAT was allowed [(?tomorrow) a cake.ACC
 essen]
 to-eat.INF]
 'The child was allowed to eat a cake/cookies tomorrow'
- (Wurmbrand 2001: 82)

The restructuring facts here indicate that *zu* is present in infinitives that lack CP and TP projections. Wilder (1988) and Biskup's (2014) proposals provide no solution to explain *zu*'s appearance in restructured infinitives. Maintaining that it is a complementizer becomes impossible. If CP is absent or deleted, how is it that *zu* is still spelled out?

2.4 Wh-infinitives and doubly-filled COMP

I will now address the evidence in support of *zu* as a complementizer. It (i) prevents *wh*-infinitives, (ii) cannot appear in ECM constructions, and (iii) blocks the V2 property. I will begin with (i): the *wh*-infinitive facts. Wilder compares properties of *zu* to the French and Italian infinitival complementizers, *di* and *de*.

- (9) a. *Je lui ai dit [CP où d'aller] (French)
 I told it him [CP where to-go.INF]
- b. Je lui ai dit [CP où aller]
 I told it him [CP where go.INF]
 'I told him where to go' (Kayne 1981: 350)
- c. *Gli ho detto [CP dove di andare] (Italian)
 Him I told [CP where to-go.INF]
- d. Gli ho detto [CP dove andare]
 Him I told [CP where go.INF]
 'I told him where to go' (Kayne 1981: 351)

(9) provides evidence of *wh*-infinitives with *di* and *de* as a doubly-filled COMP violation in French and Italian. In (9a) and (9c), *di* and *de* fill C, so moving a *wh*-phrase into Spec,CP violates the doubly-filled COMP filter. *Wh*-infinitives are grammatical without *di* and *de*.

The data in (9) applies to English *for* infinitives, as well. *Wh*-movement to Spec,CP is prohibited in (10a), while *to* in (10b) does not violate the doubly-filled COMP filter.

- (10) a. *I know [_{CP} what for to buy]
 b. I know [_{CP} what to buy]

Both Wilder and Biskup state that the effects of removing *di* and *de* in (9) apply to German *wh*-infinitives, as well. If *zu* is a complementizer, then when it is removed, *wh*-infinitives should be grammatical. (11a) in contrast to (11b) show this prediction is correct, but this remains problematic for other reasons. German permits embedded bare *wh*-infinitives like (11b), but their formation is, in actuality, highly restricted.

- (11) a. *Ich weiß nicht was zu tun (German)
 I know not what to-do.INF
 b. ?Ich weiß nicht was tun
 I know not what do.INF
 'I do not know what to do'

Choice of *wh*-phrase – *was* 'what' as opposed to **wann* 'when' in (12a) – is enough on its own to make the sentence ungrammatical. The embedded predicate (*tun* 'do' versus **essen* 'eat') plays a role, as well. Most speakers accept only *tun* 'do' or *sagen* 'say' (Wurmbrand 2001: 107). In short, these are not productive constructions.

- (12) a. *Ich weiß nicht wann tun (German)
 I know not when do.INF
 'I do not know when to do it'
 b. *Ich weiß nicht was essen
 I know not what eat.INF
 'I do not know what to eat'

(Wurmbrand 2001: 107)

Given the severity of these restrictions, embedded bare *wh*-infinitive constructions are tangential to the discussion of *zu* as a complementizer and ungrammatical *wh*-infinitives. The properties of embedded bare *wh*-infinitives are beyond the scope of this paper. I leave them open to further research.⁵ As a result, (12) should not be taken as proof that *zu* is a complementizer or that German permits *wh*-infinitives at large.

5 See Reis (2003) for a comprehensive account of bare *wh*-infinitive constructions, including non-embedded ones.

2.5 On ECM constructions

The next observation Wilder (1988) and Biskup (2014) make in support of *zu* as a complementizer is (ii): the ungrammaticality of *zu* with ECM constructions. If what we are dealing with is a complementizer, the absence of ECM with *zu* infinitives finds a natural explanation, since ECM predicates arguably select for complements smaller than CP.

- (13) a. *Er sah ihn zu liegen (German)
 He saw him to-lie.INF
- b. Er sah ihn liegen
 He saw him lie.INF
 'He saw him lie'
- (Biskup 2014: 18)

A complementizer in (13a) would prevent the matrix *v* from assigning accusative case to the DP argument of the infinitive *liegen* 'lie.' Since removing *zu* makes the sentence grammatical, this can be taken to support that it is a complementizer.

Wilder remarks that *zu*-infinitives follow a pattern similar to French and Italian constructions with *di* and *de*. Kayne (1981: 4) states that neither French nor Italian *believe*-type verbs permit ECM, unlike the English sentence *I believe him to be intelligent*. Complements of *believe* in these languages must contain an overt complementizer, and so must be control constructions.

- (14) a. Je crois [d'être intelligent] (French)
 I believe [de-be intelligent]
 'I believe (myself) to be intelligent'
- b. Credo [di essere intelligente] (Italian)
 I-believe [di be intelligent]
 'I believe (myself) to be intelligent'
- (Wilder 1988: 115)

German *glauben* 'believe' complements are much the same – ECM is ungrammatical, but subject control is fine. Complements introduced by finite complementizers are grammatical, too. The argument, then, is that the absence of ECM in (15) and *believe* infinitives is caused by the presence of the complementizer, *zu*.

- (15) a. *Ich glaube [ihn intelligent zu sein] (German)
 I believe [him.ACC intelligent to-be.INF]
 'I believe him to be intelligent'
- (Wilder 1988: 115)

- b. Manchmal glaub' ich [weniger intelligent als andere zu sein]
 Sometimes believe I [less intelligent than others to-be.INF]
 'Sometimes I believe myself to be less intelligent than others'
 (Google search)

- c. Ich glaub' [daß sie nicht so intelligent ist]
 I believe[that she not so intelligent is]
 'I believe that she is not so intelligent'
 (Google search)

Let us review ECM verbs in German. To begin with, ECM is restricted to a small group of verb clustering predicates: passive perception (*sehen* 'see,' *hören* 'hear,' etc.) and causatives (*lassen* 'let/make'). Verbs triggering clustering take a reduced size complement, that is, *vP* or smaller; they are either functional or lexical restructuring verbs in Wurmbrand's typology. English modal verbs share these properties.

- (16) a. Es drohte zu schneien (German)
 It threatens to-rain.INF
 'It threatened to rain'
- b. Es muß schneien
 It might snow.INF
 'It might snow'
- c. Es versprach zu schneien
 It promises to-snow.INF
 'It promises to snow'

(Wurmbrand 2001: 169)

Except for the classes mentioned previously, clustering verbs are thematically underspecified (Haider 2010: 276). The verbs in (16) do not specify that their arguments must be animate, so they allow for an expletive subject.

- (17) a. *Es sah den Peter donnern (German)
 It saw Peter.ACC thunder.INF
 '*It saw Peter thunder'
- b. Hans hört es donnern
 Hans heard it thunder.INF
 'Hans heard it thunder'

- c. *Es lässt den Peter donnern
 It let Peter.ACC thunder.INF
 '*It made Peter thunder'
- d. ?Hans lässt es donnern
 Hans let it thunder.INF
 'Hans made it thunder'

(Wurmbrand 2001: 174)

Conversely, ECM verbs do not allow expletive subjects in (17a) and (17c). Perception verbs and causatives require that the "surface object" of the infinitive be animate (Wurmbrand 2001: 170). This is why (17a) and (17c) are ungrammatical, but (17b) and (17d) are not. The argument is that these verbs may mark case exceptionally because they are thematically specified in the lexicon.

This aside, the main verbs in (16) and (17) select for restructured infinitives the size of *vP*. Wurmbrand (2001) demonstrates that whether extraposition is grammatical depends on the matrix predicate. Infinitive complements to functional restructuring predicates, as in (18a) and (18b), may not be extraposed. This is otherwise possible with lexical restructuring infinitives (bare VP); see (18c). Importantly, *zu* is indifferent to extraposition facts.

- (18) a. *daß Hans t_i hörte [den Peter den Kuchen essen]_i (German)
 that Hans t_i heard [Peter.ACC the cake.ACC eat.INF]_i
 'That Hans hears Peter eat the cake'

(Wurmbrand 2001: 158)

- b. *daß Hans t_i hat [den Kuchen zu essen]_i
 that Hans t_i had [the cake.ACC to-eat.INF]_i
 'That Hans had to eat the cake'

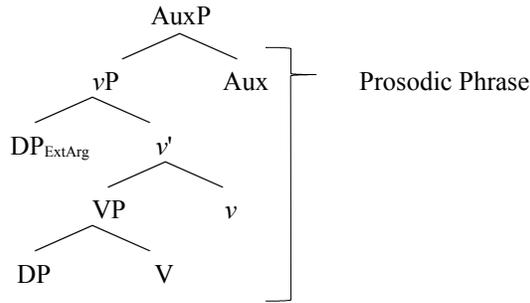
(Wurmbrand 2001: 157)

- c. daß Hans t_i versuchte [den Kuchen zu essen]_i
 that Hans t_i tried [the cake.ACC to-eat.INF]_i
 'That Hans tried to eat the cake'

(Wurmbrand 2001: 156)

The explanation for extraposition in lexical versus functional restructuring infinitives involves prosody. Wurmbrand (2001) argues that only complete prosodic phrases may extrapose. The functional heads of a clause and the main verb form a prosodic phrase (Wurmbrand 2001: 161). The brace in (19) indicates what constitutes a prosodic phrase. In this derivation, functional restructuring verbs occupy the Aux projection. Since the infinitive is a portion of the prosodic phrase where Aux is involved, the extraposition facts in (18) are justifiably ungrammatical. VP, TP, and CP complements may extrapose because they constitute complete prosodic phrases.

(19)



Since there is no CP layer to begin with, there is no way to accommodate a complementizer in these constructions. Why, then, is *zu* ungrammatical? The best solution is to look to the selectional properties of the verb. Perception and causative verbs disallow *zu* because they select bare infinitives. Modals and motion verbs, while thematically underspecified, also select a bare infinitive.

2.6 *Scheinen*: raising or control?

Another point Wilder (1988) and Biskup (2014) must account for is why a raising verb, *scheinen*, takes a *zu* infinitive. If *zu* is indeed a complementizer, it should prevent subject DPs generated in an embedded clause from raising.

(20) Er_i scheint [t_i seltsam zu sein] (German)
 He seems [t_i strange to-be.INF]
 'He seems to be strange'

(M. Kaczmar, p.c.)

From (20), it appears that quite the opposite happens. *Zu* does not prevent *er* 'he' from raising into the matrix clause. But, questions have been raised in the literature as to whether *scheinen* is a control, rather than raising, predicate. Wilder and Biskup argue in favor of *scheinen* as control.

Non-restructuring configurations can be used to verify this claim. The infinitival relatives in (21), Wurmbrand argues, are unambiguously CPs. A pied-piped infinitival relative must always be a CP, despite the choice of matrix predicate. Despite being a lexical restructuring predicate, the complement of *versuchen* 'try' is the same size as the complement to a non-restructuring verb, *plannen* 'plan.'

(21) a. der Roman [den zu lesen]_i der Hans t_i versuchte (German)
 the novel [that to-read.INF]_i the Hans t_i tried
 'The novel that Hans tried to read'

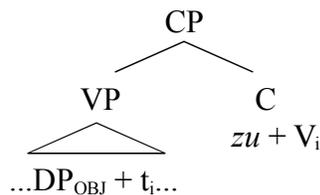
- (24) a. Peter sagte (*dass)[nie zuvor] hätte er so (German)
 Peter said (*that) [never before] had he such
 einen guten Artikel gelesen
 a good article.ACC read
 'Peter said that never before had he read such a good article'
 (Haider 2010: 47)
- b. Die Bundesregierung hat beschlossen die Verbreitung
 The federal government has decided the spread
 (*zuverhindern) von öffentlichem WLAN zuverhindern
 (*to-prevent.INF) from public WLAN to-prevent.INF
 'The federal government has decided to prevent the spread of public WLAN'
 (Google search, M. Kaczmar, p.c.)

V2 (i) causes V-to-C movement, and (ii) requires its specifier to be filled with a XP. In sentences where C is filled by a base-generated complementizer, like (24a), the V-to-C movement cannot take place. We should not consider the lack of V2 in infinitives to be evidence for *zu* as a complementizer. Given the evidence from restructuring I have presented, I follow (Haider 2010:2): it seems that V2 is a property of *finite* verbs exclusively.

2.8 No clause-final complementizers or C projections

The final point I will discuss is how Wilder derives word order for *zu* infinitives. *Zu* must be clause final and follows any additional verbal particles (*auf-zu-machen* vs. **zu-auf-machen* 'to open'). Wilder proposes that *zu* is a head-final complementizer. V then undergoes head movement to C.

(25) ..CP [VP t_i [C+V_i]]



There are a few issues with this proposal. To begin with, German has no other head-final complementizers. Another is that *zu* looks to be VP internal, which can be verified with an extraposed PP. See the following examples from Haider (2010).

- (26) a. *ohne [gelernt haben dafür zu-müssen] (German)
 without [learned having for-it to-must.INF]

- b. ohne [gelernt haben zu müssen] dafür
 without [learned having to to-must.INF] for-it
 '...without having to have learned for it'

(Haider 2010: 273-274)

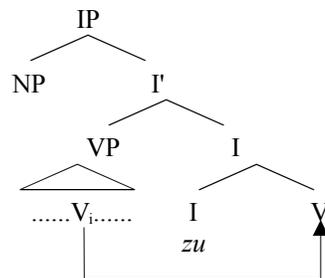
The PP *dafür* violates the compactness property of German clustering verbs that I discussed alongside ECM. In other words, *müssen* has not moved to a VP external position as (25) would suggest. Meanwhile, the compact (26b) presents a major hurdle for a clause-final complementizer position. If *zu*+V are merged together in C, it follows from (26b) that there must be a position higher than C for the PP to occupy. This is unlikely given that there is no evidence (or at least that I am aware of) suggesting the existence of a functional projection that dominates a complementizer in German.

2.9 Features of null infinitival C

I now move to Giusti's (1986, 1991) proposals arguing for *zu* as a functional tense head. *Zu* is merged as I⁰, and then the VP merges with it by way of rightward movement. Though Giusti argues against *zu* as a complementizer, there is still a "relation to V as a complementizer would have" (Giusti 1986: 158). Giusti proposes that there is an unpronounced copy of *zu* in C.

Presuming a null complementizer in *zu* infinitives means *wh*-infinitives violate doubly-filled COMP. Giusti explains that tense *zu* in raising constructions would be parallel to *to* in English. Since *zu* is not C, these complements are projected as TPs. I have already demonstrated that this is true for *scheinen* 'seem' complements, but the generalization does not hold for lexically restructured *versuchen* 'try' infinitives. Giusti's proposed structure is given in (27).

(27)



(Giusti 1986: 146)

In my discussion of restructuring, however, I have already shown that *zu* does not coincide with functional tense. Observe the contrast in (7), copied here as (28).

- (28) a. Hans hat beschlossen [(morgen) zu verreisen] (German)
 Has has decided [(tomorrow) to-go on a trip.INF]
 'Hans decided to go on a trip (tomorrow)'

- b. Hans hat versucht [(**morgen*) zu verreisen]
 Hans has tried [(**tomorrow*) to-go on a trip.INF]
 'Hans tried to go on a trip (**tomorrow*)'

(Wurmbrand 2001: 73)

Both (28) and (28b) are *zu* infinitives, yet they have different tense properties. A non-restructured infinitive in (28a) may license a future adverbial, indicating the presence of a functional tense head, while a restructured infinitive (28b), is unable to do so. While there is ample support for Giusti's claim that *zu* is lower than C, that it corresponds to a functional tense head is dubious.

This leaves the notion of *zu* triggering a null declarative complementizer, which Sabel (1996) and Reis (2003) also argue in favor of. It is likely correct that non-restructured infinitives have a null, declarative complementizer. The question is if *zu* is responsible for its insertion. Let us return to clausally pied-piped *zu* infinitives.

Giusti's (1986) proposal forces *zu* to invariably project a null complementizer. This then forces a further assumption that functional projections hosting elements introducing infinitival relatives belong to the matrix clause (Giusti 1986: 158). Giusti further proposes a two-layered CP that voids the doubly-filled COMP violation, displayed in (29). (29) displays this structure: the phrase *mit wem* 'with whom' moves to the CP projected by the embedded clause, marked as CP2. It then moves into its final, relative introducing position in the matrix clause, CP1. An empty copy of *zu* occupies the embedded C2, so *mit wem* 'with whom' necessarily moves to the matrix C position, CP1, to avoid a doubly-filled COMP violation in Giusti's proposal.

- (29) ich weiß nicht [_{CP1} mit wem_i [_{CP2} t_i [_{C'} Ø_{ZU} [_{TP} PRO t_i (German)
 I know not [_{CP1} with whom_i [_{CP2} t_i [_{C'} Ø_{ZU} [_{TP} PRO t_i
 zu sprechen]]_k [_{TP} ich dir t_k empfehlen würde]]
 to-speak.INF]]_k [_{TP} I you t_k recommend would]]
 'I don't know with whom I would recommend you speak to'

(Giusti 1986: 158)

The presence of *zu* in bare VP lexical restructuring infinitives makes separating *zu* and a null C a considerably more attractive hypothesis. Moving a relative pronoun to a higher C in (29) is not needed to avoid a doubly-filled COMP violation. Still, a phonologically null C exists in non-restructured infinitives, but it is not linked to *zu*. A possible explanation for the ungrammaticality of *wh*-infinitives in non-restructuring contexts is that infinitival C's clause type feature is declarative only, so it may not attract a *wh*-phrase to its specifier.

2.10 *Zu*, an infinitival preposition

So far, I have presented evidence showing that *zu* cannot be a complementizer or a tense head. In this section I will argue in favor of Abraham's (2004) proposal that *zu* is a grammaticalized, VP-internal preposition. I will briefly review the relevant restructuring examples here. *Zu* appears in restructuring infinitives regardless if there is a CP or TP layer, such as in lexical restructuring infinitives, like (30a). Another property of restructuring infinitives is

that they lack a functional tense projection. (30b) shows that future adverbials cannot be licensed in restructuring infinitives.

- (30) a. daß [der Traktor zu reparieren] versucht wurde (German)
 that [the tractor.NOM to-repair.INF] tried was
 'That they (implied) tried to repair the tractor'
 (Wurmbrand 2001: 19)
- b. Hans hat versucht [(**morgen*) zu verreisen]
 Hans has tried [(**tomorrow*) to-go on a trip.INF]
 'Hans tried to go on a trip (**tomorrow*)'
 (Wurmbrand 2001: 73)

Furthermore, *zu* behaves as a VP internal element. The extraposed PP *dafür* 'for-it' may not intervene between the *zu*+V and other verbs in (31a). This means that *zu* is in a verb cluster. That a PP cannot intervene between *zu*+V and other elements of the cluster suggests that *zu*+V has not been moved to a VP external position. (31b) additionally demonstrates that *zu*+V cannot have moved to a clause-final C, because *dafür* 'for-it' must then be occupying a position higher than C.

- (31) a. **ohne* [gelernt haben dafür zu-müssen] (German)
 without [learned having for-it to-must.INF]
- b. ohne [gelernt haben zu müssen] dafür
 without [learned having to must.INF] for-it
 '...without having to have learned for it'
 (Haider 2010: 273-274)

Another piece of the puzzle is that *zu* cannot be stranded when its accompanying verb moves. A scrambled verb may not strand *zu*, as shown in (32b) and (32c).

- (32) a. weil er zu schwimmen versuchte (German)
 because he to-swim.INF tried
 'Because he tried to swim'
- b. Zu schwimmen versuchte er nicht
 to-swim.INF tried he not
- c. **Schwimmen* versuchte er zu nicht
 Swim.INF he to not
 'He didn't try to swim'
 (Koopman & Szabolcsi 2000: 172)

This is possible with finite verbs. Other verbal prefixes are stranded when their accompanying verb moves. See the following examples with *auf-machen* 'to open' in (33). Verbal prefix stranding is obligatory when a finite verb moves to C in V2 clauses (33a) or imperatives (33b). When a finite complementizer like *daß* 'that' prevents the verb from moving, the verb and prefix do not separate. Such a contrast is expected where *zu* is a preposition and the verb is its complement. Under Abels's (2003) Stranding Generalization, prepositions are phase heads, and the complement of a phase head may not be extracted.⁶

- (33) a. Er macht die Fenster auf (German)
 He made the windows open
 'He opened the windows'
 (M. Kaczmar, p.c.)
- b. Macht die Grenzen auf!
 Make the borders open
 'Open the borders!'
 (Google search)
- c. daß er die Fenster aufgemacht hat
 That he the windows opened-made had
 'The he had opened the windows'
 (M. Kaczmar, p.c.)

This is the conclusion Abraham (2004) arrives at. *Zu* is grammaticalized preposition that functions as an infinitival marker. It is spelled out under infinitival aspect. Wurmbrand (2001) offers independent support for Aspect as the highest projection in restructuring infinitives. Restructuring infinitives are tenseless, but they still have irrealis aspect.

Wurmbrand (2001: 64), citing Pesetsky (1992: 143), notes that the truth value of propositional infinitives can be evaluated independently. The complement of *behaupten* 'claim' in (34a) passes the test. The complement of *beschlossen* 'decide' in (34b) is an irrealis infinitive; it therefore fails the test.

- (34) a. Hans behauptete im Lotto gewonnen zu haben (German)
 Hans claimed in-the lottery won to-have
 was auch stimmte
 which also was true
 'Hans claimed to have won the lottery, which was true'
 ✓It is true that Hans won the lottery.

⁶Stranding Generalization, (Abels 2003: 5): Given a phase head a° and a constituent X in a° 's c-command domain

a. $\diamond\checkmark[X\dots[a^\circ [\dots t_x \dots]] \dots]$ and
 b. $\neg \diamond\checkmark[X\dots [a^\circ t_x] \dots]$

- b. Hans beschloss ein Fahrrad zu kaufen was auch stimmte
 Hans decided a bicycle to-buy which also was true
 'Hans decided to buy a bicycle, which was true'
 *Hans bought a bicycle.

(Wurmbrand 2001: 64)

Restructuring predicates like *versuchen* 'try' still have an irrealis interpretation, despite being unable to license future adverbials. What this tells us is that, while restructuring infinitives are tenseless, they still possess aspectual qualities.

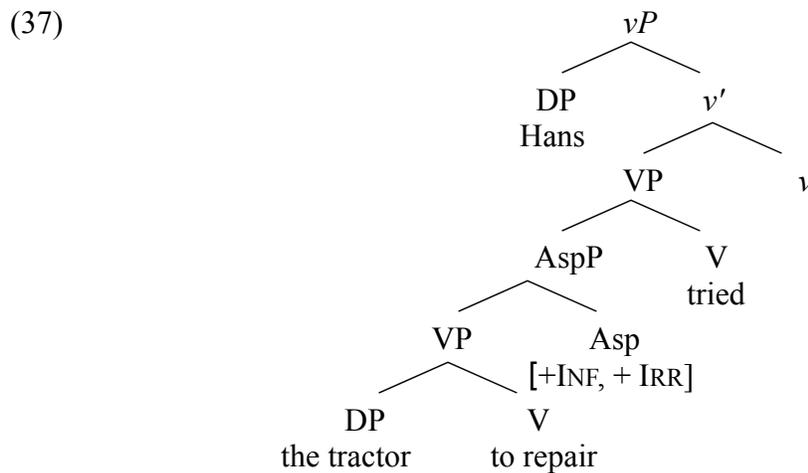
- (35) Hans versuchte ein Fahrrad zu kaufen was (German)
 Hans tried a bicycle to-buy which
 auch stimmte
 also was true
 'Hans tried to buy a bicycle, which was true'
 *Hans bought a bicycle.

(Wurmbrand 2001: 71)

Since *versuchen* 'try' infinitives have this irrealis interpretation, revisiting sentence (5), copied as (36), prompts an analysis of its structure as (37).

- (36) weil Hans [den Traktor zu reparieren] versuchte (German)
 since Hans [the tractor.ACC to-repair.INF] tried
 'since Hans tried to repair the tractor'

(Wurmbrand 2001: 17)



Now that there is reason to believe that Aspect is the highest projection in restructuring infinitives, the claim made in Abraham (2004) is much more plausible. An aspectual feature determined by the verb, call it [+/- INF], must dictate where *zu* is spelled out. I propose the distribution is as follows in (38).

(38)

Verb class	Examples	Infinitival marker	Aspectual feature
Modal, perception, causatives	<i>können</i> 'can,' <i>sehen</i> 'see,' <i>lassen</i> 'let'	*	-INF
Control	<i>glauben</i> 'believe,' <i>beschlossen</i> 'decide'	✓	+INF
Raising	<i>scheinen</i> 'seem'	✓	+INF
<i>Need and help</i>	<i>brauchen</i> 'need,' <i>helfen</i> 'help'	Optional	+/- INF

The class of modal, perception, and causative verbs are the only infinitives where *zu* is ungrammatical. Since there is no relationship between *zu* and the presence of CP or TP projections in an infinitive, the most straightforward account is that these verbs are not specified in the lexicon to select *zu* infinitive complements. The opposite is true for control and raising constructions. *Brauchen* 'need' and *helfen* 'help' are unusual cases, since the infinitival marker is optional, and this could be due to the semi-modal properties of these verbs. They must have a lexical specification of [+/- INF].

2.11 Conclusions

I have argued against proposals by Wilder (1988) and Biskup (2014) that analyze *zu* as a complementizer. Likewise, *zu* appears in tenseless restructuring infinitives, meaning Giusti's (1986, 1991) analyses of *zu* as a functional tense head cannot be correct. Restructuring evidence also suggests that *zu* does not correspond to a null complementizer, as had been suggested by Giusti (1986, 1991), Sabel (1996), and Reis (2003). Evidence that had been used to support these claims was dismissed on independent grounds.

Finally, I presented an analysis of *zu* that supports Abraham's (2004) proposal of *zu* as an infinitival preposition corresponding to an aspect head. Wurmbrand's (2001) data show that it is possible for even bare VP restructuring infinitives to have irrealis aspect. Linking *zu* and aspect leads to uniform predictions across all restructuring infinitives.

3. LONG WH-MOVEMENT, INTERMEDIATE AGREEMENT AND CYCLICITY

3.1 Introduction

Although *wh*-infinitives themselves are ungrammatical in German and mainland Scandinavian, long *wh*-movement out of an infinitive is grammatical.

- (39) a. *Tom_i hat entschieden [wen zu heiraten] (German)
 Tom has decided who to marry
- b. Wen_i hat Tom entschieden [t_i zu heiraten]
 Who_i has Tom decided [t_i to marry]
 'Who has Tom decided to marry?'
- (Sabel 2015: 7)

Long *wh*-movement out of a *wh*-infinitive raises questions regarding the qualities of the embedded C. Presumably, the *wh*-phrase in (39b) must make an intermediate movement to Spec,CP to escape the phase. So, why is intermediate movement through Spec,CP acceptable, but terminal movement is not? If the *wh*-phrase is able to undergo intermediate agreement with embedded C, the reason its movement is never licensed to terminate there is somewhat puzzling.

A standard notion in the literature is that long-distance A' movement uses Spec,CP to escape its phase and avoid spell-out. However, there is cross-linguistic evidence suggesting *wh*-phrases do not need to move cyclically through Spec,CP or agree with an intermediate C in long-distance movement.

I begin this chapter by discussing these proposals. The first, offered by Rackowski & Richards (2005) and den Dikken (2009), is that cyclic movement uses the edge feature of *v*, rather than C. Spec,CP is reserved for feature checking and agreement, and movement to it is always terminal. Bošković's (2008) proposal is similar, in that there is no intermediate agreement with C in long-distance A'-movement, but cyclic movement still proceeds through Spec,CP. This is in part due to a different treatment of uninterpretable feature checking in his system. The *wh*-phrase itself is a probe. There should be no evidence of intermediate C agreement under long *wh*-movement from a *wh*-infinitive if either proposal is on the right track.

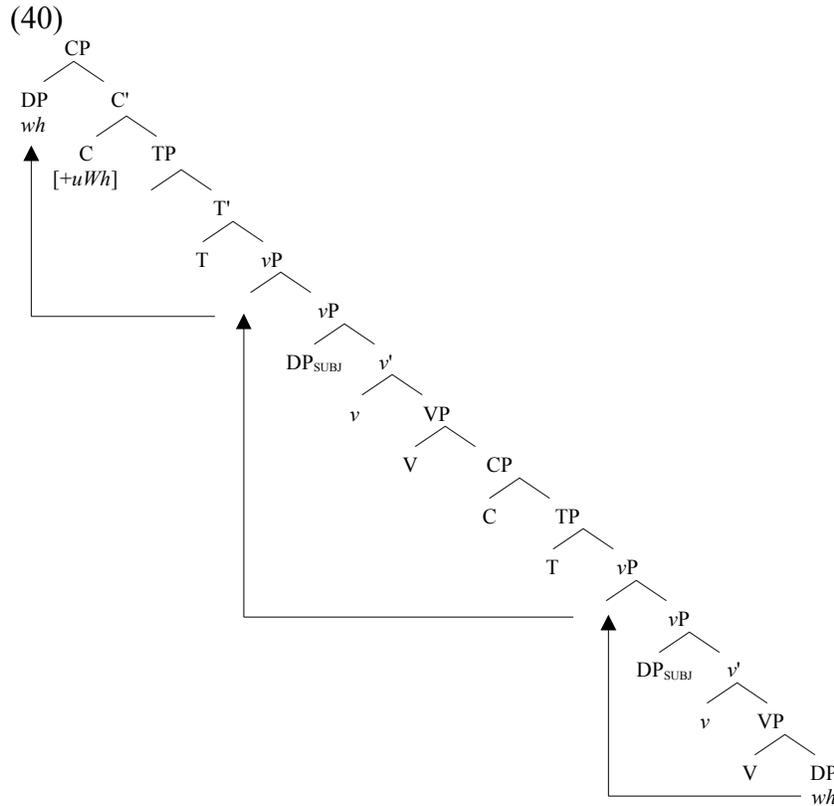
I then present claims made in the literature supporting A'-movement through Spec,CP and the counter-evidence supporting Spec,*v*P movement. These include reconstruction effects, preposition stranding in Afrikaans, Q-float in West Ulster English, and complementizer agreement in languages like Irish. I apply these diagnostics to German, where applicable.

3.2 Rackowski & Richards (2005): cyclic A'-Movement through Spec,*v*P

3.2.1 Introduction

Rackowski & Richards (2005) propose that cyclic A'-movement proceeds through specifiers of *v*, rather than C. Using evidence from Tagalog and Icelandic object shift, they

conclude that there is an uninterpretable feature on *v* that attracts *wh*-phrases to its edge. Their derivation does not need to consider the phasehood of intermediate C – *wh*-phrases are transparent for extraction once matrix *v* Agrees with the clause containing it. The entire process is depicted in (40). I will review their proposal in this section.



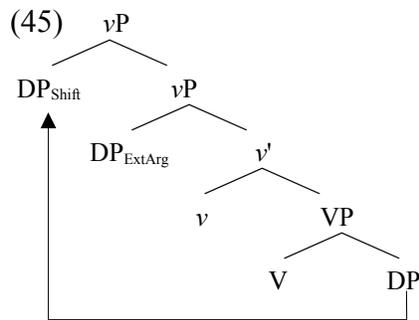
3.2.2 Tagalog

In Tagalog, object shifted DPs trigger Agreement morphology on the verb and are marked as 'subjects' by *ang*. It is possible for either external arguments or internal arguments to be the subject of a sentence. Morphology on the verb correlates to the DP that has been shifted: the external argument Agent triggers nominative case in (41a), and the direct object Theme in (41b) triggers accusative. Furthermore, DPs marked by *ang* have an obligatory definite interpretation. 'Child' in (41a) and 'cloth' in (41b) cannot be interpreted as any child or any cloth. Rackowski & Richards (2005: 7) suggest morphology on the verb and *ang* are assigned to DPs that Agree with *v*.

Because *bókinni* 'the book' is a definite DP, it may shift in (44a). (44b) demonstrates that, while both the indirect object and direct object may shift, movement must observe the same sort of locality effect from (42). The indirect object *bókasafninu* 'the library' is higher, so it must shift before the direct object *bókinni* 'the book' does in (44a). Shifting the direct object first in (44b) is ungrammatical due to an Attract Closest violation.

- (44) a. Ég skilaði bókasafninu bókinni ekki (Icelandic)
 I returned the-library the-book not
- b. *Ég skilaði bókinni ekki bókasafninu
 I returned the-book not the-library
 'I didn't return the book to the library'
- (Rackowski & Richards 2005: 37)

The idea is that both object shift and *ang* involve Agreeing with *v*: this process is depicted in (45).



3.2.4 Long *wh*-movement

Moved *wh*-phrases also affect verbal morphology. When a DP is extracted for *wh*-movement, the clause containing it must first become a subject. (46a) shows this – *ang* marks the entire clause. This is an important point for the theory of cyclic movement Rackowski & Richards propose that I will return to shortly. What is crucial here is that the verb has dative morphology, which indicates agreement with the indirect object/*wh*-phrase, *sino* 'who.' No other DP can be a subject or control verbal morphology in this configuration: see (46b).

- (46) a. **Sino_i** [ang binigy-an ng lalaki ng bulaklak t_i] (Tagalog)
 who_i [ANG gave.DAT CS man CS flower t_i]
- b. *Sino_i [ang nagbigay **ang lalaking** bulaklak t_i]
 who_i [ANG NOM.gave ANG **man.CS** flower t_i]
 'Who did the man give the flower to?'
- (Rackowski & Richards: 3)

While *wh*-movement and object shift are concurrent processes, a *wh*-moved DP is not subject to the locality constraints witnessed in (44). A direct object may *wh*-move regardless of whether the indirect object has shifted or not. This must mean that the features of *v* that drive *wh*-movement and object shift are distinct from one another. It seems that object shift and *wh*-features may be active on *v* simultaneously, and that the Icelandic *v*P has multiple specifiers to accommodate both processes.

- (47) a. Hverju skilaðirðu ekki bókasafninu? (Icelandic)
 What returned-you not the-library?
- b. Hverju skilaðirðu bókasafninu ekki?
 What returned-you the-library not?
 'What did you not return to the library?'
 (Rackowski & Richards 2005: 38)

At first, object shift and *wh*-movement appear to be competing processes in Tagalog: *v* must Agree with the *wh*-phrase as in (48a), rather than the direct object in (48b).

- (48) a. **Ano** ang **i-sinauli** mo (Tagalog)
what ANG **OBL-ASP-return** CS-you
 sa aklatan?
 DAT library?
- b. *Ano ang pinagsauli-**an** mo **ang** aklatan?
 What ANG ASP-return-**DAT** CS-you ANG **library?**
 'What did you return to the library?'
 (Rackowski & Richards 2005: 38)

What is key in (49) is that the direct object is ambiguously definite/indefinite despite having *not* visibly Agreed with *v*. Rackowski & Richards (2005: 40) find that this receives a natural explanation if Tagalog verbs "agree preferentially with *wh*-phrases." If this is indeed the case, then *adobo* can undergo object shift without affecting verbal morphology.

- (49) **Sino** ang nagluto ng adobo? (Tagalog)
Who ANG **NOM-cook** CS adobo?
 'Who cooked adobo/the adobo?'
 (Rackowski & Richards: 39)

Wh-phrases must agree with *v* before moving to their licensing C – that much is apparent from Rackowski & Richards's Tagalog data. But what do these Tagalog facts say about cyclic and long-distance *wh*-movement? An apparent obstacle to a system where Spec,*v*P is used for

wh-movement concerns the phasehood of C. Namely, if the *wh*-phrase does not make an intermediate movement to Spec,CP, how does it become visible to the matrix C?

- (50) a. **Sino_i** [ang binigy-**an** ng lalaki ng bulaklak t_i] (Tagalog)
who_i [ANG gave.DAT CS man CS flower t_i]
- b. *Sino_i [ang nagbigay **ang lalaking** bulaklak t_i]
 who_i [ANG NOM.gave ANG **man.CS** flower t_i]
 'Who did the man give the flower to?'

(Rackowski & Richards: 3)

Recall that (46), copied as (50), showed that the clause containing a *wh*-phrase must Agree with *v*. Agree makes the embedded clause transparent to the matrix clause, so it is not necessary to consider Spec,CP as an escape hatch. *Wh*-phrases never Agree with an intermediate, declarative C in this sort of derivation.

3.3 Does an intermediate C Agree?

3.3.1 Introduction

Bošković's (2008) proposal is as follows. A *wh*-phrase is a probe with a [*uWh*] feature, a [*+wh*] C is its goal. Once the *wh*-phrase has checked its [*uWh*] feature with C by Agreeing, it is frozen for the remainder of the derivation. Freezing after agreement crucially requires that the *wh*-phrase does not Agree with any intermediate complementizers. In case its goal is not visible, the *wh*-phrase moves itself to the edge of the phase under (51).

- (51) Last Resort, Bošković (2008)
 X undergoes movement iff without the movement, the structure will crash.

Because Bošković's system requires there to be no intermediate *wh*-movement to avoid criterial freezing, the evidence reviewed here is in support of this claim.

3.3.2 Selayarese: non-agreeing C in long *wh*-movement

In Selayarese, a language spoken in Indonesia, the verb shows person and number agreement with the subject and the direct object (Finer 1997: 679).⁷ Prefixes agree with the subject, while suffixes agree with the direct object. When the subject is *Baso* in (52a), the verbal prefix is spelled out as third-person singular, while in (52b), the prefix denotes a first-person singular subject.

⁷ A note on glosses: FAM glosses the familiar, as opposed to honorific, second person singular form. 'Human' DPs are marked by *i*, glossed as HUM.

finite clauses, non-finite clauses are SOV. The object must undergo movement to precede the verb in (55). Noonan offers that *an coara* 'the sheep' has undergone object shift – aL is a particle indicating said movement.

- (55) ba mhaith liom [Seán an caora a mheá ar an bhfeirm] (Irish)
 is good with [Seán the sheep aL weigh on the farm]
 'I would like Seán to weigh the sheep on the farm'
 (Noonan 2002: 271)

3.3.4 Kinande *wh-C* agreement: a process of iterative prolepsis

The last piece of evidence against intermediate agreement Bošković presents involves Kinande. Kinande, a Bantu language, has a similar agreement pattern to Irish: each intermediate complementizer has *wh*-agreement morphology.

- (56) [ekihi kyo Kambale a.si [nga.kyo Yosefu (Kinande)
 [What WH-AGR Kambale AGR.know [C.WH-AGR Joseph
 a.kalengekanaya [nga.kyo Mary a.kahuka]]]
 AGR.thinks [C.WH-AGR Mary AGR.cooks]]]
 'What did Kambale know that Joseph thinks that Mary is cooking (for dinner)?'
 (Schneider-Zioga 2005)

Bošković cites Boeckx's (2004) analysis of Kinande long-distance *wh*-movement as iterative prolepsis. Instead of *wh*-agreement morphology being spelled out as a result of the *wh*-phrase Agreeing with each intermediate C, iterative prolepsis treats *wh*-agreement as a local process. That is, the *wh*-phrase and agreement morphology are base-generated in the minimal clause containing them. *Wh*-agreement with intermediate C is made to agree with the head of a chain.

- (57) [_{CP} *wh*_i t_i [_{CP} Op_i t_i [_{CP} Op_i t_i]]]

There are further individual reasons to suspect the iterative prolepsis analysis is the correct one. Bošković's arguments in favor of iterative prolepsis are as follows. Reconstruction is possible under local focus movement in (58a). This is not the case when trying to reconstruct a long-distance dependency, such as in (58b).

- (58) a. **ekitabu kiwe**_{k/j} ky' [**obuli mukulo**]_j a.kasoma (Kinande)
 book his WH-AGR [each student]_j AGR.reads
 kangikangi
 regularly
 '(It is) his_{i/j} book that every student_j reads regularly'

- (61) *Hans hat jemand zu besuchen geplant aber ich weiß nicht
 Hans has someone to-visit planned but I know not
 wen_i Martin gesagt hat daß Hans ~~t_i zu besuchen geplant~~ hat.
 who_i Martin said has that Hans ~~t_i to-visit planned~~ has.
 '*Hans planned to visit someone, but I don't know who Martin said that Hans planned to visit'

(L. Champollion, M. Kaczmar, K. Muller, K.P. Muller, p.c.)

In this section, I have summarized Bošković's (2008) arguments against intermediate feature checking in long-distance A'-movement. Selayarese requires that clausal objects Agree with their selecting verbs. *Wh*-movement prevents agreement, providing reason to suspect intermediate *wh*-agreement does not occur. Likewise, the Irish *aL* particle was argued by McCloskey (1990) to signal intermediate agreement with a *wh*-trace. The appearance of *aL* is much more thoroughly explained as involving *vP* – it is a verbal particle that coincides with object shifted DPs. Finally, intermediate complementizer agreement in Kinande is explainable as iterative prolepsis. *Wh*-agreement is caused by intermediate complementizers entering into Agree with the head of a chain. Data from other long-distance processes, like reconstruction and focus movement, provided independent evidence for this approach. Last, but not least, I showed that Bošković's ellipsis diagnostic demonstrates that English and German also lack intermediate agreement. The above lend credence to the theory that the ban on intermediate feature-checking is a universal.

3.4 Reconstruction and *wh*-islands

The standard analysis in the literature for (62) involves satisfying Principle A in intermediate Spec,CP projections, thereby making the anaphor sufficiently local to a prospective antecedent.

- (62) Which pictures of himself_{i/j} does John_i think Martin_j bought?

However, as Barss (1982) notes, A'-reconstruction is still possible even across a *wh*-island. Consider the examples in (63).

- (63) a. ??Which pictures of himself_i did Mary ask John_i when she should buy?
 b. [Which pictures of himself]_i did Mary [_{VP} t_i ask [John [t_{ask} [_{CP} t_i when [_{IP} she should
 [_{VP} t_i buy t_i]]]]]]]]] (Abels 2003)

For a sentence such as (63a), there is a *wh*-phrase occupying Spec,CP, yet *John* is still able to bind the anaphor. Abels's (2003) proposal introduces the structure in (63b) to account for (63a). (63b) requires intermediate C to have multiple specifiers, with the added stipulation that these specifiers are not equidistant to the attracting C in the matrix clause. Were this not the case,

superiority could be violated, giving **When did Mary ask John which pictures of himself she should buy*.

Under Abels's system, any instance of *wh*-movement that does not pass through the edge of a phase head (C, *v*, etc) wherever such a projection is present is deviant due to an Attract Closest violation. A problem with this movement is that it is made under assumptions of intermediate agreement. If there is no intermediate agreement with C, we have no reason to suspect that Attract Closest is violated under such circumstances. Furthermore, since there is no new feature checked by such a movement, the movement is not licit under Abels's own formulation of Last Resort.⁹

Rackowski & Richards contest that sentences (62) and (63a) are evidence for cyclic movement through Spec,CP. They instead argue that Principle A reconstruction is "silent... on the question of whether these positions are specifiers of CP or of VP" (Rackowski & Richards 2005: 42). Further remarks from den Dikken (2009) consider that, if binding were satisfied using only CP edges, reconstruction into a *wh*-island would not be possible.¹⁰

- (64) a. ??Which pictures of himself does John think that Bill wondered whether Bob would like to buy?
- b. ??Which pictures of himself does John wonder whether Bill said that Bob would like to buy?

(den Dikken 2009: 103)

Bill should be unable to bind the anaphor in (64a), and *John* should not be a possible antecedent in (64b). Instead, some speakers find that all three DPs in (64) may bind the anaphor, despite the presence of a *wh*-island (den Dikken 2009: 103). The same holds true for German: reconstruction over a *wh*-island is possible, despite (65b) being somewhat degraded for it.

- (65) a. Welches Bild von sich selbst_i_j dachte Hans_i daß (German)
 Which pictures of himself_i_j thought Hans_i that
 Martin_j zu kaufen geplant hat?
 Martin_j to-buy planned had?
 'Which pictures of himself_i_j did Hans think that Martin planned to buy?'

⁹Last Resort, Abels (2003)

A constituent α may only be merged if that leads to the immediate satisfaction of a previously unsatisfiable feature.

¹⁰ den Dikken (2009) expresses doubts over whether binding is evidence for intermediate traces and cyclic movement in the first place. Binding in (4) may be explained semantically: for those who share this concern, den Dikken (2009) refers the reader to Sharvit (1999) and Szabolcsi & den Dikken (2000) for a scope-based analysis of *wh*-islands.

- b. ?Welches Bild von sich selbst_{i;j} fragte sich Hans_i ob
 Which pictures of himself wonder-self Hans whether
 Martin_j zu kaufen geplamt hat?
 Martin to-buy planned had?
 '?Which pictures of himself_{i;j} did Hans wonder whether Martin planned to buy?'
 (L. Champollion, p.c.)

3.5 Preposition Stranding

3.5.1 Afrikaans preposition stranding in Spec,CP

Apparent support for cyclic movement via embedded Specs,CP arguably comes from preposition stranding. Du Plessis (1977) presents data from Afrikaans where a *wh*-word + preposition compound (shortened to *wh*-PP from here on) can strand its position at intermediate points in the derivation. First, a bit of background on Afrikaans *wh*-PPs.

- (66) a. **waar** werk ons nou eintlik **voor?** (Afrikaans)
 where work we now actually for
 b. ***waar** werk ons nou eintlik **vir?**
 where work we now actually for
 c. **waarvoor** werk ons nou eintlik?
 where-for work we now actually
 'For what do we actually work?'

(du Plessis 1977: 724)

An important point is the form of *wh*-PPs and their behavior when split: the preposition in *waarvoor* 'what-for' must be stranded in its compounded variant as in (66a), rather than in its standard form *vir* 'for' (66b). We can then confirm that the preposition in (66a) is stranded by *wh*-movement, rather than base-generated in an intermediate position. Finally, (66c) demonstrates that stranding is an optional process: a *wh*-PP can pied-pipe the preposition all the way to its final landing site in the matrix clause.

du Plessis argues that potential stranding positions and cyclic movement sites, namely Spec,CP, are one and the same.

- (67) a. **Waarvoor_i** dink julle [_{CP} t_i werk ons t_i]
 Where-for_i think you [_{CP} t_i work we t_i] (Afrikaans)
 b. **Waar/wat_i** dink julle [_{CP} t_i werk ons [_{PP} t_i **voor**]
 Where/what_i think you [_{CP} t_i work we [_{PP} t_i for]

- c. **Waar/wat_i** dink julle [_{CP} [_{PP} t_i **voor**]_j] [_{werk ons t_j}]
 Where/what think you [_{CP} [_{PP} t_i for]_j] [_{work we t_j}]
 'What do you think we work for?/Wherefore do you think we work?'
 (du Plessis 1977: 724)

The location of *voor* in (67c) suggests this. I have added brackets and traces to du Plessis's original sentences to make the location of Spec,CP more apparent.

3.5.2 *No P stranding in Spec,CP: counterevidence from Dutch*

du Plessis's conclusion for Afrikaans is that it behaves quite differently than other Germanic languages, which are not known to strand prepositions of *wh*-PPs in Spec,CP or any other left periphery position (den Besten 2010: 57). In fact, evidence in the literature from Dutch suggests Afrikaans does indeed pattern with the rest of Germanic.

- (68) a. **Wat_i** had je gedacht [_{CP} dat Jan [_{t_i voorboeken}] (Dutch)
what had you thought [_{CP} that Jan [_{t_i for books}]
 zou lezen?
 would read?
 'What kind of books did you think that Jan would read?'
 b. ***Wat_i** had jij dan gedacht [_{CP} [_{t_j voorboeken}]_i] [_{C dat}
What had you then thought [_{CP} [_{t_j for books}]_i] [_{C that}
 [_{FP} Jan t_i zou lezen]]]
 [_{FP} Jan t_i would read]]]
 Intended: 'What had you then thought for books that Jan would read?'
 (Barbiers 2000)

According to data from Barbiers (2000), Dutch strands P only in midfield positions, as in (68a).¹¹ The Spec,CP variant is deviant: (68b) unambiguously shows that stranding between the complementizer *dat* 'that' and the matrix clause is ungrammatical.

Afrikaans does not differ from Dutch; stranding is grammatical only in the midfield. Rackowski & Richards (2005) present (69) as a counterexample to du Plessis's analysis.

- (69) a. **Wat_i** dink julle [_{CP} t_i [dink die bure [_{CP} t_i [stry ons (Afrikaans)
What_i think you [_{CP} t_i [think the neighbors [_{CP} t_i [argue we
 [<sub>t_i oor]]]]]?
 [<sub>t_i about]]]]]?
 (du Plessis 1977: 724)</sub></sub>

¹¹ A position between C and the VP domain ≈ TP.

- b. **Wat_i** dink julle [_{CP} t_i [dink die bure [_{CP} [t_i **oor**]_j [stry ons t_j]]]?
What_i think you [_{CP} t_i [think the neighbors [_{CP} [t_i **about**]_j [argue we t_j]]]?
- c. ***Wat_i** dink julle [_{CP} [t_i **oor**]_j [dink die bure [_{CP} [t_i stry ons t_j]]]]]?
What_i think you [_{CP} [t_i **about**]_j [think the neighbors [_{CP} [t_i argue we t_j]]]]]?
 'What do you think the neighbors think we argue about?'
 (Rackowski & Richards 2005: 44)

Both (69a) and (69b) are acceptable, and this follows from du Plessis's claim that *wh*-PPs strand P in cyclic movement sites. As Rackowski & Richards show, once a left periphery position is distinguished from a high midfield one, du Plessis's hypothesis makes incorrect predictions: Spec,CP in (69c) should be a licit stranding site for *oor*, but this is not the case. Rackowski & Richards point out that stranding in (67), (69a), and (69b) does not implicate that the *wh*-trace has moved cyclically through Spec,CP. Afrikaans can instead be analyzed in accordance with the rest of Germanic, such that stranding only occurs in the midfield (Spec,νP).

Still, the difference between (67c) and (69c) remains contradictory: stranding appears to target Spec,CP in both sentences, yet only (64c) is grammatical. den Besten (2010) explains this as a construction-specific trait of double V2 interrogatives in Afrikaans and Dutch. Observe the bracketed structure for (67c) in (70).

- (70) [Waar/wat_i dink_{ν2} julle] [_{CP} [_{PP} t_i **voor**]_j] (Afrikaans)
 [_{CP} Where/what think_{ν2} you] [_{CP} [_{PP} t_i for]_j]
 werk_{ν2} ons t_j]]
 work_{ν2} we t_j]]
 'What do you think we work for?/Wherefore do you think we work?'

Under a double V2 interrogative analysis, the matrix verb *dink* is moved to V2 position. This is expected of a normal interrogative sentence in Afrikaans, Dutch, and German. That the embedded clause retains V2 word order is unusual: embedded interrogatives clauses typically do not have the V2 property. Note that the DP *wij* 'we' does not precede the verb in either (71).

- (71) a. **Waar_i** denken jullie [t_i werken wij t_i **voor**?] (Dutch)
 Where_i think you [t_i work we t_i for?]
- b. **Waar_i** denken jullie [t_i **voor** werken wij t_i?]
 Where_i think you [t_i for work we t_i?]
 'What do you think we work for?'

(den Besten 2010: 58)

Dutch also allows for double V2 interrogatives. (72) shows that du Plessis's Afrikaans sentences in (67) can be translated directly to Dutch, a language where stranding is grammatical in Spec,νP positions exclusively. Does this mean that Dutch permits stranding in Spec,CP?

- (72) Waar dink julle **voor** (*dat) ons werk? (Afrikaans)
 What think you for (*that) we work?
 'What do you think we work for?'

(den Besten 2010: 60)

The answer becomes more apparent when (67) is translated to a non-V2 interrogative – stranding in Spec,CP is suddenly ungrammatical in Afrikaans. The stranded material can no longer come between the complementizer and the matrix clause:

What's to blame, then? den Besten (2010: 59) offers that *dink julle* 'think you' in the Afrikaans sentences in (67) and *denken ek* 'think you' for Dutch in (73) are actually clausal inserts headed by an empty operator. These clausal inserts are grammatical in multiple positions and obligatorily trigger subject-verb inversion: the insert *dink ek* in (73a) is licit at any position marked with Δ in (73b).

- (73) a. Ons sokker span **dink ek** het vandag (Afrikaans)
 Our soccer team think I has today
 huis toe gegaan
 home to gone
 'Our soccer team went home today, I think'

- b. Ons Δ sokker span het Δ vandag Δ huise toe gegaan Δ

(den Besten 2010: 59)

When (67c), copied as (74), is approached from this angle, it seems *voor* 'for' is not truly stranded between the matrix clause and the embedded clause. (67c) gives the impression that *voor* 'for' is in Spec,CP, but the insert is not part of the matrix VP. If it is not inserted in the first place, (74) appears mono-clausal. To claim Afrikaans stranding is not exceptional within Germanic is immediately feasible.

- (74) [_{CP} Waar/wat_i <dink julle> [_{PP} t_i **voor**]_j werk ons t_j] (Afrikaans)
 [_{CP} Where/what_i <think you> [_{PP} t_i for]_j work we t_j]
 'What do you think we work for?/Wherefore do you think we work?'

(du Plessis 1977: 724)

3.5.3 *Stranding is grammatical in Spec,vP only!*

There is now a united account for Dutch and Afrikaans preposition stranding: it is only grammatical in Spec,vP positions. When we replicate the Dutch and Afrikaans tests, the prediction is borne out for German.

- (75) a. **Was für eine Katze_i** hast du gedacht $[_{CP}[_c \text{ daß (German)}$
 What-for a cat had you thought $[_{CP}[_c \text{ that}$
 Hans t_i zu kaufen geplamt hat?]]
 Hans t_i to-buy planned had?]]
- b. **Was_i** hast du gedacht $[_{CP}[_c \text{ daß Hans } t_i \text{ für eine Katze}$
 What had you thought $[_{CP}[_c \text{ that Hans } t_i \text{ for a cat}$
 zu kaufen geplamt hat?]]
 to-buy planned had?]]
- c. ***Was_k** hast du gedacht $[_{CP} [t_k \text{ für eine Katze}]_i$ $[_c \text{ daß Hans}$
 What had you thought $[_{CP} [t_k \text{ for a cat}]_i$ $[_c \text{ that Hans}$
 t_i zu kaufen geplamt hat?]]
 t_i to-buy planned had?]]
- d. ***Was_k** hast du $[t_k \text{ für eine Katze}]_i$ gedacht $[_{CP}[_c \text{ daß Hans}$
 What had you $[t_k \text{ for a cat}]_i$ thought $[_{CP}[_c \text{ that Hans}$
 t_i zu kaufen geplamt hat?
 t_i to-buy planned had?
 'What kind of cat did you think that Hans planned to buy?'
 (L. Champollion, K. Muller, K.P. Muller, p.c.)

I have substituted a *was-für* 'what-for' split in (75) place of the Dutch and Afrikaans 'where-for' from (74). Much like the *where-for* constituent in Dutch and Afrikaans, the *wh*-phrase may strand *für* + DP at any site of cyclic A' movement. In (75), the *was-für* + DP constituent is base-generated as the complement of *kaufen* 'buy.' The *wh*-phrase pied-pipes *für* + DP to the matrix Spec,CP in (75a), and it remains in-situ in (75b). Most importantly, preposition stranding in the position in (75c) is ungrammatical. The preposition is stranded between the matrix VP and the complementizer *daß* 'that:' this position is unambiguously an intermediate Spec,CP. The ungrammaticality of (75d) is also expected: the *wh*-phrase does not move to a VP internal position, so it follows that *für* + DP cannot be pied-piped there.

I have presented cross-linguistic evidence supporting the notion that preposition stranding in an intermediate Spec,CP is ungrammatical in Germanic. Prepositions are stranded in the midfield, and I maintain that this position is Spec,VP. The criticisms of du Plessis's (1977) interpretation of Afrikaans data presented here undermine the notion of A'-movement to an intermediate Spec,CP. As Rackowski & Richards (2005) and den Dikken (2009) point out, the hypothesis that Spec,CP is a licit stranding site in Afrikaans makes incorrect predictions. den Besten (2010) provides a much more comprehensive analysis of du Plessis's data, allowing a direct comparison of Afrikaans to other Germanic languages on principled grounds. Finally, I confirmed that Spec,CP is an illicit stranding site in German in (72). If preposition stranding is

possible wherever there is an A'-trace, the evidence in this section suggests intermediate traces are located in Spec,vP, rather than in Spec,CP.

3.6 Floating Quantifiers

3.6.1 *West Ulster English: Q-float in Spec,CP?*

Next, I turn to the positions of floating quantifiers (FQs) as evidence for cyclic movement. A FQ under Sportiche's (1988) proposal may be floated in positions where the DP trace it modifies has moved.¹² McCloskey's (2000) analysis of West Ulster English (WUE) Q-float is cited as an instance where Q-float supports movement to an intermediate Spec,CP.

- (76) a. **What all** did he say (that) he wanted? (West Ulster English)
 b. What did he say (that) he wanted **all**?
 c. What did he say **all** (that) he wanted?
 (McCloskey 2000: 61)

The *wh*-phrase pied-pipes the quantifier into Spec,CP of the matrix clause in (76a), while in (76b) it remains in-situ. (76c) is the crucial piece of evidence for this discussion. *All* looks like it is floated in an intermediate Spec,CP here, since it is located between the matrix clause and the complementizer *that*. Bobaljik (2001: 20) suggests that (76c) could be analyzed as "involving adjunction of *all* to VP." This position is adopted by den Dikken (2009), but under the assumption that FQs are stranded by A'-traces.

McCloskey (2000: 75) and den Dikken (2009: 95) note that verbs in WUE move to a position higher than object shifted DPs. den Dikken claims that the sentence (76a), where the quantifier appears to float in an intermediate Spec,CP, can be analyzed as q-float in Spec,vP instead. The structure displaying this derivation is in (77b).

- (77) a. Who was throwin' stones **all** around Butchers' Gate? (West Ulster English)
 (McCloskey 2000: 77)
 b. $\text{who}_i \text{ was } [_{FP} \text{ throwin}'_j [_{AgrOP} \text{ stones}_k [_{AgrO'} t_j [_{VP} [t_i \text{ all}] [_{V'} t_j [_{VP} \text{ around Butchers' Gate} [v' t_j t_k]]]]]]]]]$
 (den Dikken 2009: 95)

However, the ungrammaticality of (78a) compared to (77a) is surprising. It seems that (78a) should be acceptable, given that FQs in Spec,vP are grammatical.

- (78) a. *What did he say **all** to his friends that he wanted to buy? (West Ulster English)
 b. ?What did he say to him **all** that he wanted to buy?
 c. What did he say **all** (that) he wanted to buy?
 (McCloskey 2000: 63)

¹² That FQs indicate an A'-trace is not guaranteed. See Bobaljik (2001) and sources for further discussion.

den Dikken's (2009) solution to this problem is detailed in (79). Essentially, this analysis of WUE long-distance *wh*-dependencies is the same as Dayal's (2000) analysis for German scope marking constructions like (80).¹³ The matrix *wh*-phrase is base-generated in a scope position, while the embedded *wh*-phrase undergoes *wh*-movement to the embedded Spec,CP. The result is concordial scope marking of the scope marker (matrix *wh*-phrase) and the embedded *wh*-phrase.

(79) [CP What [TP did he [vP say [CP WH+all [C that [TP he [vP wanted]]]]]]?]

(80) Was glaubt Hans [CP [welches Bild von sich selbst]_i] Martin t_i (German)
 What believe Hans [CP [which picture of self]_i] Martin t_i
 gekauft hat?]
 bought had?]
 'Which picture of himself did Hans believe Martin bought?'

den Dikken argues that *all* is pied-piped by a silent *wh*-phrase that moves to the embedded Spec,CP in (76). This analysis is not entirely unmotivated. Recall that Agree drives movement to Spec,CP. It is critical to assert that Q-float is a result of *terminal movement* to Spec,CP for the purpose of checking a [*uWh*] feature – the silent *wh*-phrase has moved to Agree with the [+*wh*] embedded C. *All* is not floated in Spec,CP by way of cyclic movement on these grounds. A consequence of this proposal left undiscussed by den Dikken (2009) is if the silent *wh*-phrase violates the doubly-filled COMP filter in sentences where overt *that* is allowed. It is not clear if this is grammatical in other contexts in WUE.

3.6.2 German: Q-float in Spec,vP positions

I now return to German in light of the exceptional WUE data. FQs in Spec,CP are ungrammatical in German. (81a) depicts this. (81b) makes it clearer that this position is indeed Spec,CP, as the quantifier is floated between the matrix verb and the complementizer.

(81) a. Welche Würste hat der Peter gesagt [CP (***alle**) (German)
 Which sausages has the Peter said [CP (***all**)
 der Hund gegessen hat?]
 the dog eaten has?]
 'Which sausages did Peter wonder whether the dog has eaten all (of)?'

¹³ The analysis of scope marking here assumes Indirect Dependency. See Dayal (2000) and Beck & Berman (2000) for further discussion on Direct versus Indirect Dependency.

- b. Welche Würste hat der Peter gesagt [_{CP} (***alle**) daß
 Which sausages has the Peter said [_{CP} (***all**) that
 der Hund gegessen hat?]
 the dog eaten has?]
 'Which sausages did Peter say (***all**) that the dog ate?'

(Bobaljik 2001: 19-20)

While Bobaljik (2000: 19) claims (81a) demonstrates stranding in a matrix clause is ungrammatical, my informants judged (82b) as grammatical. The position of the FQ in (82b) is expected if A'-traces move cyclically through Spec, vP. *Alle* is ambiguous between being in-situ or floated in Spec, vP in (82c). The data here suggest that, when a quantifier is floated, its position must be Spec, vP.

- (82) a. Welche Würste hat der Peter (***alle**) bezweifelt (German)
 Which sausages has the Peter (***all**) doubted
 ob der Hund gegessen hat?
 whether the dog eaten has?
 'Which sausages did Peter doubt whether the dog has eaten all (of)?'

(Bobaljik 2000: 19)

- b. Welche Katzen hast du [_{vP} [**alle** beschlossen [_{CP} zu kaufen?]]]
 Which cats had you [_{vP} [**all** decided [_{CP} to-buy?]]]
 'Which cats had you decided to buy all of?'
- c. Welche Katzen hast du [_{vP} beschlossen [_{CP} [_{vP} **alle** zu kaufen?]]]
 Which cats had you [_{vP} decided [_{CP} [_{vP} **all** to-buy?]]]
 'Which cats had you decided to all buy?'

(L. Champollion, M. Kaczmar, p.c.)

3.7 Summary and conclusion

I have reviewed two proposals with alternative approaches to cyclic A'-movement within this chapter, as well as arguments for and against Spec, CP as a site for cyclic movement. This provides an answer for why *wh*-phrases might be able to move cyclically through Spec, CP, but cannot be spelled out there. Under a Rackowski & Richards (2005) approach, the *wh*-phrase never moves to the infinitival Spec, CP in the first place: all of the relevant movements pass through Spec, vP. Bošković's (2008) system would still have a *wh*-phrase move to an intermediate Spec, CP, but the *wh*-phrase does not Agree with C. The same is true of Rackowski & Richards's theory.

Reconstruction, preposition stranding, and Q-float are only possible in Spec, vP positions, as Rackowski & Richards's theory would predict. Bošković's theory is largely silent on this. If

the theory is appended to include intermediate agreement steps with *v*, it should be possible to derive these effects at intermediate agreement sites. Of course, that criterial freezing is a factor poses a tremendous problem – this hypothetical intermediate agreement feature would have to be separate from [*uWh*] on the *wh*-phrase.

Either way, long *wh*-movement appears much more consistent with the facts of *wh*-infinitives. *Wh*-agreement with the infinitival C is *never* possible. Furthermore, if the *wh*-phrase does indeed move cyclically through Spec,vP, it never moves to an embedded Spec,CP, the position where *wh*-infinitives are ungrammatical in the first place.

4. ON THE AVAILABILITY OF *WH*-INFINITIVES

4.1 Introduction

While the first chapter dismissed a doubly-filled COMP explanation for ungrammatical *wh*-infinitives, I did not provide an alternative analysis. I introduce a proposal by Sabel (2015) that links the grammaticality of *wh*-infinitives to the presence or absence of overt infinitival complementizers in a language. There are some elements within Germanic, such as the German purposive preposition *um* and the Swedish infinitival marker *att*, that seem as if they could satisfy this requirement. I will argue that neither is a complementizer.

Sabel briefly remarks on how his findings could be related to language acquisition: learners must need an overt infinitival complementizer to set the parameter that permits *wh*-infinitives. I add to this conclusion by referring to an acquisition study conducted by Chacón et al (2015), which finds that learners infer *that-trace* effects from microparametric syntactic differences. I propose that this can be applied to the acquisition of *wh*-infinitives.

4.2 Sabel (2015): the *Wh*-Infinitive Generalization (WHIG)

Sabel (2015) links the grammaticality of *wh*-infinitives to the availability of an overt, base-generated infinitival complementizer. I have bolded the WHIG's key stipulations for emphasis, as these are important factors in the WHIG's ability to make accurate predictions.

(83) Wh-Infinitive Generalization (Sabel 2015: 6)

If *wh*-movement **may terminate in the Spec CP** of an infinitive in a language then this language possesses the option of filling the C-system of **this (type of) infinitive** with an **overt complementizer**.

Languages without an overt complementizer have a defective C-system. Defective C has the following traits.

- C cannot bear a complete range of features
- Defective C has a full set of phi-features, and tense qualities are transferred to T
- Force, Focus, and Topic movement are not realized in the left periphery of infinitives. Infinitives are realized as FinP.
- Defective C has an edge feature: *wh*-phrases may cyclicly move through its specifiers

(Sabel 2015: 8)

The WHIG is construction-specific. For the WHIG to be satisfied, the complementizer must be base-generated, rather than derived by movement to C. Considering the discussion I presented in section 1, defective C may not need an edge feature at all. It is possible that all long-distance *wh*-movement uses Spec,νP for cyclic movement and will not Agree with an intermediate C or move through its specifier.

I will briefly explain how the WHIG predicts that *wh*-infinitives are ungrammatical in German by comparing it to English and Dutch, two Germanic languages where they are grammatical. English, for instance, has an overt complementizer introducing an infinitive in the *for... to* construction:

- (84) a. I wanted [_{CP} for the washing machine to work normally.]
 b. *I wanted [_{CP} what for to work normally?]
 c. I wanted [_{CP} what to work normally?]

(84a) is a *for... to* construction: since *for* is base-generated in C here, the WHIG predicts that English will permit *wh*-infinitives. Adding a *wh*-phrase to (84a) produces (84b), which violates the doubly-filled COMP filter. Lastly, (84c) confirms that the WHIG is correct regarding the *for...to* construction: English may indeed exchange *for* for a *wh*-phrase.

German does not allow *wh*-infinitives, of course. *Zu* neither satisfies the WHIG or violates the doubly-filled COMP filter on its own; arguments presented in section 1 show in considerable detail that *zu* is not a complementizer.

- (85) *Lisa hat entschieden [_{CP} was Tom zu sagen] (German)
 Lisa has decided [_{CP} what Tom to say]
 'Lisa has decided what to say to Tom'

(Sabel 2015: 1)

Dutch, on the other hand, has the infinitival complementizer *om*: *wh*-infinitives are grammatical. While Dutch *om...te* 'in-order to' and German *um...zu* constructions are alike, *um* does not satisfy the WHIG. The following section will discuss the differences between the two.

- (86) a. Hij probeerd [_{CP} om zijn armen te bewegen] (Dutch)
 He tried [_{CP} C his arms to move]
 'He tried to move his arms'

(Google search)

- b. Ik weet niet [CP wie te bezoeken]
 I know not [CP who to visit]
 'I do not know who to visit'

(Sabel 2015: 2)

4.3 Is *um* a complementizer? A comparison to Dutch *om*

Since satisfying the WHIG is dependent on having an infinitival complementizer, it is not immediately clear why *um* in *um...zu* 'in-order to' constructions does not satisfy it. German *um-zu* has been argued in the past to be a complementizer (van Riemsdijk 1975), but more recent proposals have rejected this notion. This section will demonstrate that *um...zu* and *om...te* constructions, although similar, perform different functions.

German has a number of complementizer-like elements (*anstatt* 'instead of,' *ohne* 'without,' *als* 'rather') that, upon further investigation, are prepositions that take a sentential complement. Giusti's (1986) sentences in (87) show that *anstatt*, etc. can co-occur with an overt complementizer: they may take a *daß* 'that' CP complement. They must not be complementizers, given this information.

- (87) a. er ging durch die Straße **ohne** [CP **daß** er (German)
 He walked along the streets without [CP that he
 einen Mantel trug]
 a coat wore]
 'He walked along the streets without wearing a coat'
- b. du solltest früher aufstehen, **anstatt** [CP **daß** du so
 You should earlier up-wake **instead** [CP **that** you so
 lange im Bett bleibst
 long in bed stay
 'You should wake up earlier instead of staying in bed so long'
- c. er fuhr lieber mit der Straßenbahn, **als** [CP **daß** er
 he ride prefer with the streetcar **rather** [CP **that** he
 den langen Weg, zu Fuß machte]
 the long way on foot make]
 'He preferred to take the streetcar than to walk such a long way'

(Giusti 1986: 118-119)

Um and *daß* are incompatible, however – *um* appears as if it is a complementizer in (88).

- (88) er hat das Land verlassen, [**um** (***daß**) (German)
 He has the country left [**in-order** (***that**)
 sie zu retten]
 she to-save]
 'He has left the country in order to save her'

(Giusti 1986: 118-119)

While (88) supports that *um* is a complementizer, consider that *um...zu* clauses are islands for *wh*-extraction (Giusti 1986). *Um...zu* clauses are interpretable only as purposive adjuncts, so it is not surprising that they are subject to the cross-linguistic ban on extraction from adjuncts.

- (89) **wen_i* hat er das Land verlassen, [um *t_i* zu retten] (German)
who_i has he the country left [um *t_i* to save]
 'Who has he left the country in order to save?'

(Giusti 1986: 126)

Extraction from a normal *zu* infinitive is, by contrast, completely grammatical in (90). More importantly, extraction from a *daß* CP is also grammatical.

- (90) a. *Wen_i* hat Tom entschieden *t_i* zu heiraten (German)
 Who has Tom decided *t_i* to-marry?
 'Who has Tom decided to marry?'
 b. *Wen_i* denkst du, daß ich *t_i* treffen soll?
 Who think you that I *t_i* meet should?
 'Who do you think that I should meet?'

(Sabel 2015: 7)

(M. Kaczmar, p.c.)

Dutch *om* introduces true sentential complements, such as in (91a). This is not a possibility with *um* (91b), once again suggesting that it should not be regarded as a proper *for*-like complementizer. If we consider this as sufficient evidence against *um* as a complementizer, the WHIG makes the correct prediction for German and Dutch.

- (91) a. Jan heeft geprobeerd [om het boek te lezen] (Dutch)
 Jan has tried [in-order the book to read]
 'Jan has tried to read the book'

- b. Hans hat versucht [(**um*) das Buch zu lesen] (German)
 Hans has tried [(**in-order*) the book to read]
 'Hans has tried to read the book'
 (Giusti 1986: 124)

4.4 Swedish *att* is not a base-generated C, does not contradict top-down stripping

Swedish poses an obstacle to the WHIG. The Swedish infinitival marker *att* is exceptionally high in infinitives. Consider the sentences in (92).

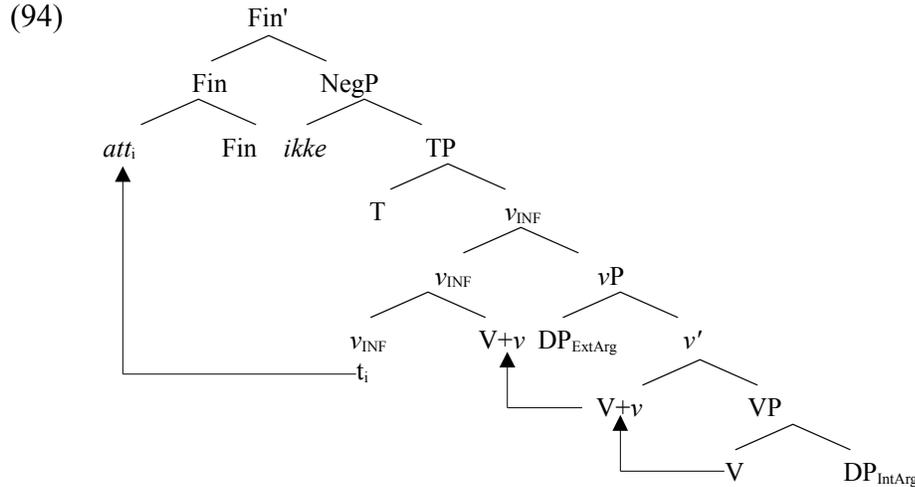
- (92) a. jag har försökt(*att*) inte köpa boken (Swedish)
 I have tried (to) not buy.INF the-book
 'I have tried to not buy the book'
 (Giusti 1991: 228)
- b. De prövade att all alltid jobba heltid
 They try.past to all always work.INF full-time
 'They try to all always work full-time'
 (Wiklund 2007: 70)

In (92a), *att* precedes sentential negation. It also comes before both a sentential adverb *alltid* 'always' and the floating quantifier *alla* 'all' in (92b). That *att* appears very high in the derivation prompts Wiklund (2007) to adopt an analysis of *att* as a complementizer.

This has repercussions for Sabel's (2015) proposal, since the WHIG should then predict that (93) is grammatical. Instead, the *wh*-infinitive in (93) may well be ungrammatical due to *vad* 'what' and *att* violating the doubly-filled COMP filter.

- (93) *Han har glömt [vad att köpa] (Swedish)
 He has forgotten [what to buy.INF]
 'He has forgotten what to buy'
 (Sabel 2015)

Recall that the WHIG requires infinitival complementizers to be *base-generated* in order to hold. Christensen (2007) proposes that *att* and infinitival markers for English, Danish, Norwegian, and Icelandic, are base-generated in v_{INF} , a projection immediately dominating vP . A full derivation under Christensen's (2007) proposal is as in (94).



The verb moves to the complement of att/v_{INF} , and att then moves to Agree with Fin, checking Fin's $[u\phi]$ and [EPP] features. If this is the case, the WHIG remains correct, since att is not base-generated in C.

Christensen's movement proposal explains another issue raised by Wiklund's analysis. Wiklund (2007) focuses on the properties of Swedish copying constructions. General properties of copying are described in (95).

(95)

- Verbs have identical inflectional morphology; morphology of V2 is dependent on V1.
- Only one overt subject; embedded clause may not contain a subject.
- Matrix verbs that introduce these constructions are limited.

A copying infinitive must be transparent to the matrix clause in order to copy its tense and negation features. On this basis, Wiklund contends that copying constructions are a restructuring effect limited to a small class of verbs, including *try*.

- (96)
- | | | | | | | | |
|----|--|----------|---------|------------|---------|--------|-----------|
| a. | Han | försökte | o | skrev | ett | brev | (Swedish) |
| | he | try.PAST | & | write.PAST | a | letter | |
| | 'He tried to write a letter' | | | | | | |
| | | | | | | | |
| b. | Han | hade | kunnat | krivit | | | |
| | he | had | can.PPC | write.PPC | | | |
| | 'He had been able to write' | | | | | | |
| | | | | | | | |
| c. | Han | satt | o | skrev | dikter | | |
| | he | sit.PAST | & | write.PAST | poem.PL | | |
| | 'He was writing poems (in a sitting position)' | | | | | | |

(Wiklund 2007: 1)

- (99) *That-trace* conservative learning strategy, Chacón et al (2015: 6)
Learners assume that grammars exhibit the *that-trace* effect until exposed to evidence that suggests otherwise.

The conservative strategy assumes the *that-trace* effect is the default in UG. Learners must then be exposed to considerable data that their L1 exhibits no *that-trace* effects.

- (100) *That-trace* indirect learning strategy, Chacón et al (2015: 7)
If a language permits post-verbal subjects, then there exists a grammatical parse for subject extractions over an overt complementizer that does not violate the *that-trace* constraint.

In indirect learning, learners use unrelated syntactic cues to derive aspects of their L1's grammar. In the case of the *that-trace* effect, they must be exposed to post-verbal subjects in languages such as Spanish and Italian.

Upon examining Pearl & Sprouse's (2013) acquisition model trained on corpora of child-directed speech, Chacón et al argue that there is insufficient evidence for children to acquire *that-trace* effects directly. The corpus contained no *that-trace* violations and just 2 long distance object extractions across an overt complementizer. It seems dubious that input so impoverished, even extrapolated over a long period, is sufficient to learn the *that-trace* effect direct. Chacón et al note that a conservative learner could be successful if this were the sole relevant input: they would default to having *that-trace* effects.

But, upon constructing similar corpora of Spanish and Italian child-directed speech, Chacón et al find that the stimulus in these languages is nearly as impoverished as English. In the Spanish corpora of 48,109 sentences, there were 49 cases of long-distance object extraction and 6 of subject extraction over an overt complementizer. The Italian corpus of 46,846 sentences had 4 instances of object extraction, and 1 of subject extraction (Chacón et al 2015: 27).

A random sample of the Spanish corpora reveal significant support for the indirect learning strategy in (100). Of 1000 random sentences, there were 40 instances of post-verbal subjects and 244 null subjects. Spanish and Italian learners have scarce access to the relevant data in a direct learning strategy to determine there is no *that-trace* effect, but instead have considerable indirect evidence to infer this property from.

- (101) Modified version of (100):
Indirect *wh*-infinitive learning strategy: learners must be exposed to an overt, base-generated complementizer to know *wh*-infinitives are available.

Returning to German and the WHIG, (101) proposes how learners might acquire *wh*-infinitives. The presence of an overt infinitival complementizer is a cue that learners rely on to determine whether or not the construction is grammatical in their L1. The position of movement-derived infinitival "complementizers" in large corpora of Swedish and Icelandic child-directed speech might be used to test this generalization.

4.6 Conclusions

This section introduced Sabel's (2015) *Wh-Infinitive Generalization* (WHIG) as a plausible explanation for why languages permit or ban *wh*-infinitives. I presented Sabel (2015) and Giusti's (1986) arguments against *um* as a complementizer, thereby demonstrating German cannot satisfy the WHIG. Swedish *att* also appeared to be an infinitival complementizer, but I followed Christensen (2007) in claiming it is not base-generated in C. It does not violate the WHIG on these grounds. Wiklund (2007) argued that *och*, an element spelled out by the same functional head as *att*, was not a complementizer that violated top-down stripping in restructuring.

Chacón et al's (2015) findings were further used to supplement the WHIG. Language learners have minimal overt exposure to sentences relevant for acquiring or dismissing *that-trace* effects in their target language. Instead, they use the presence of postverbal subjects to infer this property. I argue that overt infinitival complementizers serve the same purpose for learning whether or not *wh*-infinitives are grammatical in the learner's target language.

5. CONCLUSION

The purpose of this thesis was to explore the properties of *wh*-infinitives, particularly those in German. Let us return to the German *wh*-infinitive (1) from the introduction, copied here as (102).

(102)	*Ich weiß nicht [was	zu	kaufen]	(German)
	I know not [what	to	buy.INF]	
	'I do not know what to buy'			

First, German *wh*-infinitives do not violate the doubly-filled COMP filter. The German infinitival marker *zu* is not a complementizer, nor does it obligatorily insert a null complementizer. Evidence from restructuring infinitives tell us as much – *zu* is obligatory even in bare VP complements.

I argued in favor of Abraham's (2004) proposal that *zu* is an infinitival preposition spelled out by an Asp head. *Zu* functions like a preposition with regards to Abel's (2003) Stranding Generalization: *zu*'s complement, an infinitive verb, may not be extracted. Wurmbrand (2001) shows that, while restructuring infinitives may be bare VPs, they still carry an irrealis interpretation, lending support for an Asp head in restructuring. This allows us to correctly predict where *zu* appears, regardless of clause size.

Section 3 addressed the question of why a *wh*-phrase could cyclically move through infinitive Spec,CP in long-distance *wh*-extraction, yet could not be spelled out there. I referred to two different systems of A'-movement that required there to be no agreement with an intermediate C. First, I presented arguments in favor of cyclic A'-movement through Spec,vP, instead of Spec,CP, from Rackowski & Richards (2005) and den Dikken (2009). I also presented Bošković's (2008) proposal for *wh*-movement that utilized a reformulated Last Resort rule.

- (103) a. *Tom hat entschieden [wen zu heiraten] (German)
 Tom has decided [who to marry.INF]
- b. Wen_i hat Tom entschieden [t_i zu heiraten]
 Who_i has Tom decided [t_i to marry.INF]
 'Who has Tom decided to marry?'
- (Sabel 2015: 7)

I concluded that either proposal could better explain long *wh*-movement in languages that do not allow *wh*-infinitives. Evidence from German and other languages, however, favors the Rackowski & Richards approach. Reconstruction, preposition stranding, and Q-float all appear to target to Spec,*v*P.

The purpose of section 4 was to introduce and defend Sabel's (2015) *Wh-Infinitive Generalization* (WHIG). I introduced Sabel (2015) and Giusti's (1986) arguments against *um*, a German preposition that introduces a purposive sentential complement, as a complementizer. I then turned my attention to *att* and *och* in Swedish, two elements that seemed to be complementizers. Christensen's (2007) proposal demonstrated that *att*'s final position is derived by movement to Fin. I extended this analysis to *och*, arguing that it is not a complementizer and does not refute top-down stripping in restructuring contexts.

I discussed how the acquisition model presented by Chacón et al (2015) could explain how language learners acquire *wh*-infinitives. The presence of infinitival complementizers may act as a cue that learners use to infer if *wh*-infinitives are grammatical in their target language.

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